

GAZETTEER OF



WEST PAKISTAN



THE FORMER PROVINCE OF

SIND

Gul Hayat Institute

(INCLUDING KHAIRPUR STATE)

H. T. SORLEY

FRONTISPIECE



Gul Hayat Institute

STATUETTE—Moenjo-Daro, from drawing by H.T. Sorley.

THE GAZETTEER OF WEST PAKISTAN

THE FORMER PROVINCE OF
SIND
(INCLUDING KHAIRPUR STATE)

Gul Hayat Institute

COMPILED BY

DR. H. T. SORLEY

C.S.I., C.I.E., M.A., D. LITT., F.R.S.A. (I.C.S. RTD.)

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GOVERNMENT OF WEST PAKISTAN

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FOREWORD

The publication of Dr. H. T. Sorley's Sind Gazetteer has been delayed by various administrative and practical difficulties. For one thing, sufficient funds were not available because of the pressing requirements of more important Government projects. Amongst the most recent difficulties was the outbreak of 1965 War with India and its after-math.

The work gathered speed as a result of an enquiry made by the President of Pakistan, Field Marshal Muhammad Ayub Khan, N.Pk., H.J. The Advisor to the President, Mr. S. Fida Hassan, H.Q.A., S.Pk., conveyed the President's directive to the Provincial Authorities to complete the gazetteer work expeditiously. The Governor of West Pakistan, Mr. Muhammad Musa, H. Pk., H.J., H.Q.A., took personal interest in the matter by requiring periodical reports of the progress made in this direction. Mr. S. I. Haque, S.Pk., C.S.P., Chief Secretary, personally went into the entire situation.

Meanwhile, Mr. Manzoor Ilahi, S.Q.A., C.S.P., Member, Board of Revenue, West Pakistan, after giving deep thought to the matter, had already come to the conclusion that the Gazetteer Cell would best serve its purpose through a scientific re-organisation. Further changes were suggested by Mr. Fida Hassan with a view to ensuring even greater efficiency and in a meeting presided over by Mr. S. I. Haque and attended by Mr. Manzoor Ilahi and myself a decision was taken on the implementation of the final plan. It was decided that the main task of writing District Gazetteers should primarily be assigned to the Deputy Commissioners/Political Agents and the final vetting and editing be undertaken by a Board of Editors. The Chief Secretary wrote demi-official letters to all concerned impressing upon them the need for taking the task in hand with a sense of urgency. Similarly, the Board of Revenue provided the Deputy Commissioners/Political Agents with guide-lines to enable them to produce qualitatively superior work according to schedule.

I am grateful to Mr. Manzoor Ilahi, who reposed complete confidence in me by entrusting to me the exclusive responsibility of carrying out the new scheme. I have all along benefitted by his invaluable guidance. During his absence away on leave I was equally fortunate in having the benefit of the sound advice of Mr. Rifat Pasha Sheikh, S.Q.A., C.S.P., whose solicitude for the success of the Gazetteer work has been a source of great encouragement to us all.

Under the new set-up this year we were able to secure at a very opportune moment the services of Mr. Abdul Qayyum, M.A., formerly Lecturer in English, Government College, Lahore and Mr. Jafar Qasimi, M.A., formerly of B.B.C.'s Eastern Service, London and lately Education and Publication Advisor, West Pakistan Auqaf Department. They set about their duties in right

earnest and spared themselves no pains in seeing the work through, by personally supervising the printing process at all its stages. Their initial task was facilitated to some extent by the spade-work effected by that distinguished scholar, Dr. S. M. Ikram, S.I., C.S.P., (retired) former Member, Board of Revenue, West Pakistan, who had been associated with the Gazetteer work earlier on. The Editors also received the advice of the Sind Adabi Board rendered through its experts, particularly so by Mr. M. A. Channa, some of whose useful suggestions have been incorporated as foot-notes in Chapter—X. To all these gentlemen I extend a sincere word of thanks.

It would be proper here to warmly thank Mr. Akhlaq Hussain and Mr. Imran Shah, former Additional Secretaries, Finance Department and also Mr. Zaidi, Section Officer, Finance Department, for doing everything possible to simplify things as regards the financial side.

Now a word about the actual body of Dr. H. T. Sorley's original draft. There is no denying the fact that he is an eminent authority on Sind and allied matters as must be well-known to all those who have derived much pleasure and profit from the reading of his "Shah Abdul Latif of Bhit", an Oxford Publication. It is equally undeniable, however, that he approached the subject with a fixed habit of mind and not without a certain bias characteristic of a former I.C.S. Officer of British origin who had seen the hey-day of the British Raj. In this regard particular mention may be made of the fact that his account of the annexation of Sind is untenable, being at variance with the historical verities as established by contemporary authorities. The same applies to certain turns of expression that came naturally to him but without perhaps the least intention of offending our national susceptibilities. So without taking undue liberties with the original text, the Editors thought it fit to expurgate, as far as possible, all that was likely to constitute a solecism, albeit an inadvertent one.

When all is said and done, Dr. Sorley's work emerges as a very important document. Indeed, almost every chapter written by him has the impress of his erudition upon it and bears eloquent testimony to the infinite pains he must have taken in its preparation. Evidently it is not up-to-date. Pakistan has since taken great strides and we could not possibly take sufficient notice of it without considerably re-writing and even re-creating Dr. Sorley's work. In fact the Board of Revenue did explore the possibility of publishing a thoroughly revised version of the Gazetteer in question but circumstances were found to be rather unpropitious and it was agreed that we should go ahead with its publication with minor revisions only and without any further loss of time. We feel that the best way of updating it would be to issue supplements as soon as possible, or better still by bringing out an entirely new edition later on. This should not present much difficulty as we feel that the recent reorganization of the Gazetteer Cell will go a long way in producing better results.

So much regarding "the sins of commission". As regards "the sins of omission", Dr. Sorley did not treat of Karachi exhaustively in his Gazetteer, because it was then enjoying the status of Federal area. Similarly his treatment of Places of Interest would be found to be less than comprehensive. Furthermore a great deal of modern research in various fields of human knowledge seems to have necessitated additions to some of his observations as well as those made by the three experts who contributed the valuable chapters on botany, geology and zoology. All such matters will be taken care of in any further editions.

It would also be pertinent to point out here that various statements and observations made by Dr. Sorley throughout this work must be treated as his personal views and that they do not prejudice the rights and claims of Pakistan in any shape or form. In fact this is the most important reason why a future edition is strongly indicated.

In conclusion, I would like to place on record my appreciation of the hard work put in by all those who have remained in the background, as it were, and whose quiet but sustained efforts have contributed not a little to the successful completion of the present publication. In this regard I would like to mention Mr. Ghulam Murtaza Khan Bajwa, M.A., P.C.S., Deputy Secretary (Gazetteer) who has been looking after the Gazetteer Wing with his characteristic thoroughness and efficiency. Similarly Mr. Nasir Ali Gardezi, Administrative Officer, Gazetteer Cell, together with all other members of the Cell, deserves special commendation. I must further acknowledge the keen interest shown in the project by Al-Hajj Hafiz Muhammad Inamul Haq Siddiqi, Controller, Printing and Stationery, West Pakistan, as well as the willing and helpful co-operation extended by Mr. G.A. Mujaddidi, Superintendent, Mr. Muhammad Ismatul Haq Siddiqi, Manager (Works), West Pakistan Government Press, Karachi and all their staff. Finally, mention may also be made of the excellent performance of Naz Photo Service, Lahore in preparing the coloured photographs most satisfactorily in a remarkably short time.

Gul Hayat Institute

SYED JAMIL HAIDER SHAH, CSP.,

Lahore,
August, 1968.

Secretary,
Board of Revenue, West Pakistan.

PREFACE

The Sind Gazetteer, now renamed the Gazetteer of Hyderabad and Khairpur Divisions (of the political unit of West Pakistan) has been rewritten after more than fifty years. The half century has been a momentous and revolutionary one. It has seen two world wars, the partition of the Sub-continent, the creation of Pakistan, the birth and death of Sind as a Governor's province with a legislature of its own, and a series of changes economic, political, social and administrative of the most far-reaching kind. The present volume constitutes the third edition of the Gazetteer. The first edition was compiled in 1874 by A.W. Hughes, a member of the Bombay Revenue Service, and there was a slightly amended re-issue of it in 1876. The second edition was compiled in 1907 by E. H. Aitken, of the Bombay Salt and Excise Department. Both editions have long been out of print and are hard to obtain. Mr. Hughes's work shows many defects of arrangement and exposition but it contains a vast amount of valuable material, some of which now possesses historical importance as illustrating a state of affairs that no longer exists. Mr. Aitken's edition was distinguished especially by its expert treatment of natural history of which Mr. Aitken was himself an acknowledged master, as he proved in his two delightful classics of British India, "Tribes on my Frontier" and "Behind the Bungalow". The present edition, for which I am responsible, has drawn heavily upon Mr. Aitken's work where this is still true of present day Sind and Khairpur region. To a lesser extent it has relied on portions of Mr. Hughes's Gazetteer. It would indeed be sad if these two interesting works were now to be found only in extracts in the present volume. The West Pakistan Government would be wise to reprint, in a special publication of its records, such portions of the 1874 and the 1907 editions as may be considered now to possess matter of historical and sociological importance. I have been greatly honoured in being asked by the West Pakistan Government to undertake the rewriting of what is from any point of view a volume of more than local interest. The former Sind has during the last half century roused world-wide interest by reason of the excavations of Moen-Jo-Daro from 1922 onwards. These drew the attention of the archaeological world to the true significance of the prehistoric civilisation of the Indus Valley with its undeciphered script and its wonderful carved seals or amulets. Sind's achievement in irrigation has also made it world famous. The irrigational revolution began with the opening of the Lloyd Barrage over the Indus at Sukkur in 1932 and the subsequent extension of flow irrigation over most of the fertile, cultivable valley of the Indus plain. It was continued with the building of second Barrage, the Ghulam Muhammad Barrage at Kotri in 1955, and with the undertaking of yet a third Barrage, the Gudu Barrage (still under construction) at Gudu in Upper Sind. These great schemes carry the silt bearing waters of the Indus through hundreds of miles of canals and distributaries

from one end of the country to the other, and provide the life for the agriculture on the cultivable land that can be profitably taken up. Thus both in archaeology and in irrigation former Sind has lessons to teach the whole world.

My own qualifications for the task I was asked to undertake are mainly administrative. It was my good fortune to begin my career in the Indian Civil Service in Sind during the British period. Later on I held charge of the districts of Hyderabad, Nawabshah, Tharparkar, Sukkur and Jacobabad at various times. Later still, from 1950 to 1952, when I occupied the post of Member, Central Board of Revenue, Government of Pakistan, I had further opportunity to renew my acquaintance with, and deepen my affection for, the country which today comprises the Hyderabad and Khairpur Divisions. In a work which I wrote in 1939 on Sind's National Poet, Shah Abdul Latif of Bhit, I have paid tribute to the people and the region of Sind. In much that I have written for the present volume I have been fortified by personal knowledge of many of the events of the last forty years in from and by personal friendship with hundreds of Sindhis over more than a generation. This is an advantage which neither Mr. Hughes nor Mr. Aitken had the good fortune to enjoy. The visit I paid to West Pakistan in the spring of 1956 showed me the vast improvement brought about by the immense extension of flow irrigation in the Indus plain since the early thirties of the present century. I visited Khairpur and noted the great changes there, and I saw once again three of the houses which, in the days of my service in Sind, I had occupied as a Collector. This trip in 1956 allowed me to plan with the Chief Secretary in Lahore the general form of this Gazetteer and inspect the Record Office in order to obtain facilities for the use of administrative and departmental records of over half a century.

The practical difficulties in the compilation of this Gazetteer have been considerable. This was due, not merely to the long period of half a century which the volume covers, but also to revised administrative set-up caused by political changes and also, to some extent, by the impact on the administration of the Second World War. This event caused much more complication than the First World War in the running of departments and in the regular issue of official reports. But the greatest difficulties arose from the unsettlement occasioned by the partition of the sub-continent in 1947 and the period of confusion which followed it with the enormous problems created by the settling in Pakistan of huge numbers of uprooted people. Finally, when Pakistan was established and Karachi became the Federal capital of the new state, the Government of Sind, which then existed as a sovereign unit, had to transfer its headquarters to other accommodation in Karachi and then in 1955, when the Government of Sind ceased to exist as a sovereign unit, the seat of provincial Government of West Pakistan was transferred to

Lahore. All this was most disturbing for the keeping of records and it is feared that many important departmental records are not available. Moreover, during the days of the greatest unsettlement several departments delayed publication of annual reports or issued them in abbreviated form, often only typed and not printed. When I visited the Record Office of the West Pakistan Government at Lahore Secretariat in 1956, the Sind records were in the course of transfer from Karachi to Lahore and many of them could not be traced. As a result of these vicissitudes it was found impossible to obtain a complete set of all administration reports from 1907 till the date of rewriting of this Gazetteer, and the best that could be done had to be done with only what was readily obtainable. In these circumstances the plan I have followed in rewriting this Gazetteer has been to make typical selections from the record at various periods of the half century. Perusal of the whole mass of issued reports was out of the question. To cover fifty years of administration in any case was a most formidable undertaking in itself. Many defects which appear in the treatment of subjects in this volume must therefore be ascribed to the inherent obstinacy of a complicated problem.

In compiling this Gazetteer I have been helped in important ways. The three chapters dealing with botany, geology and zoology have been written by experts in their subject, namely botany, by Dr. S. Z. Hasanain, Ph. D., Professor of Botany in the University of Karachi, who is probably the most knowledgeable person on the botany of Sind region alive today; by Dr. H. H. Rennison, the Senior Geologist to the Pakistan Petroleum Company, who is familiar with the latest borings done in Sind in the search for oil and has studied the stratigraphy of the Sind rocks; and by Mr. K. R. Eates, M.B.E., who is one of the foremost ornithologists with specialised knowledge of the Sind countryside and an acknowledged expert in the study of the eggs of Sind birds, of which he has formed a most impressive collection. Mr. Eates is also a recognised herpetologist and qualified also to write with authority on all branches of zoology. He is a Fellow of the Zoological Society, an F.R.S.A. and an M.B.O.U. and has contributed many papers of importance on natural history. Furthermore, as a police officer in Sind for many years, he knows the countryside like the back of his hand. I have no hesitation in saying that the chapters on botany, geology and zoology contributed to this Gazetteer represent the latest expert knowledge on the subject. My thanks are due also to the Geological Survey of India through Shri. N. S. Gidwani, Deputy Secretary, Ministry of Steel Mines and Fuel, for a list of "the Vertebrate fossils from the Manchhars of Sind" and for a note on "the Jurassic/Cretaceous plant remains from the Jaisalmer area". This information has been obtained through the good offices of the Commission for India, Salisbury, Southern Rhodesia, which was addressed direct. For this service I am deeply grateful. Dr. N. B. Baloch,

Professor of Education at the University of Sind, Hyderabad, has helped me greatly in dealing with Sindhi music and superstitions. Sir Patrick Cadell, Kt., C.S.I., V.D., a former Commissioner in Sind, has written a note on Military Cantonments and another on the Army in old Sind, and Sir Henry Holland, Kt., C.I.E., has provided me with information on the work of the famous C.M.S. Eye Hospital which he ran for years in Shikarpur and later in Karachi and elsewhere in Sind. He became one of the foremost eye surgeons in the world, and has recorded his life in his book "The Frontier Doctor." Miss Alice Ward has given me some details of the work which she and Miss Rachel Piggott did in pioneering the village midwifery work in the rural areas of Sind region for the best part of a generation.

Shamsul Ulema, Dr. U.M. Daudpota had promised to deal with the subject of Sindhi literature for this volume. By his untimely death in 1958, before he had submitted his contribution, a valuable addition to the Gazetteer was lost, as Dr. Daudpota was, after the death of Mirza Kalich Beg, the best Sindhi scholar living at the time of his death. By means, however, of an article he wrote on Sindhi literature for the brochure "Sind People and Progress" published in 1954 by the Director of Information, Sind, I have been able to compose an account of Sindhi writers, and in this I have leant heavily on Dr. Daudpota's expert guidance.

The orthography in this volume is unsatisfactory. Until there is some accepted standard for spelling oriental words in English little can be done to improve matters. I have not adopted the scholarly spelling of Arabic words writing the letters of the Arabic alphabet used in the originals, but an attempt has been made to be consistent in the spelling of well-known names like Muhammad and Hassan. In the chapter on history I have endeavoured to spell the words showing the singular and plural as, for instance, "Kalhoro" for the singular and "Kalhora" for the plural instead of Kalhoro for the singular and Kalhoras for the plural which is neither logical nor accurate. But even in this I have not been wholly consistent myself because in the case of tribes which still retain more of Rajput than the Sindhi characteristics, like Sodha, I have used "Sodha" for the singular and "Sodha" for the plural, though this is not really defensible. Dr. Daudpota himself called himself Daudpota and not Daudpoto. There are many extracts from previous writings in this Gazetteer where the spelling is completely capricious and incorrect. But correcting all these inaccurate spelling is not worthwhile and would possibly make confusion worse confounded. In transliterating the Sindhi words and sounds into English the task is quite hopeless as no signs exist in ordinary English type for final short vowels and nasal endings and for many of the peculiar Sindhi letters. In the section dealing with Sindhi proverbs the difficulty of doing accurate transliteration is evident.

I have therefore decided to do little about consistency in spelling outside the limits which I have explained here. The setting of a standard of spelling is a task to which the Sind Adabi Board would be well advised to devote attention sooner or later. Meantime readers will have to put up with variations like Karachi and Kurrachee. Sind should be spelt correctly Sindh, but Sind is so well established as the English form of the word that it would be pedantic and utterly precisian to depart from it. Arabic, Persian and Sindhi scholars will be annoyed at the varieties of spellings of the same word, most of them inaccurate, but as a Gazetteer is not a scientific treatise on language, they will just have to bear with the weakness. No previous gazetteer has worried about the matter.

The appendices attached to this volume deal with matters of detail which cannot conveniently form part of the text, but which are none-the-less of permanent interest and importance. The appendices cover the following subjects:—

List of Vertebrate fossils from the Manchhars of Sind.

Note on Jurassic/Cretaceous plant remains from the Jaisalmer area.

List of plants of Sind and Khairpur.

List of birds of Sind and Khairpur.

Note on Tribes and Castes of Sind and Khairpur as reported in 1931 Census of Bombay Presidency.

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List of Governors and Commissioners of Sind.

List of Rulers of Khairpur State.

A separate section follows, making acknowledgement to authors and publishers of copyright works who have kindly granted permission to use extracts from them.

Finally, a word of thanks is due to all who have helped in the production of this complicated work. In particular I wish to state how grateful I am to the special contributors and to Mr. N. A. Faruqi, the Chief Secretary, Political and Services Department, Government of West Pakistan, in whose time this work was started and who granted all the facilities I asked for, and to Mr. Fida Hassan who succeeded him as Chief Secretary and has been equally helpful. I have to thank also all the officers and staff of the Revenue and Rehabilitation Department of the West Pakistan Government on whom most of the wearying

load of collecting statistics has fallen. Nor do I forget the good services rendered by the Ministry of Commerce of the Pakistan Government, through which I was able to enlist the active co-operation of the Trade Commissioner for Pakistan in Salisbury, Southern Rhodesia. Squadron Leader Muhammad Akram rendered me continuous help and supplied me with any information for which I asked him. He also made available an office room in which the work of the Gazetteer was carried on for a year and a half. When Squadron-Leader Akram was transferred from Southern Rhodesia, Mr. Ismatullah, who carried out the Trade Commission's work was similarly obliging and helpful. I am grateful to both of them. Then Miss M. V. Davy who has for three years been responsible for all the correspondence, stenography, typing, filing and arranging of sheets deserves special commendation for accurate and conscientious work carried out uncomplainingly, even where it meant wrestling with what must have been to her multitudes of strange and unintelligible words. Everyone of us all has had to do his allotted task. As the Sindhi proverb has it "Lachar khe subhki rawa". Necessity knows no law.



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“Akbar the Great Moghul” by Vincent Smith.

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PHOTOGRAPHS : ACKNOWLEDGMENTS

DR. H. T. SORLEY.

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ARCHAEOLOGICAL DEPARTMENT, PAKISTAN, KARACHI

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NAZ PHOTO SERVICE, LAHORE.

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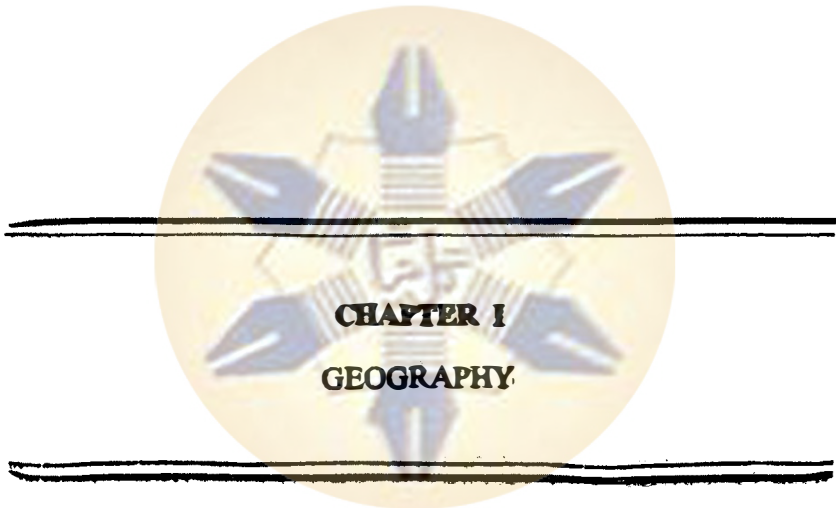
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WEST PAKISTAN GAZETTEER
SIND REGION

(DESCRIPTIVE)
CHAPTER I



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CHAPTER I

Raverty in his "Mihran of Sind" says, "The name Indus was and is unknown to oriental geographers and historians. It was Europeanised by the Greeks out of Sindu, as they may have called the Indus, as being the river separating Hind from Iran-i-Zamin, and not intending it to be understood that Indus was the proper name of the river," and Pliny says that the Indus was called Sindhus by the inhabitants. The Sindhis today call the Indus the Sindhu Nadi when they do not call it Daryah, the ocean. Philologists do not know the origin of the word Sindhu. It appears to be an Indo-European word and seems to have been applied to the river from the earliest days of recorded history. The words Sind, Hind and Ind are all the same, Hind and Sind are often being interchanged in the Indo-European languages and an initial "H" is often dropped. The form with "H" appears in the Iranian branch of the Indo-European languages, and in Gujarat many speakers today cannot easily pronounce an initial "S" sound in certain combinations and change it into an "H" sound, so Sind, the name of the country, Indus, the name of the river, and Hindustan, the former name of the Indo-Pakistan sub-continent, are all philologically the same word, and no one knows whether the river takes its name from the land, or whether the land takes its name from the river.

The name
"Sind"

The territories of the former Province of Sind and State of Khairpur lie between the latitudes of 23° and 29° North (just North of the Tropic Cancer) and between longitudes 67° and 71° East. The region forms the Southern part of the Western Wing of Pakistan and its area almost coincides with the physiographic division known as the "Lower Indus Basin".

Main geo-
graphical
features.

The length of the region from North to South is about 360 miles and its breadth which varies from North and South, is about 170 miles in the centre.

The country of Sind occupies an area of 50,397 square miles* with a total population of 46,08,514, an average of 91 persons per square mile. Sind has neither the vastness of Baluchistan, which has 37% of the total area and 1.5% of population of Pakistan, nor the density of East Pakistan which has 15% of the area of Pakistan with 55% of the population. Sind including the former State of Khairpur, occupies 15.5% of Pakistan's area and has 6.5% of its population.

The former Khairpur State which lies in the eastern part of the region occupies an area of 6,050 square miles and has a population of 3,19,543.

*As a result of an international arbitration over the disputed territory in the Rann of Kachh, an area of approximately 350 square miles was awarded to Pakistan, forming part of the Sind region. The actual demarcation has yet to take place. Editors.

The recorded area, however, varies from decade to decade. This is mostly due to the action of the river Indus and to improvements in the Survey.

Except for a narrow coastal strip of about 150 miles in the South-West along the Arabian Sea, the region is surrounded by land in all directions. In the south it borders on the Rann of Kachh and the Kachh State of India. The Eastern boundary extends towards Rajasthan (India). In the North East it touches the former Bahawalpur State. Punjab and Baluchistan lie to its North and West.

Mountains.

In the extreme West of Sind is the mountainous region consisting of the Kohistan section of the barren Khirthar Mountains. To the East is the sand belt stretching from the borders of the Bahawalpur State to the Rann of Kachh. Between these tracts lies the Indus Valley terminating in the deltaic area in the South-West. The Northern portion of this Valley is called the "Siro" (Upper), the Southern the "Lar" (Lower) and between them is the "Vicholo" (Central). These areas have rich alluvial soil and the central portion has a perennial water supply from the Sukkur Barrage which provides the Province with enormous agricultural and kindred potentialities.

Except for a small hilly tract in the South East corner of the Tharparkar District (Nagar Parkar), western Sind is the only region which is mountainous. This region is known as Kohistan. The mountains here are however, not high enough to attract rain clouds during the monsoon season with the result that the rainfall in Sind is generally precarious.

Sind may be regarded as, on the whole, a low and flat country, but exception must be taken of the mountains tract, partly of limestone and sandstone formation, on its western boundary, which forms a natural line of demarcation between it and Baluchistan. The country in the western portion of the Karachi District, known as Kohistan (area 8,500 square miles), is also very hilly, while a few insignificant ranges of limestone hills are found in other parts of the province. One of these (the Ganju hills), in the Hyderabad District, average 100 feet in height, and it is on this range that the city of Hyderabad is built. Another running in a north-westerly direction from the vicinity of Jaisalmer, attains towards the Indus an elevation of 150 feet, and forms almost exclusively the rocks on which the town of Rohri and the island fortress of Bukkur stand. A third, the Makli hill range situate near Thatta in the delta, is about ten miles in length with an elevation varying from 80 to 150 feet.

Of all these the mountain barrier dividing Sind region from Baluchistan is by far the loftiest, and first touches the Sind region frontier about the 28th parallel of north latitude. Hitherto this range has been generally, though erroneously, known by the name of the "Hala" mountains, but its proper appellation is believed to be the "Khairpur" and this it may be so called till it

reaches the 26th parallel of latitude, when the chain merges into the Pabb hills, which after a length of ninety miles in a southerly direction, meet the sea at Cape Monze. The elevation of the Khirthar mountains is considerable, some of the peaks rising to a height of above 7000 feet. The Pabb hills, on the other hand, are much less lofty, and are not believed to possess a higher elevation than 2000 feet. Among the valleys and ravines of this range flows the Habb, only permanent river in the province except the Indus, and this, for a considerable distance, forms the western frontier of Sind. A striking feature in the Khirthar mountains is their division into three parallel tiers of ridges. The first or most easterly has its sides steep and precipitous towards the west, but with a long gradient to the east; the second has flat tops and rounded sides, with deep ravines and fissures; the third consists of vast plateaux of table-land, and is composed, in part, of fossiliferous limestone. They possess but little soil, and in consequence have little or no vegetation upon them. As yet this range has not been utilised in a sanitary point of view, with the exception of two small stations, Dhar Yaro, and the Danna Towers, both situate in the Mehar Deputy Collectorate at elevations respectively of 6000 and 4500 feet above sea-level, but access to them is so rough and difficult as to make them but of little use.

Connected with the Khirthar chain of hills, and running eastward into the Sehwan, is the dry and arid Lakki range, fifty miles in length, the result evidently of volcanic action, as shown by the frequent occurrence of hot springs and sulphurous exhalations. The highest elevation of this range, which terminates abruptly on the west bank of the Indus, near Sehwan, is estimated at from 1500 to 2000 feet. All the hill ranges hitherto mentioned may be said to be of sandstone and limestone formations, and several of them abound in marine exuviae.

Alluvial
regions.

In the extension alluvial plains, the area perhaps the finest and most productive is about Shikarpur and Larkana, comprising a long, narrow island extending from north to south about 100 miles, and enclosed by the river Indus and the former Western Nara. It is the expansion of this latter stream which has formed the only large lake to be found in Sind Region, that called the "Manchhar", in the Dadu District. When full this sheet of water is said to be twenty miles in length, and to cover an area of about 180 square miles.

Another of these areas, on an average between seventy and eighty miles wide, is to be found stretching eastward from the Indus, having the Eastern Nara flowing through it. Through this tract, and indeed through much of the immense district now called the Tharparkar, the Indus is supposed ages since to have

poured its waters, rendering fertile what has since been known as the Eastern Desert. This fact seems to be indicated not only by the many vestiges of ancient towns that have been observed, but by the numerous beds of rivers long dried up which intersect this arid tract. The deserted course of a large river, now known as the Ren Nala, still exists in the Bahawalpur and Rohri areas, and this, joining the Eastern Nara, may very probably have emptied itself into the sea by what is now called the Kori mouth of the Indus.

**Desert
region.**

On the eastern border of Sind, the region is much covered with sand-hills, which vary and shift under the influence of the tempests prevailing in this sterile wilderness. This desert, called the Registan, has an area of 13,100 square miles. Large tracts destitute of the means of irrigation are also frequent in Sind. Of this nature is the Kachhi Plain, the northern part about thirty miles across, and lying between Shikarpur and the Bolan pass, being known as Pat. It consists of the clay deposited by the Bolan, the Nari, and other torrents which flow down from the Khirthar range of mountains and are lost in this dreary waste. A canal taking off from the Guddu Barrage is to irrigate part of this area.

Scenery.

The natural scenery of a flat and level country like that of Sind cannot be expected, in this respect, to vie with the many more highly favoured spots of the Indo-Pakistan sub-continent. To a stranger approaching the shores of Sind nothing can perhaps be more dreary and uninteresting than the first appearance of the coast, which, with a very few exceptions, is entirely destitute of trees or shrubs. On the other hand, in parts of Kohistan, the hilly region of the old Karachi district, the scenery is very fine, but, owing to the volcanic nature of the rock, it is wanting in that most desirable accessory to beauty, trees and foliage. Again, in the Tharparkar districts, and in the eastern portions of the Khairpur territory, and of the Rohri Deputy Collectorate, there is the "Registan", or desert tract, where nothing is to be seen but sand-hills, many of them, however, bold in outline and fairly wooded. These hills succeed each other like vast waves of sand.

In the inundation season, in the numerous "dhandhs" (or flood hollows) of the Eastern Nara, are spots of great beauty, but, owing to miasmatic influences, they are exceedingly unhealthy places to encamp in. The alluvial tract on either side of the Indus, extending for a distance varying from ten to twelve miles, though superior to any other part of Sind in soil and productivity, is, as regards its scenery, tame and uninteresting, except

where fine stretches of the river Indus are seen bordered by extensive "babul" (acacia) forests, which in many places skirt the river edge for miles together.

Near the town of Sehwan, the Lakki range of hills terminates abruptly on the Indus, in a nearly perpendicular face of rock 600 feet high, and presents a splendid appearance from the river; but unquestionably the finest view in the region is that afforded by the towns of Sukkur and Rohri, and the island fortress of Bukkur, with its lofty castellated walls, lying in the stream between them. They are all built on the limestone range of hills which intersects the Indus, and the minarets and houses, more especially those of Rohri, rise up to a towering height above the river, which they seem apparently to overhang. The pretty verdure covered island of Sadh Belo, with its sacred shrine, lies a short distance to the south of the Bukkur fort, and on either side of the river dotted here and there, are groves of date and acacia with their dark green foliage, the whole, with the magnificent stream which rushes swiftly by, combining to form a picture at once brilliant and beautiful.

The River
Indus.

Sind territory was created and sustained by the river Indus, without which it would be a Sahara. The river's length from the Kailas Range to the sea is about 1800 miles and for nearly a third of that (580 or 590 miles) it traverses the region and annually, when the snows at its source begin to melt with the advance of spring and monsoon rains fall in its catchment area and that of distributaries, rises and overflows its banks to be contained throughout most of its length by bunds, and floods the areas lying between them. From times immemorial its superabundant waters have been restrained and directed by the art of man, as narrated in the section on Irrigation.

Its most noticeable characteristic is the extent and rapidity of the changes that take place in its course. There are in the whole of Sind region only two really stable portions, the first the gorge at Bukkur and the other at Kotri. Even in these there are frequent changes taking place, changes which prevent an estimate being formed, with any reasonable degree of accuracy, of the discharge of the river at any given stage.

The reason for this instability is threefold:—

1st.—The soil over nearly the whole of the Indus valley is extremely friable and easily disintegrated by the flow of water, in consequence of which the impingement of the current against a bank at even a low velocity is sufficient to cause its rapid erosion. The result of this friable nature of the soil and its extremely finely

divided state is that the water always has a large amount of silt in suspension, which in any places, where the velocity falls below what is required to transport it, begins to fall and rapidly forms banks and shoals.

2nd.—The fall of the country is fairly rapid and consequently in order to keep the velocity within the limits that can be borne by the banks without considerable erosion, the river is compelled to work out for itself a very tortuous course.

3rd.—The banks are very low and are in most cases overtopped during the inundation season. Owing to the tortuous course of the river it frequently happens that the distance across the neck of land separating two great bends is comparatively very short. The difference in level between the surface of the river on the two sides of this neck is that due to the distance round the bend. The river may then force its way through this neck of land and what is technically called a cut-off eventually takes place, resulting in the shortening of the length of the river, possibly by some miles, a reduction in the ratio of tortuosity and an increase in velocity of the current beyond the normal. As the banks are unable to withstand this velocity, they are cut away in the endeavour to recover the normal ratio and heavy erosion is set up until such times as the river has recovered its normal length. The river generally speaking is broad and moderately shallow, with one or more main channels (generally one only) of depth over the bars from 4 to 6 feet at low water, the pools lying alternately on either bank with a shallow bar or crossing between. Its breadth in the cold weather may be anything from 1000 to 4000 feet, while during the inundation it spreads over the banks and is only retained by the bunds, or high ground, on either side, and may thus be several miles in breadth.

The following figures are interesting:—

Commencement of Irrigation season 15th June.

Average height on that date (5 years):—(1955-59).

Bukkur 12.82 Average discharge 247917.

Kotri 10.88 Average discharge 160294.

Maximum of 5 years average occurs on 11th August at Bukkur, height 20.80, discharge 9,48,817 cusecs; and on 22nd August at Kotri, height 25.30, discharge 7,72,730 cusecs.

Minimum of 5 years average occurs on 2nd January at Bukkur, height 1.00, probable discharge 25,940 cusecs; and at Kotri on 17th January, height 1.30, probable discharge 19,430 cusecs.

WEST PAKISTAN GAZETTEER
SIND REGION

(DESCRIPTIVE)
CHAPTER I

The following tables show heights on certain dates for the last five available years:—

BUKKUR

	1955	1956	1957	1958	1959
15th June	10.70	13.20	13.30	12.90	14.40
Highest	19.6	20.7	17.3	20.6	20.9
15th September ..	12.9	12.9	12.9	13.5	15.2
31st December ..	1.00	11.10	4.10	5.10	1.30
Lowest	0.70	1.00	— .50	3.80	1.30

KOTRI

	1955	1956	1957	1958	1959
15th June	8.1	17.8	11.0	2.1	15.4
Highest	24.7	26.6	20.5	24.5	24.5
15th September ..	22.6	15.3	16.9	15.5	20.2
31st December ..	5.1	0.8	8.5	5.7	7.3
Lowest	—2.2	—2.2	—0.8	—4.4	3.5

JHERRUCK

	1955	1956	1957	1958	1959
15th June	3.10	12.60	6.10	— .80	11.30
Highest	20.90	22.90	15.30	19.50	19.60
15th September ..	18.80	9.50	12.30	10.90	15.0
31st December ..	1.80	—4.60	3.90	1.30	3.70
Lowest	—8.1	—7.0	—6.9	—7.9	—0.4

In order to prevent excessive flooding the river is banded in nearly all places where floods are liable to occur.

The principal bunds are the following :—

Right Bank.

	Length Miles.
Kashmore Bund	73
Sukkur Begari Bund	46.5
Ghar Canals Bunds	45.8
Nara Bunds	77
Manjhand Bunds	5.75
Karachi Canals Bunds	65

Left Bank.

Naich Bunds	34
Kasimpur Bund	10.5
Small Bunds north of Sukkur	28.25
Naulakhi Bhorthi Bund	8.9
Fuleli Canals Bunds	35.01
Karachi Canals Bunds	98

From the Kotri creek, through which the Fuleli once found its way to the sea, to the creek which runs from Ghizri to Gharo, a distance of quite 125 miles, the whole coast line is scalloped with inlets of the sea, of which perhaps there is not one that has not been at some time a chief outlet of the Indus. Before the Fuleli was the Ren and before that the Puran. The present head of the Delta may be placed at the bifurcation of the Ochito and the Haidari, about 139 miles below the offtake of the Fuleli. These two are the main branches through which the water of the river reaches the sea, the latter being at the present day by far the more important. They divide, however, into several creeks further down, of which the principal, are the Turshian, Kalandari, Jong, Mutni, (Haidari), and Mull. The Sir creek may also be mentioned because on it is situated the port of Sirganda, the only port besides Ket Bandar (on the Ochito) on any of the mouths of the Indus; but very little water now finds its way by that mouth.

In the old Gazetteer it is stated that the influence of the tides is felt almost as far up as Thatta. A few observations that have been made show that the tide does not now reach so far, and it is not much felt above the bifurcation, or the head of the Delta, a distance of about 42 miles below Thatta. It is believed that the effect is only from 3 to 6 inches at this point.

The delta of the river Indus is growing every year, the discharge of spoil matter being $217\frac{1}{4}$ millions cubic yards per year. The deltaic region covers an area of about 1,500 square miles but it is unfertile. The river changes its course from time to time, which has been the cause of the dying down of some of the old towns which existed on its banks. The mouths of the river are Sir, Pakhar, Kajhar, Kharak, Kabr, Kalandari, Turishian, Hajamro, Sisa, Duboo, Pitiani, Khudi and Phitti.

As reported by Assistant Surgeon Heddle in 1836 "Owing to difficulties of navigation, the merchants of Thatta have abandoned the Indus and they now use the camel to transport their wares from Kurrachee to Shikerpoor and Hyderabad. Besides the danger to boats of being swamped by falling banks, the navigable channel was continually being changed by their action, and the closing of the Gharo, Beghar and other old beds has been attributed mainly to this cause. Further down the elephant grass (*Typha elephantina*, Sindhi, Pan) in many parts binds the soil with its far-reaching roots and effectually prevents erosion." Mr. Heddle found that the natives of the district were well aware of the services rendered by this grass and cutting it for the manufacture of matting, "an industry

which then, as now, gave employment to a large section of the population, they cut the plants close to the soil but did not disturb the roots". Nearer the coast, in the tidal creeks and marshes, there can be no doubt that the same purpose is most effectually served by the Mangrove, (*Rhizophora mucronata*, Sindhi Kandal) and the white Mangrove (*Avicennia officinalis*, Sindhi Timar, or Tiwar) and much damage has been done by the unrestricted destruction of these for fuel. The foliage of the Mangrove is excellent fodder for camels. Above the immediate influence of the sea, Tamarisk (*Tamarix gallica* and *dioica*, Sindhi Lai and Jhao) appears and rapidly covers, if allowed, every newly exposed bank. The wood of this, as more of Mangrove, was also used by the river steamers. The Shikargahs, or hunting forests, of the Mirs consisted of tamarisk and babul, extending for more than thirty miles between Hilaya and Hyderabad, and beyond that again to near Sehwan, and the latter tree still clothes both banks of the river for a great portion of its length.

Besides the Indus, the Habb, was the only permanent Habb river, river in former Sind. Numerous torrent beds, known as Nais, drain the hills after rain, discharging their waters into the sea, the Indus, or the Manchhar Lake and other dhandhs. The volume of water brought down by some of these, the Baran for example, which discharges into the Indus near Kotri, or the Malir, which enters the Ghizri creek, is at times so great as to waste the low-lying country through which they flow, and all of them are turned to account by damming their water for purposes of irrigation. The city of Karachi obtains part of its potable waters from the wells sunk in the bed of the Malir Nai.

An account of the rivers of Sind would, however, be incomplete without mention of the Eastern and Western Naras. The former for part of its course runs in the bed of the "lost river" about which there have been so many theories. One is that it was the Sotlej, which some centuries ago forsook its original bed not far from where it leaves the mountains and, turning westward, effected a junction with the Beas, thus adding a large volume of water to the already over-charged channel of the Indus and condemning to sterility a wide tract of country once fertile and populous. In the map illustrating Thomas Pennant's quaint and learned "View of Hindoostan", (1798) this river is shown as rising in the Himalayas east of the "Setlege" and flowing down past the town of "Ammercot" into the Gulf of Cutch. It is there called the Gaggar river, which may be a corruption of the Hakra, the name still applied to parts of its ancient bed. Long after it ceased to be an independent river.

Eastern
Nara.

its bed, under the name of the Nara (Nala), served as a channel by which the flood waters of the Indus were guided down to the Dhoru Puran ("ancient channel") and so into the Kori creek. In 1857 it was converted into a canal by the opening of a controlled channel between it and the Indus at Rohri. Subsequently it was linked up with the headworks of Sukkur Barrage.

**Western
Nara.**

The Western Nara, which also was a canal, by that name but subsequently renamed as Mehar Branch of Rice and was evidently at one time a loop of the Indus, the waters of which, leaving the main bed above Larkana, took a course more or less parallel to it, which led them into the great natural depression that forms the Manchhar Lake. Another body of water poured into this depression through a channel leaving the Indus south of Sehwan called the Aral river; but when the inundation began to subside, this river flowed the other way, discharging the Manchhar into the Indus. As the retreat of the Manchhar water exposes about 20,000 acres of the richest land for cultivation in the cold season, the proper regulation of the Aral is a matter of very great concern to the Irrigation Department.

**Rann of
Cutch.**

The Rann (or Run: in Sind it is pronounced Ryn.) of Cutch forms the southern, or south-easterly boundary of Sind from Rajputana to the sea and it is difficult to understand the history of the country without bearing in mind the great changes which have come about in that tract. It is now a vast salt waste, flooded to a great extent for several months of the year by the waters of the sea driven into it by the force of the south-west monsoon, which converts it into a salt lake. At other seasons it is a desert, flat, firm and quite bare, except for a few "islands", where there is scanty herbage. Chinkara and the wild ass roam over it, crossing the border only to feed. But reasons are not wanting for the belief that, when Alexander the Great was in Sind, it was an inland sea, or lake, fed by the "lost river" and afterwards by the Puran. More recently the western part at least of the Rann, from Ali Bandar to the Kori creek, was richly fertile, according to tradition, and intercourse between Sind and Cutch was free and frequent, obstructed by no desert barrier. In fact, there was probably a good water-way by the Puran from Lakhpat to Umerkot. About 30 miles from Lakhpat and 20 from Ali Bandar was the fort of Sindhri, a Rahimki (more correctly Raomki) Bazar was another important town. But in 1762, or thereabouts, Ghulam Shah Kalhoro built a great dam across the Puran at Mori which served two purposes, fertilising his own lands and desiccating those of his enemy, the Rao of Cutch. The Kori became a

mere creek and Lakhpatt the furthest habitable point of Cutch. Then the terrible earthquake of 1819 completed the work of desolation. A sudden subsidence of the land caused an inrush of the sea, which converted the country round Sindri into a salt lake for the time and destroyed that place. A sketch of Sindri, taken by Captain Grindlay in 1808 and published by Alexander Burnes in his "Travels into Bokhara", shows a square fort, with a high round tower at one corner, situated on the bank of a large river with boats sailing up it. Since the earthquake the frontier of the region from the Kori creek to Nangar Parkar, has been an unmitigated saline desert, and the frontier towns, like Raomki Bazar, have dwindled away.

The edge of the Rann is a paradise for flamingoes, demoiselle crane, wild asses and geese. Pelicans are also numerous. The present writer has seen these creatures by the thousand in the cold weather there. There are immense breeding places of flamingoes in the Rann. In various areas the surface of the damp ground can be seen pecked into the appearance of ploughed fields by the strong beaks of the demoiselle crane searching for food at the roots of the grasses. The Rann donkeys are strong beautiful animals with fine beige and dark brown colouring, and they can outpace for miles a motor-car going all out.

Towards the end of the cold weather the greylag geese gather in their thousands near the open water stretches of the Rann, preparatory to their migration north. It is beautiful to see how sentinel geese are posted at considerable distances all round the main flock, to give warning of the approach of anything suspicious. It is quite impossible to get close to these birds when they are gathered in immense communities. No birds could possibly be wrier.

From time immemorial Sind has depended for its fertility on floods. As the river rose in the beginning of the hot season, it regularly surmounted, or breached, its banks at certain weak points, letting loose a great volume of water, which took its own course to the sea, submerging all the lowlands on its way. Thus one deluge left the Indus regularly in Bahawalpur territory and flooded all the eastern half of what is now the Sukkur District; while another left the right bank between 20 and 30 miles above Sukkur and, after traversing the Shikarpur Taluka, fed the dhandhs in the Larkana District, or found its way to the Manchhar Lake and so back, by the Aral river, to the Indus. Further north, in the Upper Sind now Jacobabad District, the overflow of the Indus was often supplemented by floods from the northern hills, with serious Indus inundation.

results. Towards the south, and especially in the Delta, these distinct flood courses gave place to a general inundation, the river rising everywhere above the level of its banks and laying the surrounding country under water. From a very early period local rulers and enterprising communities and individuals raised protective embankments and dug canals; but under the divided and unsettled Governments to which Sind has been subject for centuries, any comprehensive scheme for superseding uncontrolled by controlled irrigation was impossible.

Earthquakes. The whole of Sind is liable to seismic disturbance, more especially the eastern desert and the southern talukas of the Hyderabad and Thatta Districts; but since the earthquake of 1819, which is said to have caused extensive changes in the Delta, no severe shock appears to have been recorded. There was one about 8 o'clock on the morning of 15th October, 1898, which was felt from Shah Bunder to Khairpur and all through Tharparkar, but it was nowhere severe, though the fall of some old walls and houses was hastened by it. Very slight shocks followed at intervals for some months. On the 14th of January, 1903, a sharper shock, accompanied by a loud rumbling, was felt throughout Tharparkar and in the south of the Hyderabad District, where it had some remarkable effects. At several places in the Badin Taluka fissures appeared in the ground, out of which warm water and mud surged, or spouted, in such volume that in one place not less than a square mile of the surrounding land was inundated. This irruption lasted for twelve hours or more, and when it subsided, geyser-like blow holes were left of various sizes from a few inches to 15 or 20 feet in diameter and at least 8 or 10 feet in depth, with a bottom of soft mud. A similar occurrence in connection with the great earthquake of 1819 is recorded in the Transactions of the Bombay Geographical Society, Vol. X, P. 152, "Near the town of Sinderee, situated where a branch of the Indus joins the Rann, and which was permanently submerged on the occasion, a number of small cones, six or eight feet in height, burst up from the ground and continued for many days to emit bubbles of air and mud from their summits." In the same paper it is stated that in October 1849, "something like an ebullition of pestilential gas, the discharge probably of a submarine volcano, occurred off Porebunder in Kattywar and was manifest 30 or 40 miles out to sea, the fish were poisoned by it and for days lay floating in myriads on the surface of the water." The last mentioned phenomenon, whatever may be the cause of it, is common. In May, 1905, dead fish were washed up at Clifton beach in such incredible quantities that they formed a deep, thick layer, from 5 to 10 or 15, feet wide and several miles long. The mud volcanoes of Las Bela are well-known.

The present writer, while encamped at Reti in the extreme north of the Sukkur district, remembers very distinctly powerful heavings of the earth by his tents. This was the effect of the great Bihar earthquake of 1932.

Cyclones are occasionally experienced in Lower Sind and do serious damage at times. There have been several in the present century, causing flooding in Karachi and its vicinity and destroying quantities of stored grain in the railway yards, as well as drowning much live-stock. A cyclone in May 1902, struck the coast and travelled in a north-easterly direction causing heavy loss of life. In Shah Bunder Taluka alone two hundred and twenty five persons were reported to have been drowned. Another cyclone struck the Karachi area a month later in 1902, the wind reaching a velocity of 100 miles per hour, doing damage to the harbour, the tide rising 7 feet 2 inches above the height predicted in the published tide tables. In the harbour, piers were washed away, stone-faced embankments were breached and broken up, sheds in the import yard were extensively unroofed and ventilators weighing two or three tons were blown away. Cyclones

Sind cyclones are, however, rare and on an average need not be expected more than once in fifteen years. They seem to be confined mostly to the southern littoral area. In June, 1883, there is a record of a tidal wave in the southern part of Shah Bunder Taluka. It carried away ninety-two persons, mostly women and children, and destroyed great numbers of camels and cattle. On the whole, however, the climate of Sind is remarkably stable and constant in behaviour from one year's end to another, the seasons following a regular pattern of uniformity.

Climatologically the year in Sind is divided into four seasons; the general characteristics of each are discussed below and the climatological normals for different stations are given at the end:— Season.

(1) *Winter Season.—December to March.*

Low pressure waves coming from the west frequently affect the weather of this region in this season. On the average, six disturbances pass eastward in each month but not all of them are active. They generally begin to be active from the middle of December. These disturbances are sometimes associated with well marked cold fronts; cold waves with strong northerly to north-westerly winds lasting for a day or two. These occasionally cause widespread frost in Sind. The tracks of the low pressure waves lie farthest south in February and March. The mean daily minimum temperature varies from 50° to 65° F. The lowest temperature recorded during the season at plain stations is 24° F in January. The mean daily relative humidity varies between 46 to 54 degrees. The total normal rainfall during the season is 0.71".

(2) Summer Season—April to June.

It is a season of increasing temperature, markedly gusty afternoon winds and convective phenomena like dust-devils, dust-storms and thunder-storms. Low pressure waves continue to move eastward, the cold fronts of these disturbances are generally associated with dry dust-storms and sometimes with thunder-storms. The atmosphere becomes hazy being charged with dust. The mean daily maximum temperature varies from 100° to 105° F. The highest temperature on record is 127° F at Jacobabad. The mean daily relative humidity varies from 45 to 57 degrees. The total rainfall during the season is 0.61".

(3) Monsoon Season.—July to September.

The monsoon extends into lower Sind in the second or third week in July. The moist winds withdraw from this region early in September. The clouding in this season is controlled by the monsoon currents, rain in Sind usually occurs in this season mainly in July and August. The rainfall when it does occur is usually heavy and attended by dust-storms. The mean daily maximum temperature is about 97° F in Sind throughout the season. The mean daily relative humidity varies from 66 to 68 degrees. The total rainfall during the season is 4.63". The wettest month of the year is July with rainfall amounting to 2.42".

(4) Autumn Season.—October and November.

Skies are generally clear with good to excellent visibility. The mean temperature varies from 80° to 170° F. The mean daily relative humidity is about 47 to 50 per cent. The total rainfall during the season is 0.10". November is the driest month of the year. Taking the year as a whole, the annual mean temperature is 80° F, the annual range mean temperature is about 28° F, the annual range of the mean daily extreme temperature is 57°. The annual mean daily relative humidity is 51 degrees. The annual rainfall is 6.05".

The arithmetical average of rainfall, however, conveys little as rain is often capricious; years of heavy falls, particularly in the desert area, alternate with years of near-drought. In the District Volumes the local rainfall by districts is recorded, and the figures therein may be used to correct the bare arithmetical average for the whole region.

Frost is occasionally encountered for a day or so at night, usually in the end of January, or early February. The present writer has memories of water in a water-jug in camp being frozen solid at Talhar in the Hyderabad district in 1916 and of the water in the irrigation channels in 1932 at Darkhan in the Sukkur district being coated with a film of ice, which melted in the morning sun.



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Kohistan—Typical Scenery near Thano Bulo Khan.

SCENERY



Teak logs from the Punjab in river near Sukkur Barrage in background.

CHAPTER II
GEOLOGY

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A SUMMARY OF THE GEOLOGY OF SIND

CHAPTER II

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CHAPTER II

*A summary of the Geology of Sind.*I. Introduction.

1. With the exception of rocks belonging to the upper Cretaceous Series, which are found in the northern part of the Lakhi Range and some isolated granite exposures of presumed Archaean age in the Nagar Parkar area on the northern edge of the Rann of Cutch, the rocksexposed in Sind region belong entirely to the Tertiary Era, and on account of their excellent development are recognised as a type for the rest of the Indo-Pakistan sub-continent. They were first studied in detail by Messrs. W.T. Blanford and F. Fedden of the Geological Survey of India in the years 1874-1877. The results were published in 1879 (Mem. G.S.I. Vol.XVII (1) by Mr. W.T. Blanford, in which he divided the Tertiaries of Sind into five Series. The original classification of Mr. W.T. Blanford is still followed, with slight modification. In 1900, Messrs. F. Noetling and E. Vredenburg discovered differences in the fossil contents in the lower and upper part of Blanford's original Khirthar Series and the latter separated the older beds under a distinct name, Lakhi Series. In 1906, Mr. E. Vredenburg included the Meting Shales as a lower member of the Lakhi Series, to which, in 1926, Dr. W.L.F. Nuttall added the Meting Limestone and a bed of ferruginous laterite, the latter representing the unconformity between the Lakhi and Ranikot Series.

2. Sind region has evoked considerable interest from the oil companies in view of the potentialities of its rocks as a source of oil. The geologists of the oil companies have contributed considerably towards the advancement of geological knowledge of Sind region.

II. Physiography.

3. Except for a few isolated ridges in Hyderabad neighbourhood and in Thar Parkar area; the whole of eastern Sind region constitutes a vast sandy plain which north of Schwan, extends westwards up to the base of the Khirthar Range.

4. The principal hill ranges of Sind region lie to the west of the Indus River. The general trend of these hill ranges is north-south or N.N.W—S.S.E. and between them lie broad, undulating valleys. The hill ranges become higher towards the west. Near to the Indus River the low ridges in the Lakhra neighbourhood attain a maximum height of only 685 ft. above sea level; further west the Lakhi Range rises to over 2350 ft. in the southern part of the range and is possibly higher further north; the Bhit Range rises to 2786 ft. and the Khirthar Range is, in places, over 6000 ft. above sea level.

5. As a general rule the hill ranges attain greater heights in the north and there is a gradual reduction in elevation southwards, until the ranges die out under the alluvium before reaching the sea.

III. Structure.

6. A large number of the hill ranges are formed by anticlinal folds separated by synclinal valleys. The general strike of the folds conforms to the main north and south trend of the topography, except in the south-west near Karachi where the axes of some of the folds assume a N.E.-S.W. trend.

IV. Geological Formations.

7. The stratigraphical succession of rocks exposed in Sind region is tabulated below:—

Series	Stage	Lithology	Principal Exposures	Geolog .
Manchar Series 1000-9000 ft.	Upper 500ft.	Pebble Conglomerates	Along eastern slopes of Khirthar Range north of Nari River	Upper Miocene to Pliocene.
	Middle 500-4600 ft.	Orange clay and brownish sandstones with pseudoconglomerates.	East and south of Khirthar Range.	
	Lower 500-4000 ft.	White-grey and brown sandstones, red and orange clays.	Western Sind.	
Gaj Series 2400 ft.		Limestones, sandy shales and sandstones	Western Sind (Absent or thin east of Lakhi Range)	Lower Miocene Range.
Nari Series up to 7000 ft.	Upper up to 7000 ft.	Sandstones, sandy shales and shales.	Western Sind, Hab Valley (Absent east of Lakhi Range).	Oligocene
	Lower up to 1800 ft.	Shales, calcareous sandstones and sandy limestones with white and pale brown massive limestones near base.	Western Sind (Absent east of Lakhi Range)	
	Upper up to 1500 ft.	White-grey massive limestone.	Khirthar, Bhit and Badhra Ranges and the anticlinal ranges immediately west of the Khirthar Range	
Khirthar Series 6000-8000 ft.	Middle 2000 ft.	Green and grey shales, with several bands of highly fossiliferous brown and grey limestone.		Upper and Middle Eocene.

Series	Stage	Lithology	Principal Exposures	Geolog. Age.
Lakhi Series 1000 ft.	Lakhi Lime- stone up to 1000 ft.	Very hard, cream white limestone.	Lakhi Range and low rolls to east and south east of Lakhi Range.	Lower Eocene.
	Meting Sha- les 100 ft.	Shales with thin bands of brown limestone.	Locally developed in Meting-Jherruck region only.	
Ranikot Series 3000 ft.	Meting lime- stone 140 ft.	Hard, Massive lime- stone.	Locally developed in Meting-Jherruck region only.	Palaeocene
	Upper Rani- kot up to 1150 ft.	Brown limestone and shales.	Lakhra and Jherruck folds and northern part of Lakhi Range.	
Ranikot Series 3000 ft.	Lower Rani- kot up to 2000 ft.	Variegated and ferr- uginous sandstones and shales.	Northern part of Lakhi Range and Lakhra area.	Palaeocene
Upper Creta- ceous.	Cardita beaumonti beds 230 ft.	Olive green shales with thin bands of impure limestone.	Northern part of Lakhi Range.	Cretaceous
	Pab Sand- stone up to 2000 ft.	Coarse gritty sandstone with dark- grey shales	Northern part of Lakhi Range.	Cretaceous
	Hemipneustes beds 315 ft.	Sandy, massive limestone.	Bado Hill in northern part of Lakhi Range.	

V. Jurassic.

8. Several thousands of feet of massive limestone of probably Jurassic age have been penetrated in deep wells sunk in the search for oil, but they are not exposed at the surface in Sind.

VI. Cretaceous.

9. The same deep wells which have penetrated to the Jurassic limestone have drilled through great thicknesses of Cretaceous shales, marls and marly limestone. Over 9000 ft. of such beds ranging in age from Senonian to Neocomian, were encountered in the Lakhra well (lat. 25° 38' long. 68° 08') drilled in 1948. In Sind region the oldest exposed beds of sedimentary origin belong to the Upper Cretaceous Series. They are present in the northern part of the Lakhi Range where about 1450 ft. are exposed.

10. The lowest beds, known as the *Hemipneustes* Beds, consist of very hard and compact massive crystalline limestones with sandstones alternating with them towards the top. They are rich in fossils which indicate a Campanian to Maestrichtian age. The following are the characteristic fossils.

- Cephalopods, .. *Nautilus subloevigatus*, *parapachydiscus dulmensis*, *Bostrychoceras polyplocum*.
- Echinoids, .. *Hemipneustes pyrenaicus*l, *H. leymeriei*, *H. compressus*, *Echinoconus gigas*, *E. helios*, *Pyrina ataxensis*l, *Hemiaster blanfordi*.
- Lamellibranchs, .. *Ostrea (Lopha) pectinata*, *O. (Pycnodonte) vesicularis*, *Neithea (Neitheops) ouadri-costata*, *Chlamys dujardini*, *Varicorbula harpa*.

11. The *Hemipneustes* Beds are overlain by the Pab Sandstone which forms the middle of the three ridges constituting the Lakhi Range. The boundary between the *Hemipneustes* Beds and the Pab Sandstone is transitional, alternations of sandy limestone and calcareous sandstones of varying thicknesses from the passage beds. The Pab Sandstone consists of massive or current-bedded gritty sandstones with some pebbly sandstones, conglomerates and grits and very subordinate bedded shaly sandstones and sandy shales. Thin beds of basalt which are regarded as intrusive occur interstratified with this group. The Pab Sandstone is mainly unfossiliferous, but in the upper part of the group some rare fossiliferous shaly horizons are found at some localities.

12. The third division of the Upper Cretaceous Series in Sind region which overlies the Pab Sandstone is known as the *Cardita beaumonti* Beds from the occurrence in large numbers of the lamellibranch *Cardita beaumonti*. These beds consist of fossiliferous limestones, marls and shales. The boundary between the *Cardita beaumonti* Beds and the underlying Pab Sandstone is also transitional. The age of the *Cardita beaumonti* beds is considered to be between Cretaceous and Palaeocene.

VII. Ranikot Series.

13. The lowest division of the Tertiary system in Sind region is called the Ranikot Series from the fort of this name in the Lakhi Range, north-west of Kotri ($25^{\circ}.54'$ $67^{\circ}.56'$). The Series is divided into a lower and an upper stage. The best exposures of the Lower Ranikot stage are in the Lakhi Range and in the neighbouring Daphro fold, where it is about 1430 ft. thick.

14. Three sub-divisions are recognised within the Lower Ranikot. The lowest sub-division known as the Daphro Beds, consists of thick bedded and massive olive-green sandstones and vareigated shales and these are overlain by highly weathered volcanic rocks of the Trap sub-division. In the Lakhi Range the thickness of the

Trap varies from 50 to about 100 ft. The third and the highest sub-division of the Lower Ranikot is known as the Khadro Beds and consists of sandstones, argillaceous sandstones, sandy shale and sandy clays of variegated colour. On the west flank of the Lakhi Range the rocks comprising this sub division give rise to low hills at the foot of the lofty scarp formed by the Lakhi Limestone.

15. The Lower Ranikot is believed to have been deposited under fluvial conditions, while the Upper Ranikot is a shallow-water marine deposit. There is perfect conformity between the two main divisions of the Ranikot Series. Beds of Lower Ranikot lithology persist upwards well into the shallow water marine rocks of the Upper Ranikot.

16. The best exposures of the Upper Ranikot are found in the Lakhra area but due to the overlapping of the Lakhi Limestone the full thickness is not exposed. In the Lakhra area the Upper Ranikot consists of ferruginous and carbonaceous shales and calcareous and variegated sandstones with thin fossiliferous bands of pale brown limestones.

17. Other exposures of Upper Ranikot beds are found in the northern part of the Lakhi Range and between Kotri ($25^{\circ}22':6819'$) and Hilaia ($24^{\circ}52'; 68^{\circ}3'$). In the last mentioned area a series of orange to yellow-brown fine-grained highly fossiliferous limestones, separated by shales, sandy shale, and sandstones, are found.

18. The lower Ranikot of fluvial origin is almost unfossiliferous but some dicotyledonous leaf impression and oysters are found at the base. The Upper Ranikot on the other hand, has yielded a rich fauna comprising foraminifera, corals, echinoids and molluscs. The following are the chief Ranikot Fossils.

Foraminifera, *Nummulites nuttalli*, *N. thalicus*, *N. globulus*, *N. wadiai*, *N. lahrii*, *Operculinoides sindensis*, *Assilina ranikotensis*, *A. dandotica*, *A. spinosa*, *Operculina canalifera*, *O. subsalsa*, *O. Jiwani*, *O. patalensis*, *Miscellanea miscella*, *M. stampi*, *Lockhartia conditi*, *L. haimei*, *L. tipperi*, *Rotalia trochidiformis*, *Dictyoconoides flemingi*, *Discocyclina ranikotensis*, *Alveolina vredenburghi*, *A. ovodea*.

Corals, .. *Cyclolites*, *Trochosmilia*.

Echinoids, *Pyhlacanthus sindensis*, *Phymosoma abnormale*, *Salenia blanfordi*, *Dictyopleurus haimei*, *Conoclypeus sindensis*, *Plesiolampus placenta*, *P. ovalis*, *Eurhodia marisi*, *Hemiaster elongatus*, *Schizaster alveolatus*

- Lamellibranchs. . . *Ostreacif. multicosata*, *O. bellovacina*, *O. talpur*, *O. (Liostrongia) haydeni*, *Spondylus rouaulti*, *Venericardia hollandi*, "*Trachycardium*" *sharpei*, *Pitar morgani*, *Corbula vredenburgi*.
- Gastropods, . . *Turricula (Pleurofusua) polycosta*, *T. (Aplotoma) vredenburgi*, *Turris (Eopleurotoma) jhirakensis*, *Calyptrophorus indicus*, *Conus (Lithoconus) blagrovei*, *Neoathleta (neotliegi)*, *Volutocorbis eugenian*, *Lyria feddeni*, *Clavilithes leilanensis*, *Strepsidura cossmanni*, *Pterynotus (Purpurellus) sindiensis*, *Transovula (Oxycyprea) jhirakensis*, *Tibia morgani*, *Clava subnudum*, *Turritella (Haustator) jherruckensis*, *Crommium rouaulti*, *C. dolium*, *Velates noorpoorensis*.
- Cephalopods, . . *Eutrephoceras subfleuriusianus*, *Deltoidonutilus deluci*, *Cimomia cossmanni*, *Nautilus sindiensis*.

19. The Ranikot Series is of Palaeocene age.

VIII. LAKHI SERIES.

20. The Upper Ranikot is unconformably overlain by the Lakhi Series of Lower Eocene age. This series was formerly grouped with the overlying Khirthar Series, but was subsequently separated on account of its distinct faunal contents. The unconformity between the Ranikot and Lakhi Series is marked by a bed of laterite which at places attains a thickness of up to 25 ft.

21. The Lakhi Series in Sind region is divisible into three, the Lakhi Limestone, Meting Shales and Meting Limestone. The Lakhi Limestone is well developed in the Lakhi Range, and in the hill ranges immediately to the west and in the low rolls to the east and south-east of the Lakhi Range. It consists of hard ridge-forming bedded limestone alternating with somewhat argillaceous nodular limestone. Its maximum development in Sind area exposures is at the southern and northern extremities of the Lakhi Range where it reaches a thickness of about 1000 ft.

22. The Meting Shales and Meting Limestones are of purely local development, their best exposures being near Meting. The Meting Limestone consists of white or light cream coloured and chalky limestone which in places alternates with shales and marls.

Its complete sequence is exposed only between Meting and Latif Chang Railway Stations. The Meting Shales consist mainly of shales with subordinate limestones and sandstones and occasional conglomerates.

23. The fauna of the Lakhi Series is as follows:—

Foraminifera, *Nummulites atacicus*, *N.cf. mamilla*, *N. irregularis*, *N. lahirii*, *Assilina granulosa*, *A. leymeriei*, *A. spinosa*, *A. daviesi*, *A. obesa*, *A. laminosa*, *Rotalia trochidiformis*, *Lockhartia conditi*, *L. tipperi*, *Sakesaria cotteri*, *Cictyoconoides vredenburgi*, *Discocyclina archiaci* var. *baluchistanensis*, *Orbitolites complanatus*, *Alveolina oblonga*, *Opertor bitolites douvillei*, *Alveolina ovicula*, *A. lepidula*, *A. ovoidea*.

Echinoids, *Leiocidaris canaliculata*, *porocidaris anomala*, *Phymosoma macrostoma*, *Gagaria venustula*, *Conoclypeus alveolatus*, *Echinocyamus nummuliticus*, *Amblypygus subrotundus*, *Eolampas ex-centricus*, *Echinolampas rotunda*, *E. obesa*, *Hemiaster nobilis*, *H. carinatus*, *Metalia sow-erbyi*, *M. depressa*, *Schizaster symmetricus*, *Macropneustes speciosus*.

24. The following mollusca are found in the Lakhi and Khirthar beds and some of them are common to both.

Lamellibranchs, *Ostrea (Pycnodonte) brongniarti*, *Pholadomya halaensis*, *Vulsella legumen*.

Gastropods, *Velates perversus*, *Natica aff. longispira*, *Terebellum carcassense*, *Gisortia murchisoni*.

IX. KHIRTHAR SERIES.

25. The Khirthar Series which derives its name from the Khirthar Range has been divided mainly on lithological grounds into an upper, middle and a lower subdivision. The lower subdivision which is predominantly argillaceous is not exposed in Sind region.

26. The Middle Khirthar stage of Sind region consists of green shales with several bands of limestone which are grey to palebrown in colour, and are often highly fossiliferous. The limestone bands are more numerous in the lower part of the stage.

27. The Upper Khirthar stage consists of hard, massive, white to grey limestones, the best exposures being along the Gaj River.

28. The Khirthar Series attains its maximum thickness some distance north of the Gaj River, where it is well over 700 ft. thick. From this locality it thins to the south and east and is absent east of the Lakhi Range.

29. A rich fauna has been recorded from the Khirthar Series which indicates a Middle Eocene age. The important fossils are:—

Foraminifera,

Nummulites obtusus, *N. perforatus*, *N. acutus*,
N. djokdjokartae, *N. beaumonti*, *N. laevis*,
N. stamineus, *N. obtusus* var. *uranensis*,
N. carteri, *N. gizensis*, *Assilina exponens*,
A. mamillata, *A. irregularis*, *A. subpapillata*,
Dictyoconoides cooki, *Aktinocyclus alti-*
costata, *Discocyclus dispansa*, *D. sowerbyi*,
Alveolina elliptica.

Echinoids,

Phymosoma undatum, *Conoclypeus rostratus*
Sismondia polymorpha, *Amblypygus tumidus*
A. latus, *Echinolampas sindensis*, *Echinanthus*,
intermedius, *Micraster tumidus*, *Schizaster*,
simulans.

X. NARI SERIES.

30. The Nari Series is divided into a lower and an upper subdivision. The Lower Nari generally rest unconformably on the Middle Khirthar limestone and consist of hard brownish and whitish limestones at the base and shales, sandstones and sandy limestones above. Over most of Sind region the Lower Nari show a general tendency to thicken in a westerly direction. They attain their maximum development in the Gaj River area where they may be 1800 ft. over thick.

31. The Upper Nari consists mainly of coarse, massive sandstones and ferruginous conglomerates, with subordinate bands of shale, clay and ironstone shale. The sandstones are usually of greyish to brownish colour, but sometimes massive variegated sandstone forms the bulk of this stage. In Thano Bula Khan and Thana Shah Beg neighbourhood the Upper Nari consist of a hard brownish limestone.

32. On account of the softness of the sandstones the Upper Nari beds are very poorly exposed, except in the more southerly areas where the hard limestone bands give rise to scarps.

33. The Upper Nari very rapidly thickens in a westerly direction and along the Hab Valley the Upper Nari may attain a total thickness of as much as 7000 ft.

34. The Upper Nari rests on the Lower Nari unconformably. Near Bagatoro, on the western flank of the Lakhi Dome, only the lower part of the Lower Nari stage is exposed and the Upper Nari beds rest on the denuded edges of the hard limestone forming the local top of the Lower Nari. In several areas in Sind region especially the more easterly areas, the unconformity is marked by the presence of a conglomerate bed at the base of the Upper Nari.

35. The Nari are of Oligocene age, but the Upper Nari, in part at least, may range to Lower Miocene. The fauna consists of:—

Foraminifera,	<i>Nummulites intermedius</i> , <i>N. fichteli</i> , <i>Lepdocyclina</i> (<i>Eulepidina</i>) <i>dilatata</i> .
Lamellibrahchs,	<i>Ostrea aff. fraasi</i> , <i>O. subangulata</i> , <i>Pecten</i> (<i>Amussiopecten</i>) <i>labadyei</i> , <i>Chlamys senatoria</i> , <i>Trisidos semitorum</i> , <i>Lucina columbella</i> , " <i>Crassinella</i> " <i>sulcata</i> , <i>Chionella splendida</i> , <i>Macrocallista</i> (<i>Costacallista</i>) <i>exintermedia</i> , <i>Periglypta aglaurae</i> , <i>Ventricoloidea multilamella</i> , <i>Pitar porrectus</i>
Gastropods,	<i>Terebra narica</i> , <i>Ancilla</i> (<i>Sparella</i>) <i>indica</i> , <i>Volutospina sindiensis</i> , <i>Lyria anceps</i> , <i>Proadusta pruniformis</i> , <i>Ptychocerithium sindiense</i> , <i>P. bhaghothorens</i>

XI. GAJ SERIES.

36. The Gaj series is well developed in Sind and exhibits great lithological variations. Along the Gaj and Nari Rivers it consists mainly of shales with some thick sandstones and thin bands of limestones but further south calcareous bands become more numerous and prominent.

There is again a change to argillaceous facies in the south-westerly direction, the calcareous bands again becoming subordinate near Pir Mangho. In the more easterly areas, between the Maher Plateaux and the Lakhi Range, the lower part of the Gaj Series is mainly calcareous and forms prominent scarps.

37. The thickness of the Gas Series is variable, it is about 2500 ft. near Cape Monze and about 1600-1800 ft. in the Gaj River. East of the Lakhi Range, the Gaj oversteps the Nari and the Khirthar Series and rests directly on the Lakhi Limestone, still further east it is entirely absent.

38. The Gaj Series is of Lower Miocene age and is rich in fossils. Of foraminifera, species belonging to the general *Miogypsina*, *Miogypsinoidea*, *Lepidocyclina* (*Nephrolepidina*), *Operculina* and *Austrotillina* are of common occurrence. The genera *Archaias*, *Cyclodypeus* and *Gypsina* are also represented. *Spiroclypeus* occurs towards the base of the group. Other fossils which are found throughout the series include:—

Echinoids,	<i>Breynia carinata</i> , <i>Eupatagus patellaris</i> , <i>Echinolampas jacouemonti</i> , <i>Clypeaster aff-</i> <i>profundus</i> , <i>Echinodiscus</i> (<i>Tretodiscus</i>) <i>placenta</i> .
Gastropods,	<i>Vicarya verneuili</i> , <i>Turritella</i> (<i>Zaria</i>) <i>angulata</i> , <i>Telescopium Pakistanicum</i> , <i>Olivancillaria</i> (<i>Anazola</i>) <i>nebulosa</i> var. <i>pupa</i> .
Lamellibranchs,	<i>Chlamys</i> (<i>Aequipecten</i>) <i>scabrella</i> , <i>C. sena-</i> <i>toria</i> , <i>Dosinia pseudoargus</i> , <i>periglypta</i> <i>granosa</i> , <i>Clementia papyracea</i> , <i>Discors-</i> <i>triforme</i> , <i>Lucina columbella</i> .

39. *Ostrea latimarginata* is characteristic of the Upper Gaj. Other species of *Ostrea* include *O. (Crassostrea) gajensis* *O. (Lopha) hyotis*, *O. (Crassostrea) gryphoides*, and *O. vestita*; there are also *Pecten (Amussiopecten) placenta*, *Amusium sub-corneum*, *Anadara peethensis*, *A. craticulata* var. *burnesi*, *Trisidossemi tortum* and also some remains of *Rhinoceros*.

XII. MANCHHAR SERIES.

40. The Manchhar Series which is the highest division of the Tertiary System in Sind region is named after the Manchhar Lake (26° 25': 67° 42') a few miles west of Sehwan. It is well developed along the Gaj River where the rocks belonging to this Series attain a thickness of over 9000 ft. Three sub-divisions are recognised in the Series.

41. The Lower Manchhars are a group of alternations of red and orange clays and whitish and greenish massive sandstones and are well exposed in the neighbourhood of the Nari and Gaj Rivers. The massive pale green and grey sandstones have

yielded vertebrate fossils. There appears to be a considerable thinning from the Gaj River southwards and east-wards and there is evidence of an unconformity between the Gaj and Manchhar Series, between the Nari River and the Pir Ghazi area.

42. The middle subdivision consists of a group of alternations of orange clays and brown coarse sandstone and pseudo-conglomerates.

43. The Upper Manchhar which form the outermost ridge at the eastern extremity of the Khirthar Range consist of pebble conglomerates in which there occur pebbles of Eocene limestones. Associated with the conglomerates, some lenticular bands of coarse, gritty sandstone are found.

44. The Manchhars range in age from Miocene to Pliocene and are often correlated with the Siwalik Series of areas further north. They are mainly fluvial, but gradually become estuarine and marine southwards.

XIII. POST TERTIARY DEPOSITS.

45. The post-tertiary deposits of Sind region consist of sub-recent conglomerates, gravels, blown sand and alluvium. The conglomerates contain large boulders in a mass of gravel and sand, calcareous material derived either from Eocene or Gaj limestones sometimes forming the cementing matrix. These conglomerates form low ridges. Gravel and blown sand occupy large tracts in the valleys between the main ranges, but the alluvial area is confined mostly to the east of the Lakhri Range.

XIV. IGNEOUS ROCKS.

46. In the Nagar Parkar area on the northern edge of the Rann of Cutch there are isolated hills of mainly granites which are generally considered to belong to the Aravalli System of the Peninsular Sub-continent but the age is uncertain.

XV. ECONOMIC GEOLOGY.

47. The former Province of Sind is made up mainly of sedimentary rock alluvium and desert sands and there are only a few minerals of economic importance which are found associated with these.

48. The annual rainfall of Sind region is very scanty and precipitation is mostly in the form of sudden heavy showers with the result that most of the water flows down the streams before it has any chance to soak into the soil and replenish the meagre accumulation of under-ground water. If this water could be conserved it would go a long way to meet the requirements of the country.

49. In such a large sedimentary basin it might be hoped that some hydrocarbons would occur although no evidence of such has been found in the exposed rocks of Sind. Several test wells have been sunk by Oil Companies in the past and exploration is still proceeding but so far there have been no indications of commercial quantities of oil or gas in the area.

50. Other minerals of economic importance are the building stones, limestone, celestite, Fullers Earth, some poor quality coal, glass sand, gypsum, flint stone and alum shale.

51. Some soft limestone belonging to Gaj and Nari formations has been used as building stone. This limestone, though easy to work, is not very lasting. Gradually its use for building purposes is being discontinued.

52. Limestone occurs extensively in the hilly parts of Sind region and is being used in the manufacture of cement. Three sizeable cement factories are working at Karachi, Hyderabad and Rohri.

53. Celestite occurs in the form of veins in foraminiferal limestones near Thano Bula Khan.

54. Fullers Earth occurs extensively interbedded with limestones ranging in age from Gaj to Ranikot. The best occurrence of Fullers Earth is in the Khairpur Commissionary along the base of the foraminiferal limestone scarp in the hills east of Khairpur town.

55. Fullers Earth also occurs near Thano Bula Khan and Hyderabad and also near Jhimpir and Jherruck railway stations. Some poor quality Fullers Earth occurs in the Gaj limestone outcropping in the Drigh Road anticline.

56. Poor coal or lignite occurs as a thin seam in the Sonhari beds of the Upper Ranikot Series near Jhimpir and Meting. This deposit has been commercially exploited since 1941 and is estimated to contain a reserve of about 10 million tons.

57. Glass sand occurs around Jungshahi in Thatta district in considerable quantities but is not of very high quality. This sand is used by the Indus Glass Works for glass manufacture.

58. Gypsum in crystal form and fibrous veins occurs in Tertiary clays and shales over a large part of western Sind region. It is worked on a small scale in many places. The gypsum is being used for cement making but is rather too impure for other purposes.

59. Flintstone in the form of nodules is associated with limestones of Eocene age. The most accessible locality where large quantities can be obtained is around Rohri and in the adjoining hills of Khairpur.

60. Alum was previously prepared from pyritous shales obtained in the hills of western Sind region but this is now discontinued because of the low price of imported alum.



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Lime stone rock eroded by wind near Rohri

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CHAPTER III

I. ANIMALS (MAMMALIA).

General. Sind region, excluding the riverian Kutchag and the lands drained by the Indus Barrage system, is an arid reion, more or less barren, sandy or stony hills, desert or desert scrub, with a scanty rainfall, extreme temperatures and winds which can be scorching in summer or bitterly cold in winter. On the whole the climate of Sind region particularly the interior can best be termed as plus-tropical.

A terrain and climate like that of Sind region can but allow for a restricted flora and consequently a fauna less rich than that found in moist climates, where conditions are more favourable to an abundance and variety of both plant and animal life.

Both the flora and fauna of Sind region differ in several respects from those of other parts of Pakistan, particularly the great Himalayan Range and its extensive foothill and plain belt (Terai and Babar) of dense tropical vegetation.

The mammalian fauna of Sind contains a number of forms of an Indo-African character, which do not extend far beyond the eastern boundary of the region while animals peculiar to well-wooded hills, heavy forest, and extensive jungle swamps are conspicuous by their absence. As a matter of fact the character of the mammalian fauna of Sind, like that of the avi-fauna and reptilia shows a marked analogy to that of the surrounding dry region areas South East Persia, Baluchistan, South Afghanistan, the North West Frontier of Pakistan, the Punjab and the Rajputana Rajistan. Mammalian life though not numerous owing to the lack of natural forests, excluding riverian tracts and coverts producing plant life is nevertheless varied and interesting.

Murray records 71 forms, which comprise Bats (*Chiroptera*) 20, Insect-eating (*Insectivora*) 4, Flesh-eating (*Carnivora*) 20, Marine Mammals (*Cetacea*) 4, Gnawers (*Rodentia*) 15, Hoofed Mammals (*Ungulata*) 7 and Toothless or semi-Toothless Mammals (*Edentata*).

There are no representatives of the Orders, *Primates* (Apes, Monkeys and Lemurs), *Demioptera* (Flying Lemurs) or *Sirenia* (Dugongs or Sea-cows) in Sind and Khairpur area.

The *Chiroptera* (Bats), are well represented in the region. The flying Fox (*Pteropus indicus*), the Chamro of Sind and Chamgidar of the Indo-Gangetic plains, the largest of Fruit Bats, with a wing span of 4 feet is rare but does occur in the North, where it has come to notice in Jacobabad, Larkana and Shikarpur.

These bats roost in vast colonies in large trees Pipal (*Ficus religiosa*) and Amri (*Tamarindus indica*) are favourites, and are most riotous and quarrelsome when roosting, hanging head down as is their wont.

In Bengal they are partial to large bamboo clumps as roosts, and feed mostly on ripe betel-nut and palm fruit while in South India they feed chiefly on the green nuts of the Alexandrian Laurel (*Colophyllum mophyllum*) which contain a strong smelling oil, on which these bats wax amazingly fat, and when boiled yield an oil which is said to be an excellent hair restorer, yet bald pates in the south of the sub-continent are perhaps more numerous than in the North, East or West. The bone of this bat tied on to ankle or wrist by a cord of twisted black cow hairs is said to be a sovereign remedy for rheumatism.

These bats can do incalculable harm to cultivated, fleshy fruits, particularly guavas, loquats, peaches, figs and plums, but draw the line at all citrus fruits. Among wild fruits and flowers favoured by them, may be mentioned the Badam (*Terminalia catppa*), Nim (*Azadirachta indica*), Ber (*Zizyphus jujuba*), Jambol (*Eugenia jambolana*), Pipal (*Ficus religiosa*), Bar (*Ficus bengalensis*) and other ficus forms and the fleshy flowers of the Mowha (*Bassia latifolia*). Simal (*Bombax malabaricum*) and Kachnar (*Bauhinia variegata*).

They are capable of long and sustained flight. In Ceylon they have been known to fly 30-40 miles to feed on Eucalyptus flowers.

In the Northern plains of the sub-continent they have a great fondness for guavas and play havoc in extensive fruit orchards despite the effort, not very successful, made to protect the fruit by suspending fine nets between high poles to catch the bats. Few, however, are caught, as they very rarely fly into them.

The diet of these fruit bats is not entirely vegetarian. Shortt describes how, like the American Fishing Bat (*Noctilio leporinus*), they hover over water alive with small fish swimming on the surface and seizethem with their feet, flying to trees on the bank to devour them at leisure.

Like other bats they drink by dipping down and scooping up mouthfuls of water as they skim the surface in flight.

According to Dr. Day they have most intemperate habits and guzzle the toddy from the clay pots fastened to toddy palms, and fly home in varying stages of intoxication. This perhaps is the reason why they are so ill-tempered and quarrelsome the 'morning after.' They dine and wine at night and into the early hours of the morning.

The flesh of this bat which is delicate and not ill-flavoured is said to restore muscular energy and is relished as a curry in diabetic cases.

The Fulvous Fruit Bat (*Xantharpyia amplexicaudata*) which has a wing span of about two feet is not uncommon locally and lives in old tombs on the Makli Hills near Thatta and in caves at

Clifton and Lak Bidok on the Mekran coast. It extends west to the Persian Gulf and as far east as the Philippine Islands. Like its large relative the Flying Fox, it is not entirely vegetarian and near Moulmein in Burma, it has been known to feed on small crabs. Its smaller relative the Short-nosed Fruit Bat (*Cynopterus marginatus*), which has a wing expanse of about 18 inches, is common in districts where fleshy fruits are grown. It is a perfect pest and plays havoc in guava, mango and plantain gardens. This small fruit bat which has a range from Indo-Pakistan sub-continent to the Far East has the effortless flight of insectivorous bats and, like the Flying Fox, roosts hanging head down, in clusters in trees, favouring palms and plantain clumps. It is a most voracious feeder and can eat more than its own weight in a few hours, food passing through its alimentary canal almost unchanged. Because of its gluttonous habits it does incalculable damage to fleshy fruits.

The Small Eastern Horse-Shoe Bat (*Rhinolopus tridens*) and its allied forms *speoris* and *fulva* are insectivorous bats which occur in Karachi. *Tridens* in particular swarms at dusk during late March and April.

The Large-eared Vampire (*Megaderma lyra*) is an evil looking bat and not to be confused with the true vampire bats of America (*Phyllostomatidae*). It occurs throughout Indo-Pakistan sub-continent and Ceylon and inhabits old buildings, tombs and caves, not infrequently entering verandahs and rooms at night flying low in search of food, insects attracted by light. Though an insect feeder, it preys on small bats, birds, frogs, fish and lizards, even devouring some of the bones of its prey. According to Blyth it has been known at times to suck the blood from smaller bats, fastening on to them behind the ear. This bat is not common, but occurs in Karachi and Sukkur districts where it is found in old tombs and hillside caves.

The Sind Bat (*Vesperugo nasutus*) is a small insectivorous species peculiar to Sind region, where it has been found at Sukkur and Shikarpur. Little beyond its description is known about it.

The Common Yellow Bat (*Nycticejus tenuimicrus*) is one of the commonest bats in Sind region and comes to particular notice as it inhabits buildings and emerges early to feed. I have seen over a score of these bats having a whale of a time gorging on swarms of flying ants brought out by an evening shower of rain. The flight of this bat compared with that of others is rather slow.

The smallest and perhaps the most familiar of all bats in Sind region is the Pipistrelle (*Vesperugo abramus*) which frequents houses and enters rooms in search of insects attracted by light.

It is an extremely fast flier and lives in caverns, holes in trees and hollow bamboos. It can fly so fast in a restricted space such as a room, that it has been mistaken for a large moth.

I have found this little bat in deep narrow caverns in the Makli hills overlooking Kalan Kot dhand.

The Mouse-tailed Leaf Bat. (*Rhinopoma microphyllum*) is not un-common in Sind region and occurs in Karachi, Hyderabad and Sukkur districts, where I have found it roosting in caves, old tombs and amongst the dried leaves of date and cocoanut palms.

Among other insectivorous bats of interest which occur in Sind region, may be mentioned the Lobe-eared Bat (*Vesperugo kahlii*), the Long-armed Bat (*Taphozous loegimanus*), the White-bellied Sheath-tailed Bat (*Taphozous saccolaemus*) and the Kutch Bat (*Taphozouskachensis*). The Long-armed Bat frequents buildings and is not uncommon in large towns, while *saccolaemus* haunts caves and buildings and is not so common.

The *Insectivora* in Sind region is poorly represented and comprises but four forms, three of which are hedgehogs.

The Musk-Shrew (*Crocidura caerulea*) the Chuchundar of sub-continent or Kathori Kuho of Sind is perhaps the most familiar of house mammals even more so than the ubiquitous house-mouse, as it makes its presence felt (or smelt) when disturbed, by emitting shrill sharp-prolonged squeaks and skurrying off as hard as it can go on its diminutive legs hugging the angle of the wall with the floor. It is nocturnal, concealing itself by day in drains or holes in walls or garden rookeries. At night it enters buildings in search of food, and though a most useful insect destroyer, it does not turn up its long delicate nose at table food. It has been known to tackle a toad, large spiders and even a scorpion. It is not usually killed, as it is believed that the musky odour it emits keeps away snakes. It is also believed that its scent glands exude an irritant poison which causes sores to form on animals over which it has run.

Cats and dogs may kill, but will not eat a musk-shrew and I have seen a Kite (*Milvus govinda*) pick up one killed and abandoned by a cat and drop it after perching on a tree and tearing off a beakful or two of its fur.

The Musk-Shrew has come to notice in Karachi, Kotri, Sehwan, Hyderabad, Sukkur and Jacobabad, and most likely occurs in all large towns in Sind and Khairpur areas. In Karachi it does a great deal of good by feeding on the huge, loathsome cockroaches which live in drains and sewers and contaminate food in dwelling houses at night.

At Sukkur a pair which had their home in a garden drain, used to enter my verandah in search of food and eventually became quite friendly, taking beetles, locusts, grasshoppers and dried crusts of bread out of my fingers. On several occasions they tried to get at some Warty Ground Geckos I had in a cage. Their presence in the house was most welcome and kept away rats and mice, as before the advent of the shrews, rats in particular were a pest and a menace to some cage birds which I had.

Before I left Sukkur I had the pleasure of making the acquaintance of the whole Shrew family, six of them, who used to troop in head to tail, one holding the tail of the other, and skurry along the angle of the verandah wall for all the world like a toy, clockwork train, giving vent to shrill, shrewish squeals if Billy the Bullpup happened to take more interest in them than his usual bored, side-long glance from the corners of half closed eyes.

Of the three hedgehogs which occur in Sind region all known as Jaho or Kando Kuho, the Collared Hedgehog (*Erinaceus collaris*) which extends to the Punjab, Rajputana and Ajmir, has been met with in Karachi, Kotri, Hyderabad and Nawabshah. Jerdon's Hedgehog (*Erinaceus Jerdoni*) ranges to the Punjab region and occurs in Karachi, Hyderabad, Nawabshah, Rohri and Sukkur, while the Painted Hedgehog (*Erinaceus pictus*) which ranges from Agra (India) to Rajputana (India) and Cutch (Pakistan), is not as common as its two congeners. It hides like others during the day, but in holes or under grass clumps in open country.

Hedgehogs make most interesting pets. At Campbellpur (Punjab region) in 1916, I had a family of six Collared Hedgehogs, but had to release them before they became really tame, as I had to proceed overseas on service.

Near Duber (Sind region) in 1932, I found a Jerdon's Hedgehog with a family of four, well concealed in a hollow beneath a Kandaro (camel thorn) shrub grown over with Kalh grass.

The mother and one hoglet escaped *en route* to Sukkur, but the remaining three, named Babbar, Ber and Kandi, became very tame and roamed *ad libitum* about the house.

They waxed fat on a diet of bread and milk, grasshoppers, large black ants, crickets and an occasional small snake. All three loved long *doob* grass, which they would chew to a pulp and plaster themselves, using their tongues as trowels. The contraction of certain muscles parted the spines and enabled them to plaster their skins with grass paste without impaling their tongues. Only spine tracts were treated in this manner. After application the grass paste dried and caked off like scurf. Their underparts growine the softest fur, they kept clean by the ordinary process of licking

The flesh of the hedgehog is said to be tender and tasty. It is relished by Nomadic tribes.

The *Carnivora*, despite the predominance of arid terrain in Sind region is well represented.

The Himalayan Black Bear (*Ursus torquatus*), Sindhi and Panjab Richh, and Baluchi Mam, occurs in the Khirthar Range and in the Baluch hills near Mand where Major Mockler, Political Resident, Gwadur, obtained several skins, and W. H. Lucas shot one near Kute-Ji-Kabar in 1902. Baluchis believe that the Mam carries away women and children.

The Ratel or Badger (*Mellivora indica*), Sindhi, Gorpat or Gornar Grave-digger), is found throughout Sind region and very often lives in cavities beneath old tombs in disused Muslim burial grounds. It is because of this choice of home perhaps, that it has gained the reputation of digging up dead bodies and devouring them. It is also believed that they enter houses and carry away infants and that should one meet an adult alone, it will rise on its hind legs, hold the person in a close embrace and suffocate him or her as the case may be, with sepulchral breath.

The Ratel is nocturnal, mainly carnivorous and a menace to village poultry. I came across a family party of three in an old graveyard at Sarhad, and though I was alone and unarmed except for a forked stick to catch snakes, I was not treated to a close embrace or even an attempt at one. When I related the incident to a Baluch orderly, he remarked quite seriously that the Bijoo knew that I was the 'Police Kaptaan. !

The Common Otter (*Lutra vulgaris*) is fairly common in the Indus and some of the old canals, while the Smooth Otter (*Lutra ellioti*) which closely resembles it, is apparently partial to still waters and deep, well sheltered pools. I found quite a colony in a Kund between two spurs of the Makli hills near Kalan Kot, where they were fishing for Jarko (Murrel), which when caught, were taken to the bank and eaten.

Both species are known to Sindhi Muhanas as Ludhro. The sleeker form *vulgaris*, is often tamed by Muhanas and Mirbahars and used to drive fish or porpoise into pools, river inlets, where they can be easily netted.

The Tiger (*Felis tigris*), the Wagh or Sheenh of Sind no longer exists in the region. The last survivor, a tigress, was shot by Colonel McRae in 1886. A tiger and a tigress and cub were brought to bag by H. C. Mules and his party in 1878.

In 1884 Murray recorded its occurrence in former Khairpur State, but its strongholds were the dense lai and grass jungles of the Indus riverain, where it occurred in the Rohri extending its range to Sukkur and Jacobabad districts, but not venturing south into Lar or Lower Sind region.

A Panther (*Felis pardis*), the Chito of Sind did apparently haunt the dense jungles of the Indus delta at one time, as Lieut: Carless records meeting with it in 1837. The scene since has changed considerably and the Panther is now confined to the Khirthar Range and the Pabb Hills in Las Bela District, whence they venture occasionally into the plains of former Sind. No less than twenty one panthers were killed in Sind region, all but two in Karachi district, between the years 1896 and 1915, while others have been shot in the Pabb Hills, the last two in 1936 by G. Grosenbacher.

Sind panthers, as to be expected, are much lighter in colour and not so heavily built as Indian forms generally, yet two Black Panthers have been shot in Sind region during the course of eleven years. Dr. H. T. Sorley, when Deputy Commissioner U. S. F. records the bagging of one near Jacobabad in 1928 and the other was trapped in cave and shot near Rerhi in 1939. The occurrence of Black Panthers in Sind region, where conditions, climate and environment, in no way favour melanism is of more than ordinary interest.

Below is a brief account of the second occurrence which was published in the Journal of the Bombay Natural History Society.

Early in April 1939, pye dogs of Bramhyderi village in Karachi district were disappearing most mysteriously and villagers thinking that a hyaena was responsible organised a hunt and followed pug marks to a cave in a ravine in low hills near Rohri

Finding the 'hyaena' as they thought the animal to be, 'at-home' a Muhana entered the cave with a light and a length of rope, a common practise in Sind, to catch the 'hyaena' alive. On entering the cave the Muhana was attacked by the animal inside and badly mauled. He was taken to hospital where he died a few days later of blood poisoning because he refused to have his leg amputated.

A stout fishing net meanwhile was placed over the mouth of the cave and information sent to the police at Malir about six miles distant.

On the arrival of the police, some zamindars and a horde of men armed to the teeth with guns, spears and clubs, the animal which

turned out to be a fine adult Black Panther was smoked out of the cave and shot, speared and clubbed to death as it struggled to free itself from the net through which it tried to escape.

The cave contained, besides a number of canine bones, the remains of a freshly killed pye dog. The much damaged skin which I secured measured 6 feet, 8 inches from tip of nose to end of tail, the tail taping 2 feet, 6 inches.

The Large Tiger Cat or Fishing Cat (*Felis viverrina*), occurs in the Eastern Nara area where one was shot by M. D. MacKenzie in 1906.

Murray states that it is not uncommon on the tamarisk fringed banks of the Indus. I have met with it but twice in four years in Sukkur district, at Taror dhand in a dense patch of pan reeds and in thick lai and grass jungle on the banks of the Karo Naro above its confluence with the Eastern Nara.

This large cat which is fierce and aggressive by nature lives mainly on fish, but has been known to take dogs, sheep, calves and even young infants, left unattended in hammock cradles slung on trees, while the mother cut grass or collected fuel near by.

The Desert Cat (*Felis ornata*), the Jhangrad or Jhang-Jo-Bilo of Sind, occurs in Karachi, Hyderabad and Nawabshah districts, where it haunts gardens, grass and scrub jungle. It has a penchant for village fowls and has been known to carry away rabbits. It however feeds mainly on field rats and birds.

The Common Jungle Cat (*Felis chaus*), Sindhi Jangrad or Jhang-Jo-Bilo, is the common wild cat of Sind and occurs throughout the region. It is partial to open country, where there is scrub of grass cover, standing crops near villages or hamlets, and Kalh grass growing in dry beds of dhangs. It plays havoc with village poultry and is not above feeding on village offal, such as the entrails of a fowl, goat or sheep. I have known this cat to enter a rest house verandah and steal game shot during the day. When brought to bay it fights fiercely. I once found this Jungle Cat and a large cobra both dead under a culvert over a small kario in Sukkur district. The cobra which had three coils round the cat was terribly testant about the head, neck and mid-body. The fight between cat and snake must have been fierce, fast and furious, for the two contestants to have killed each other where they met. They probably entered the culvert at opposite ends and meeting suddenly, got to grips more because of surprise than any intention of a fight to a finish, as neither cat nor cobra prey on the other for food.

The Red Lynx or Caracal (*Felis caracal*), Sindhi, Phekari or Siah-gosh (Black-ears) is rare in Sind region but is said to occur in all districts where there is suitable terrain. I have met with it but twice in many years, at Khar in the Habb valley and near Moidan in the Karachi Kohistan. It is said to prey on rats, hares and Sand-Grouse, and I heard of a pair attacking, killing and partly eating a sorely wounded Chinkara buck, which was shot in hilly, desert scrub near Meting.

In 1884 Muray wrote that the Hunting Leopard or Cheetah (*Felis Jubata*) was found in Sind. This cat is now extremely rare anywhere in Pakistan and India, and those used for hunting to-day are nearly all imported from Africa. I doubt very much if the Cheetah occurs in Sind now.

The Striped Hyæna (*Hyæna striata*), Sindhi, Charakh, is found in suitable terrain, low, scrub covered hills and ravines, throughout Sind and Khairpur region. It has a great fondness for the domestic ass and is responsible for the killing or maiming of a number yearly.

It lives in caves and Sindhis, who enter their lairs with a light and a length of rope, catch them alive. They seldom if ever show fight and are apparently blinded by the light, allowing themselves to be roped and forcibly dragged out, when they are clubbed to death or gagged and baited by village dogs.

Hyænas can always be turned up in the rough country around Orangi Nai, Khadeji, Gujo and the Makli Hills in Karachi district and around Aror and Kalka in Sukkur district.

In 1939, a pair of hyænas attacked a peon who disturbed them while they were digging up a grave on the outskirts of Thano Bulo Khan. The peon beat them off and ran to the police station, where he sought asylum. Neither of the hyænas gave chase. Tracks at the scene established that the hyænas *had* been nosing about an ancient grave and that while the peon had bolted in one direction, the two hyænas had turned tail and bolted, probably much faster, in another.

Incidentally a news item in a local paper a few days later stated that one of the hyænas had leapt on the peon, who bravely stood his ground, caught the hyæna in his arms, held it firmly in a close embrace and took it to the police station.

The Small Civet or Rasse (*Viverricula malaccensis*), Sindhi, Khathori Bilo, occurs in Sind but is scarce and very local. It is partial to forest tracts growing clumps of sar and other coarse

grasses. D. G. Ommanney found it in Hyderabad and Larkana districts and I turned up a fine pair in a forest clearing between Duber and Sangi in Sukkur district. It is the Chito Khathori Bilo of the Jagiranis of Duber.

The Large Civel (*Viverrazibetha*) though mentioned in the 'Sind Wild Birds and Wild Animals Protection Act, 1940,' does not occur in Sind region.

The status of the Mongoose family in Sind region is not clear and calls for further work in both field and museum.

Murray (1884), lists *mungo* as *griseus*, the red form apparently of *mungo* as *ferrugineus* and *andersoni* as a new species peculiar to Sind on the authority of a single specimen obtained at Kotri.

The three forms which do definitely occur in Sind region are the Common Grey Mongoose (*Herpestes mungo*), the Ruddy or Long-tailed Mongoose (*Herpestes smithi*) and the Small Pakistani Mongoose (*Herpestes auripunctatus*), Sindhi, Nor or Noreo for all three species.

The Common Grey Mongoose is the most familiar and is found in every district. I have seen a Grey Mongoose with a snake about two feet long in its mouth leap on to a wall quite three feet high.

The Ruddy Mongoose which is a handsome creature, larger than the Grey, is a forest species not often met with. Usually it comes to notice tearing across a forest *pahie* or in a forest clearing growing clumps of sar grass, where it will skuttle into cover and sit up on its hind legs, like a dog begging, to get a better view of the 'stranger within its gates'.

The Small Pakistani Mongoose compares with *mungo* as much as a stoat with a polecat, and is the smallest and sleekest of the family.

It is not so common as *mungo* and if cornered spits defiance like any cat.

The Mongoose family live on fruit, insects, eggs, rats, mice, bird and small reptiles including snakes. They are easily tamed and make most interesting, useful and affectionate pets.

The Pakistani Wolf (*Canis patipes*), Sindhi, Baghar, is not uncommon in Lower Sind area where I have met singles or couples near Hadero, Haleji, Sonda and Luka loping across country towards broken ground and cover, shortly after dawn. A wolf or two can always be turned out of the dense ber scrub near Lak Bidok on the Mekran coast. The broken country

round about the Bhagar Dhoro was at one time noted for the number of wolves which sheltered in the thick scrub jungle and caves in the vicinity. Not beyond the memory of man wolves in Sind region were a menace to sheep and goats and destroyed as many as 2,900 head annually. During the years 1897 to 1907 no less than 1,178 wolves were destroyed and by the end of that decade the wolf menace in Sind was well under control and has not reared its ugly head since.

According to Blanford, the wolf which occurs in Western Sind is the European form (*Canis lupus*) and differs from its Eastern relative by little less than its closer and longer fur.

The Jackal (*Canis aureus*), Sindhi, Gidder, Mekrani, Toluk is very common throughout Sind and Khairpur region. As elsewhere in Pakistan it is a noisy prowler, but a most useful scavenger.

Shikaris have told me that they hunt in couples and catch hares and partridge. I have seen couples hunting in broad daylight, one crouched low behind a bush near a path, while the other approaches through the scrub from the opposite direction, hoping presumably, to drive hare or partridge into the jaws of its waiting mate. I have not however been fortunate enough to witness a catch. At Kalan Kot Dhand I have seen a pair of jackals chasing mud fish (Murrel) in shallow water. In Fyzabad (India), I witnessed two jackals attack and kill a weakling of their own kind. They were so engrossed in the killing that I was able to get a ring side view of the proceedings. The ailing jackal, almost full grown was very thin and cried out most pitifully while being mauled to death. One of the killers had it by the throat and was worrying it as a dog does a cat. Both jackals sniffed their victim before slinking furtively away in different directions.

Jackals, though of carnivorous lineage, have a penchant for the thorny, shrub ber (*Zizyphus rotundifolia*), neem (*Azadirachta indica*) berries and bar (*Ficus bengalensis*) fruit, which they greedily pick up from the ground, squabbling like pups while feasting. The seeds of the ber and neem are passed out as eaten, whole. When evacuating they like squatting against a shrub or large stone and very often choose a furlong-stone to be adorned in this manner. They also have a fondness for sugarcane and ripe mellons and do great damage to such succulent crops.

The Pakistan Fox (*Vulpes bengalensis*), is fairly common in most districts in Sind region and as a rule is met with singly in grass land or desert scrub. Like the jackal it has a fondness for fruit, particularly grewia and ber berries, the seeds of which are passed out whole. It lives chiefly on field rats, land crabs, small birds and lizards, including the Sanda, which it catches despite its formidable, spiked tail.

In Agra (India), wandering Banjharas used to sell this fox to be shikared by dogs. The chase never lasted long, as the luckless animals weakened by confinement and lack of food and water, their

mouths invariably sewn up, were no match for well fed dogs eager for the chase.

The Desert Fox (*Vulpes leucopus*), Sindhi, Nando or Acho Lekar Baluchi, Lombar, is not unlike the European fox about the face and is a true desert form, feeding mainly on gerbilles and lizards and haunting terrain growing desert plants such as kerrar, ak, khap and phog. It is at times found on the same ground as the Indian Fox, which seldom if ever affects the arid, sand tracts, the true home of the Desert Fox.

The Small Punjab Fox (*Vulpes pusillus*) has so far been recorded from Upper Sind region only, where I have found it around Reti, Ubauro and Kashmor. It inhabits terrain similar to that of the Desert Fox, with which, according to Murray, it is oftentimes associated. Both these species have white-tipped brushes, while the Indian Fox has a brush with a black tip. This form *pusillus* is also known as Nando Lekar in Sind region.

The Cetacea (whales, dolphins and porpoises) are represented by four species, which comprise two dolphins, one porpoise and one whale, all except the porpoise are marine.

The Plumbeous Dolphin (*Steno plumbeus*) and the Beaked Dolphin (*Steno longirostris*) are both marine forms found in the seas along the Sind coast, the former has been noticed in some of the Indus delta creeks.

The Pakistani or Gangetic Porpoise (*Platanista gangetica*) which grows to 7 feet is a fresh water form and is entirely blind, because of its imperfectly developed eyes. Though it is named after the Ganges it is not peculiar to that river but is found in most of the large rivers of sub-continent. It is very common in the Indus and is known in Sind region as Bulhan or Sisur. Muhanas and Mirbahars value its oil as a specific for rheumatism and also use it in lamps to light their boats and houses. Many coastal casts relish its flesh which they consider a great delicacy and prefer it to turtle and all fish, except the pallo (*Clupeatlissa*), more of which anon.

This porpoise is caught by Sindhi fisher folk with the aid of trained otters which are let loose in a river inlet or Kund containing fish. The otter chase the fish and the porpoise hearing the disturbance enters the pool to catch the fish, but is itself caught in a strong bell-shaped net and speared through the meshes.

The Rorqual or Blue Whale (*Balaenoptera indica*) is the largest living mammal known and grows to a hundred feet in length. It is not infrequently met with off the Sind or Mekran coast. It lives on small crustacea. On two occasions at least it has come into collision with steamers between Karachi and Bombay. One of these whales was found entangled in the Submarine Cable on the Mekran coast. In 1879 a skull, over seventeen feet long was cast up on the beach at Clifton.

The Chito or Bahari Buhlan of the fishermen of Bhit and Baba is apparently this whale which is at times harpooned and towed into port, where it is cut up for the sake of its oil, which is much prized by coastal fisher folk. On the South Persian and Mekran coasts the bones of stranded whales are used in the construction of palm-frond huts built by coastal folk.

The *Rodentia* (Gnawers) are fairly well represented in Sind and Khairpur region.

The striped Palm Squirrel (*Sciurus palmarum*), Sindhi Noriaro the Gilehri of the Indo-Gangetic plain where it is so common and the most familiar garden and roadside mammal is scarce in Sind and Khairpur region. It is met with in all districts, but is nowhere common. It is subject to local migration. In Karachi it is preyed upon by the ownerless cats which infest the town and I have seen a House Kite (*Milvus govinda*) stooping at it when on the ground in search of fallen *siris* or *tali* beans of which it is very fond. I have also seen House Crows baiting it, attacking front and rear as is their habit. This little squirrel, the Tree Rat of the British soldier, makes a charming and most entertaining pet if hand reared. It breeds in captivity.

The Pakistani Gerbil (*Gerbillus indica*) and its smaller relative the Desert Gerbil (*Gerbillus hurrianae*) are perhaps the commonest rats in Sind and Khairpur region in their respective habitat. The latter which prefers drier tracts, though more local is more common than the former. Both, as a rule, live in colonies and burrows to a depth of 4 to 5 feet. They feed on grass roots and grain and are mainly diurnal. The Pakistani Gerbil is most prolific, producing as many as a dozen young at a time. Because of their colouring, long hind-legs and leaping ability, they are also known as Kangaroo or Antelope Rats. The Pakistani Gerbil can escape a dog by leaping clean at a bound and has been known to clear as much as 5 yards over its back.

The Hairy-footed Gerbil (*Gerbillus gleadowi*) discovered by F. Gleadow of the Forest Service at Rohri, the smallest of the three species which occur in Sind region, is very local and has the habits of its two larger congeners. I have come across it in small colonies in sandy, stunted scrub tracts between Reti and Khenju in Sukkur district.

It is apparently peculiar to Sind region, but since it occurs so near the Punjab border, it will probably also be found in Bhawalpur and other, adjoining districts which border Sukkur district, where it was discovered by Mr. Gleadow, who did a deal of excellent field work in former Sind.

The Short-tailed Mole or Field Rat (*Nesocia hardwicki*) and its larger relative, the Mole or Common Field Rat (*Nesocia bengalensis*) both occur in Sind region. The former, the dreaded Kuho

of the Kurmi, which plays such havoc in areas under cultivation and to river and canal bunds adjoining, is widely spread and plentiful wherever it occurs. The latter which is the common outdoor rat is scarce in Sind region and has according to Murray, so far been found only in Tharparkar district. It is fierce and solitary, making large burrows, covering an area of several yards, in which it stores as much as a pound of grain or grass seed. This Rat is one of the species known as 'plague rats'. Its flesh is highly prized by the Wadars, a wandering tribe of Bombay (India).

The Bandicoot or Pig Rat (*Nesokia bandicota*), which grows to two feet and over in length and can turn the scales at three pounds, though said to be found in Karachi, where it affected cotton godowns, does not to my knowledge, now occur anywhere in Sind region. The large rats seen in Karachi godowns during the time of Murray, 73 years ago, may have been the Brown or Sewer Rat which grown to a large size and in Calcutta have been mistaken for the Bandicoot.

The Brown or Sewer Rat (*Mus decumanus*), and the Roof or Black Rat (*Mus rattus*) are both common house dwelling species and ranked as 'plague rats' especially the latter, which lives in house and is also called the Roof Rat because of its climbing activity.

Both species are carnivorous, nocturnal, can swim well and have a fondness for table food which they steal at every opportunity.

The Sewer Rat is cunning, fierce and destructive. It will kill pet birds as large as a partridge. A rat of this species killed a tame Grey Partridge which had the run of the house in Sukkur, and another killed one out of three Close-barred Sand Grouse I had in a wire cage at Karachi. This rat has been known to bite sleeping humans and is the cause of 'rat-bite fever', a disease communicated by the protozoan parasite *Spirillum nirsus-muris*. A pup 4 months old I had in Karachi, was severely bitten in the throat by one of these rats and took weeks to recover. The bite developed into a nasty suppurating sore and gave the pup high fever, which almost killed it. Both the Grey and Black Rat occur commonly in all large towns and villages in Sind and Khairpur region.

The Persian House-Mouse (*Mus bactrianus*) is the common house mouse of Sind. The House-Mouse (*Mus musculus*) is said to occur in Upper Sind region but has not to my knowledge so far been recorded. The Persian form has all the habits, mostly gnawing, of its Pakistani cousin about which all that matters is already common knowledge.

The soft-furred Field Rat (*Mus mettada*) occurs in Sind region but is not nearly so common as the Short-tailed Rat or the common Field Rat. It lives in small parties and is partial to cultivated lands, where it lives in poorly made burrows, in old field rat burrows or shelters in heaps of stones or rubble.

The Spiny Brown Mouse (*Mus platythrix*) is said to occur in Sind region but little is known about it locally. It lives in pairs and is partial to red gravel soil where it burrows, blocking the entrance from the inside, when at home, with pebbles, a stock of which is kept outside. The living chamber is also bedded with small pebbles. Its habits are very like those of the Indian Field Mouse (*Mus bunduga*), which does not occur in Sind and Khairpur region.

The Bush Rat (*Goñunda ellioti*) which makes a nest of grass placed low in a bush or concealed in grass on the ground is listed as a Sind species. It is solitary, diurnal and lives on grass roots. Little is known about it.

Very little is known about the Field Mice of Sind generally. I have come across typical field mice nests in khabar and kerrar bushes bordering cultivation in Lar, Wichlo and Siri (Lower, Middle and Upper Sind region,) and have on occasions found them occupied by a field mouse very like the Long-tailed Tree Mouse (*Mus oleraceus*), but unaware at the time that so little was on record about the field mice of Sind region, I never took more than a casual interest in them.

There is much scope for serious field and museum work amongst the field mice of Sind and Khairpur region.

The Porcupine (*Hystrix lecura*), Sindhi, Serh, Syal, Sinkor or Kharpusht is common where there is suitable terrain and cultivation.

It is a great pest and particularly destructive to yam and potato crops and young plantain shoots. There is no truth in the belief that it can discharge its quills like arrows.

The Persian form (*Hystrix cristata*) has been found near the Mula Nai on the Sind-Baluchistan border and possibly extends into the Khirthar Range and its outliers as far south as the Karachi Kohistan, as it is partial to broken, hilly country and is common in such terrain in South Persia where I have frequently come across it.

The Common Pakistani Hare (*Lepus ruficaudatus*) does not occur in Sind region.

The Persian form (*Lepus craspedotis*), which is listed by Murray as a Sind species, does occur but sparingly in Mekran, where I have brought a few to bag in scrub jungle near cultivation along the banks of the Vinder and Titian Nais. I have not met with it further east, across the Habb river but it probably does enter Sind region as a straggler by this route, as the Habb is a dry crossing except when the river is in spate during the rainy season,

The Sind Hare (*Lepus dayanus*) Sindhi, Saho, Sissa or Sehar is the common hare of Sind region and plentiful in suitable country everywhere, particularly in Lar (Lower Sind region) where it abounds in the Gadap plain and scrub jungle ground Jungshahi, Pir Patho and Gulamallah.

The Jokhias of Lar are adept with their short throwing sticks and I have seen hares going their best bowled over by a clean hit at 15 to 20 paces. Majna, a Jokhio Shikari of Braudabad was a treat to watch at this form of Sindhi Shikar.

A hare obtained by F. Gleadow near Jungshahi and listed by Murray as *Lepus joongshaiensis*, must be very local and scarce, as Colonel W.J. Dixie, Majors Williams and Gibbons and I failed to find it, despite every effort to do so. This hare may be a variety of *dayanus*, which as stated by EHA, 'appears to be the only species' in Sind region nevertheless the matter is one of more than ordinary interest and calls for further investigation.

The *Ungulata* (Hoofed mammals), which is poorly represented due to the dearth of cloven-hoofed ruminants, comprises 7 forms, excluding the now extinct Swamp Deer and the Four-horned Antelope, the inclusion of which on the Sind region list is hardly justified.

The strongholds of the Asian Wild Ass (*Equis hemionus*) Sindhi, Gur Khar or Ghor Khar, are the Rann of Cutch and the deserts of Bikanir and Jaisalmir.

Searching enquiries in the desert areas of Tharparkar in 1936 failed to confirm that it was a permanent resident. Kolhis and Tharis said that they sometimes saw a few near the Rann area and that they were very wild and had the speed of an arrow. If disturbed, they fled back to the area where they lived.

The Wild Boar (*Sus cristatus*), Sindhi, Mirun, Dhookar Suar, is common throughout riverain forest tracts and Kutchas which provide the dense cover it requires. It grows to great size and is fierce and fearless. A solitary boar is dangerous and can be most vicious. Monsters with tusks 8 to 10 inches long have been speared or shot. I have seen some nasty wounds inflicted by their tusks on both man and horse. The belief that they cut their throats with their sharp fore-feet hooves if they try to swim is entirely without foundation, as they are strong swimmers and do not hesitate to enter and swim across broad backwaters in order to reach their feeding grounds. Wild pig are a menace to cultivation and are responsible for much damage to *matar* (vetch), *chano* (gram) and *gidro* (melon) fields in the Indus Kutchas. They have also a great fondness for *Kamand* (sugar-cane) and will not cavil at carrion should they come across a dead animal in their nocturnal wanderings.

The young of the wild pig are striped and when tamed follow their owner like a dog.

The Urial (*Ovis vignei*), Brahui, Gad, occurs in the Khirthar Range and its outliers, and the Pabb Hills in Lasbela district. At one time it could be had near Soorjana, Khadeji, Khar and Modian in the Karachi Kohistan, but now due to wanton destruction, it is scarce even in its stronghold the Khirthar Range. The finest head so far recorded in Sind region measured 36 inches round the curve. Some very fine heads can still be had in the Punjab Salt Range where it is protected to some extent.

The Asian Wild Goat (*Capra aegagrus*), Sindhi, Sarah or Ter, occurs in the higher hills of the Khirthar Range and the Pabb Hills. At one time it was not uncommon in the Tirith Laki Hills, but like the Urial, its numbers have been rapidly reduced by indiscriminate killing and even in the higher Khirthar it is now very scarce, if not totally absent in areas where it was once a sure find and that in some numbers. The record head for Sind region with horns 52½ inches and a base circumference of 7 inches was bagged by General E.C. Marston who as a Lieutenant in the 25th N.I. saved the life, of Napier at the battle of Miani near Hyderabad in 1843.

The Chinkara or Ravine Gazelle (*Gazella bennetti*), Sindhi Haran occurs everywhere in Sind and Khairpur region where there is suitable terrain, but it is not now as numerous as it was twenty years ago, and one seldom meets with more than half a dozen head together, except in the dune tracts of Tharparkar, where it still can be found in great herds. It also enters Sind region from the Rajputana and Rejistan where it is strictly protected

Here again the mass and utterly wanton destruction in Sind region, of this most graceful antelope by extensive herd driving or running down and shooting by day and night from motor cars has greatly diminished its numbers, except perhaps in Khairpur District where it is protected. In the hilly scrub jungle, the approaches to the Karachi Kohistan and the plains bordering this tract from Ran Petani to Bholari the Chinkara was fairly plentiful, but it is now so scarce that it is seldom seen. The record Sind head with horns tapping 16 inches is in the possession of the Mir of Khairpur.

The Persian form of this antelope (*Gazella subgutturosa*), does not occur in Sind or Khairpur areas.

The Black Buck (*Antelope cervicapra*), Sindhi, Karo Haran was introduced from India into Khairpur where it multiplied exceedingly under the strict protection of the Mir. The record head possessed by the Mir is a Royal Head, and the horns measure 26 inches in length and the same across the spread.

from tip to tip of horns. The horns of the Khairpur herd are noted for their great spread. A Royal Head, I believe, is the rule rather than the exception.

The Four-horned Antelope or Chausingha (*Tetraceros quadricornis*), is listed by Murray, but to the best of my knowledge it does not now occur anywhere in Sind or Khairpur, if it ever did, it is now extinct like the Barasingha or Swamp Deer.

The Hog-deer (*Cervus porcinus*), Sindhi, Pharo or Jango, is common in dense riverain jungle throughout Sind and Khairpur region.

It does much damage to crops grown in Kutchas or bordering thick jungle. The young are spotted and can swim as strongly as adults. Near Luka I found a fine hind stuck fast in river quicksand. A record head with horns measuring 23½ inches is in the possession of the Mir of Khairpur and some very fine heads adorned the walls of famous Kot in Sukkur district.

The Swamp Deer or Barasingha (*Cervus duvauceli*), Sindhi Goin, the Gond of the Gogra river Swamps in India, which once inhabited the dense grass and lai jungles of the Indus riverain near Rohri and Sukkur is now extinct, though it was in 1933 still remembered and spoken of as the Chitto Pharo or Goin by Jagirani Greybeards of the Duber and Sangi forests.

The sole representative of the *Edentata* is the Pangolin or Scaly Ant-Eater (*Manis pentadactyla*), Sindhi, Chhala-Mirun, which seldom comes to notice because of its nocturnal habits and underground existence. It occurs in Lower Sind area where it has been found in the Habb and Khadeji valleys and near the Lak Bidok Pass on the Mekran coast.

It lives in pairs and digs a deep burrow at the end of which is a large living chamber. When 'at-home' it blocks the entrance to its burrow from the inside with loose earth. It lives on black ants and white termites, which it digs out and eats by means of its long tongue, which is well lubricated for the purpose by large salivary glands. Its formidable forefeet claws, which are 'perfectly adapted for digging are kept sharp by the peculiar pose of the forefeet when walking, the claws being turned inward on the soles of the feet. The hindfeet are used in a normal manner, the tread being on the soles.

The voice of this heavily armoured mammal is a hiss, like that of the Monitor lizard. The Pangolin is host to a parasite in the shape of a small blue tick, which at times simply swarms over its entire body, particularly beneath each scale, where it may be found in clusters. It rolls itself into a ball when threatened by danger and sleeps perhaps instinctively in a similar position.

A Baluch shikari who was asked why the Pangolin lived so much underground said that they went 'beneath the earth' to avoid the persecution of Mirs and Pirs, who had them slaughtered wherever found for the sake of the aphrodisiac virtues of their flesh.

II. BIRDS (AVES)

Historical.

Sir Alexander Burnes toured Sind in 1830 and listed about 190 species, Dr. W. Griffith made a small collection round about Shikarpur in 1839. In 1854 and 1855 Dr. H. Gould also made a small collection of Sind birds. Allan O. Hume, and Dr. Francis Day worked Upper Sind in 1872 and added over 200 species to the 190 listed in 1830 by Sir A. Burnes. W.T Blandford made small collections in 1871 and 1877. During the seventies' and 'eighties' and onward till 1920, Colonel E.A. Butler, Scrope B. Doig, W.E. Brooks, Lieut. H.E. Barnes, Colonel Le Messurier, Sir Evan James, J.D. Murray, J. Davidson, Casement, T.R. Bell, Gordon, R.L. McCulloch, Frank Ludlow, Harrington Bulkely, D.G. Ommanney, J.M.S. Culbertson, R.E. Gibson, Sir Charles Clee, A.E. Jones, H.T. Labmbrick, N.H. Mensesse, Hotson and Dr. C.B. Ticehurst all contributed in greater or lesser degree to the valuable ground work of Allan Hume which was published in Vol. I of 'Stray Feathers'.

Scrope Doig worked the Eastern Nara area and was mainly interested in the breeding species, as was T.R. Bell, who concentrated on the forest and riverain tracts in Sukkur district. Colonel Butler and Lieut. Barnes worked Hyderabad and Karachi districts and contributed many papers of interest to 'Stray Feathers', while Blandford and Brooks worked Upper Sind and parts of the desert areas in Tharparkar district, respectively.

After Hume's excellent account published in 'Stray Feather' nothing beyond odd notes appeared from time to time in ornithological journals. In 1884, Murray published his 'Vertebrate Zoology' which contained little information about the birds of Sind. Barne's 'Birds of the Bomay Presidency' contained nothing more about Sind region than what was already known, while Butler's Catalogue of the Birds of Sind' compiled in 1879 was but a bare 'list' brought up to date. After 1880 all that was brought on record were some casual notes appearing from time to time in the Journal of the Bombay Natural History Society and in 1907 E.H. Aitken, E.H.A. incorporated an abbreviated list of birds in his '*Sind. Gazetteer*'. Dr. Claude B. Ticehurst, who was stationed in Karachi from 1917 to 1920, devoted his spare time to ornithology and not only brought up to date all that was already known about the avifauna of Sind but added much which was new and of interest to it. His valuable paper the "Birds of Sind" was published in the 'Ibis'.

I was posted to Sind in 1920 and for 34 years devoted most of my spare time, such as it was, to the study of the Fauna of Sind in main bird and reptiles. I worked the Province as a whole and through unable to pay but short visits to areas difficult of access such as the Khirthar Hills in the West and the Thar desert tract

in the South East I was fortunate in being able to add four new forms to the Sind List bringing the total up to 426 species.

Like Barnes, Doig, Bell and Bulkley I concentrated on breeding species and besides confirming the hitherto uncertain breeding records of 13 species, established the first breeding records of 24 other species.

The four additions to the Sind List are the Long-billed Vulture (*Gyps indicus indicus*), a winter visitor to the extreme South East of the Sind region where it was found breeding in 1946, the Crested Honey Buzzard (*Pernis cristatus ruficollis*) met with in Sukkur district (1931, 1932 and 1949), Tharparkar, Jamrao (1936), and Upper Sind Frontier (New Jacobabad) Chai (1949), where it breeds and is partial to Talli (*Dalbergia sisu*) trees in open forest and canal banks, the Lesser Orange-breasted Green Pigeon (*Dendrophasa bisincta*) three seen and one shot in Karachi (1938) and the stiff-tailed Duck (*Erismatura leucocephala*) one shot at Sakrand (1922) and shown to D. G. Ommanney, who told me that he had shot one in Sukkur district in 1908 and another shot at Drig (Larkana) in 1935 by H.T. Lambrick.

The breeding in Sind region of the undermentioned thirteen species was confirmed.

1. Raven. *Corvus corax laurencei*.
2. Wandering Minivet. *Pericrocotus peregrinus pallidus*.
3. Persian Bee-eater. *Merops persicus persicus*.
4. Large Parroquet. *Palaeornis eupatria nipalensis*.
5. Barn Owl. *Tyto alba javanca*.
6. Griffon Vulture. *Gyps fulvus*.
7. Spotted Sand-Grouse. *Petrocles enegallus*.
8. Coronetted Sand-Grouse. *Pterocles coronatus atratus*.
9. Great Bustard. *Choriotis nigriceps nigriceps*.
10. Florican Bustard. *Sypheotis indica*.
11. Kora or Water-Cock. *Gallicrex cinereus*.
12. Grey Quail. *Coturnix coturnix coturnix*.
13. Rain Quail. *Coturnix coromandelicus*.

The first breeding records of the following 24 species were established,

1. Sind Grass Babbler. *Pyctorhis altirestris scindicus*.
2. Streaked Scrub-Warbler. *Scotocerca inquieta striata*.
3. Long-tailed Hill-Warbler. *Suya crinigera striatula*.
4. Hooded Chat. *Oenanthe monacha*.
5. Pallid Crag-Martin. *Ptyonoprogne obsoleta*.
6. Sind Red-winged Bush Lark. *Mirafra erythroptera sindianus*.
7. Northern Yellow-fronted Pied Woodpecker. *Liopicus mahrattensis*.
8. Unwin's Nightjar. *Coprimulgus europaeus unwini*.
9. Common Nightjar. *Caprimulgus asiaticus*.
10. Arabistan Brown Fish Owl. *Ketupazeylonensis semenowi*.
11. Striated Scops Owl. *Otus Brucei*.
12. Long-billed Vulture. *Gyps indicus indicus*.
13. Great Spotted Eagle. *Aquila clanga*.
14. Crested Honey Buzzard. *Pernis cristatus ruficollis*.
15. Close-barred Sand-Grouse. *Pterocles lichtensteinii lichtensteinii*.
16. Cream-coloured Courser. *Cursorius gallicus gallicus*.
17. Caspian Tern. *Hydroprogne caspia caspia*.
18. Mekran Large Crested Tern. *Thalasseus bergii bakeri*.
19. Mesopotamian Ternlet. *Sterna albifrons praetermissa*.
20. Sooty Gull. *Larus hemprichii*.
21. Common Coot. *Fulica atra atra*.
22. See-see Partridge. *Ammoperdix griseogularis griseogularis*.
23. Little Button Quail. *Turnix dussumieri*.
24. Button Quail. *Turnix tanki tanki*.

The undermentioned *Zamindars*, all keen *Shikaris* and fine *Topjis* ably assisted me in my field work: Pir Taj Mahammed of Kamarro Sharif, Hyderabad and Tharparkar districts, Khan Abdul Razak Khan of Daharki, Sukkur district, Rais Fakir Muhammad and Rais Ali Muhammad of Bramhyderi, the Indus delta and Karachi district coastal tracts.

The short papers among others mentioned below, appeared in the Journals of the Bombay Natural History Society and the Sind Natural History Society from time to time :

1. The nidification of the Western Reef Egret in Karachi (1926).
2. Larks, Pipits and Hedgehogs. (1936).
3. Wagtails, Flamingoes and Shikras. (1937).
4. The Status of the Koel in Sind. (1937-38).
5. The distribution and nidification of the Northern Yellow fronted Pied Woodpecker in Sind. (1937).
6. The distribution and nidification of the Greater Spotted Eagle in Sind. (1937).
7. The distribution and nidification of the Large Indian Parroquet in Sind. (1937).
8. The distribution and nidification of the Rock Horned Owl in Sind. (1937).
9. The occurrence of the Lesser Orange-breasted Green Pigeon in Sind. (1938).
10. The distribution and nidification of the (Punjab) Raven in Sind. (1939).
11. The status and nidification of the Persian Bee-eater in Sind. (1939).
12. The Resident Owls of Sind. (1931).
13. The Mekran Large Crested Tern breeding off the Sind Coast. (1943).

There is still much of interest to be discovered in such areas as the Khirthar and its outliers, the perennial reed beds and marshes of the Manchur, the desert tracts of Tharparkar and the swamps, creeks and islands of the coastal belt and the Indus delta, all of which are '*terra incognita*' to ornithologists, as the bare fringes alone of these areas have been penetrated and none systematically worked during the non-winter months, the breeding time of most birds except some *Raptores*.

My zoological collection of the Indo-Pakistan-Malayan Region comprising over 12,000 specimens and about 800 species, which took me over 40 years to build up, was taken over by the former Sind Government in May 1954, prior to my departure from Sind.

Physical features and vegetation. As this chapter is but an integral part of the former Sind Gazetteer as a whole, it is not necessary to dwell here on either physical features or vegetation, both of which will be dealt with in their more appropriate places by a far abler pen than mine. Suffice it to say that in the 54,000 square miles which comprise Sind region the physical features which are as contrasting and as varied as the vegetation range from arid desert and *pat* to rich arable lands, from sand dunes to precipitous mountains, from coastal swamps to fresh water marshes and lakes, from desert scrub to dense riverain forest, from seasonal streams to perennial canals and rivers and from river islands to coastal deltas. These features and the varied vegetation they produce and support are factors of primary importance to all organic life, for it is this combination of land, water and plant life which provide the conditions and environment essential for the existence and survival of all forms of fauna.

Migration. Excluding local migration from one area to another consequent upon climatic conditions or lack of food, water and shelter, there are two great migratory movements each with a distinct route, and from one of these two main movements, the vast North to South and South to North migration, there is a distinct offshoot, with a more westerly trend, which takes some species from their winter quarters in Indo-Pakistan sub-continent to their summer haunts in Persia. One of the main routes is that taken by the western wing of the great North to South and South to North movement by which winter migrants come from and return to their northern breeding grounds.

The other main route is the eastern margin of the route taken by migrants from Afghanistan and farther north to their winter residence in Africa.

General. Sind region is extremely rich in most forms of bird life and is of considerable ornithological interest as it is the western limit of the Pak. Malayan or Oriental Region and lies more or

less within the eastern fringe of the Palaearctic Region. Actually speaking there is no barrier beyond which no Palaearctic species goes east and no Indo-Pakistan-Malayan species goes west. The fringes of the two regions overlap each other over a considerable area from South Persia to Sind region. I have come across more Palaearctic species than Indo-Pakistan-Malayan east of a line roughly from Bandar Abbas in the south to Kirman in the north. This limitation of the extension of Indo-Pakistan-Malayan forms is possibly due to the lack of suitable terrain west of the Indus valley and the dry, barren and practically waterless barrier formed by the Khirthar and Mekran coast ranges, which undoubtedly limit, to a great extent, the progress west of a number of Indo-Pakistan-Malayan species, which require forest and lake lands for their survival.

The varied and contrasting physical features of Sind region and the plentiful supply of bird food and water in the plains drained by the Indus and its Barrage canals, provide the habitat necessary for the existence of the 426 species on the Sind List. The great majority of these species are of course winter visitors, a few are breeding migrants and the remainder are resident breeders.

The majority of resident breeders naturally belong to the Pakistan-Malayan Region of which Sind forms the western limit, nevertheless a number of true Palaearctic species, some of them resident, are on the Sind List, while a fair number of Palaearctic winter migrants are only or almost only met with in Sind region.

The race found in Sind region in many cases is the dry area form found over North-West Pakistan generally and the dry tracts of Baluchistan region bordering Sind on the west, and not that found over most of prepartitioned India, yet very few species are peculiar to Sind alone. Until a few years ago there were three, but the discovery of the Sind Grass Babbler (*Pyctorhis altiloris scindicus*) by H.W. Waite in the Punjab region, now leaves only two, the Sind Starling (*Sturnus vulgaris minor*) and the Black-shafted Sea Tern (*Sterna albifrons saundersi*).

The Sind Grass Babbler was first obtained by Blanford at Mangrani, Sukkur district, between 1871 and 1877 and remained 'lost' till found again in 1930 by me on the Eastern Nara, Sukkur District and later by Waite in the Punjab region. In September 1930 I was most fortunate in finding a nest with two eggs at Januli and later found this babbler a great skulker, in dense grass jungle near Duber, Jainab Wah, and near Rahuja, old Sind Wah not far from Mangrani where it was first discovered by Blanford. The Sind Starling during the breeding season keeps strictly to Indus riverain (*Kutchas*) and forest tracts subject to *Abkalani* inundation, where it still breeds in localities where found by Scope Doing in 1878.

The completion of the Barrage Canals systems has already affected the fauna of Sind region, and in time to come, the

presence of great perennial canals, trees, orchards, and thousands of acres of cultivation which will provide food, water and shelter in abundance, must result in the extension to Sind of many species of birds which hitherto have been completely absent or have visited the area either as summer migrants or stragglers. I am convinced that the Indus Barrage Canals systems, Sukkur and Kotri, will in due course bring about great changes in the avifauna of Sind and Khairpur region. Much can be done to stabilize these changes by protecting species which find suitable habitat for permanent residence because of the changed environment and conditions.

Detailed district lists of birds are obviously beyond the scope of this Paper, nevertheless the notes which follow and the List of Sind Birds given in the Appendix, clearly show the peculiar and interesting character of the avifauna of Sind, due to its geographical position, greatly contrasting physical features and varied vegetation.

The great Indus valley is isolated from the rest of the country or sub-continent by an arid desert barrier which is clearly responsible for the complete absence or scarcity of many other species such as Jungle and Spur Fowls, Rock and Bush Quails, Ioras, Flower peckers, Horn-bills, Bulbuls except two, Fruit Pigeons except two, both rare stragglers; Sun-birds except one, and Barbets one, and that a very rare straggler. Among the ornithological oddities may be mentioned the great abundance of the Pheasant-tailed Jacana (*Hydrophasianus chirurgus*) and the complete absence of its near relative, the Bronze winged Jacana (*Metopidius indicus*) despite ideal conditions for both species. What makes the total absence of this jacana harder to understand is its prevalence in Baroda, particularly around Deesa, which is only about a hundred miles, as the crow flies, from the Sind border. EHA lists the 'Common Grey Indian Tit' presumably (*Parus major cinereus*) if so, it definitely does not occur in Sind region. The Punjab region Grey Tit (*Parus major planorum*) though common in Lower Punjab region has not been recorded in Sind or Khairpur region nor has the White-winged Black Tit (*Parus nuchalis*) which is found in Kutch, where also no grey tit occurs.

The Rosy Pastor (*Pastor roseus*) found breeding in the Tekkes valley in Turkestan by Ludlow is absent from Sind region for about two months only.

Adult males are the first to return followed by adult female and sprinkling of juveniles in their brown plumage. About two weeks later, the juveniles arrive in vast flocks and mix with the adult birds.

This starling though named the *Jowari* Bird, is contrary to popular belief, NOT a grain crop destroyer. It does, however, destroy a number of insect pests harmful to the farmer, such as locusts in the hopper and early winged stages, grass hoppers, crickets and caterpillars.

The Rose-ringed Parroquet (*Palaeornis torquata*) is much more of a crop destroyer than the innocent 'Pastor' who however, does not draw the line at ripening dates and plays havoc with them in the date groves at Rohri, where it was shot by the hundred by *bannia shikaris* before partition and the advent of Pakistan. The Sind Jungle Sparrow (*Passer pyrrhonotus*) first discovered by Sir A. Brunes about 1830 and lost for 40 years, till rediscovered by Scrope Doig in its breeding haunts in 1870, is now one of the commonest birds in the Indus *Kutch*, forests and tract subject to inundation, where it often shares breeding areas with the Sind Yellow-throated Sparrow (*Gymnoris xanthosterna transfuga*) and the Sind Starling (*Sturnus Vulgaris minor*). The Sirkeer (*Taccocua leschenauetii sirkee*) obtained by Blanford in the Habb valley and by Doig in the Sukkur district was found by me in the Eastern Nara, Sukkur district, and at Jamrao Head and Umarnot in Tharparkar district. The Large Parroquet (*Palaeornis eupatria nipalensis*) has now established itself in Upper Sind region, where it breeds freely in Sukkur district. A few birds, either stragglers, strays or escapes, breed in the cocoanut palms around Malir. Alexander the Great took one of these birds back with him from Sind and it was named *alexandri* after him by Linnaeus. According to EHA it is now named *nipalensis* in contempt of Alexander the Great.

The Lammergeyer or Bearded Vulture (*Gypaetus barbatus grandis*) is found in the higher Khirthar where Hume met with it on two occasions and Day noted it at Dharyaro. During the winter it ventures further south. MacDonald has come across it near Beli and still lower down in the Habb valley near Khand Jhang, while I met with it near Karchat and Garwari in December 1934. Sher Muhammad, a Rind Baluch of Laki, told me that this bird is seen about the Laki hills quite often in the cold weather. In Europe the Western form is most appropriately named 'Ossifrage' or Bonebreaker, as it has a decided penchant for large bones which it carries high up into the air and lets fall on to rocks below, where the bones are smashed into fragments which can be easily swallowed by the bird when it alights to feed on them. I have seen these birds dropping large bones on to a rock bed in a valley in the hills near Cherat, in former North West Frontier Province. In the Levant tortoises are treated in the same way and according to legend Aeschylus of Athens was killed in Sicily by an Ossifrage which dropped a tortoise on to his bald pate, and apparently broke bones but not those of the tortoise.

Space is limited but some may be spared for a few notes on some less familiar sporting birds. Of the six Sand-Grouse in Sind region, all but the Imperial (*Pterocles orientalis*) and the Large Pintailed (*Pterocles alchata caudactis*) are resident. The Close-barred (*Pterocles lichtensteinii lichtensteinii*) which is the dry area form of the Painted (*Pterocles indicus*) has all the habits of *indicus*.

and is found in terrain similar to that favoured by it. The Coronetted (*Pterocles coronatus atratus*) and the Spotted (*Pterocles senegallus*) are not un plentiful in thier own particular enviroment. The former favour hilly broken ground while the latter prefer bare *pat.* The Imperial which is a winter visitor is more common in Upper Sind area like the Large Pintailed which is fairly plentiful around Jacobabad where it winters in some numbers. Of the five bustards the Indian Great Bustard (*Choriotis nigriceps nigriceps*) is the only resident species and is not uncommon about Rojhan in Tharparkar district

It is rare in Upper Sind region and a straggler to Lower Sind region, where it has been met with in Hyderabad, Dadu, and Karachi districts. E.T. Fardy shot a pair near Khuman in 1924. The European Great Bustard (*Otis trada*), like the Little Bustard (*Otis tetrax*) is a very rare straggler. One out of a party of four of the former was shot by a Zamindar near Jacobabad in 1911, while one of the latter, identified by S.A. Stirp was shot in the Moach plain near Karachi in 1912. The Florican (*Sypheotis indica*) is not so common now as it was in 1875. It is still however an occasional seasonal (rainy) visitor to the Habb valley plains where it breeds. To my knowledge its last seasonal visit in any numbers was in July 1937 when I met with several cocks which attracted attention by their usual jumping display in heavy grass tracts between Mochko and Bund Murad Khan in the valley of the Habb and several other birds were seen the same year in the Gadap grass lands. This bustard should be very strictly protected as it visited Sind region during the breeding season, though in days gone by a few used to winter in Larkana and Nawabshah districts, where Hotson found it and shot several. The Houbara (*Chlamydotis undulata macqueeni*) is a winter visitor and not uncommon where there is suitable terrain, thin desert scrub and Jhambo (*Eruca sativa*) cultivation. The Woodcock (*Scolopax rusticola rusticola*) is a very rare passage straggler in Sind region and all records are from Karachi. Butler shot one in 1877, General Marston bagged but two in fifty years, Strip met with one in 1881 and Colonel Nesbit saw one in 1917. The Common Snipe (*Gallinago gallinago gallinago*), the Pintailed (*Gallinago stenura*) and the Jack Snipe (*Lymnocyptes minimus*) are all met with. The two latter are not abundant like the Common Snipe. The Painted Snipe (*Rostratula bengalensis bengalensis*) is resident and breeds in suitable localities. In Sukkur district I have found odd pairs nesting in rain filled pits and one pair nested in a small patch of grass and reeds on the edge of a shallow pool in the bed of the Habb river. The Mute Swan (*Cygnus olor*) is a very rare straggler. In 1878 Watson saw a number on the Manchur lake and later bagged three out of a herd of five near Sehwan. In 1900 a herd was seen on the Habb river and from then onwards during that winter they were seen or shot as follows; Kotri. 8, Manchur

Lake 1, Laki 10 and Meting 1. A single Whooper (*Cygnus*) was shot in 1904 at Kambar by Crerar and in 1907 McCulloch shot a Bewicks Swan (*Cygnus bewickii*) near Jacobabad. This is the only record of this Swan in the whole of pre-partitioned sub-continent. The White-fronted Goose (*Anser albifrons albifrons*) was noticed on the Indus by Hume and Ticehurst obtained two specimens from the Manchur lake. The comb duck or Nukta (*Sarkidiornis melanotos melanotos*) has been recorded from the south and east of Sind region only. Butler, Webb McCulloch and Gordon have brought them to bag in Karachi and Hyderabad districts. The Pigmyt Goose or Cotton Teal (*Nettapus coromandelianus*) is very local and rare. It has been seen or shot by R. E. Gibson, Ludlow, McCulloch, Thornhill, Hotson and myself in Karachi, Hyderabad and Larkana districts. The Sheldrake (*Tadorna tadorna*) is local and rather rare. It has been seen or brought to bag by Hume, Campbell, Ticehurst and myself in Dadu, Karachi, Larkana and Hyderabad districts.

In 1901 L. Robertson bagged a crested or Falcated Teal (*Anas falcata*) in Tharparkar district. The Baikal or Clucking Teal (*Querquedula formosa*) is one of Sind's rarest visitors. The only one obtained in Sind region was shot by Colonel Le Messurier. A Scaup (*Nyroca marila*) was obtained by Murray near Karachi in 1879 and the Golden-eye (*Glaucion clangula*) by Sir Alexander Burnes on the Indus. Ticehurst saw five duck flightings inland from the sea at Karachi in 1917 and took them to be Golden-eye.

The large Whistling Teal (*Dendrocygna fulva*) is very local. Sir Evan James noticed it on several occasions in 1872, Doig records it on the Eastern Nara and Barnes near Hyderabad while Butler and Becher found it on the Manchur. In 1921, I saw several at Palh in Hyderabad district and in 1947 I met with it near Kalri in Karachi district. It has not been recorded from Upper Sind region. The Goosander (*Mergus merganser*) is another rare visitor. A female was shot by Captain Bishop in Karachi harbour and Ticehurst saw a pair in a backwater of Haliji dhand near Jungshahi in 1918. The Red-breasted Merganser (*Mergus serrator*) also a rare straggler, was obtained by Yerbury in the Karachi harbour, while Hume met with the Smew (*Mergus albellus*) on the Manchur and on the Indus near Kashmore.

Ticehurst saw it twice in three seasons presumably in Karachi district where I have met with it myself at Jamdari dhand.

The Rain Quail (*Coturnix coromandelicus*) is a seasonal visitor provided the rain fall has been heavy. It occurs and breeds in the plains of the Habb valley in Karachi district. Doig records it breeding in the Eastern Nara area and Butler found in it Hyderabad district. The Common Quail (*Coturnix coturnix coturnix*) is plentiful and many remain to breed in the gram and vetch fields in the Indus kutchas of Upper Sind. The Pea-Fowl (*Pavo cristatus*) is an introduced species and has established itself firmly in Hyderabad, Dadu, Sukkur and Tharparkar districts. It breeds

wherever found and is said to kill many snakes in Tharparkar. I saw a Pea-hen kill a small *Lundi* or Saw-scaled Viper (*Echis carinata*) at Digri in 1936. The bird may have eaten her prey had I not disturbed her in order to identify the snake which was about fourteen inches in length. Lastly like the Rain Quail, the Little Button Quail (*Turnix dussumieri*) and the Button Quail (*Turnix tanki tanki*) are rain visitors and breed in favourable years in the grass lands in the valley of the Hubb river in Karachi district. Malden obtained the former near Jacobabad and Butler met with it in the Eastern Nara and around Hyderabad.

Le Messurier like myself found both species in Karachi district in the Moach and Gadap grass lands.

III. REPTILES (*PEPTILIA*)

The reptiles of Sind and Khairpur region belong to three Orders: Crocodiles and Caimans (*Emydosauria*) Tortoises and Turtles (*Chelonia*) and Lizards and Snakes (*Squamata*).

There are no Alligators (Caimans) in Asia and of the 24 forms of Crocodiles known, only 2 are found in the Sind and Khairpur region.

The Gharial (*Gavialis gangeticus*), the *Sesar* of Sind is partial to flowing water and is common in the Indus and some of the old canals which were fed by the flood waters of the Indus during the *Abkalani* season. In August, 1930 I saw *Sesars* sharing a small island with several *Wagus* at the confluence of the Karo Naro and Eastern Nara canals. On the Indus itself I have seen some very large *Sesars* between Jherruck and Kharo Chan. The name *Gavial* is probably an error for *Gharial*, the vernacular name of this crocodile in the large rivers of Northern India. It grows to 20 feet and feeds mainly on fish, for the catching of which its long narrow jaws and their formidable rows of teeth are specially adapted. It has the saurian habit of swallowing smooth stones, presumably as an aid to digestion and in Northern India, where Hindu dead are consigned to the waters of the Ganges, Jumna, Gogra, Sarju and other rivers, this crocodile does without any doubt feed on corpses, despite the fish diet assigned to it by Nature as many a stomach of the Northern India Gharial will contain besides the stones already mentioned, a few ornaments, anklets, armlets or bangles, such as worn by the poorer Hindu classes. A male Gharial sixteen feet long shot in the Gogra river near Fyzabad had a complete human arm up to the shoulder and the greater part of a *Goonchi*, a River Shark, one of the large *Siluridae* in its stomach.

The Estuary Crocodile (*Crocodilus porosus*) is a marine form which fortunately does not occur on the Sind Coast. It grows

to 33 feet and over and is the largest of living reptiles, fierce and a dangerous man eater.

The Sind Crocodile (*Crocodilus palustris*) or the *Wagu* of Sind, is common in river canal and *dhand* alike, but it prefers back-waters pools and *dhands*. Specimens over 12 feet in length are rare in Sind region. It is dangerous to man and beast, particularly goats and sheep which fall an easy prey while drinking. A Mohana was badly bitten by one in Kinjhar lake in 1937 and died of blood poisoning because he did not want to part with one leg to save the other.

This Crocodile which has made Muggar peer (Pir Mangho) a 'place to see' travels long distances overland to get to suitable water. In the Hab valley I have found them in desert pools several miles away, as the crow flies from the river and on one occasion I found one about ten feet long making a bee-line for the Hab river across the Gadap plain. The *Mohr* (Peacock) in the tank at Muggar Peer last seen by me in 1954 is a massive scarred brute and must be well over 116 years of age, if the same beast as seen by Lieut. Carlless in 1838. In 1919 J.W. Smyth, compiler of the Sind Gazetteer, aptly remarked that they 'present a squalid and uninteresting spectacle' in a walled in small and dirty tank. In 1954 the scene had not changed except perhaps that the water was 35 years dirtier. Adults of this species are as snappish as those only a few days old, as several 'holy' ones in the tank lack a part of a limb or tail. Kincaid records that 'General Nicholson won bets by crossing Mangho Pir (tank) hopping from the back of one crocodile to another'. His wife incidentally was one of the most popular poets of the day and wrote under the name of 'Lawrence Hope'.

The *Wagu* is very wary and difficult to approach even when basking or asleep on land. One about 9 feet long, shot in a desert pool on the Moach plain in the Hab Valley had fed on a large Cat-fish (*Rita buchanani*) and several Coot (*Fulica atra*).

This crocodile like its congeners, has a habit of swallowing smooth stones, varying in size up to a goose's egg. Probably this is done to aid digestion. The stomach contents in Northern India will also, as a rule, include leg or arm ornaments off the limbs of Hindu corpses thrown into a river.

Roping crocodiles alive is a sport peculiar to Sind region alone. I have seen *Wagus* 7 to 10 feet long caught by Mohanas in *dhands* at Taror, Kinjhar and Kalankot. When a *Wagu* is located, two Mohanas dive and plant tall reeds, one on each side of the reptile to mark its position.

After surfacing and waiting a few minutes the Mohanas dive again with a length of rope which one ties round the Wagu, just behind its forelegs. He accomplishes this ticklish feat while the other Mohana gently strokes the side and belly of the Wagu, which raises itself on its legs and so permits the passing of the rope under the fore part of its body. Once the rope is secured, the Mohanas come to the surface and the Wagu is hauled out of the water by the combined efforts of several men. The operation takes place in water 8 to 10 feet deep and is quickly performed once the Wagu is located. Apparently the reptile, which is asleep or only partly awake, is lulled into a false sense of security by the magic hands of the Mohano and fails to realise its peril till too late. Once on land the unfortunate Wagu is given its quietus by a rain of axe blows on its head, the Mohanas taking good care to keep well clear of its tail. The skin of the Wagu is not so fine as that of the Gharial for making leather articles.

TURTLES, TORTOISES AND TERRAPINS (*Chelonia*)

Fresh Water Turtles. (*Trionycidae*). Four forms of Softshelled, Fresh-water Turtles occur in Sind and Khairpur region. All are carnivorous and aggressive and some are of great size with a shell length of five feet. Typical Soft-shells belong to the genus *Trionyx*, which includes the largest and most ferocious. The great rapidity with which they can dart out their heads and bite, renders large ones dangerous to people bathing as they are known to attack without provocation.

The Ganges Soft-shell (*Trionyx gangeticus*) may grow to five feet in length of shell and is common in the Indus and the larger canals, where it may be seen basking on islands or on a river or canal bank with its long neck erect, head motionless except for an occasional turn right or left, ever on the watch for danger. The southern form of this turtle (*Trionyx leithii*) is also found in the Indus and is very like its northern congener, except for its smaller size and longer snout.

The Chitra (*Chitra indica*) which has a dorsal disk length of two feet, is not unlike *Trionyx* except that it has a smaller head, a feeble lower jaw, a much shorter snout and its eyes placed well forward. It is neither aggressive nor dangerous. The last form in this class is the Bungoma or Common Box Soft-shell (*Emyda granosa*), with a dorsal disk length of ten inches. This small Soft-shell is common in the Indus and in most canals and *dhands*. On the banks of the Baghar canal near Pir Patho in 1934 I came across a number of scooped out shells of this turtle near a burnt out fire. A Mirbahar informed me that Bhils and Bhanjaras ate the flesh of this and larger soft-shells. The Bungoma is at times found some distance away from water. One about 8 inches in length which

was found between Kinjhar lake and the Indus in 1936 was brought to me by a Mohani in Karachi. I later released it in a pool in the Hab river.

Only two forms of Land Tortoise (*Testudinidae*) occur in Sind region. A third probably occurs but has so far not been met with. All are terrestrial and herbivorous. The Starred Tortoise (*Testudo elegans*) which has a shell length of 12 inches is found in grass cum hillocky tracts in the Hab valley and Gadap grass lands. Its small congener Leith's Tortoise (*Testudo leithii*) which was described from Sind in 1869 has not been met with again. Its small size, about 5 inches, and fondness for broken terrain, growing grasses and shrubs, which afford it excellent concealment, may be the reason why it has not been found again. The Three Keeled Land Terrapin (*Nicoriatra juga*) which occurs in the southern Punjab region, where it was found near Chachran in Bahawalpur area, probably extends to Sind region but has so far not been found. Hamilton's Terrapin (*Damonia hamiltonii*) a semi-aquatic form, with a shell length of nine inches, is recorded by Boulenger from Upper Sind region.

Four forms of Freshwater Tortoises (*Testudinidae*) occur in Sind region. All are aquatic, herbivorous and damage standing rice crops.

The Thurgi (*Hardella thurgi*) is found in the Indus. The female of this tortoise has a shell length of 20 inches, but the male is much smaller. The Batagur (*Batagur baska*) which has a shell length of 15 inches, and a pointed up-turned snout, is found in the Indus also and is considered good eating by Bhanjaras, Bhils, Wagris and other wandering tribes.

The Dhongoka (*Kachuga dhongoka*) has a shell length of 20 inches and is found in the Indus also, while Smith's Kachuga (*Kachuga smithii*) which has a shell length of 9 inches is recorded by Murray as common in the Indus. The Dura (*Kachuga tectum*) which has a shell length of 9 inches, is yet another Indus species, and very likely occurs in the old canals such as the Baghar, Phuleli, Kalri, Pinyari, Jamrao, Nara, Sind and Mahie. It is more than likely that all these species of Freshwater Tortoises which occur in the Indus, probably extend to the old canals system, which was fed by the overflow or spill waters of the Indus during the Abkalani season and so provided outlets to canals and *dhands*.

Two species of Marine Turtle (*Chelonia*) occur on the coast of Sind region. The Kachhau or Green Turtle (*Chelonia mydas*), so named because of the colour of its fat, is the common turtle of the Sind region coast. It has a shell length of four feet and is mainly herbivorous. Its flesh is highly prized by Mekrani, Kutchi and other fisher folk, but according to Sir Emerson Tennent it is said to be

occasionally poisonous. At one time this turtle was a regular seasonal visitor to the sands at Ghizri, Clifton, Sandspit and Hawkes Bay, where it deposited and buried its soft shelled spherical eggs by the hundred, only to have them dug up and sold as food. So much labour of love lost ; still the eggs are said to be excellent eating.

The Loggerhead Turtle (*Thalassochelys caretta*) also called Kachhau by Sindhi fishermen, like the Green Turtle grows to four feet in length.

According to Murray it is common, but fisher folk of Bhit, Babar, Bram Hyderi, Rehri and Ketu Bunder state that it is not so and that its flesh is not liked, though the Chinese and Bengal Hindus are said to relish it. It is a carnivorous form and feeds chiefly on mollusca and crustaceans. Its eggs which are like those of the Green Turtle are deposited and buried in the sand in March or April. Eggs have been taken by Bram Hyderi fishermen on the large sand islands at the mouths of the Kajhar and Seer creeks near the Sind border.

LIZARDS AND CHAMELEONS. (*Lacertilia* ET *Rhoptoglossa*)

There are 38 species of lizards found in Sind and Khairpur region. These comprise Geckos (*Geckonidae*) 11 forms, Eye-lid Geckos (*Eublepharidae*) 2, Agamids (*Agamidae*) 8, Monitors (*Varanidae*) 3, Typical Lizards (*Lacertidae*) 4 and Skinks (*Scincidae*) 10. There are no Slow-worms (*Anguidae* and *Dibamidae*) or Chameleons (*Chamaeleontidae*) in Sind or Khairpur region.

Geckos are mainly insectivorous and nocturnal. They usually have expanded toes bearing suction plates which enable them to move fast on a smooth surface and in any direction, even upside down on a wall. They lay round, hard shelled eggs and the more common forms occur in every house and garden. Bold and greedy to a degree, many house individuals, scorning the insectivorous diet assigned to them by naturalists, wax fat on table food which they steal with avidity.

The Common House Gecko (*Hemidactylus gleadowii*), the Narrow-toed House Gecko (*Alsophylax tuberculatus*) and the Asian House Gecko (*Hemidactylus coctaei*) are the forms most likely to be met with in buildings or on garden trees, while Dunsterville's Gecko (*Stenodactylus orientalis*) is commonly found in sandy desert, wind blown sand tracts preferably, or amongst the roots of Ak (*Calotropis*) bushes, while the Rock Gecko (*Gymnodactylus kachhensis*) is partial to rock crevices and is seldom found in house.

The Eye-lid Geckos are closely allied to the true geckos, but differ from them externally by the presence of connivent eyelids and thin toes which are not dilated. The skin is granular and warty and the tail fat and bulgy. Two forms occur in Sind region and both are partial to stone, rubble or decayed wood heaps and ruins or tumbled down huts in dry situations. Hardwick's Warty Gecko (*Eublepharis hardwickii*) and the Blotched Warty Gecko (*Eublepharis macularius*), the dreaded Hun-Kun of Sind, are perfectly harmless creatures, nevertheless they are so feared as deadly that they bear the name Hun-Kun, *Hun* (to strike) and *Kun* (to carry), implying that a person bitten is as good as dead, a corpse to be carried away. The Sindhi proverb '*Padam, na khara kadam*', a free translation of which is 'When bitten, not another step—Death where stricken', clearly expresses the dread and terror Sindhis have for the bite of these perfectly harmless and inoffensive geckos. The former grows to 8 or 9 inches, while the latter which has been found in the ruins at Nineveh near *Mosul* in Iraq, grows to about a foot in length. Both are warty, ungainly and coloured too highly to be attractive. The Caliban-like shape given them by nature is perhaps responsible for their evil reputation which is quite unjustified. Sindhis believe that its bite is fatal and that it attacks by leaping from a distance of several feet.

I had several of both species in captivity in Sukkur for over two years and they became quite unafraid, taking large insects from between my fingers. When stalking their prey, they creep very slowly up to easy striking distance, raise themselves slowly on their legs and Gecko like make a sudden rush and snap up their prey. They would not touch water, but eagerly lapped up drops of water off Ak leaves and grass or they would lick water off their bodies, if lightly besprinkled with it. They cast their epidermis in patches, often pulling pieces off their body and eating them. They were never aggressive and though they did not like being handled, they never attempted to bite. Their tails, like those of true geckos and Lacertine lizards, were brittle and broke off easily, perhaps as a protest. They grew again but as gristly stumps hardly tails.

Only two forms of lizard, both belonging to the genus *Hemiderma* or Beaded Lizards, are known to be *poisonous*. One occurs in America and the other in Mexico.

Of the 8 species of Agamid lizards which occur in Sind region only four need be mentioned. The 'Bloodsucker' or Garden Lizard (*Calotes versicolor*) is the most common and is found in gardens and orchards; in desert scrub, where it loves to sun itself on Thuar (*Euphorbia*) bushes and in open dry tract forest, where it is partial to Kandi (*Prosopis spicigera*) and Babul (*Acacia arabica*) trees. It has a chameleon like habit of changing colour and in the breeding

season the lordly male assumes a brilliant coat of red, black and yellow, which gives him a truly formidable appearance. They are, however, quite harmless, despite the name of 'Bloodsucker', which is in no way justified. This lizard is a great sucker of birds' eggs, but no sucker of blood. This lizard, which, like others of the Genus *Calotes*, has the habit of bobbing its head up and down, also, delights to sun itself on the topmost branch of a shrub or tree falls an easy prey to the Shikra (*Accipiter badius dussumieri*) and the Red-headed Merlin (*Falco chicquera*) and I have seen a Coucal (*Centropus sinensis sinensis*) catch and swallow one, about two inches of the tail sticking out of the bird's mouth and moving from side to side. The Coucal looked most uncomfortable but managed eventually to swallow the feebly protesting tail end. I once saw a House Crow (*Corvus splendens zugmayeri*) swooping at a large male basking on the end of a high branch of a Gular (Fig) tree. The Lizard stood his ground with jaws angrily agape and the crow flew off in disgust after several determined but futile attempts to dislodge the Blood sucker. The Blue-flanked Agama (*Agama isolepis*) is found alike on plains, stony hills, rocks and shrubs. The male has a small dewlap and during the mating season assumes a cobalt blue throat and flanks. The Red-throated Agama (*Agama rubigularis*) is a sandy or semi desert form and both sexes have a bright red patch beneath the throat.

It is not uncommon along the base of the Khirthar foothills and I have met with it around Laki and the Baran river gorge near Surjana.

The Collared Toad-head (*Phrynocephalus olivieri*) is an evil looking lizard which occurs in stony, barren wastes, dry gravelly river beds and such like situations. Its protective colouring is perfect and when disturbed, it scuttles away and quickly buries itself in soft sand, under gravel or small stones. It is not uncommon in the Jangri cum Baran river-bed area in Karachi district and I have found it in the dry gravelly bed of the Malir and Khadeji rivers when not in spate in April and May.

Lastly the Spiny-tailed Lizard (*Uromastix hardwickii*), the *Sanda* of Sind, deserves mention. This heavy, ungainly lizard which grows to 15 inches, is one of the commonest species in sandy, stony, arid tracts and usually first comes to notice when seen scuttling across a road in the very face of an approaching car and literally tumbling into the mouth of its desert burrow. This lizard is herbivorous and frugivorous and entirely terrestrial. It digs its own burrow which may be 8 or 9 feet long and 4 or 5 feet below the surface. When the weather is cold and wet the Spiny-tail retires to its burrow and carefully closes the entrance from the inside by making a road block of heaped up sand. It is commonly preyed upon by the Lugger Falcon (*Falco jugger*) and I have seen the Long Legged

Buzzard (*Buteo lerox lerox*) stoop at them, but without success. The Sanda is docile and never bites, but large specimens are apt to use their heavily armoured tails in defence and can inflict a nasty wound if handled carelessly. The formidable spiked tail which is very broad at the base is a most effective defensive weapon. Several reliable Shikaris have told me that when chased by a snake the Spiny-tail bolts for its burrow, which it only partly enters, leaving the whole of its tail protruding outside. Once in this position which affords every protection to its soft, unarmoured parts, it resorts to jerky, lashing movements with its tail, the formidable spines of which are too much for any snake, fox or jackal bent on mischief.

There are 3 species of Monitor Lizards (*Varanidae*), miscalled Iguanas, in Sind and Khairpur region. All are called *Goh* by Sindhis and are large, carnivorous and terrestrial. No Water Monitors occur in Sind region, but the land forms are more or less semi-aquatic and quite at home both in and out of water. In the plains of Northern India they are called *Goh-Samp* because, perhaps, of their tongues which are bifid like those of snakes.

The Dragon Lizard of Komodo (Indonesia) which grows to ten feet is a monitor lizard. The Great Land Monitor (*Varanus bengalensis*) grows to six feet and is the common monitor of sub-continent the *Goh* of Sind and the *Gorpad* of Kathiawar and the Mahratta country. Its hold in a crevice in a rock face or wall is so tenacious that it is believed that burglars use it as a living grapnel to scale high walls. A rope is fastened to the lizard which scurries up the face of the wall till it reaches a crevice at the right height. It enters the crevice and holds on firmly enough to enable a man to scale up the wall. At Aghemani Rest House in Karachi district, a *Goh* of this species scaled up a verandah pillar and attacked some bats which lived in a space below a beam. The squeals of the bats and the crunching of bones attracted my attention but the *varanus* caught and ate several before I was able to scare him away. The *Goh* is common in Karachi district, where it lives in dry wells in the gardens around Malir and Landhi. Its flesh is relished by Nomadic tribes. Dr. Kelaart remarks *inter alia*, 'Natives of the Deccan and Sind region are also partial to its flesh and esteem it as a specific for rheumatism. The blood drunk fresh or applied to the loins is considered a cure for lumbago, and is also said to be a good aphrodisiac.' Incidentally the skin of this monitor, besides being exploited for the vanity of woman, is used for making Sindhi drum and Sufi fiddle and tambourine heads. The young of this monitor and of others of the family are spotted and highly coloured, quite unlike their parents. They are called *Bis-cobra* by the ignorant, who believe that their bite is poisonous and fatal to man and beast. There is, however, no truth in this belief which is purely legendary. All monitors are carnivorous and it is possible that their teeth may use an infection in some cases of *varanus* bite.

I have seen this monitor on several occasions feeding on locusts in Karachi, Nawabshah and Hyderabad districts.

The Desert Monitor (*Varanus griseus*) grows to 4 feet and is not uncommon in desert tracts where it lives in large burrows which it excavates itself. The Barred Monitor (*Varanus flevescens*) which grows to 3 feet, like *bengalensis*, is a land form and is usually found in terrain between arid desert and cultivated land. It is partial to terraced slab like formations of loose stone in dry river beds. One about three feet long had a home in such a situation near a pool in *Orangi Nai* near Karachi and used to make dashes, never successful, at Sand Grouse and Little Brown Doves drinking at the pool.

The true Water Monitor (*Varanus salvator*) which grows to 7 feet and is fully adapted for an aquatic life by having a strongly compressed tail does not occur in Sind or Khairpur region.

The Typical Lizards (*Lacertidae*) are poorly represented in Sind region and comprise but four species, only three of which deserve mention. All are very active and like the warmth of the sun. The two Sand Lizards (*Acanthodactylus cantoris* and *Acanthodactylus micropholis*) which grow to 8 or 9 inches in length are very common in sandy places and partial to wind blown ridges, where they are often found together. Young Striped Lizards (*Acanthodactylus micropholis*) have a brilliant blue tipped tail which is used possibly to attract insects and lure them to their doom.

The lizard lies on the sand, head towards tail, and is motionless except for the rapid vibration of the blue tail tip, which is repeated frequently at short intervals. Whether this tail quivering is done to entice small insects on which they feed or whether it is a protective device against attack or whether it has any sexual significance in the way of display is not known. I have not, however, seen an insect lured to its doom or a female of the species attracted by it. Perhaps I have not waited long enough for either of such incidents to take place. Both these lizards are adapted for sand travel by having strongly fringed toes. The Spotted Sand Lizard (*Eremias guttulata*) which grows to 6 inches is more or less localised and not often met with. It is, however, not uncommon in the sandy desert tracts in the vicinity of rivers such as the Baran, Habb, Malir and Khadeji rivers, where it is found near Khip (*Leptadeniaspartium*), Ak (*Calotropis procera* and *Calotropis gigantea*), Phog and Booh bushes. I have also met with it in similar situations in sand *bhitis* near Taror, Ghulam-jo-Goth, Laiwari and Berwari in Sukkur district.

The Skinks (*Scincidae*) are well represented in Sind and Khairpur region where ten species occur, five of which are found in

Karachi. Skinks are perfectly harmless and have fragile tails, which break off easily like those of the Geckos and Lacertine Lizards. In most places in Northern India where skinks are found they are known as *Baman* or *Bamani*. They live in cracks in walls, gardens, hedges, under dry leaves or mould and in buildings. Only three species need mention. The Striped Skink (*Mabuia carinata*) which grows to 14 inches is the common skink of pre-partitioned sub-continent and has a very wide range. It is found throughout Sind and Khairpur region. Breeding males have a red band from shoulder to thigh. The Spotted Skink (*Mabuia macularia*) which grows to six inches, is partial to gardens and hedges. It is common in Karachi. The Three-toed Skink (*Ophiomorus tridactylus*), the Rejor Rejistan-Mahie (Sand or Desert Fish) of Sind and the Punjab regions which grows to six inches, is a true desert form and well adapted for burrowing in the sand. It is partial to tracts of wind blown sand growing the usual sand loving plants Ak, Khip, Phog and Booh. I have found it on the banks of the Baran river and on the sand *bhitis* near Taro Salehpat, Mamro and Sahipat in Sukkur district. The fat of this skink is used in Sind and the Punjab regions as a cure for rheumatic pains in the limbs and lumber region.

SNAKES (OPHIDIA)

The known snakes of the world are divided into 9 families and comprise 1,536 species. Fortunately the venoms of about 300 species only are dangerous to man.

According to dentition all snakes fall into one of three distinct classes. All have teeth. The first has no poison fangs and are termed 'Fangless'. The second has slightly grooved poison fangs at the back of the maxilla or jaw-bone and are termed 'Backfanged', while the third has deeply grooved poison fangs at the front of the maxilla and are termed 'Frontfanged'. All frontfanged snakes have a highly developed poison apparatus and their venoms are dangerous, if not all deadly to man. All species which comprise this class belong to two families and are either Colubers or Vipers. The former include Sea-snakes, Kraits, Cobras and Coral Snakes, while the latter comprise the True Vipers and the Pit Vipers. The former are confined to the Old World. The latter though well represented elsewhere in pre-partitioned India do not occur in Sind or Khairpur region.

The teeth of snakes in the 'Fangless' class are simple in that they are solid. Poison glands are absent, nevertheless the saliva of Colubrine fangless snakes has been found to contain a toxic element similar to, if not identical with, that to which the deadly venoms of Frontfanged Colubrines owe their lethal properties.

Sind and Khairpur region can account for 43 species of snakes. of these, 21 have no poison fangs, the remaining 22 have, and with

the exception of 4 Backfanged forms, are all front fanged and possess venom dangerous to man. The 18 Frontfanged species comprise 13 marine forms, 2 Kraits, 1 Cobra and 2 Vipers. There are no Pit Vipers or Coral Snakes in Sind or Khairpur region. The dearth of terrestrial forms is more than made up for by their numbers. Cobras, Kraits and Saw-Scaled Vipers are common in all districts where there is suitable habitat. The Sind Krait (*Bungarus sindanus*), the dreaded *Peehun*, which grows to six feet, abounds in the desert tracts of Tharparkar, Sukkur and Khairpur, while the Saw-scaled Viper (*Echis carinata*) is just as common, if not more plentiful, in every district where there is suitable terrain, dry, stony tracts, low hills or desert scrub. This little viper, the *Khappar* or *Lundi*, is by far the commonest snake. It grows to about two and a half feet and has the sluggish and snappish ways so characteristic of the family (*Viperidae*) and which renders all vipers dangerous, as they are apt to strike with intent but without provocation or warning, as I know to my own cost. Fortunately the venom of this viper is not too highly potent. It has been estimated that only about 20 per cent of cases of *Echis* poisoning prove fatal. In 1933, in the Rohri Sub-Division of Sukkur district, out of ten cases of authentic snake bite reported to the police between April and August, six deaths were due to *Echis* poisoning and four to Cobra or Krait.

This viper is not entirely terrestrial and has aboreal habits like most land snakes with broad ventral shields. I have found it many times sunning itself on the tops of Kirrar (*Capparis aphylla*) bushes, in one case quite 9 feet high. On another occasion one had climbed a Lai (*Tamarix gallica*) tree and bit a man who was lopping off branches about 20 feet up.

The Common Krait (*Bungarus caeruleus*), which rarely grows over four feet, is very like the Sind Krait (*Bungarus sindanus*) in colour and markings. It has been recorded from Karachi, Hyderabad, Nawabshah and Sukkur districts and is probably found elsewhere also. I have, however, not found it in dry, desert areas where its larger relative *sindanus* abounds.

Incidentally, Colonel Frank Wall had some doubt whether *sindanus* was entitled to rank as a species apart from *caeruleus*, while Dr. Annandale thought that *walli* and *Sindanus* were identical. I have had the opportunity to examine a number of live and freshly killed specimens of all three forms and have no reason to believe that either *caeruleus* and *sindanus* are identical or that *sindanus* and *walli* are identical forms. Apart from other characteristic differences, I found *sindanus* a dry region snake, while *walli* and *caeruleus* are both more at home in moist lands, that is not arid desert.

The Cobra (*Naia tripudians*), the Karihar of Sind and Russell's Viper (*Vipera resseli*), the Korar, both prefer fairly moist situations and the former like the Krait is partial to hamlets and villages where they are attracted by rats and mice, their staple food. The Russell's Viper or Daboia is a rare snake in Sind region and has been found mostly in Lower Sind region (Lar), where J.W. Rowland killed two at Jharruck, Flynn found it at Dumlotte and I have records from Khar, Khadeji, Hillayah and Pir Patho while Murray reports it from Jacobabad, where yet another was killed in 1934 near the lotus pond behind the old Residency. The venom of this viper which grows to four feet, is most deadly. A case of Daboia poisoning as a rule proves fatal.

The great majority of Cobras found in Sind and Khairpur region are of the black, binocellate variety. The monocellate and the nonocellate varieties also occur. The former which is recorded by Murray is the Bengal-Burma form and must be rare in Sind region, I have not come across it, though I have seen it with snake charmers or handled a great many cobras from Sind during the 34 years I was in the region. A dark, reddish brown binocellate cobra over 4 feet in length was killed near Darbelo, Nawabshah district in 1935 and some found in the South East (Nagar Parkar) are intense black like the Arvalli (Mount Abu) form. The Karihar or Karo Nag grows to six feet and over one killed near Badin in 1922 taped 6 feet 3 inches and I have seen or killed a number of very large cobras, driven out of their lairs by the Indus floods in Sukkur district in 1930. On one occasion I came across scores of snakes, mostly Saw-scaled Vipers, Cobras, Kraits, Sand Snakes and Rat Snakes, sheltering on a small island in the course of the flood waters. The Kirrar and Khabar shrubs on this bit of high ground were literally festooned with snakes but I gave the place a wide berth as it was not possible to land without forcing a passage through the snake festooned bushes and shrubs over hanging the surrounding water.

All 13 species of marine (sea) snakes are highly venomous. The venom of a common form *Enhydrina valakadien*, the Hawk-nosed Sea Snake, is 7 to 8 times as potent as that of the Cobra and 4 to 5 times as that of the Common Krait, one of the most deadly of terrestrial snakes. A camel being given a sea bath was bitten on the nostril by a Hawk-nose about four feet long and died within the hour. Fortunately sea snakes are neither aggressive nor snappish and seldom bite unless provoked. Creek fishermen fear the Sairie, a small mud fish having poisonous dorsal-fin spines, more than they do any sea snake.

The venoms of all snakes are compounds and those of the Front fanged Colubers (Sea Snakes, Kraits, Cobras and Coral Snakes) like

those of the Vipers, differ but slightly among themselves in their composition and main effects on man, but the train of symptoms evoked by Colubrine venoms taken collectively differs considerably from those produced by Viperine venoms taken collectively. Colubrine venoms act mainly on the central nervous system and paralyse the respiratory centre in the brain; death is due to asphyxia, the blood is little affected. Haemorrhages are unusual and where present are slight and never excessive. On the other hand Viperine venoms have no paralysing effect on the central nervous system except the *vaso motor* centre, but greatly affect the heart and blood. Death is due to paralysis of the *vaso motor* centre and extreme exhaustion brought about by persistent haemorrhages, both external and internal, or to an indirect cause, septicaemia due to germ infection. This last condition is due to the sloughing away of cellular tissue at the seat of the bite, causing a deep ulcer like sore, which is very susceptible to germ infection.

The action of snake venom is most rapid and once introduced into living tissue it is locked in so tenaciously that only with great difficulty and then only incompletely can any neutralising agent be brought into chemical relationship with it. Such agents to have any effect must be brought into direct contact with the venom. Antivenene is the only remedial agent which will neutralise and render inert venom which has been absorbed and entered the circulatory system.

Alcohol incidentally is *not* a neutralising agent and its use as an antidote in a case of snake toxemia cannot be too strongly condemned.

The stimulating effect of alcohol is but temporary. It soon wears off and the depression which follows is most harmful in cases of snake poisoning. By dilating the blood vessels and increasing the vigour of the heart, alcohol induces a bleeding tendency which, if it already exists, as it must do, in a case of viper poisoning, would only be aggravated. Again, the stimulation of the blood current by the increased action of the heart can but increase the rapidity of absorption of venom from the seat of the bite. Lastly, alcohol induces a condition whereby the capability of resisting disease is considerably lowered. Such reactions clearly establish that alcohol rather than counteracting the action of snake venom, actively assists it to perform its destructive work sooner and more effectively.

Among the four Backfanged Colubers, the Brown Tree Snake (*Dipsas trigonata*) and the Striped Sand Snake (*Psammodphis leithii*) are the most common; the former is marked and coloured very much like *Echis* and is often mistaken for it by the inexperienced. In Karachi *trigonata* is more or less a garden snake and a menace to cage birds. It grows to four feet and away from gardens, strange to say, it favours desert scrub in dry tracts. Though less arboreal than others of the genus, I have seen it sunning itself on Kirra

and Kandi bushes or small trees and one in Karachi over three feet long climbed into a large Tamarind tree, where it caught and swallowed two adult male sparrows. Scores of other sparrows mobbed it and the snake lost its hold and fell to the ground about 20 feet below, apparently unhurt, and was killed while trying to get away. The two sparrows had been swallowed head first, both were freshly dead and were in the abdomen about two inches apart. Another snake of this species got into a bird cage and swallowed a Spotted Munia (*Amandaya amandaya*). When detected, because of the agitated fluttering of the other birds, it tried to escape, but was unable to get through the bars of the cage because of its distended condition. After several attempts to squeeze through it disgorged the Munia and got through the bars of the cage. The Munia, like the two sparrows, was coated in mucus and had been swallowed head first. It took some effort to disgorge the Munia, as the toes, though tightly clenched, appeared to impede the process of ejection till the feet had reached the mouth, after which the rest was easy. Another large specimen about 4 feet long when brought to bay in a room by a cat, threw itself into a coil and struck repeatedly and aggressively at the cat. When killed it was noticed that it was almost entirely coated with a yellowish, offensive smelling slime, which later caked and peeled off like bits of transparent glazed paper. Apparently the snake exuded this viscid substance as a defensive measure against the attack of the cat.

The Striped Sand Snake (*Psammophis leithii*) which grows to four feet, is fairly common in open sandy tracts growing Kurrar, Kandi, Ak and Kandiro and is often seen sunning itself on stunted desert scrub or Kurrar bushes. *Psammophis condanarus*, another sand snake similar to and just as handsome as *leithii*, grows to 3 feet and is a rare snake in Sind region. It has been recorded from Jacobabad, Upper Sind only. Both these snakes are backfanged. The fourth backfanged species found in Sind region is the Dog-faced Estuary Snake (*Cerberus rhynchops*), which grows to three and a half feet and is found on coastal mud flats, Mangrove (Kamo and Timar) swamps and the gup of tidal creeks. It lives entirely on small fishes and is not aggressive.

Little is known about the venoms of Backfanged Snakes, except some of the South African forms. The fangs of this class (*Opisthoglypha*) which are fixed, are grooved and the poison glands which are situated below the eyes and over the fangs, are not connected to the fangs by a duct or canal as in the Frontfanged (*Proroglypha*) forms, but apparently transude their contents through small orifices within the gingival fold surrounding the fangs, which are placed well back in the maxilla. Hence it is not possible for these snakes to get a good grip on anything but very small creatures such as mice, callow young of small birds and small lizards on which they feed.

The non-poisonous snakes in Sind region comprise 21 forms. The worm like burrowing snakes (*Typhlopidae*) are represented by two species and the allied rare Hip Snake (*Glauconia blanfordi*). All three forms are seldom met with because of their burrowing habits and aversion to light.

The *Boidae* (Boas) comprise the Rock Python (*Python molurus*) which grows to 20 feet and over, the Sand Boa (*Gongylophis conicus*) and John's Earth Snake (*Eryx johnii*). Rock Pythons have come to notice near Jhurruck (1926), Sakrand (1935), Kalan Kot (1936) and Jungshahi (1937). None of them taped over 12 feet and all were met with near water. The Sand Boa is a rare snake in Sind region. One sent to me by Colonel Harty in 1932 was found on the ridge near his house in Sukkur. This boa has markedly small eyes and scales; the latter, particularly those of the tail, are strongly keeled. It grows to about 2 feet and is a handsome snake, but it has a nasty temper and is as fierce as its not too distant relative, *Eryx johnii*, is gentle. *Johnii* despite its small beady eyes is nocturnal and lives on small mammals and worms. It is fairly common in sandy tracts and is the much abused and exploited 'Double-headed' snake of Pakistani Snake Charmers. It grows to 4 feet and is a most harmless and docile creature. Needless to say that it has no more a double head than the snake charmers who have given it one, to boot the tail, which is said to function as a head or six months in the year in order to give its true head a rest while it functions as a tail.

The remaining 15 non-poisonous species represent the Colubers and comprise Wolf Snakes (Genus *Lycodon*) 2, Rat Snakes (Genus *Zamenis*) 6, Keelbacks (Genus *Tropidonotus*) 3, Genus *Pseudocyclophis* 1, Genus *Oligodon* 1, Genus *Lytorhynchus* 1 and Genus *Coluber* 1.

The Common Wolf Snake (*Lycodon aulicus*) is coloured and marked much like the common Krait (*Bungarus caeruleus*) and is often mistaken for it.

Mice and the eggs and callow young of sparrows attract it to village huts and servants quarters in towns. Specimens over two feet are rare.

The Royal Wolf Snake (*Lycodon striatus*) is rare in Sind region. One was sent to me in Sukkur by S.B. Hicken in 1933. Among the Rat Snakes, the Dhaman (*Zamenis mucosus*), the Royal Rat Snake (*Zamenis diadema*) and the Spotted Rat Snake (*Zamenis ventrimaculatus*) are not uncommon in grass land tracts and lowhills in the Habb valley and other such terrain. The first two grow to six feet, are bad tempered and fight fiercely to avoid capture. The Spotted Rat Snake grows to three feet and is not so fierce as its congeners. Among Keelbacks, the Striped Keelback (*Tropidonotus stolatus*) and the Chequered Keelback (*Tropidonotus piscator*) are common. Specimens of the former over two feet are rare.

The latter has aquatic habits, grows to four feet and lives mainly on fish and frogs. It is bad tempered and snappish by nature. *Stolatus* has a marked habit of puffing out the sides of its neck when angered or brogght to bay. This action is purely defensive.

The Striped Keelback is a very handsome snake. The black-bellied Keelback (*Trepidonotus plumbicolor*) is rare snake in Sind region. I came across it at Sakrand in 1935. It grows to about two feet six inches and has the same habit of neck puffing as *stolatus*.

Of the remaining four forms only one deserves mention, the Beak-nosed Desert Sand Snake (*Lytorhynchus paradoxus*) which is peculiar to Sind region and most difficult to locate even in its stronghold the desert, because of its burrowing habits. Only three species of this genus are known to science: *L. diadema*, which ranges from Persia to Algeria, *L. ridgewayi*, which is found in Afghanistan and Turkestan and *L. paradoxus*, which is peculiar to Sind region. This little snake with its perfect protective colouring is a true desert species adapted for burrowing in the sand. Specimens over foot long are unusual. I have found it at Khokrapar in Tharparkar district and at Khenju in Sukkur district.

LEGENDARY. Tharis believe that the Peehun (to drink coils itself on the chest of a sleeping person, drinks in his breath and breathes out its venom into the mouth of the sleeper. A blister containing the venom forms on the tongue of the victim and should any kind of light be seen, total blindness results. When the blister bursts the venom is swallowed and the victim loses consciousness and dies in a coma. Raw onions are carried by Thari to keep the Peehun away. They are crushed and scattered on the ground around the sleeping place. A floor light is also kept burning; as the Peehun is said to avoid going near a light at night.

Tharis believe that the egg of the Egyptian Vulture (*Neopharon percnopterus percnopterus*) or the Great Bustard (*Choriotis nigriceps nigriceps*) neutralises the venom, so they carry a small tin containing cotton wool soaked in the contents of an egg of either a vulture or a bustard. When required, the cotton is dipped on to water and the contents squeezed into the mouth of the victim, whose eyes have been tightly bound to prevent blindness should any light be seen by him. The victim (he now becomes one) is then hung head downwards in a darkened room or dry well and kept hanging till he recovers or dies. Invariably he dies. The hanging head downwards is to prevent the victim swallowing the venom in the blister when it bursts. If the egg treatment cannot be administered, the victim is made to swallow several handfuls of powdered alum before he is suspended head downwards. The alum is supposed to neutralise the venom.

Exhaustive enquiries in the desert areas failed time and again to obtain any reliable evidence of a single cure effected by this kill

not cure treatment, yet the Tharis have implicit faith in its efficacy and continue to practise it, invariably accomplishing that which the Peehun may not have succeeded in doing. In some desert areas the Tharis fear the Peehun so much that fires or lights are kept burning all night. After rain in the desert, snakes are apt to take shelter in the grass roofs of Choras (huts), and Tharis put up a cloth ceiling to prevent snakes falling from the roof on to the floor of the Chora. After heavy rain in Tharparkar, snakes appear in great number and are a menace. At Gadro in 1934 the Peehun appeared in such numbers and caused so many deaths amongst both man and beast that numbers of Thari Hindus left the village temporarily. I have known mosquitoes to cause a similar exodus in Sukkur district in 1930 during the Indus floods, when mosquitoes in the forest and Katcha tracts made it impossible for both man and beast to get any rest day or night. The Peehun and other snakes are fond of hibernating in the roots of desert scrub such as Khabar (*Salvadora persica*), the Mustard Tree of the Scriptures, Thuar (*Euphorbia nerefoila*) and Kirrur (*Capparis aphylla*), the Leafless caper. Around Gharo in Karachi district, where the Khabar grows in dense clumps on low ridges, I once dug out 7 snakes, 3 Peehuns and 4 Lundis (vipers) from the roots of a single clump of Khabar.

Another legendary belief that Sindhis hold dear is that the tail of the Dhaman (*Zamenis mucosus*), the harmless Rat Snake, is poisonous and that a limb struck by it slowly withers and becomes useless. Some go so far as to believe that even a stick coming into contact with the tail of this snake can poison any part of the body contacting the infected end of it.

FROGS, TOADS, NEWTS, SALAMANDERS AND CAECILIANS. (AMPHIBIA)

The Amphibia (*Batrachia*) comprises Frogs and Toads (*Ecaudata*), Newts and Salamanders (*Caudata*) and Caecilians (*Apoda*).

There are no newts, salamanders or caecilians in Sind Khairpur region.

The frogs and toads are poorly represented. Of the six species of frogs which occur, only three need be mentioned. The Bull Frog (*Rana tigrina*), Sindhi *Wadho Daydar*, which grows to six and a half inches, is the largest and most common. It is essentially aquatic and spends most of its time in water. Every village well has a family and they are just as much 'at home' in wells out of which they cannot escape, as in rivers, canals, lakes or ponds. Adult or juvenile they are greedy to a degree and have been known to attack small birds and even snakes, yet, when the tables are turned and a snake gets hold of one, it protests, loud and long, most mournfully. In the Rest House garden at Larkana a Roller (*Coracias bengalensis bengalensis*) caught and gobbled a fair sized Bull Frog which was sunning itself on the edge of a garden tank. The Roller, after considerable effort, got rid of all but the hind

legs which tuck out of its mouth for all the world like a pair of goblin's ears, giving the Roller a grotesque and most comical appearance and the bird's continued contortions to dispose of its additional ears were most distressing to witness, leave alone experience. Eventually the legs disappeared leaving the Roller hunched up with feathers fuffed, looking anything but contented after its froggy meal.

The Water Skipper (*Rana cyanophlyctis*), Sindhi *Daydar*, grows to three and half inches and is the frog of ponds, shallows of *dhands*, inundated fields, village tanks and even brackish pools in borrow pits. Its habit of skipping along the surface of the water is characteristic of the species. Strachan's Frog (*Rana strachanii*) named after J. Strachan, who obtained it at Malir, is apparently peculiar to Sind region. It is a small frog with toes not fully webbed and little is known about it.

Only two forms of toad occur in Sind and Khairpur region, Anderson's Toad (*Bufo andersoni*) and the Common Toad (*Bufo molanostictus*). The former grows to 3 inches and was found in ponds in Thatta and Jungshahi. Little is known about it, except that it also occurs in Arabia and India. The latter is the form which enters dwelling-houses and is the common toad of pre-partitioned India. It grows to 6 inches and is found under stones, in crevices, under boxes and in fact anywhere, where it can conceal itself.

This toad should not be handled too freely as its warty skin exudes an irritant secretion, which is the cause of dogs frothing at the mouth when one is picked up. It is as bold and gullettous as any of its congeners. I have watched several squat round a hurricane lantern on the verandah floor of a rest house and gorge themselves to near bursting point on the myriads of flying ants brought out of their nest in the ground by a sharp shower of rain and attracted to the light of the lantern. On such occasions the ants simply swarm around the light and many shed their wings for no apparent reason, they just drop off. On one occasion at Mir Khan, a fine *Echis*, turned up and after surveying the scene grabbed a toad and slowly swallowed it. After a breather he grabbed another and after swallowing it, lay inert with ants crawling all over it and three toads still on the scene, bolting ants as fast as they could, not caring a jot about the near presence of the viper, which had already polished off two of their number. After waiting some time without any further developments I stepped into the picture on the side of the toads and despatched the *Echis*. The two toads swallowed by it were well coated with mucus and quite dead. So was the viper. The irritant secretion exuded by the toads failed to protect them against the attack by the *Echis* and did not have any visible effect on it. Murray records this toad being taken by a Chequered Keelback and one of its own species.

Apparently the irritant secretion of this toad does not afford it protection against attack in all cases.

IV. PISCES (FISHES)

Marine Fishes.

The coastal fishing waters of Sind region extend from the mouth of the Habb river near Ras Muari (Cape Monze) to the Sir Creek near Kutch.

This coast line from Ghizri to Sir, about 120 miles, is scalloped with inlet of the sea, creeks such as Korangi, Jhari, Piti, Khobar, Mull, Kajhar and numerous others, all connected by an immense net work of criss-cross channels extending many miles inland and forming perhaps one of the largest and most perplexing natural mazes in the East, for no land survey, without the aid of aerial photographs, could hope to plot accurately the intricate tangle of creeks and channels involved.

The Indus delta has altered considerably throughout the ages, old channels of the river, such as the Puran, Ren, Phuleli, Gharo and Baghar are no longer outlets.

The great earthquake of 1819 brought about extensive changes in the topography of the Delta, the present apex of which is the bifurcation of the Ochito (Hajmro) and Mutni (Haidari), about 8 miles below Sanwalpur. The base of the delta is formed by the irregular coast line between the Hajmro (Ochito) and Mutni (Haidari) the main outlets, both of which divide further south into several large creeks such as the Turshian, Kalandari, Kahr and Mull.

The influence of tidal waters is not felt much above the bifurcation of the Indus below Sanwalpur, nevertheless the predominance of salt over sweet water, except at low tide has had a most damaging effect on the arable lands drained by the lower reaches of the Indus.

Among coastal fishing villages of note may be mentioned Bhti Baba, Ghizri, Bram Hydari, Rerhi, Ketu Bunder, Jadewari and Sirganda.

Submarine upheavals probably of volcanic origin, in which the release of poisonous gases is a predominant feature, are responsible for the mass destruction of many thousand of fishes in Sind region coastal waters.

In 1849 an eruption of this nature occurred off the coast of Porbandar (Khatiwari) and poisoned myriads of fishes which lay floating on surface of the water for days.

EHA Records:

"In May, 1905, dead fish were washed up at Clifton beach in such incredible quantities that they formed a deep, thick layer, from 5 to 10, or 15 feet wide and several miles long.

When returning to Karachi by country craft in December, 1929, the water-line of a large island at the mouth of the Hajamro was strewn with thousands of dead fish, from a few inches to a foot in length and what struck me as most odd was that though gulls and terns were about in some numbers the repast of dead fish was left severely alone. Again in May, 1934, I came across a similar occurrence at Kot Rato in Jari creek and further west on the shores of Akab island, off Piti creek. I asked some Muhanas if these fishes has been netted and discarded and they said, "no," that they has been killed from poison from gup mud volcanoes which suddenly appeared and as suddenly disappeared from time to time, in the creeks along the coast."

In 1945 a phenomenon of this kind occurred near Churna Island off the mouth of the Habb river and heaps of dead fishes up to a foot or so in length were washed ashore near Gadani and along the Makran coast as far as Miani Hor.

Dr. Francis Day lists 224 species of fishes, of which 160 are marine and 64 fresh-water forms and there must be many more species, both marine and fresh water, which he failed to obtain.

Only those species fit for consumption or of some economic value need be mentioned here.

Promateus cinereus, Sindhi, Pithun, the Silver or Grey Pomfret and *Stromateus niger*, Sindhi, Karo Pithun, the black Pomfret, both the familiar 'Paplit' of fish stalls. Both these fishes are good eating, the flesh of the former is more delicate and tasty than that of the latter. Pomfrets are not a regular catch and only to be had occasionally.

Drepane punctata, Sindhi, Phano, a fish somewhat like the Pomfret and often passed off as such to the unsuspecting housewife. The flesh is inferior to that of the true Pomfret.

Cybius guttatum, Sindhi, Gor, the popular Surmai of the fish market. A fine table fish with few bones. It grows to a large size. *Cybius interruptum*, Sindhi, Kakan, and *Cybius commersonii* Sindhi, Karghan, are closely related forms. The flesh of all these species is highly esteemed as table food.

Clupea ilisha, the renowned Pallo of the Indus and famous Hilsar of Benal. This species which is allied to the popular herring of the West, though a salt water fish, like the salmon ascends

rivers in order to spawn. Before ascending the Indus they collect in vast numbers and at this time of the year can be netted in the sea, but once the migration up-stream begins they are netted in the Indus in every favourable stretch of water in a manner as unique as it is original. The movement up-stream continues through February, March and April and during this period many hundreds of these fine fishes are caught and go to feed rich and poor alike.

The Pallo, despite its intricate bony-system, is the finest flavoured fish in the East. To quote EHA, "It is esteemed by both Europeans and Natives as the very best fish for the table in Sind region, and this would scarcely be disputed if the disposition of its countless bi-and trifurcate bones were within average human comprehension."

The enjoyment of eating Pallo is an ordeal to the uninitiated. If patience is a virtue, it is indeed a blessing when introduced to Pallo, which is no meal for the hungry or those about to catch a train. It however has other uses. A Dahar Zamindar told me that it was common knowledge in the district that a Baluch Sardar who possessed a shrewish Shidi female for better or worse, fed her on Pallo so that he could have his *mani-jo-bad* siesta in peace and quiet. With a twinkle in his eye he added that the Khan Bahadur was very unlucky, as his *zal* so far had been able to pull out every bone which had stuck in her throat.

Pallo is so oily that it does not keep and should be eaten very fresh to be really enjoyed.

Large quantities of this fish are salted for the market, but salting deprives the fish of its original flavour but the odour so dear to the *assal* Sindhi remains.

The manner of river netting is peculiar to Sind region and so well described by EHA that I can do no better than quote him.

"The commonest method of catching the Palla is one of the original things which the Sindhi does. The instrument used is a bag-net attached to the end of a very long pole forked at the end. The limbs of the fork are about 5 feet in length and keep the net open, like a huge butter-fly net, as long as a double cord which runs along them is kept taut. As soon as this is relaxed the net collapses.

The fisherman launches a very wide and flat chatty, or earthen pot, with a small mouth, and laying himself on it so that his belly forms a close fitting stopper to its mouth, he floats gaily down stream, guiding himself by kicking the water with his feet like a somewhat paralytic turtle. The net is now let own perpendicularly like an inverted Y, the cord being drawn

tight with the right hand. As soon as a fish, driving against the strong and muddy current, strikes the bag, the man lets the cord go, the net collapses and is folded and rolled by the current. It only remains to draw up the net, stab the fish with an iron spike carried in the girdle and introduce it into the chatty. How this is achieved without collapsing and foundering is a mystery of acrobatics. Sometimes the fisherman floats by means of a kind of life-belt made of gourds instead of the chatty but this is unsportsmanlike. When he has reached the bottom of his beat he comes to the bank, shoulders his chatty and net and strudges up the bank to begin again. It should be mentioned that the mesh of the Palla net is about $7\frac{1}{2}$ inches in circumference, so that only fish of fair size are caught in it."

After spawning the Pallo swim down stream back to the sea but are then out of condition and no longer sought after, as they have now neither flavour nor odour.

Polynemus indicus, *Polynemus*, *sextarius* and *Polonemus tetradactylus* all large fish and known as "Seer", Sindhi Siar, are the 'Salmon' of the fish stalls and thought highly of as table fish. All yield good maws, particularly *indicus* which is greatly esteemed and recognised in Sindhi as "Sir Photai" because of its superior maws. *Polynemus sextarius* is the 'Rawas' of Bombay and Goa; and *Polynemus tetradactylus*, the 'Bamin' of sea anglers.

Mugil waigiensis, Sindhi, Mori or Phar, *Mugil dussumieri* Sindhi, Choddi and kindred species are the 'Boi' or Mullet of the fish market. All more or less are good table fish and as a rule plentiful and cheap.

Crenidens indicus and *Crenidens forskalii*, known as Kisi, *Sargus noct*, *Chrysophrys sarba*, *Chrysophrys bifasciata* and *Chrysophrys berda* all known as Dandio, some other *Sparidae* and *Diagramma nigrum*, Sindhi, Mui, are all classed as Rock or Stone Fish and disposed of under the market appellation of 'Ishtone Pish', some of which are good table fish.

The sole, *Synaptura orientalis*, Sindhi, Phani, a fine and delicate table fish is esteemed by all. The Creeks yield the best catches.

Plagusia blineata, Sindhi, Chhail and another sole like species knows 'Hajam', though marketable are inferior to the true sole.

The 'Bombay Duck' or Bummaloh, *Harpodon nehereus*, dried and served as a relish with curry is esteemed by all classes. It is seasonable and like the 'Leddy Fish' of the Goans is plentiful on occasions only.

The Oil Sardine, *Clupea longiceps*. Sindhi, Luar, Marathi, Tarli, is netted periodically when it visits the Sind region coast in vast shoals. It is greatly valued by the poorer classes and though a most tasty fish is seldom seen on the tables of the elite or 'fussy', being considered too vulgar and 'kuch nain' for any but the plebeian palate.

Clupea chapra, Sindhi, Nando Pallo, belongs to the herring family like *longiceps* and is believed by Muhanas and Mirbahars to be young Pallo. It does not grow as large as *Clupea ilisha*, the true Pallo and seldom exceeds 9 or 10 inches in length. It is found in the Indus and its estuaries, the Ochito and Mutni.

Clupea fimbriata, *Clupea lile* and *Engraulis malabarica*, Sindi Kareri or Padan all belong to the herring family and are sold as Sardines and like the mackerel, *microlepidotus*, *Scomber*, Marathi, Bangda, are abundant as a rule cheap and excellent eating, yet they have no place on a menu card merely because of petty, penny-prejudice.

Lates calcarifer, Sindhi, Dhangro, which frequents river estuaries and deep water creeks is a fine, heavy fish which grows up to five feet in length. It is highly esteemed because of its food value.

Serranus lanceolatus, Sindhi, Gissir, and *Serranus diacanthys*, Sindhi, Dambo, and other species of the genus are highly valued for the good maws they yield. These fish are also good eating, though the flesh is somewhat coarse.

Pristipoma hasta Sindhi, Dothar, is a popular food fish and highly esteemed by the Parsis despite the belief that some hold, that its flesh causes leucoderma. It is one of the large fishes salted for export.

Sciaena sina and *Sciaena miles*, both known in Sindhi as Sua are salted in great numbers for export. The Sua, like the Dothar and A'll (*Chorinemus sancti-petri*) visit the Sind coast in vast shoals both before and after the monsoon when they are netted by the thousand and salted for export. As many as 25,000 Sua alone, all large fish, have in a good season been brought to the Khadda salting yard in a single day.

Sciaena axillaris, Sindhi, Gol, *Scinnena coitor*, *Sciaena glauca* and others are species which are salted and highly valued for the good quality maws they yield.

All the large *Siluridae* also yield maws which are of considerable market value. In the creeks Cat-fish are at times hunted only for their maws. The body of the fish is discarded after the removal of the maws, the air vessels of certain fishes from which is in glass is repaired, which are exported in quantity to Europe and China.

The Gar Fish (*Bellone strongylura*), Sindhi, Kango, which is not uncommon is not considered to be a fish of any particular food value. When feeding they are easily caught on hook and line with prawn or minnow as bait. I have seen them pulled out one after the other on a hand line let down vertically through a gap in the boarded floor of the pier at Keamari at high tide.

The Cat Fish (*Arius thalassinus*), Sindhi, Khago, and others of the genus; Sharks, Sindhi, Mangro and Saw-fish, Sindhi, Mor Mangar are greatly esteemed for their food value by Cutchi Makars, Muhanas, Shidis and Mekranis. The coarse flesh of sharks in particular is held to be very strengthening. Great numbers are salted for export.

Sharks fins and those of Skates, Rays and Saw-fishes are salted for export to China, and the oil extracted from the livers of these fishes, though a most valuable product is not commonly exported because it is widely used to grease the keels and bottoms of fishing craft and other sea going country boats.

Mudskippers (*Periophthalmus*) with their large goggling eyes, simply Swarm on the mud flats in the creeks at low tide and provide good, sport for pye dogs and urchins, who flounder about after them in the gup and slime at the mouth of the Lyari near the Khadda.

Rod and line deep sea fishing is enjoyed by trawling with live or dead bait, prawn or fish, from country craft or launch, according to the pocket of the sportsman.

The best catches are made in the region of Churna Island, off the mouth of the Habb river.

Land fishing is indulged in by all classes, mostly for the pot and some quite good catches of Sea Bream, Eels and other marine fishes are made in the rocky coves and inlets at Hawkes Bay and Baleji and along the coast to the lighthouse at Ras Muari.

Fresh-water Fishes.

Dr. Day records the finding of 64 species of fresh-water fishes, which he obtained from rivers, river pools and lakes.

As fishing for species is a precarious undertaking at the best of times, there must be many species of fresh-water fishes which were not obtained by him.

The main sources are rivers and lakes. The Indus and its canal systems, semi-perennial rivers such as the Habb and Baran, which fed by hill streams, only flow after heavy rain, and those

of a like nature, which have cut through the Khirthar Range and flow into the plains of Sind region, such as the Khenji, Sita, Dilan, Salari, Gaj and Naing Nais.

The Indus is the only river in Sind and Khairpur region which flows from source to sea throughout the year. All other rivers or Nais are seasonable and depend entirely on the rainfall for their flow, nevertheless few, if any are completely dry all the year round. Extensive, deep pools form at bends and in depressions in the river bed, and one, two or more of these may be connected by a shallow flow or even little more than a trickle from one to the other.

Among the larger lakes may be mentioned the Manchur, Kinjhar, Sonahri, Hadero and Haleji which are perennial, and Daba, Saro and Taror which may be very low in dry years, not to mention the numerous smaller dhands formed by overflows from rivers or canals and by the filling of natural depressions, such as Siranda on the Mekran coast, into which seasonal hill torrents pour their contents when in spate after heavy or continuous rainfall in the hills.

The majority of fresh-water fishes are edible, so only the more important and familiar need be dwelt on here.

The Carp (*Labeo rohita*), Sindhi, Dambhro, the Rohu is a grand fish which grows to a length of three feet. The flesh is good but the flavour at times muddy. It is liked generally throughout Pakistan and India as well.

Labeo gonius, Sindhi, Siriho, *Labeo calbasu*, Sindhi, Dahi, and *Labeo dyochilus*, Sindhi, Nigari, all large fish are closely related to rohita.

Cirrhina mrigale, Sindhi, Morakho and *Catla buechanani* Sindhi, Thelhi are also members of the carp family and good table fish.

The Thelhi is an immense fish. It grows to a length of six feet and over and is heavy in proportion.

The home of all these fishes is the Indus, whence they have spread over the country during floods to dhands where they breed.

As seasonal dhands gradually dry and contract in the summer, hundreds of well grown fish and myriads of fry are destroyed, the former by the hand of man and the latter without the malice of his hand, by following the outgoing flow through canal channels or distributaries, whence they are unable to return and so perish by the million.

The Cat-fishes and other *Siluridae*, which include a number of very large species and contribute greatly to the value of fresh-water fisheries in river, dhand and canal include among others *Rita buchanani*, Sindhi, Khago; *Macrones aor*, Sindhi, Singari; *Wallago attu*, Sindhi, Mali, Muli or Poiki and *Callichrous bimaculatus* Sindhi, Diman.

The last two named in particular are good table fish and easily caught on rod and line, with worms, frogs or a bird's entrails as bait.

The Murrel (*Ophiocephalus striatus*), Sindhi, Jarko; *Mostacem-blus armatus*, Sindhi, Goj; *Notopterus kapirat*, Sindhi, Gandan and *Notopterus chitala*, Sindhi, Phandan, all of the mud fish family are common in most weedy dhands, fringed with Pan (*Typha elephantina*) or Deer, a type of bulrush very like *scirpus lacustris* the English Bulrush.

Pools in the Khirthar Range Nais, such as the Sita, Dilan and Gaj and the Habb and Baran have yielded twelve species of fishes and it is more than likely that many other forms were not obtained.

The species caught were :—

Labeo diplostomus, *Cirrhina dero*, *Cirrhina gohama*, *Cirrhina Sindensis*, *Cirrhina reba* and *Cirrhina mrigana*, all members of the Carp family, *Botia dario*, *Scaphiodon watsoni*, *Chela bocaila*, *Wallago attu*, *Nemacheilus sinuatus* and *Barbus tor*.

Barbus tor, Sindhi Karia is the famous Mahseer, which attains a good size in the pools of the Habb river between Mochko and Loharni. M. and W. MacDonald, Colonels J. Anderson and W. Dixie, W. Histed, A. DeLima and H. Thompson have landed some heavy fish from pools in the Habb river.

Muhanas and Mirbahars often keep tame otters which are used for driving fish and luring porpoises into a pool, where they can be netted easily or speared. Pelicans and Cormorants are also kept as pets, and used, I believe, to catch small fish for baiting dead lines strung across the mouth of an inlet or backwater.

Besides those fishes dealt with above, there are numerous small and bony species which are relentlessly pursued by men and naked, pot-bellied urchins with hand-net or basket-trap in every likely water, from shrinking dhands to fast drying borrow-pits flanking rail or road, even digging ugly Bull-head types out of the gup in mud churned shallows by feel of foot or fingers.

All is grist for the mill of the poor, an empty stomach has no nose to turn up.

CHAPTER IV
BOTANY

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CHAPTER IV

BOTANY

Sind region is a part of the great Afro-Indo-Pakistan desert, running from Morocco in the West to the Gangetic valley in the East. It is in many respects a natural region, more or less clearly circumscribed from the adjoining regions and having, amongst other things, a flora and fauna characteristic of the area.

General features.

Although the area is now mostly arid or semi arid, there is definite geological and archaeological evidence to show that in the past it used to have a fairly humid climate. Thus during the period of Moenjodaro civilization, circa 2,500 to 1500 B.C., it seems to have been the abode of marsh loving animals. Upto about 500 B.C., it was well wooded with tropical forests, haunts of elephants and wild buffaloes. For geophysical reasons, however, the climate gradually became increasingly drier till the basin of the Indus and its tributaries remained the only oasis in the all pervading desert.

Geological evidence also supports the view that in the past, there were probably two other river systems, the Sutlej and the Sarswati, flowing through this region and emptying into the Gulf of Cutch, formerly a much larger sea. Later, the Saraswati dried up and is now represented by the defunct Ghaggar, to the east of Bahawalpur, while the Sutlej shifted its course, joining the Indus a little above the point where this latter enters Sind. These streams have left their mark in the shape of vast alluvial beds, some of which are now being used as part of the canal network irrigating the region, e.g., the Bughar, Kalri, Fuleli and Piniari canals. The Indus itself seems to have had a course far to the east of its present channel. During the last few thousand years there has been going on in its course a shift to the West until it was arrested at the Rohri gorge in the north, by the Laki Hills near Sehwan in the middle and in the South at the Kotri gorge. One of the old channels called 'Nara', is now being utilized as the Eastern Nara Canal, irrigating the Tharparkar district.

Besides the river beds, the area is not devoid of lakes and ponds. Only a few of these however are perennial, others being only seasonal. Of the former, the largest is the Manchhar near Sehwan probably the largest fresh water lake in Pakistan; of the seasonal lakes, the Haleji near Gharo, Makhi Dhandh in Sanghar district, Chari Dhandh near Jheruck are some of the important ones; Haleji having been linked with the Indus through a channel is now a permanent lake and is the main source of water supply for Karachi.

*Climatological Features.***Rainfall.**

In Sind region the average rainfall is about seven inches a year, falling mainly in the hot season. This meagre rainfall, coupled with the high temperatures prevailing, is insufficient to support any permanent vegetation except that of a scrub nature.

Studying the climatological data available from the stations at Jacobabad, Hyderabad, Karachi, Nawabshah, Larkana, Sukkur, Dadu and Mirpur Khas it seems that there has not been any persistent trend for the rainfall to vary over the area during the last seventy years, the deviations from year to another being in the nature of fluctuations, not statistically significant. There, however, appears an upward trend after 1932 for the stations in the canal zone as well as at Karachi, possibly due to the completion of the Sukkur Barrage System. This barrage, completed in 1932, brought large areas in Upper and Middle Sind region under irrigation resulting in a considerable increase in humidity and reduction in the diurnal range of temperature and humidity. This thermal balance too has been markedly effected. Consequently the position of the centre of lowest pressure during the monsoon months has progressively shifted towards Baluchistan region. It would, therefore, not be surprising, if the incidence of rainfall in the region has been significantly increased during the last two decades. Increase in the vegetation cover in the canal areas must lead to decrease in the temperature range and consequently to an increase in the rainfall. Completion of Kotri Barrage is expected to further augment this trend in Lower Sind region.

Temperature.

Like other sub-tropical deserts, the region is characterized by an extreme type of climate, very hot in summer and cold in winter. The summer temperatures in the shade frequently reach upto 130°F., the highest period having been 133°F. at Jacobabad, in 1935. The hottest month is May. The minimum is recorded in the month of January with an average of 36°F.

The annual mean temperature, and the annual mean minimum temperature for 21 stations have been examined and just as for rainfall there does not seem any persistent general tendency during the past 70 years for the temperature to vary in a definite direction.

Humidity.

The relative humidity is at the minimum in the hot weather months, *i.e.*, March, April, May and June. It is at the maximum during the monsoon months, *i.e.*, July, August, September, being lowest in May, and highest in August.

Wind.

The predominant wind direction is West-South West for over four months in the year, *viz.*, May to September. The wind during this period is markedly strong and steady, blowing with an average speed of from 20 to 25 miles an hour. During the winter months of December and January it blows mainly from the *north-east*

This is particularly dominating on the coast and in lower Sind area. During this same cold season, there is also an occasional blowing of the North West wind. Since it is fed from the dry atmosphere of the high-lands of Baluchistan, (Kalat and Quetta Divisions) it is mainly dry and desiccating.

During the months of May and June, there is a deflection from south-west north-easterly direction to west-easterly direction. The winds too are dry and have a desiccating effect.

In July and August the winds are charged with moisture and have a beneficial effect on the plant life.

The former province of Sind has four well-defined tracts viz., (i) the Kohistan region, a narrow strip bordering Baluchistan region along the Khirthar range, (ii) the central alluvial plain watered by the Indus, its soil having been formed by the changing courses of the river and of its inundations, (iii) Registan or Thar desert stretching from the Eastern Nara and merging with the Rajasthan desert in the East, (iv) Coastal swamps typifying the mangrove vegetation.

The soils of the Kohistan tract contain fragments of rocky material of which lime stone forms a considerable proportion. The surface soil contains about 85 to 87 per cent. of sand and about 10 per cent. of clay. **Soils.**

The soils of the Registan desert contain as much as 90 to 96 per cent. sand and only about 5 to 7 per cent. of clay.

The central alluvial plain has fertile soils containing about 20 per cent. sand and 80 per cent. clay and silt, formed as they mainly have been from the deposits of the Indus and its tributaries. As such, in a vertical section of the soils, we get alternate layers of sand and silt. This soil being subjected to extremes of heat and cold leads to a rapid weathering down of the alluvial soil particles. Some of the resulting salts, viz., Sodium chloride, Sodium sulphate, and Sodium carbonate are extremely injurious to plant growth. These salts continue to accumulate from year to year, because the meagre rainfall is not enough to wash them away. The small amount of moisture rather helps the process of weathering. The salts formed in the soil move down to a small distance after a shower of rain and again come up to the surface by capillary action when evaporation of water takes place in the dry weather rendering the soil barren.

In the coastal strip the soil in estuarine regions and in other protected areas forms typical tidal swamps; otherwise it is usually argillaceous and firm. In the region above the coastal swamps the soil is generally composed of clay, mixed more or less with sand, and contains a large quantity of salt, which frequently appears

in a thin crust on the surface. In a few spots it is a stiff, tenaceous clay that hardens when exposed to the sun and turns white. These soils contain about 20 per cent. of sodium chloride. The south eastern coast of Sind region forms a vast expanse of salt waste almost devoid of vegetation.

Percentage Composition of the soils at surface levels in the different regions of the areas are as follows :

	Surface soil in Kohistan %	Surface soil in central alluvial plain %	Surface soil in Registan %
Clay ..	10.59	24.19	5.97
Salt ..	2.60	56.11	2.33
Fine sand ..	35.15	19.52	30.41
Coarse sand ..	51.66	0.18	61.29
	100.00	100.00	100.00

Biotic
factors.

Probably the most important biotic factor is vegetation itself, playing an important part in the growth and regeneration of the plants. The existing plants serve as anchor places for the organic matter and thus provide conditions for seed generation and protection of the plants during the early stages.

Except for areas irrigated by the Indus or the canal systems, Sind region is a thinly populated desert, parts of the area showing a density of less than 20 per square mile. In these regions, population is mainly pastoral and nomadic, keeping herds of camels, sheep and goats, the last being most destructive of vegetation. Besides the depredations of these and of the wild animals, large amounts of vegetation are cut down for use as fodder and for fuel, by the nomadic as well as the settled population.

After the natural desiccation, overgrazing and overburning have been the main causes which have reduced the once green area to its present state. During the last decade, the inroads of hordes of landless refugees, driven across Rajasthan and the states of Gujarat and Kathiawar in India have, if any thing, made the situation worse.

It had been hoped in 1932 that the building of the Sukkur Barrage would revolutionize the phytophysiographic nature of the region within a couple of decades. While there has undoubtedly been considerable increase in cultivated area and, along with it, in the natural vegetation, irrigation has unfortunately often been applied without a thought to the future. Consequently large areas in the neighbourhood of the canals are already waterlogged. Others have too much salt precipitates to permit any crop except paddy; at places even paddy will not grow, the only vegetation possible being Typha, Tamarix etc. Large areas are thus again going out of cultivation and a scrub forest is coming up to take its place. This is specially true of the so called 'rice tracts' in the districts of Larkana, Dadu and Khairpur.

Often the level of the canals is so high that seepage is inevitable. With seepage goes waterlogging and the attendant evils.

Since there are so many different climatic zones in the region it is not surprising to find that there are definite ecological plant associations characteristic of the different zones.

Species of
the various
ecological
zones.

While the species are listed in the text under the appropriate natural orders, it would therefore not be out of place to mention the more important types which characterize various ecological areas in the region under discussion. Thus in Kohistan and in the hilly regions in Sind the dominant trees, shrubs and under shrubs are as follows :—

Plants of
Kohistan.

Abutilon glaucum, *Abutilon indicum*, *Abutilon muticum*, *Acacia arabica*, *Acacia senegal*, *Aerua pseudotomentosa*, *Aerua tomentosa*, *Astragalus stocksii*, *Capparis aphylla*, *Commiphora mukul*, *Cordia rothii*, *Crotalaria brurhia*, *Daemia extensa*, *Emphorbia cauducifolia*, *Grewia populifolia*, *Grewia villosa*, *Indigofera pauciflora*, *Lycium barbatum*, *Mimosa hamata*, *Pavonia arabica*, *Prosopis spicegera*, *Periploca aphylla*, *Rhazya stricta*, *Salvadora olioides*, *Senra incana*, *Sida grewioides*, *Zizyphus rotundifolia*.

In these same habitats, i.e., in hilly and rocky regions, the herbaceous sector is represented by the following species :—

Agrostis spp., *Aristida scoparia*, *Cleome brachycarpa*, *Cleome viscosa*, *Convolvulus glomeratus*, *Eragrostis ciliaris*, *Euphorbia hirta*, *Euphorbia thymifolia*, *Heliotropium undulatum*, *Inula grantioides*, *Kickxia incana*, *Launea* spp., *Melhanian denhamii*, *Mollugo hirta*, *Panicum* spp., *Pennisetum cenchroides*, *Portulaca quadrifida*, *Salvia aegyptiaca*, *Trianthema pentandra*, *Zygophycum simplex*.

Elsewhere the nature of the flora is governed by the soil type, i.e., sand, gravel, alkaline etc. and by the amount of moisture available. The dominant trees, shrubs, and under shrubs of sand and sand-dunes are represented by the following species :—

Plants of
sand dunes

Acacia arabica, *Aerua pseudotomentosa*, *Calotropis procera*, *Capparis aphylla*, *Cordia rothii*, *Crotalaria burhia*, *Euphorbia caudicifolia*, *Grewia populifolia*, *Indigofera* spp., *Leptadenia spartium*, *Lycium barbarum*, *Prosopis spicigera*, *Salvadora oleioides*, *Sericostoma pauciflorum*, *Tamarix dioica*, *Zyzyphus rotundifolia*.

The more commonly herbaceous species associated with these areas :—

Alternanthera, *nodiflora*, *Aristolochia bracteata*, *Aerua* spp., *Asparagus* spp., *Aristida funiculata*, *Boerhaavia diffusa*, *Citrullus colocynthis*, *Cleome brachycarpa*, *Cressa cretica*, *Cymbopogon* spp., *Cyperus* spp., *Echinochloa colona*, *Daemia extensa*, *Eragostis tenella*, *Eragrostis ciliaris*, *Cenchrus catharticus*, *Farsetia jacquemontii*, *Ipomoea biloba*, *Indigofera argentea*, *Launaea chondrilloides*, *Launaea nudicaulis*, *Leucas urticaefolia*, *Leptadenia spartium*, *Momordica balsamina*, *Maerua arenaria*, *Pentatropis* spp., *Panicum turgidum*, *Pennisetum cenchroides*, *Rhynchosia arenaria*, *Sonchus oleraceus*, *Trianthema monogyna*, *Zygophyllum simplex*.

Plants of the
Alluvial re-
gions: Gravel
Soil.

In the alluvial region plants of the gravel soil are as follows :—

Trees, shrubs, and undershrubs: *Acacia arabica*, *Acacia farnesiana*, *Aerua tomentosa*, *Alhagi camelorum*, *Calotropis procera*, *Cordia rothii*, *Crotalaria burhia*, *Euphorbia neriifolia*, *Fagoni*, *cretica*, *Grewia populifolia*, *Salvia aegyptiaca*, *Sericostoma pauciflorum*, *Sida grewioides*, *Withania somnifera*. Grasses and herbs :— *Aristida mutabilis*, *Boerhaavia diffusa*, *Cleome papillosa*, *Corchorus antichorus*, *Elusine* spp., *Euphorbia pilulifera*, *Heliotropium* spp., *Indigofera tenuifolia*, *Tribulus* spp.,

On soil impregnated with salts, the flora is naturally very meagre, represented by the following species.

Aeluropus villosus, *Arthrocnemum indicum*, *Salsola foetida*, *Scaevola frutescens*, *Suaeda fruticosa*, *Suaeda nudiflora*, *Sueda monoica*.

Plants found
near villages.

The biotic factors associated with human habitation combine to make the flora near villages etc. of specially distinct character. Thus plants found cultivated or wild near villages in the alluvial tracts are as follows :—

Trees, shrubs and undershrubs :—*Acacia arabica*, *Albizzia lebbek*, *Azadiracta indica*, *Cassia fistula*, *Casuarina equisetifolia*, *Cordia myxa*, *Eugenia jambolans*, *Euphorbia tirucalli*, *Mangiera indica*, *Moringa pterygosperma*, *Musa sapientum*, *Parkinsonia* spp., *Pithecolobium dulce*, *Phoenix* spp., *Prosopis spicigera*, *Terminalia catappa*, *Zizyphus jujuba*.

Herbs: Abutilon spp., Achyranthes aspera, Amaranthus spp., Chenopodium album, Chenopodium murale, Chochochorus tridens, Datura spp., Sida spinosa, Solanum spp., Euphorbia hypericifolia, Euphorbia hirta, Trianthema spp.

This region is also dotted with ditches, and ponds, and seasonal lakes, which abound in plants of an aquatic or semi-aquatic habit such as the following :—

Aponogeton spp., Ceratophyllum demersum, Coix aquatica, Convolvulus spp., Crinum asiaticum, Cyperus spp., Hydrilla verticillata, Ipomaea aquatica, Nymphaea rubra, Panicum spp., Polygonum plebejum, Phragmites karka, Scirpus squarrosus, Tamarix spp., Trapa bispinosa, Typha elephantina, Vallisneria spiralis.

Aquatic or
semi-aquatic
Plants.

Near the sea coast, the following species are found on the sand :

Aeluropus spp., Cyperus spp., Echinochloa spp., Ipomaea biloba, Oryza coarctata, Phragmites karka, Tamarix spp.

Plants near
sea coast.

On the sea coast in the creeks etc. near mangrove zones, the following other species are found, besides the mentioned above :—

Ipomaea aquatica, Atriplex stocksii, Salsoia foetida, Suaeda spp.

In the swamps of the protected creeks and river estuaries, the following mangrove plants species are found :—

Aegiceras majus, Avicennia officinalis, Brugiera gymnorhiza, Ceriops candolleana, Rhizophora mucronata, Rhizophora conjugata.

'Mangrove'
Plants.

SCENERY



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Water Lilies by road-side near Thatta.



CHAPTER V
ARCHAEOLOGY

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A view of ancient remains of Moenjo Daro.



A lane and stupa in Moenjo Daro.

CHAPTER V

Sind region as a portion of the Indo-Pakistan sub-continent forms archaeologically part of the southern zone of Eurasia. This zone is divided into three great regions—Higher-Asia and Iran, Indo-Pakistan sub-continent and Indo-China and Malaya. The southern zone extends through the Mediterranean to Pakistan and India, and prehistorically is still very largely unknown. Indo-Pakistan sub-continent has from the Tertiary period been a favoured abode of the primates, and in the Siwalik hills, which constitute a fringe of erosion debris stripped from the Himalaya and then raised by folding, vertebrate fauna of various dates ranging from the Miocene to the Upper Pleiocene have been found. Sind and Khairpur region, however, have yielded no traces of elementary forms of these primates or of man. In the thirties of the present century an attempt was made by Terra, Paterson and de Chardin to correlate the stratification in the alluvia of the Upper Indus Valley with Himalayan moraines. On the Himalaya five glacial cycles can be distinguished. The deposits of the third glaciation are called the Potwar deposits. These form a gravel base and thick beds of a loess that recalls to archaeologists the loess of China and Europe. Diggings in the gravel at the base of the Potwar discovered a stone industry of large quartzite pebbles broadly retouched with alternate retouches on a cutting edge. This stone industry has been called the Soan. In his "Prehistoric India" Professor Stuart Pigott, while commenting on the presence of climatic phases during the Pleistocene, which can be correlated with similar phases in Europe and probably with others in South India and Africa, where pluvial conditions replace glaciations, believes that two main traditions in implement manufacture can be traced: one in the north of Indo-Pakistan sub-continent which he thinks related to other similar flake, or chopper industries known from several East Asiatic sites, and the other in the south belonging to the core tool family, whose contribution includes Africa and Western Europe. Although no human fossils have been found, Stuart Piggott is inclined to believe tentatively that the tools of the flake, or chopper tradition may be the products of the ancient palaeanthropic stem in human evolution, such as the Pithecanthropus and that those of the core technique were made by the earliest representative of Homo sapiens in the modern or neanthropic family.

In the Potwar (Rawalpindi Division) discovery has been made of large rough flake tools considered to belong to the very end of the Lower Pleistocene phase and contemporary with the earlier Pithecanthropoids in Java. This flake industry has been classified as Pre-Soan as indicating its chronological position before the main series of Lower Palaeolithic cultures in the Valley of the Soan river. The Soan river is a tributary of the Indus in the Potwar region of the former Punjab. The early Soan industry consists of two main types of

Sind Pre-
history.

implements; one type is made from rounded pebbles and the other consists of thick heavy flakes and the rough parent cores from which the flakes have been detached. The Stone Age record of finds in Sind region is poor and fragmentary, and very much work has still to be done before the stages of the Palaeolithic and the Neolithic Ages in Sind and Khairpur region can be properly classified and correlated with the artifacts other parts of the southern zone of Eurasia.

Sind region has produced several examples of microlithic industries, but very little is known about their true place in the archaeological records. Stuart Piggott considers that they may represent a transition from Palaeolithic industries to those of a more advanced or specialised type, and is inclined to the view that the microlithic industries of Pakistan and India represent the arrival of new peoples, probably from the west. But whether the communities which made these microliths were hunters and food gatherers, in the palaeolithic tradition, or whether they were agriculturists, is not known. For the vast quantity of ground stone axes of the neolithic type which exist in sites in North of Pakistan, the existence of a considerable population in some fairly advanced stage of culture can be inferred, but so far it has not been possible to establish the stratigraphical relationship of these artifacts with those of the earliest agricultural communities in Baluchistan and Sind region.

In the latest edition of Chambers' encyclopaedia in the article dealing with this subject the writer states that finely prepared flakes from the Potwar loess of the Upper Pleistocene are very similar to the Mousterian flakes of Europe and Western Asia. In the second phase an African form of culture can be found carrying Acheulian bi-faces and cleavers, and in the last phase of the Upper Pleistocene three main groups of tools are distinguishable, one carrying on the Mousterian tradition, one the Soan-Acheulian technique. The same writer believes that a great new cultural invasion came at end of the Pleistocene, and brought with it microlithic industries made from quartz, jasper, chert and such like amorphous rocks contrasting strongly with the more massive quartzite industries of earlier time. This invasion is not thought to have wiped out the indigenous people, who survived into an age when pre-neolithic and neolithic polished picks and axes were used contemporaneously with primitive pottery. The microlithic implements survived to the end of the Neolithic Age and disappeared in a tide of invasion coming from the west and the east, the western invasion being that of the Indo-Europeans and the eastern that of Indonesians

Sind Stone
age.

A vast quantity of ground stone axes of the kind which are associated elsewhere with neolithic culture have been found in many sites scattered over this area. These ground stone axes are often associated with microliths, but it has not been possible to

establish the exact stratigraphical relationship of such sites with those of the earliest known agricultural communities in Baluchistan and Sind regions. At Rohri and Sukkur, and also at Drigh Road near Karachi, there has been unearthed an industry using chert and flint from the Sukkur limestone. This industry has produced some long thin blades and the conical cores from which they have been struck. These artifacts are considered comparable exactly with those of the Indus Valley civilisation seen in Harappa in Montgomery district and Moenjo Daro and in the earlier cultures of Amri in Sind region and of the Zhob Valley in Baluchistan region. There are, however, other implements suggesting an independent and probably early tradition, while other implements of probable archaic survival with Levallois flaking and overhand axes in addition to cores and blades seem to argue a relatively great antiquity of the Rohri Industry.

Mr. Henry Cousens, M.R.A.S. in his important volume "The Antiquities of Sind, with Historical Outline" says: "Amongst the earliest prehistoric remains are the cores and flakes of the neolithic inhabitants found in the Valley of the Indus, chiefly in the vicinity of Rohri and Sukkur, which are of flint from the nummulitic limestones. The following notice of these is taken from the Catalogue "Raisonne" of prehistoric antiquities in the museum at Calcutta. "In Sind on the hills near Sukkur and Rohri quantities of Imperfect flakes and cores are found made from the flint which abounds in the nummulitic limestone. Many of the cores are from three to four inches long, some smaller but very perfectly and regularly shaped cores of the same material have also been found in the bed of the Indus at Sukkur. The early finds from the bed of the river have been described by Sir John Evans, while later examples are recorded by W.T. Blanford, who writes "There can be little doubt about the late age of these cores. They are by far the most carefully formed of any hitherto found in sub-continent and are so far superior to all ordinary forms made of the same material that, as was pointed out by Mr. Evans in the Geological Magazine, they rather resemble those of obsidian which are found in Mexico and in some other places." Mr. Fedden noticed a peculiarity in many of the cores which I do not recollect having seen before. This is that several of them at the base present the appearance of a flat surface ground by artificial means. The material is in all cases nummulitic flint. I am much disposed to believe that the cores found in the Indus were made by different people from those who chipped thier flakes on the hills around. This may be due to the more civilised flake-makers having established themselves on the river bank, while their less expert contemporaries roamed among the neighbouring hills or visited them for the purpose of obtaining a stock of cutting implements; or the former may have lived later when the art of flint chipping had been brought to greater perfection. There is a

possibility that the best flints were selected and carried home to the dwelling on the bank of the river, in order that cutting flakes might be obtained from them by pressure while less perfect materials were utilised and thrown away at once. However it may have happened, it is certain that all the specimens I have yet seen from the river bed are singularly well formed showing as a rule no trace of a flaw and although an occasional well-shaped core may be found on the hills, the majority are broken or imperfect. Lieutenant Twenlow, R.E. who found these, discovered them three feet below the rock in the bed of the river. The specimens were from a mass of flints packed together in layers of from one and half to two feet in thickness resting on limestone, which proved to be the true nummulitic limestone full of nummulites laevigata and covered by a recent silt deposit".

It is plain from the vague and confused conclusions as to cultural influences which had been drawn from the evidence provided by the Sind finds dating from the Stone Ages that a vast amount of work has still to be done and that field studies will have to be undertaken on a very considerable scale before the scientific description of the cultures of the Stone Age in the Lower Indus Valley can be said to be satisfactory. In fact the study of the Stone Age cultures in Sind region is still in its infancy.

In the nineteen twenties of the present century Mr. G.E.L. Carter spent some time wandering about the limestone ridges near Hyderabad on Ganjo Takar and across the river near Kotri opposite Hyderabad in an endeavour to make a collection of stone implements which he was sure could be found in numbers in these areas. He propounded the theory, which may be perfectly sound that, in a region like Sind, consisting as it does of a vast plain of alluvium brought down by a capricious river which swings about for miles during the inundation season, and with a number of limestone ridges rising above the level of the spreading floods, that the trade routes of the Stone Ages must have followed the most convenient ways, and that these ways must have lain largely along the tops of the stone ridges. As a result of his searches he made a collection of stone implements mostly flint knives and scrapers, and these were accepted by the Prince of Wales Museum in Bombay, where they may be studied. Mr. Carter, however, was not a trained archaeologist, and experts today are rather doubtful whether many of the stone pieces which he collected were actually of the nature and character which Mr. Carter thought them to be.

Sind stone monuments

Sind region has many stone monuments of a different kind, such as cairns, cromlechs and stone enclosures. The cairns, and cromlechs are generally known as Kaffir's graves. Whatever their age, and that age is not thought to go back much beyond the

Middle Ages, they certainly do not provide evidence of the kind Neolithic who inhabited the Indus Valley in the Palaeolithic and of people Ages. Something is said about these stone monuments and memorials in the district volume of this gazetteer where in the particular district in which they are found some notice has been taken of them and a brief comment made upon their character.

The importance and value of the Indus Valley civilisation were not realised until the early twenties of the present century. It was only with the practically simultaneous excavations of Harappa near Montgomery in the Punjab region and Moenjodaro in the Larkana district of Sind region that archaeologists became aware of the existence of a vast and ancient civilization in the north-west of Pakistan. This uncovering of the Indus Valley civilisation may perhaps rank as the greatest archaeological discovery since Sir Arthur Evans at the end of the nineteenth century unearthed the Minoan civilisation of Crete.

**Indus Valley
Civilisation.**

The existence of an ancient civilisation in the Valley of the Indus had long been surmised. Indeed the present writer, when he was serving as an Assistant Collector in the Tando area, before the excavation of Moenjo Daro, used to hear stories from people living in the Badin area of the Hyderabad district that in Badin under mounds there were the remains of ancient cities. Actually no ancient city has yet been unearthed at Badin. It is quite possible, however, that there may be something in the local tradition. In a sense both Harappa and Moenjo Daro were discovered by accident; the former in the mid-fifties of the nineteenth century, which was the beginning of the railway age in north-west Pakistan. There were two engineer brothers called Brunton. John Brunton was the engineer constructing the railway through Sind on the left bank of the Indus up to Rohri. His brother, William was engaged in similar activities in the Punjab region of West Pakistan extending the railway line from Rohri to Lahore. John discovered in the city of Brahmanabad, which was flourishing at the time that Muhammad bin-Qasim conquered Sind in 711 A.D., a vast store of bricks which he found extremely useful as ballast for the new railway line. His brother, William, looking about for ballast in the Montgomery district of the Punjab region dug into the huge mound which proved to be the remains of the ancient city now named Harappa.

William Brunton's ballast excavations in the Harappa site drew the attention of General Cunningham, who retired from the army in 1861 and became the Director-General of an Archaeological Survey of Northern region of the country. General Cunningham has claims to be considered the father of archaeology in the sub-continent, for it was he who in 1856 discovered on the Harappa

site engraved steatite seals of the kind which we now know are typical of the prehistoric Indus Valley civilisation. These seals had an unknown script upon them and one showed the figure of a bull. General Cunningham realised that these objects were something quite outside the range of sub-continent's antiquities as they were then known, and he was sure that they were important. General Cunningham's discovery at Harappa in 1856 had, however, to wait till after 1920 before the real nature of his find was properly understood. The excavation at Harappa was begun in 1922 by Rai Bahadur Daya Ram Sahni, and almost simultaneously Mr. R. D. Banerji began the excavation of Moenjo-Daro. The excavation of these two sites proceeded somewhat spasmodically over a period of about ten years, and the results of this exploration were published in the monumental work of Sir John Marshall, who was Director-General of Archaeology in sub-continent from 1902 to 1931. The names which deserve to be remembered in this epoch-making unearthing of the Indus Valley civilisation are, in addition to these two names, Mr. M. S. Vats, Mr. K. N. Dikshit, Mr. Ernest Mackey and Mr. N. G. Majumdar. These archaeologists were, apart from Mr. Mackey all employed under the Archaeological Department of the British Government of India. It is sad to record that Mr. N. G. Majumdar, while carrying on his excavations in Sind, was murdered by a gang of Brahui dacoits from the Khirthar hills, thus meeting in 1938 a destiny which must have been common in the decaying days of Moenjo Daro when raids of marauders from Baluchistan region must have done much to seal the eventual fate of the Indus Valley civilization. Subsequent excavations in Sind at Moenjo-Daro, Chanilhu-daro and other sites took place in 1935-36.

Moenjo-Daro. The writer of the article on "Archaeology" in Chambers' Encyclopaedia (latest edition) states that the area covered by known sites of the Indus civilisation extends over the whole of Sind and the Punjab region, in West Pakistan through the Mekran coast to the Rajputana desert and from the Gulf of Cambay to Rupar near Ambala, (India) a much larger area than the Babylonian or Egyptian Empires, or than the British Isles. It is remarkable that over this vast expanse of territory the Indus Valley civilisation shows few variations in its type and remained astonishingly uniform in the material products of its culture. In 1944 Dr. R.E.M. (now Sir Mortimer) Wheeler was appointed Director-General of Archaeology in British India during the viceroyalty of Lord Wavell. He carried out still further excavations and later in 1950 he made another exploration of the site of Moenjo Daro. A brochure on Moenjo-Daro published under the auspices of the former Sind Government states in this respect: "The picture of Moenjo-daro has emerged out of the dark past with much greater clearness

of features as a result of important excavations carried out in 1950 by Pakistan authorities under the direction of Dr. R.E.M. Wheeler. A beginning was made in understanding the internal history and evolution of the Indus Valley civilisation and many other matters, but the most impressive discovery was a great granary, the wall of which was first taken between the rampart of military fortifications. It was stated above that the discovery of Moenjo-Daro was more or less accidental, because Banerji had gone, not to look for traces of this ancient civilisation, but to examine the remains of a Buddhist stupa which stood upon the site. It was while he was examining the nature of this Buddhist stupa that Banerji realised that underneath it was something very much older and of a completely different type of culture and civilisation.

There is now an immense literature on the Indus Valley civilisation, and it seems right that in this gazetteer, which deals authoritatively with Sind the correct name of the site should be set out. It is commonly written "Mohenjo Daro" as if there was some connection with Mohan, the Hindu divinity, which was one of the avatars of Krishna. Actually Mohenjo Daro is a pure Sindhi expression. It should be written correctly as Muyan-jo-Daro or Moenjo Daro, Moen or "muyan" being the inflected objective plural of the past participles of the verb "maran" to die. "Muo", the singular form means "the dead man." Daro" is the ordinary Sindhi word for a mound, or heap, and is philologically connected with the Pak-European root which appears in cognate form in numerous European languages today. The root meaning is "to place" or "to pile up" or "to heap" so that "Moenjo Daro" is the highly accurate and, at the same time, most picturesque description of what the place really is, namely "the Mound of the Dead Men."

The Indus Valley civilisation so far unearthed, seems to have consisted of two large cities Harapa and Moenjo Daro, and a large number of small towns and villages of differing sizes. There are believed to be at least three fortified sites in Sind region. Whether Harappa and Moenjo Daro were the heads of separate states like the city states of Sumer and Akkad or whether they were two large towns in one empire is not known, but possibly the Lower Indus area consisted of the two city states with Moenjo Daro and Harappa as metropolitan towns. In all so far more than sixty sites have produced elements of the Harappa and Moenjo Daro culture and between Rupar near the Simla Hills and Sutkagen-dor in Baluchistan region of West Pakistan near the coast of the Arabian Sea and 300 miles west of Karachi. In his book "Indus Civilisation," published in 1953, Sir Mortimer Wheeler states that with rare exceptions, the towns and villages, are towns and villages of the plan and that most of them line the present or former, courses of

the Indus and its tributaries. Sites have also been found by other rivers which flow southwards from the hill region by Ambala, like the Saraswati or Ghaggar, the Hakro or Wahandot, which formerly spread their waters over the desert land of Bikanir and Bahawalpur, and perhaps even reached the Arabian Sea as a rival to the Indus after struggling through the sands considerably to the east of it. In 1951 the Indian Archaeological Department, under the leadership of Mr. A. Ghosh, identified about twenty five sites in the northern part of the Bikanir division of Rajasthan particularly, along the banks of the former Ghaggar or Saraswati river. If these have been correctly identified, it seems that there was a string of Harappa culture sites along the border-land between Pakistan and Rajputana.

Most of the sixty or so sites along the valley of the Indus are in Sind region and many of them are very small. These may possibly have been either administrative out-posts for the Government of the country, or they may have been serais, or places of halt for travellers. Apart from Moenjo Daro itself excavation on an extensive scale has been confined to Chanhudaro and Amri. Chanhudaro was excavated in 1935/36 by Mr. Ernest Mackay and later by Mr. N.G. Majumdar. Mr. Majumdar also excavated the site at Amri where valuable evidence in the shape of pottery has come to light. The extant remains of Chanhudaro cover an area of 1,000 by 700 feet, but a hamlet like Amilano has no more than 300 feet by 200 feet of superficial area. The site of Ali Murad in Sind appears to have been fortified, as it is surrounded by a stone wall three to five feet thick enclosing an irregularly rectangular area. Another fortified place seems to have been Sukagen-dor in the Mekran, where the fortifications were more formidable and a stone wall enclosed a rectangular area of 125 yards by 170 yards. This stone wall was built of stone blocks, roughly squared, and set in courses 30 feet wide at the foot and with an outer face set at an angle of 40 degrees. Another site which is believed to hold fortifications is that on Tharro Hill. There the fortifications consist of double walls, curved, of massive construction, and 250 feet apart. There is still another site, Dhillanjo Kot, where there seem to be finds of a defensive wall surrounding a settlement of the Amri type.

Stuart Piggott in his book "Prehistoric India" believes that in general the villages appear to have been undefended and without walls or ramparts. Other Sind sites of the Indus Valley civilisation were found at Pandhi Wahi and Ghazi Shah. There many signs of human occupation were found, but no buildings can be identified now. At Kohtras Buthi, Majumdar identified a structure as a bath occupying a corner of one room by the entrance; and in the same house he thought he had found the remains of a stairway, from which it was deduced that the house had a flat roof, or an upper story, to which access was gained by means of stairs. In

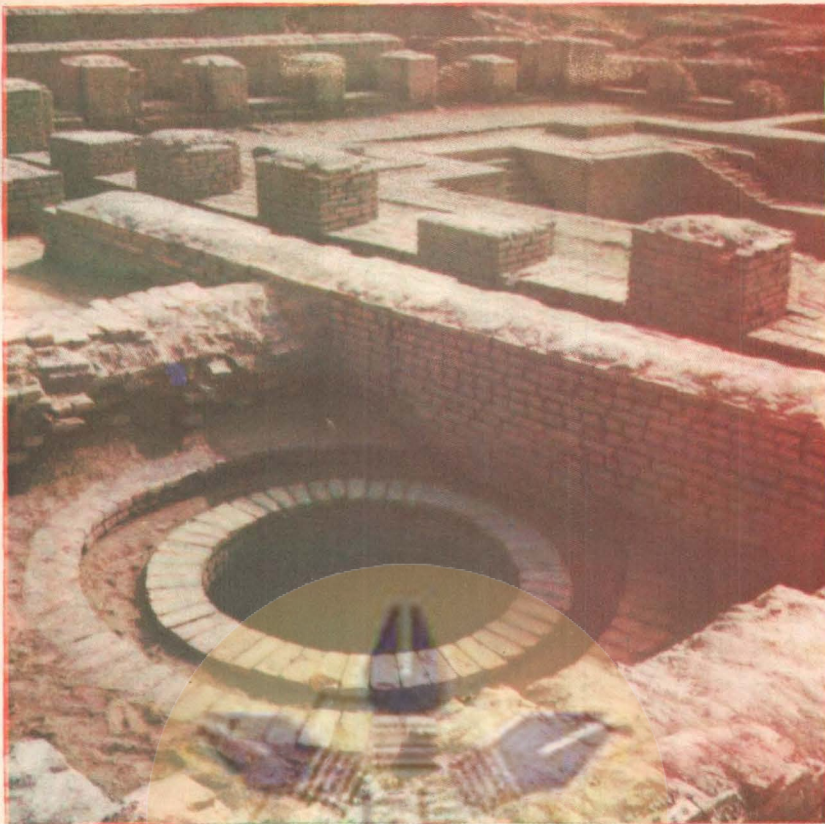
Sind region the culture thus exposed has shown itself rich in material finds. These consist of buildings, objects of common and commercial use, ornaments, jewellery and toys, statuettes and figurines, seals and an immense array of pottery of different designs. To quote again from Stuart Piggott's "Prehistoric India," talking of Moenjo Daro and Harappa, he says "the two main cities lie, like the foci of an ellipse, one to the north and one to the south of the known area of settlement, Moenjo Daro on the right bank of the Indus in Sind and Harappa on the left bank of Ravi in the Punjab." Built on regular lines, the town plan was a rectangular one with wide intersecting streets, provided with drains. The width of the streets varied from nine to thirty-four feet and ran sometimes for a long distance in straight lines. The construction of the buildings was of fine, but lightly fired, brick. Some houses were large with a courtyard in the middle. Such houses had staircases and bathrooms and rubbish chutes were used for depositing garbage in the brick ash-bins in the streets. Striking objects in Moenjo Daro were the wells, which when excavated proved to be so capable of use. The great bath at Moenjo Daro is probably the most remarkable feature of this ancient city. In a large building measuring 170 feet by 95 feet there was a pool 39 feet long by 23 feet wide. It is this, with some of the wide streets and supporting buttresses, which impresses the visitors today more than anything else amongst the ruins of the city.

The official brochure regards the granary as worthy of special remark. It says, "Situated on the citadel mound, the granary forms one of the most outstanding buildings in an area noted for its impressive remains. Solid cubes of brickwork up to 20 feet high form a block over 50 yards long and 25 yards wide. Above this masonry base the granary proper was raised on a timber framework. The base was divided by a grid of corridors, or air-ducts, which served to ventilate the granary and keep it fresh. Along the northern face ran a loading platform with a small recess, or yard, into which bullock carts from country districts could bring the grain and where sacks could be hauled up for storage. The great size of the granary suggests that it must have been a public building comparable in this respect with other nearby edifices. To it tributes and taxes were granted in the form of grain, and here was stored the country's wealth against times of famine. Thus it served both as a State Bank and a treasury to the ancient city of Moenjo Daro."

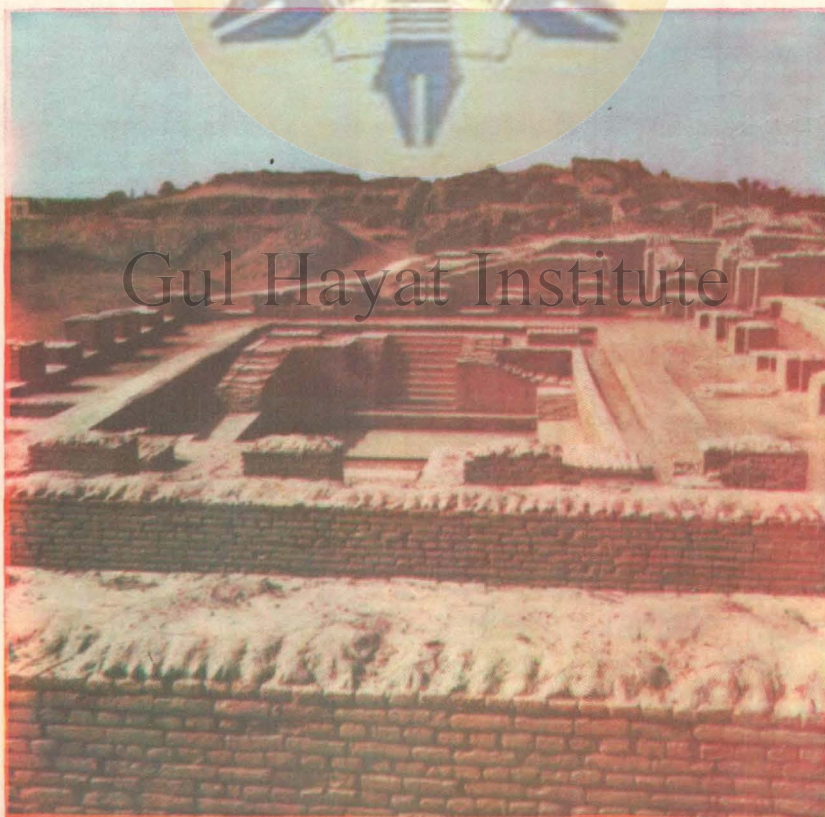
It still has not been established that Moenjo Daro was a fortified city. In 1944 the view was that the administrative nucleus of the city was strongly fortified, but a later conclusion is that the great public centre of Moenjo Daro does not seem to have any extant fortifications around it. It thus differs from Harappa,

which has defensive walls. Further exploration is, therefore, necessary before it can be definitely asserted that Moenjo Daro was an unfortified open town whose inhabitants lived in a state of peace. In the city which contained an immense granary, which may have been a State Bank and a treasury, and a magnificent public bath, which possibly was connected with ceremonial ablutions required by religion, it is remarkable that no building has been identified as likely to have served as a temple, or place of religion. Neither in Moenjo Daro nor in Harappa is there any evidence that any such building existed. Like the cities of the Indo-Sumerian period from about 3,000 to 2,000 B. C., Moenjo Daro was built of brick. These cities were settlements of traders, who obviously possessed a highly developed sense of civic life and required considerable material comfort for their well-being. The buildings which exist are plain and strictly practical. They consist mainly of dwelling-houses, store-rooms, baths and wells. The city drainage was exceedingly intricate and extensive, and is indeed more perfect than that of many cities in Pakistan and India today. The true arch was not known. What arches existed are corbelled, but we are safe to assume that wooden architecture must have been highly developed, but of this there is, of course, no trace extant today.

Who were the people who created this elaborate civilisation between four and five thousand years ago? The question cannot be easily answered, and no unanimous opinion on the part of archaeologists at present exists in the matter. The view, however, is that there are close resemblances between the Indus Valley civilisation and its culture and the civilisation and culture of early Sumer and Babylonia, especially with the proto-or pre-Sumerian of Kish. It is the general belief of experts today that the early Pakistan and Mesopotamian cultures probably represent cognate developments. This view is not based merely on the nature of the material finds which have come to light in Harappa, Moenjo Daro and the ancient cities of Babylonia. It is founded on a wider basis of cultural study, such as the history of design and analogies which exists between Babylonian mythology and the cult of Dravidian agamic traditions in Indo-Pakistan sub-continent. There is no sound reason for a belief that either the Mesopotamian, or the early Pakistan cultures were derived the one from the other, or that they borrowed extensively from one another at any one time. The culture of the Indus Valley civilisation is called chalcolithic, which is itself rather a stupid term, since all it means is that bronze implements and stone implements were found in use at the same time. The culture is an early chalcolithic culture, and this extended from the Adriatic as far east as Japan, and has been associated with the dolicho-cephalic Mediterranean races of Southern Asia and Europe. This widespread culture reached its fullest development in the great valleys of the Nile, the Euphrates and Tigris, the Karun, the Helmand, and the Indus in West Pakistan.



Moenjo Daro—A well.



Gul Hayat Institute

Moenjo Daro—Bath.

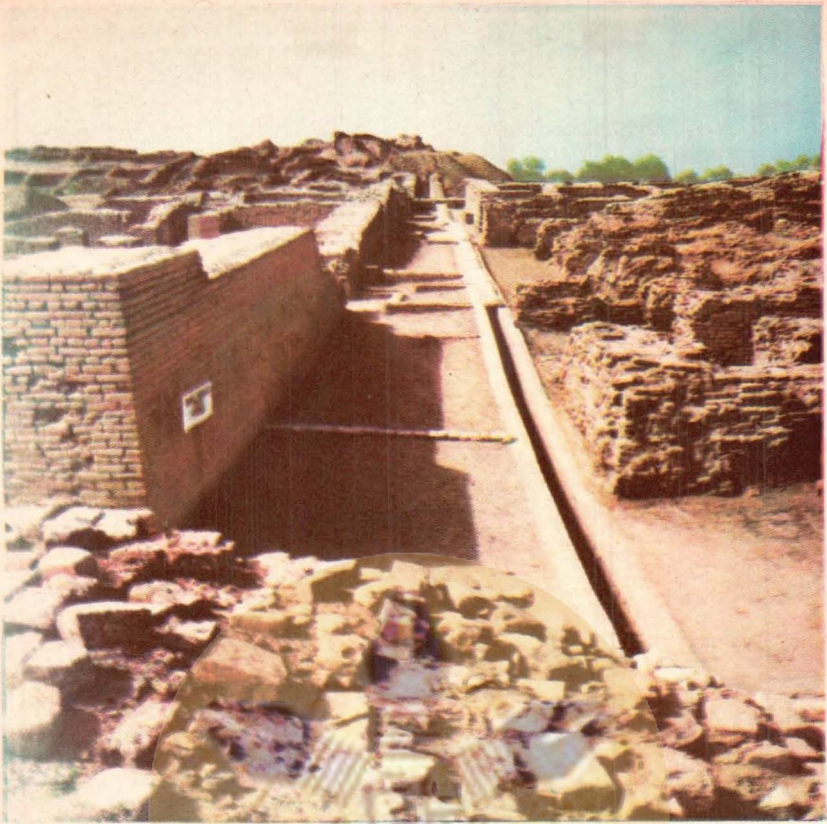
Some authorities take the view that Armenia was the original focus of this culture, since it was a country rich in metals, and was very possibly also the starting point of early race movements across the highlands of Persia. These movement turned in two directions, one went towards Elam in Southern Mesopotamia and the other towards central Asia, Pakistan and India. As regards the cultural affinities which may exist between the Indus Valley civilisation and that of early Mesopotamia, the following points have some value. In the development of design there is a similarity in the treatment of animals and in architecture. As regards analogies between Babylonian mythology and the Dravidian tradition in the Indo-Pakistan sub-continent some analogy is possibly apparent in the use of similar formulae for the representation of mountains, clouds and water, and in the motif often used, of animals with long necks interlaced and of heraldic fabulous animals generally. For example, the representation on Babylonian seals of dragons with serpentine bodies and human busts recalls the Nagas, the cult of the waters seems connected with the symbols of the flowing vase in Babylonia and the brimming vessel, or base of plenty, purna kalasa in the sub-continent. In addition to these, there are similarities in technical procedure, of which one example is a process of decorating carnelian by calcining and by the similar composition of Pakistani and Assyrian glass.

As regards the date of the Indus Valley civilisation and Moenjo Daro and other sites in Sind, Ernest Mackay in his book "The Indus Civilisation" says that "its date has now been fixed with some certainty. Certain objects found during the excavations now proceeding in Mesopotamia have been identified as of Indo-Pakistan workmanship." He continues, "It is enough to say here that the upper levels of Moenjo Daro are contemporaneous with the latter part of the early dynastic period of Babylonia circa 2500 B.C., while the lower levels, as far as we have descended, where the objects found are barely distinguishable from those of the latest levels, could hardly ante-date the latter by more than five hundred years, perhaps as little as three hundred. This dating of the upper levels is now accepted by most authorities, but it must be remembered that it depends on Mesopotamian chronology and that any modification of the latter must entail a corresponding re-dating of the Indus Valley finds". The culture of the Moenjo Daro people was that of communities of successful traders living on an established system of agriculture, possibly supported by extensive irrigation systems for the bringing of the waters of the Indus on to the flat alluvial soil, such as was done in Babylonia in the Sumerian and Akkad epochs, Wheat, barley and dates were cultivated. Domestic animals

included cattle, humped and unhumped, pigs, sheep, buffalo, goats, donkeys, fowls and dogs. The people knew of the elephant, the monkey, the tiger, the rhinoceros, the gharial or long-mouthed fish-eating crocodile and the mongoose. It is only in the latest levels of Moenjo Daro that the horse is found and the evidence suggests that the Indus folk were not acquainted with it.

Pottery, was made on the wheel and the wheel was used also for transport, perhaps for irrigation as well. The bullock cart was the chief means of transport. Models in terra-cotta and bronze of bullock carts have been found at Moenjo Daro, and these recall very forcibly to mind the bullock cart which the Sindhi peasant uses today. There were textiles; there were bronze instruments, jewellery made of gold, silver, gilt bronze, turquoise and other precious materials. Potters occupied an important place and possessed great skill in the fashioning of miniature pottery, like children's toys, such as rattles, models of carts, monkeys, dogs, birds, rhinoceroses and bulls. At Moenjo Daro these demonstrate the ancient craftsmen's skill in the making of these objects. Nothing connected with the Indus Valley civilisation of Moenjo Daro has raised greater interest among archaeologists than the numerous seals of exquisite workmanship which have been unearthed in this region of West Pakistan. Associated with the seals is a form of pictographic writing, which has not yet been deciphered. No scholar has yet succeeded in reading this writing; but at various times scholars have claimed that it is Sumerian, proto-Elamite, or proto-Dravidian. The seals are generally made of glazed steatite. Their exact use is not known, but it is probable that they were amulets and that the wearers of them carried them about fastened on them by strings, passed through a hole perforated in the seal.

The usual objects depicted with exquisite skill and clarity of line on these seals are the long-horned humped bull, the buffalo, the bison, the elephant, the tiger, the rhinoceros, the gharial, the pipal tree, and a cross-legged male figure wearing a horned head-dress and surrounded by four animals. Sir John Marshall has characterised the seals as distinguished by a breadth of treatment and feeling for line and plastic form that has rarely been surpassed in glyptic art. The two artistic masterpieces discovered in Moenjo Daro are the bronze figure of a dancing girl and a statuette in limestone of a bearded man dressed in a trefoil embroidered shawl. Stuart Piggott considers that the dancing girl seems clearly "of the proto-Austroloid type with full lips and, if" he says, "as seems likely, she is indeed a representation of a Baluchistan type, one may note in passing that the very dark complexion associated with the proto-Austroloid group would be in accord with the name given to southern Baluchistan region of West Pakistan in classical times, Gedrosia, the country



A street and underground drain in Moenjo Daro.



Moenjo Daro—Terra-cotta figures.

of the dark folk." As regards the second artistic masterpiece Mackay believes that this, the only stone image up to that time discovered, can definitely be said to be that of a deity. The figure is clothed in a robe carried over the left shoulder and under the right arm and on each is carved in relief the trefoil pattern, which Mackay thinks, judging from its frequent appearance at Moenjo Daro and Harappa, is obviously a sacred symbol. The figure has a short beard and shaven upper lip, the latter fashion resembling other figures both of God and men found in ancient Sumer. The hair, practically cropped, is parted in the middle and secured by a fillet tied round the head with two long ends hanging down behind. Mackay believes that a hole bored in each side of the neck, just below the ear, is evidently intended to take the end of a necklace. The lips are full and the (broken) nose was probably of ordinary size. From the fact that the image wears a robe ornamented with a sacred device and that provision is made for a necklace, Mackay infers that it could have been intended for any human being, even a priest. The peculiar half-shut eyes have been thought by one authority to represent a state of contemplation. While Mackay thinks that this is possible, he remarks, "Very much the same kind of eye has been noted in early clay figures from Kish and Ur."

A light is thrown upon the religious beliefs of the people who lived in Moenjo Daro and Harappa only by the material objects which they have left behind. Those which are believed to have had some religious importance have been studied carefully by a number of archaeologists. In Rawlinson's "Short Cultural History of India" the author says that the most common object of worship appears to have been the Mother Goddess, whose cult spread all over Asia Minor. This goddess is represented in numerous pottery figurines and on seals and amulets. Another goddess appears as horned in an association with a sacred Pipal tree. A horned three-faced God, who is represented upon one of the seals in a seated attitude surrounded by animals, has been identified with the Shiva Mahadeva and this hypothesis is strengthened by the discovery of representations of the lingam, the symbol of Shiva.

No cemetery has been unearthed in Moenjo Daro, though one has been found in Harappa. In the absence of a cemetery and graves, archaeologists find it difficult to come to any clear-cut conclusion about the nature of the religious belief. Had there been graves, these could have been associated with human remains and contained objects of pottery, metal and stone. This might have thrown some light upon whether these people entertained views of the state of human beings after death and whether they had any belief in the existence of heaven and immortal life. The absence of graves at Moenjo Daro may perhaps be explained by the practice of

cremation, which is the almost universal form of disposal of the dead in present-day India by Hindus of all kinds. But the position is that neither at Harappa or Moenjo Daro, or any other site has there been any trace of a temple or of a religious building. We are forced to the conclusion that in the Indus valley either any religious buildings that may have existed have disappeared without trace, or that religion was practised by the family in small house-shrines, much in the manner of the early Roman religion with its worship of the lares and penates.

From the great number of figurines of the Mother Goddess which have been found, we may safely infer that the worship of this divinity must have been widespread. The Mother Goddess may be regarded, as she was at Uruk, as a patroness of fertility and love. There she was known as the great Goddess Ishtar and was called Astoreth by the Zidonians and Astarte by the Greeks. From the new Testament we know that at Ephesus in the time of Saint Paul the prevailing divinity was the many-breasted Diana of the Ephesians, who was a personification of the powers of reproduction and fertility in nature. Mackay states that the poorer and more illiterate people probably found a deity like the Mother Goddess easier to understand and worship than any other. In India today the Mother Goddess in various forms is still the most popular rural divinity guarding the house and village and presiding over childbirth. Mackay believes it likely that the Mother Goddess was so regarded by the inhabitants of the Indus Valley. But whether she was considered in those days to be one of a trinity, that is with a male counterpart and a son, or whether she was worshipped alone, is still unknown. The breasts of the Mother Goddess of the Indus Valley are small compared with those of the more matronly female figures believed to have been used for votive offering. This has led some archaeologists to believe that the Mother Goddess of the Indus Valley was a virgin. Mackay has drawn attention to one seal which depicts a horned goddess in the midst of her people before a sacred fig-tree, before which another horned deity is kneeling while doing obeisance. Both the goddess and her worshipper wear long plaits of hair and her arms are adorned with many bangles and the face of the worshipper has a floral or leafy spray springing from the head behind the horns. Behind this worshipper can be seen a goat with a human face; he looks on with interest. A row of seven spirits or deities facing the opposite way to the scene above occupies the whole lower portion of the seal amulet. Each figure wears a sprig on his head and carries a long pig-tail behind but has no horns.

A comprehensive study of the seals and figurines found at Moenjo Daro and Harappa tends to confirm the belief that the inhabitants of the Indus Valley in those days worshipped in one form or another a divinity connected with fertility, reproduction

and growth and that associated with this was the worship of trees, particular kinds being regarded as sacred. Very likely, too, it may be inferred from some of the seals that in some way or other animals were regarded as sacred and became objects of reverence.

In his volume *The Cambridge History of India* on "The Indus Civilisation," published by the Cambridge University Press in 1953, Sir Mortimer Wheeler discusses the dating of the Indus Valley civilisation. He says that it is to be dated primarily by its contacts with the proto-historic cities of Mesopotamia in the latter half of the third millennium B.C. and in the early centuries of the second. Mr. C.J. Gadd in the *Proceedings of the British Academy* (1932) set out the results of his examination of sixteen seals of the Indus valley in the Indus style which were found in Ur and two other seals of unspecified Babylonian origin. He cites a list of references relating to these early discoveries from Kish, Susa, Lagash, Umma and Tell Asmar and two from unknown sites. "Of the twelve seals" says Sir Mortimer Wheeler, "from which any sort of dating can be postulated, seven may be Sargonid, one pre-Sargonid and four of the Larsa or later periods. On current dating the maximum period required to cover these possibilities would be 2,500 to 1,500 B.C. with a strong focus on about 2,350 B.C."

As regards the pictographic writing in the Moenjo Daro seals, the main difficulty about decipherment comes from the fact that there are no long inscriptions. The writing on the seals consists of a few signs only. Without a comprehensive number of long inscriptions it would be exceedingly difficult for any expert to make sense of what there is. One of the most interesting suggestions about the Moenjo Daro script is contained in an article, "The Numeral Signs of the Moenjo Daro Script" by A.S.C. Ross in the *Memoirs of the Archaeological Survey of India* No. 57, 1938. Dr. Ross bases his arguments on the numeral signs in the Moenjo Daro writing, on the assumption that these numeral signs do not represent actual numbers. He concludes that, if their use is not ideographic, the decipherment of the script depends upon whether the numeral signs are homonymous or quasi-homonymous with the numbers of the base language of the script or they are groups of phonemes. In considering the hypothesis which result from the study of these alternatives, he follows a process of elimination between languages like Modern Chinese, Egyptian and a syllabic phonematology. Arguing from the non-ideographic use of the numeral signs for, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 12, he concludes that in the base language none of these numbers were compounds. The chief enumeration system of Moenjo Daro, as known from the system of weights and measures, was decimal. Dr. Ross tested four languages in his process of elimination, namely,

Primitive Dravidian, Primitive Munda, Primitive Burushaski, Primitive Indonesian. He concluded that only Primitive Indonesian satisfied the test of the hypothesis and, therefore, became of the final opinion that, if the Moenjo Daro script has affinity with any known language, it is more likely to be Primitive Indonesian than anything else. De Hevesy has suggested that the scripts of Easter Island and Moenjo Daro are so strikingly similar that there can be no question of fortuitous resemblance. On this point G.H.R. von Koenigswald in his book on "Meeting Prehistoric Man," 1956, in dealing with a pictographic script of Easter Island says that it was De Hevesy who compared these hieroglyphics with similar signs found in the prehistoric settlements at Harappa and Moenjo Daro in the Indus valley at Pakistan. He points out that, though there is a certain resemblance between these two groups of signs, namely, Easter Island and Moenjo Daro there is one very important difference; the hieroglyphics of Easter Island are always in silhouette, while those of the Indus Valley consist only of strokes.

The similarity, therefore, between the Moenjo Daro script and the Primitive Indonesian script of Easter Island and Sumatra remains a puzzle, which is completely baffling solution at the present moment. Perhaps the most promising line of development, always assuming that inscriptions of the Moenjo Daro script showing a larger number and greater variety of the pictographic signs come to light hereafter, seems to be to follow up development of the Sumerian script. Sumerians are thought to have been the inventors of writing, and it is from the early Sumerian script that the cuneiform of Mesopotamian and the hieroglyphics of Egypt are thought to have arisen in their own particular way. If the theory is correct that a great race of Mediterranean people passed over Persia, going in one direction to Sumer and in the other direction towards Pakistan and Central Asia, it is possible that, granted the necessary evidence becoming available, following up the development of the Sumerian script provides the most hopeful line of approach to the puzzling question of deciphering the Moenjo Daro inscriptions. If the above theory is correct, there is a chance that these people brought with them something that had connection with the early Sumerian writing. Some link may be found between such early Sumerian writing and the Moenjo Daro script. But where the Indonesians fit, if at all they do, into the jig-saw is something that hitherto has been quite inexplicable.

The human remains found in Moenjo Daro are not numerous. In volume II of Sir John Marshall's monumental work, "Moenjo Daro and the Indus Civilisation" (1931), there is an account of the skeletons and skulls which were discovered. These were as follows: Firstly, three skulls were found to belong to the proto-Australoid race, and it is noted that there is a very close agreement between the

skulls from Moenjo Daro, the recent extinct Tasmanian race and the prehistoric homo neanderthalensis from Europe and North Africa, the cranial capacity being between 1400 and 1500 cubic centimeters. Secondly, six skulls were found of a type which suggests that they represent the true Mediterranean race, and the examples agree very well with the Nal skull from Baluchistan region and skull No. 4 in Buxton's account of the Kish remains. The book states: "Among the data we possess we have evidence of one sort or another regarding the living height of three individuals belonging to this type, namely, one man and two women. The male was about 5'4½"; the two women were considerably shorter than this, measuring respectively 4'9" and 4'4½". Thirdly, one skull of the Mongolian branch of the Alpine stock was found; this skull was held to be quite characteristic of its type, and for the purpose of classification the Naga skull is comparable. The close correspondence between the two leaves no room for doubt regarding the racial origin of this individual. Fourthly, the Moenjo Daro remains included four skulls of Alpine race. It was found impossible to go further than that, and the anthropologist who examined the skulls was not in a position to determine to which branch of the Alpines the skulls may have belonged.

The evidence found is meagre and it is impossible to draw any firm conclusion from the description of these human remains as to the composition of the people who inhabited Moenjo Daro four to five thousand years ago. It is interesting that the bronze statue of a dancing girl was thought to be of a person belonging to the proto-Austroloid race, of which three skulls have been found in Moenjo Daro. From the fact that the number of skulls of Mediterranean race which have been found outnumbers any other kind of skull, it may be possible to conclude that the general population who comprised the Indus Valley civilisation belonged to the Mediterranean race. This would be in accord with the general probability that the earliest probable inhabitants of India, whoever they were, the primitives who have now mostly disappeared from the land, were overrun by Mediterranean peoples, who provided the culture which the Aryan invaders found flourishing in the middle of the second millennium B.C., a culture which was analogous to that existing in the Nile valley, the Tigris and Euphrates valley and the Indus valley. Looking at the problem from the point of view of the racial composition of the bulk of the Indian population at that time, we shall be safe to say that they were akin to the people who are today called Dravidian.

The Indus Valley culture has been called chalcolithic. But this term is liable to misunderstanding. The lowest levels which have been excavated have yielded finds of copper and bronze, and also neolithic materials have been discovered on the site although archaeologists believe that it was not an established site in the

Stone Age. The fact that some stone implements have been discovered with metal finds proves nothing more than that these were used at the time, and not that they are the products of persons living in a Stone Age civilisation. The culture of Moenjo Daro and Harappa was a Bronze Age culture having little, or no relation to the cultures of the Neolithic Age. If the civilisation of today were suddenly blotted out and its remains preserved as they are, it would be possible for archaeologists of the future to deduce that the twentieth century in Europe had not divested itself of the use of stone for objects in common use, as mortars and pestles, hones, grindstones, knife handles, bird baths, tombstones, millstones, marbles, curling stones, cheese presses, table and wash-stand tops, and butchers' slabs still in use today are made of stone. Thus an explanation on these lines would satisfy the conditions unearthed at Moenjo Daro. The stone implements found are mostly simple ribbon flakes of flint serving as knives, and the cores from which they are struck were also found in most of the houses. Mackay concludes justly, that no doubt, a knife of this type was cheaper than, and perhaps as efficient for certain purposes as a metal one.

It is not possible to dig deeper than has yet been done into the lower levels of Moenjo Daro. This arises from the fact that the Indus is gradually raising itself above the level of the plain, and in the course of ages is higher by many feet than the level it must have followed five thousand years ago. Mackay states that where the excavations have penetrated 40 feet below the surface of one of the principal mounds, the objects found were identical with those of the later levels. Digging could not be continued below this level, although it was obvious that the walls descended to yet lower levels in the waterlogged soil. It is fair, therefore, to conclude that the foundations of the city were of much earlier date than the levels it has been possible to reach in the modern excavations. The uniformity of culture through all the levels of Moenjo Daro seems to argue that the inhabitants living at the time of the lowest levels were not more primitive, or less civilised, than the inhabitants of the city during its latest days. This means, as Sir John Marshall has pointed out, that the Indus Valley civilisation as found argues a long existence to bring it to the standard of efficiency which modern excavation has proved must have existed.

Though Moenjo Daro is the largest and most important site of the Indus civilisation in Sind region, it is not the oldest. Amri, about 80 miles south of Moenjo Daro, is older and so, it is believed, is the recently discovered Kot Diji, about 10 miles south of the town of Khairpur. The present writer visited Kot Diji in 1956 and saw many evidences of the stratifications indicating the passage of time in respect of differences in the colour of the soil and in the nature of the debris embedded at various levels. The excavations at Amri are regarded as important, as they have

thrown light upon the history of the use of pottery in these early days of the Indus Valley civilisation. The evidence from the pottery is very confused and complicated. A good description of the complexities of the case has been set out by Stuart Piggott in his 'Prehistoric India.' A broad classification of prehistoric cultures in Persia has been made according to the techniques employed in the pottery painting. In the south buff-ware exists and in the north red-ware. Stuart Piggott says that in Baluchistan a similar distinction can be observed, with buff-wares in the south and red-wares in the north, and that within the buff-ware regions of south Baluchistan and Sind other sub-divisions must be made. He has classified the pottery of this portion of the world as: "(A) *The buff-ware cultures*:—(1) the Quetta culture from sites in the Bolan pass; (2) the Amri-Nal culture from two sites, the first in Sind region and the second at the head of the Nal valley in Baluchistan area; and (3) the Kulli culture from a site in Kolwa in south Baluchistan region, and (B) *The red-ware cultures*:—(4) the Zhob cultures from sites in the Zhob valley of north Baluchistan". Of the Amri-Nal culture Stuart Piggott says "It indicates the two extremes of variation which can be seen in an otherwise allied group of pottery types which can be divided into three phases, the earliest typologically is represented at Amri in Sind, where characteristic ware was first identified by Majumadar, the latest by the cemetery of Nal in Baluchistan excavated by Hargreaves. The site of Nundara discovered by Stein in south Baluchistan region of West Pakistan is a convenient representative of middle phase". He thinks that these pottery types are really linked and that other factors, notably the absence of clay figurines of animals or humans in all three phases seems to justify their treatment under one inclusive head. The Encyclopaedia Britannica (latest edition) takes a somewhat more cautious view on this question. It says that the analogy of painted pottery of Babylonia and Assyria to the early painted wares of Persia, Baluchistan region and the Indus valley in West Pakistan and even of China has been discussed, but no conclusions are yet agreed upon.

The writer of the article on "Babylonia" in the latest edition of Chambers' Encyclopaedia states that some archaeologists have seen affinities with the painted pottery cultures of the Iranian highlands and others would bring them to the north. It is also uncertain whether they were the people whom we know at a later period as Sumerians. The date of the beginning of history in Sumer, that is to say, of intelligible written records, cannot be determined with any certainty, though it may be approximately 3,000 B.C. Archaeology has established the existence at this time of cities of a considerable size with imposing temples and houses of elaborate plan, also the complex urban organisation. These Sumerians were skilled in the

manufacture of metal vessels in the casting of copper, in the carving of stone and the fashioning of jewellery. The Royal Cemetery of Ur has produced treasures which are witness to a considerable foreign trade. There are shells from the Persian Gulf, lapis-lazuli from Afghanistan, silver, gold and copper which must have come from distant mountains, and fine stones, such as chalcite, obsidian and diorite, none of which is found in Iraq. It is impossible to study the history of these early Sumerians without recognising the extraordinary similarity which exists between their culture and that which has been found in the Indus valley in West Pakistan.

Even in the early dynastic period, when there was no single ruler over Sumer, there existed a number of city states: Eridu, Ur, Erech, Larsa, Umma, Adab, Shuruppak, Kissura and Nippur and others. This dynastic set-up may very well have been duplicated in the Indus valley, with one state of Harappa in Punjab region of West Pakistan and another state of Moenjo Daro and a complicated series of communities in the form of small towns and villages scattered over the alluvial plain. Glyn Daniel, writing on the "Archaeology of India" in the latest edition of Chambers' Encyclopaedia, calls attention to the fact that a culture identified at Jhukar in Sind region of West Pakistan by Majumdar and named after this type site is characterised by buff-ware with black and red paint, copper soft core axes and copper pins with rolled heads. He says that correspondences have been noted between copper objects, beads and other personal portable objects in the (later) Jhukar culture of Baluchistan region of West Pakistan Province and the last phase at Moenjo Daro, Anau III and Hissar III. The same writer considers it probable that the origin of the Indus civilisation lies in small villages of settled farmers established before 3,000 B. C. in Baluchistan region, which are characterised for the archaeologist by black and buff painted pottery in the south and red and black painted pottery in the north. The black and red-ware is well seen and Piggott saw this culture at sites such as Sur Jangal, Periano Ghundai, Mughal Ghundai and Kaudani in north Baluchistan area. The black and buff-ware is known from the sites of Nal, Quetta, Kulli, Shahi Tump in south Baluchistan region and from Amri in Sind region. Daniel says that the urban civilisation of Harappa, Moenjo Daro and Chanhu Daro has affinities with both groups of wares and appears to be a development from these peasant communities of the former Baluchistan villages, though the idea and practice of urban life must in some way have been derived from the earlier cities of the Tigris Euphrates valley.

It seems to the present writer to be somewhat dangerous to ascribe the Indus Valley Civilisation to these scattered villages of settled farmers in former Baluchistan, especially when most of the evidence seems to depend upon similarities in the kind of pottery found in various parts of the area. Very likely there may well have been communication between these Baluchistan region communities and the flourishing organisation of traders who developed Harappa and Moenjo Daro. But surely it is more probable that the Indus Valley Civilisation, showing features common to the civilisations of the Tigris-Euphrates valley and to the cultures of Seistan and other centres which were explored by Sir Aurel Stein, provides a surer indication of where the chief formative influences moulding the Indus Valley Civilisation must be sought. These formative influences must have come with the influx of the Mediterranean people who, as surmised in this chapter already, poured in one great stream from somewhere in central Europe or western Asia to carry with them a way of life which produced the civilisation of Egypt, Mesopotamia, the Indus valley in Pakistan and perhaps also the river civilisations of China. The general opinion of archaeologists today seems to be that the Indus Valley civilisation flourished for about one thousand years, from 2,500 B.C., and that before 2,500 B.C. it must have had some lengthy period of incubation, the details of which are not known to us.

Why and when exactly the Indus Valley Civilisation died is not known for certain. Stuart Piggott and Sir Mortimer Wheeler believe that the civilisation was destroyed by the invading Aryan about the middle of the second millennium B.C. They think that the records of the Aryan invaders of northern region of sub-continent point to the cities of the Indus valley as having been amongst the fortresses which the conquering Aryans destroyed. Sir Mortimer Wheeler has even gone so far as to assert that it is now generally accepted that the Indus cities were, in fact, those referred to in the Rigveda and that they were those destroyed by the Aryan invader in, or about, the fifteenth century B.C. This view appears open to the gravest doubt on general grounds. The chief of these grounds is that there is no solid tradition whatever of the Aryan invaders having passed down and settled in the Indus valley to the river mouth in the way in which they settled down in those vast areas of northern India which became Aryanised, if the expression can be allowed. The tide of Aryan invasion has been hitherto believed to have in the Punjab by-passed the Indus from the north and streamed into the northern plains of sub-continent, along the valleys of the Ganges and the

Jumna. The cultural history of Indo-Pakistan sub-continent seems fully to support this view that the first Aryanisation of sub-continent missed out the lower Indus valley. The Aryanisation of Sind region and the sandy portions of Rajputana must have come later and been a species of infiltration by the conquering Aryans in the centuries that followed their settlement in those parts of sub-continent which they came completely to dominate and in which they established their language. It is very strange, if the areas of the middle and lower Indus valley were included in the primary conquest of the Aryans, that so little contact culturally should have existed between these areas and the admittedly Aryanised portions of the sub-continent till so much later. Surely if the conquering Aryan chiefs had established kingdoms in the middle and lower Indus valley, the subsequent history of the areas that are now the Lower Punjab, Bahawalpur and Sind regions of West Pakistan would have been similar to that of those portions of India where the Aryans defeated the Dasus and imposed their Vedic language upon them. Of the state of Sind between 1,500 B.C. and 325 B.C., when Alexander the Great made his expedition down the Indus, we have no knowledge whatever. The Sindhi language had presumably found its place in Sind at one of the later stages of the development of the prakrits, for Sindhi is itself a language of the Outer Band. But what happened before Sindhi was established as the language of the autochthonous inhabitants of the country we know absolutely nothing. The reference to the hymn in the first book of the Rigveda 1.53, which Stuart Piggott makes as arguing that there is authority in the Sanskrit epic for the destruction of the fortified cities of the lower Indus by the Aryans, is singularly jejune and unconvincing. It is couched in the vaguest and most general of terms and would apply to any fortress anywhere of similar construction which the Aryans destroyed. It is probably a pure coincidence that the Moenjo Daro civilisation declined and died about the very time as the Aryan invaders were thrusting their way through the north-western passes on their progress of conquest.

There are many reasons other than destruction by an army of hostile invaders why the civilisation of Moenjo Daro should have perished. It had lasted for one thousand years. In the ordinary course of historical experience civilisations rarely last so long a time in their pristine vigour and determination. A law of human nature seems to rule that even civilisations must in the end become effete and disappear. If the Indus Valley civilisation did, after a thousand years of existence, cease to be as strong and powerful and intelligent as it had been in its early strength (and as indeed the decline in the quality of the pottery in the highest levels of Moenjo-Daro and Harappa confirms), it would from this fact alone have become an easy prey to any kind of raiding and marauding bands, in which Baluchistan and the Brahui regions were

never lacking. Then again, if the civilisation was becoming effete, it is more than likely that the irrigation system on which its agriculture depended was allowed to fall into neglect. This was the experience of the city states of Babylonia. Furthermore, the Indus is an absolutely unpredictable river of terrible potentiality for destruction. Even today, when it is confined in its dangerous progress through Sind by enormous embankments to control its fury during the inundation season (abkalani), it is capable of changing its course between the embankments by as much as a mile, or two miles, at a time. It would not have taken much of a change in the direction of the Indus to destroy the efficiency of the irrigation system on which Moenjo-Daro existed.

If that were so, there is a ready explanation at hand for the death of Moenjo Daro and its territory. Ernest Mackay, himself the chief excavator of Moenjo-Daro, does not believe in the theory that Moenjo-Daro was destroyed by the invasion of the Aryans. Mackay says that "While it now seems certain that Moenjo Daro was attacked by enemies during one period at least of its later history, the identity of these enemies has not yet been definitely established". Mackay himself is strongly inclined to the view that they came from Baluchistan region of West Pakistan Province which was probably, as it was up to a hundred years ago, the home of turbulent and warlike tribes. He thinks that these tribes became a danger to Moenjo Daro only in its later years when the decline of the city laid it open to attack, for the skeletons which were found were without exception, unearthed in the latest levels. "In addition to the enemies, by which it was beset at a later time Moenjo-Daro, perhaps from its foundation," says Mackay, "had a more serious foe with which to contend. This was the Indus." He points out that the subsidence of the walls and well-linings at two distinct levels of the city, one much lower than the other, proves that a flood took place early in the history of Moenjo Daro and that another marked the beginning of its decline. On both occasions the city was deserted for a comparatively short period. But when all the danger was passed it was again occupied. Mackay does not think that Moenjo Daro was ever flooded to any great depth, but the city had to be constantly rebuilt and the rebuilding took the form of setting the houses higher above the surrounding plain. The most probable explanation, therefore, of the disappearance of the Indus Valley civilisation is that at the time when it had become weak it was assailed by a variety of foes in which hostile invading tribes, changes in the course of the river Indus and the ruin of the irrigation channels all may have played their part. It seems much safer to hold that Moenjo Daro and its civilisation disappeared for these reasons than that, contrary to the cultural traditions of Indo-Pakistan sub-continent, the Aryans poured down to the end of the Indus valley in the way in which they had poured down

the valleys of the Ganges and the Jumna, destroyed the towns and cities which they found there, and then departed, leaving no trace. Such an explanation seems to verge on the impossible.

In Chapter X of this gazetteer places of interest in Sind region are dealt with and in that chapter there is more detailed information about Moenjo Daro, Chanhudaro and some other ancient sites which have proved important. The present chapter has been devoted to an examination of the general history and the nature of the Indus civilisation and to an endeavour to connect these up with the prevailing cultures contemporaneous with its greatest prosperity.

**Buddhist
remains.**

Apart from its numerous evidences of the Indus Valley Civilisation, Sind region is interesting also to the student of Buddhism. The Buddhist remains in Sind region are few, in a poor state of preservation, and, on the whole, not very rewarding to the explorer. All the same, certain finds have been made on these Buddhist sites which are important. Between the time of the decay and death of the Indus Valley civilisation, about 1,500 B.C., and the time of the Buddhist stupas in Sind region there lies the long spell of nearly 1,500 years, since authorities today seem satisfied that the remains of the Buddhist stupas in Sind area can be estimated to date from about the beginning of the Christian era. Of the condition of former Sind during this long period of time practically nothing is known. Alexander the Great went down the Indus to the sea in 325 B.C. The account of his expedition in Plutarch's "Lives" throws very little light upon the character of the country and the nature of the peoples through whose land he passed. All that Plutarch says is that Alexander, sometime after the defeat of Porus, was eager to see the ocean, and for this purpose he caused a number of row-boats and rafts to be constructed, and upon them floated down the river at his leisure. "This navigation," says Plutarch, "was not unattended with hostilities. Alexander made several descents on the bank by the way and attacked adjacent cities, which were all forced to submit to his victorious arms." However, he was very near being cut to pieces by the Malli, who are called the most warlike people in sub-continent. He had driven some of them from a fortified wall with showers of arrows and was the first man that ascended it. It was in the siege of this fortress that Alexander himself was seriously wounded, an arrow having found its way through his cuirass and entered his body by the ribs under the breast. In the course of this expedition, Plutarch says, Alexander took ten of the gymnosophists who had been principally concerned in instigating the Sabbas to revolt and questioned them about their beliefs. From the context it appears that these gymnosophists were either Jains or so but it seems that they cannot have been Buddhists.

It was about 250 B. C. that Asoka proved himself the great proselytizer of the Buddhist religion in the sub-continent, and that was seventy-five years after Alexander the Great's expedition into Sind. We do not know who the Malli were and where the fortress was at which Alexander sustained his nearly fatal injury, but it is possible that the fortress, which was on the river bank, may have been Sehwan, and the Malli are thought by some authorities to be the Mohana, a people very likely of Dravidian origin, now mostly occupied in fishing and catching wild-fowl. At Sehwan in Sind region there is still a mound of decaying bricks which goes by the name of Alexander's Fort, though there can be no possibility that in its present condition it dates from the time of Alexander, and the Mohana are still numerously settled at the Manchhar lake twenty miles from Sehwan.

The great authority for the Buddhist religion in Sind region is Henry Cousens, M.R.A.S., who has described in considerable detail the nature of the Buddhist remains in his important work, "The Antiquities of Sind, with Historical Outline." The most flourishing period of Buddhism seems to have been about the time when the Sind stupas were built. This was more than two hundred and fifty years after the earnest proselytizer Asoka had died, and three to four hundred years before Buddhism, by that time seven hundred years old, had begun to weaken before a revived and resurgent Brahmanism, a process which was accelerated by a great split in the Buddhist religion itself. By this schism, which occurred in the second century A.D., the Buddhist faith became divided into two schools, the Hinayana, or Little Vehicle, and the Mahayana, or Great Vehicle, the latter being cast in a somewhat Brahmanical mould. Ja'nism and Buddhism had arisen in the sixth century B.C. as a protest against the excessive sacerdotalism into which the Vedic religion of the Aryans had degenerated. Both these protestant religions were excessively intellectual. Each was burdened with a most complicated system of metaphysics and epistemology beyond the comprehension of the ordinary man. That they both managed to survive so well is one of the marvels of human experience. But when Brahmanism in the fourth and fifth century A.D. began to assimilate the higher ethical, intellectual and metaphysical traits of the Buddhist faith, it was certain that sooner or later a revived Brahmanism would displace Buddhism. This it eventually did, so that today in India little trace of institutional Buddhism remains.

All that we know of Buddhism in Sind during the first six centuries of the Christian era is obtained from scanty and casual literary references. It is, for instance, recorded by Hieun Tsang, the Chinese pilgrim of the seventh century A.D., that in his day there were several hundred Sangharanas in Sind occupied by about

ten thousand priests, and that they studied the Little Vehicle. He also added that "when the Tathagata, the Buddha, was in the world, he frequently passed through this country. Therefore, Asoka raja had founded several tens of stupas in places where the sacred traces of his presence were found. Upargupta, the great Arhat, sojourned frequently in this kingdom, explaining the Law and convincing and guiding men. The places where he stopped and the traces he left are all commemorated by the building of Sangharanas, or the erection of stupas. These buildings are to be seen everywhere." It is somewhat remarkable that the Chinese pilgrim in the seventh century A.D. should have spoken of the Hinayana School of Buddhism as being paramount in Sind, as this school proved by far less popular than the Mahayana which gave many of its doctrines to the revived form of Brahmanism. Cousens says, "as to the point about the Hinayana School of Buddhism as being paramount in Sind in the seventh century, as Hieun Tsang tells us, and the amount of image sculpture upon these stupas proclaiming them as of the Mahayana School, we must remember that a good few centuries intervened between the time of their building and Hieun Tsang's time, during which many changes may have occurred." Kanishka had favoured the school most then in vogue, namely, the Mahayana. The Buddhist Stupa at Mirpur Khas in the Tharparkar district and about forty miles east of Hyderabad is the best preserved Buddhist ruin in Sind region. Of this Cousens says that the stupa was not an isolated building, "for of the same period, we have, judging from the remains of the sculptured brick which adorned them, stupas at Thul Mir Rukan near Moro, Depar Ghangro near Brahmanabad, Sudaranjo-daro near Tando Muhammad Khan and one near Jerruck." General Haig tells us that the Buddhist settlement of Sawandi, which is perhaps Depar Ghangro, is mentioned in the legend of the Munjmal-at-Twarikh as having been built by the King of Kashmir during an expedition to Sind. The legend is full of absurdities, but we may perhaps safely infer from it the antiquity of Sawandi. "About the middle of the seventh century, Chach, the Hindu King of Alor, paid a visit to a Buddhist devotee in the vicinity of Brahmanabad and the latter complained that the temple and monastery had fallen into a state of disrepair, due to the wear of time. If we take it that the place had been in Buddhist hands continually from its establishment to that time, and had not fallen into disrepair from absolute neglect, the wear must have been very slow and gradual in a country where there was little rain, we are forced to put back the stupa of Depar Ghangro (Sawandi) to the early centuries of the Christian era. But the want of sufficient data prevents any very approximate estimate of these being made as yet." In his account of the Sudaranjo-daro stupa Cousens says, "Mr. Bhandarkar thinks the original stupa cannot be later than the time of Kanishka, about 100 A.D., and we shall not be far wrong if we assign it to the beginning of the Christian era. If we accept this for this stupa, we must also accept it for

Mirpur Khas, Thul Mir Rukan and others of similar construction and decoration in Sind. Depar Ghangro, as already stated, is credited as having been built by the Kashmir King during an expedition to Sind. The King referred to, I gather, was Kanishka, who alone among the Kushan Kings has left a name cherished by tradition and famous far beyond the limits of India. His dominions included Sind."

The King was a Brahman; the Governors of the forts were generally Buddhists. The important town of Sehwan was held by the King's own son, Bajhra, where the principal citizens were Buddhists.

That the Buddhist remains in former Sind, unsatisfactory as they are, are not without interest for the historian of early Indo Pakistan history can be demonstrated by the result of Cousens' examination of the site of the Mirpur Khas stupa and of the stupa Sudaranjodaro near Tando Muhammad Khan. The following extracts from Cousens' work will show the kind of evidence for a very little known part of Indo-Pakistan history disclosed by the finds which Cousens unearthed at Mirpur Khas and at Sudaranjodaro. Cousens' exploration took place in 1909. Speaking of Mirpur Khas, he says, "Around the circular core of the stupa of sun dried bricks which projected from the top of the mound was found a kind of rough platform which was the remains of the flat terrace originally surrounding the base of the circular tower. This was deep in loose debris and on starting to clear this on the south side, the head of a Buddha rolled away when a few inches of earth covering it was removed. An examination of the spot showed us that we had struck a line of wall at a point where there was a sunk panel containing a seated image. As the head of the image was only just below the surface, the neck had disintegrated and become separated from the body. As this wall was opened out, other image-niches were found, and it was easily seen that we had struck the south wall of the great square basement of the stupa. All four sides were now laid bare to the original ground level. Three sides, the north, east, and south, were found to be alike, the upper wall space being divided into five bays by pilasters whose bases rest upon the top member of a great heavy roll-moulding plinth which runs round the four walls, except where interrupted in the middle of the west wall. The three central bays on each of these three sides each contained an image-niche occupied by a seated figure of the Buddha, while the end ones at the corners on each side contained a similar niche but filled with blind lattice tracery in intricate patterns in imitation of lattice windows, but of these only two in the north-east corner remain."

Further on, he says, talking of the west wall, "At either end of this west wall on the face of it there had been a very large number of panels, or niches, the sills only remaining with the base

of the two flanking pilasters that framed them in. Under the still of that of the south end, in fact forming part of the sill, or bottom of the frame of the niche, is a band of decorated bricks about $8\frac{1}{2}$ inches high with a little female figure standing and holding a water-pot in the centre and at each end. It is a great pity that the rest of the niches and their contents have disappeared, for it is quite likely that they held some kind of groups in terra-cotta representing such scenes as the birth of the Buddha, or his great Renunciation, as we have found upon a smaller scale at Thul Mir Rukhan. Between these large panels and the shrines are two smaller panels, one on each side of a peculiar shape, that on the north side holding a small image of the seated Buddha whose hands are broken off, while that on the south side has been mostly destroyed. He wears his robe over both shoulders in the same manner as in the other images in the lower niches, and is seated upon a lotus with a background made up of flame-like leaves spreading out from the back of the body all around. The eyes are quite shut, the upper and lower lids meeting, the arms have been broken off from the elbows, but they were probably placed in the lap. But of this it is impossible to be certain, as there appear to be no fractured surfaces upon the upturned feet or legs to show that they had been in contact with them any where, except at the toes of the right foot."

Cousens excavated a well to a depth of 25 feet from the summit of the mound. In the centre of the excavation he came upon a square area of red burnt brick about 4 feet square. As the upper layer of bricks was removed a little chamber in the middle about fifteen inches square was disclosed whose sides were set parallel with the sides of the stupa. Within this reposed two blocks of stone roughly dressed to a circular shape about thirteen inches in diameter and five to six inches thick placed one upon the other. When the upper slab was raised, it was found that in the middle of both was a cup-shaped hollow about 3 inches in diameter, the lower one being $2\frac{1}{2}$ inches and the upper, the lid as it were, $1\frac{1}{2}$ inches deep standing within the cavity. In the lower stone was a small crystal bottle. All around it and upon the surface of the stone was sprinkled, amidst a quantity of white sand, from which they had to be sifted, a number of offerings consisting of three-coil beads, seven crystal beads, drilled and undrilled, two small crystals cut to simulate diamonds, each of about half the size of a pea, thirty very small seed pearls—most of them not much larger than a pins' head, and all drilled, four gold beads, two being ribbed and melon-shaped and three about $\frac{3}{8}$ inches in diameter; one small gold-wire ring, ten copper coins, some small lumps of charcoal, a few grains of wheat and some other small beads and chips. Upon the mouth of the crystal bottle was a small flat silver cap much corroded, and on the cap rested a copper finger ring encrusted in verdigris, the corrosion adhering to the cap so tightly as to cause it to break when taken off. Inside the bottle was a small silver cylindrical

case with a slip-on lid, but so corroded that the lid came to pieces in taking it off. The case had been wrapped round with a gold leaf which was as fresh and bright as on the day when it was first put on. This case measures 1 inch in length and $\frac{5}{16}$ inch in diameter. Within this silver case was a very small gold one of the same shape out of which, when it was opened over a clean sheet of white paper, rolled a very minute substance about the size of a pin's head, together with a speck or two of dust. There was nothing else in the case, but within the crystal bottle underneath the cases and not in them, was found about an eggspoonful of what appears to be brown cremated ash, some lumps of which have the texture and convex surface, as seen through a magnifying glass, of charred bone. The crystal reliquary had been broken and the bottom portion lost, after which it had been mended by putting a tightly fitting case of silver on the bottom reaching half-way up the phial. The lip around the top had also been chipped. It is probable that an accident happened at, or about the time, of enshrining the relics in the present stupa, when the little bottle fell from the careless hands of some person who was holding it. The fact of the new silver bottom having been provided and a silver cap to take the place of a crystal stopper, or lid, instead of providing a new bottle, would lead one to suppose that this reliquary had already held the relics for so long a time that it was felt it would have been sacrilege to throw away the old phial for a new one, even in its shattered condition." Cousens asks "Is the present stupa a reconstruction of an older one of many built by Asoka when he redistributed the relics of Buddha in order that the actual bodily presence of the great teacher might pervade the land through all its length and breadth? If so, this would account for the very small relic, if relic it is, and I have little doubt of it, found in the gold case, but possibly the ashes in the phial beneath the gold and silver case may be some of those of the faithful disciple Upargupta, the friend and erstwhile religious associate of Asoka, who made the oversight of the Buddhist cult in Sind his especial care".

Less spectacular, though perhaps equally interesting from the archaeological point of view, is the result of Mr. Bhandarkar's examination of the Sudaranjo-daro near Tando Muhammad Khan. This is the stupa which was examined by Sir Richard Burton, who in his "Sind Revised" says "Easily climbing to the top by one of the wide clefts which rain had dug on the side of the tumulus, I found a short sunk shaft to the foundation. Below the base was a tunnel to which I penetrated, despite the fiends and dragons, the cobras and scorpions, with which my native friends peopled it. It was about seven or eight feet in length and it led nowhere". "The hole" says Cousens "which Burton looked into from the top—he does not say that his agility in climbing the tower was equal to his deascending into it, since it might have been more troublesome to get out—was probably the hole made where the relics were fished out

of the dagoba which was found in the base of the tower, which had become partly filled in again with earth from the sides". Mr. Bhandarkar, whose curiosity was aroused by a layer of sand in the masonry of the mud tower, drove in a tunnel from the north side into the middle of it on the level of the top of the terrace which originally surrounded the base of the tower. "Here occupying the centre, he came across a dagoba, such as we find in the cave temples, standing 6 feet 9 inches high, composed of sun dried bricks covered with plain plaster, the surface of which had been painted. It was completely built-in and embedded in the tower. Through the centre of the dome-top ran a round shaft reaching down to the base of the dagoba and containing traces of wood powder indicating that it held a wooden staff, probably surmounted by a tee and umbrella. The shaft could be easily traced nearly two feet above the dome, and I suspect that it went at least one more foot upwards." He opened the dagoba but found nothing in it, and goes on to say that, "no doubt, this stupa (dagoba) once stood alone on the platform, and as its sanctity and fame increased it was encased in the larger structure. The walls of the tower were from the top to the bottom, constructed of sun-dried bricks well laid, and arranged in regular courses, and with due regard to the rules of bonding, except for about four feet immediately above the small stupa (dagoba), which were loosely built. This is explained by the fact that immediately above the small stupa (dagoba) came the wooden tee and umbrella and that in erecting the new superstructure they had to build more or less loosely immediately round them to prevent their being damaged".

Mr. Cousens dissents from Mr. Bhandarkar's view "My own opinion is that this dagoba was in reality a relic chamber, instead of the rough brick one as at Mirpur Khas, and that the relics were lowered into it and down the shaft which Mr. Bhandarkar discovered, the top opening being closed by a tee, there being no umbrella. By digging down to the centre of the tower the relics were easily removed in the same way, and it was perhaps as short a way to them as it would have been by tunnelling 26 feet or 27 feet in from the side. Moreover if they thought of returning to the spot when peaceful times came round again, the Samans in charge would refrain from mutilating the outside of the stupa as far as possible. A somewhat similar shaft to that down the centre of this dagoba was found leading down to the relic chamber of the Sue Vihar stupa near Bahawalpur, not far north east of the Sind border, in which were found, an inscribed copper plate of the time of the Emperor Kanishka with coins, pieces of iron, a few beads and fragments of ornaments mixed with ashes.

It is not possible in this brief account of the Buddhist antiquities of Sind region in West Pakistan to do more than give this general picture of the probable conditions of the time when they were constructed. In Chapter X of this gazetteer, which deals

with places of historic and general interest in former Sind, some greater detail is given of the character of the chief Buddhist remains in the country.

Besides the relics of the Stone Ages, the Indus valley civilisation and the Buddhist period, which have been described in general terms in this chapter, Sind region possesses also certain other antiquities which more properly can be considered not as archaeological curiosities, but as portions of recorded history. Of these some account is given latter in this gazetteer. Antiquities which fall into this category are the ruined cities of Alor or Aror, Brahmanabad, Bhambor, Debal or Dewal, and Vijkot, and these probably belong to the ages of recorded history and are not considered as correctly classified under archaeology.



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Moenjo-Daro Seal.

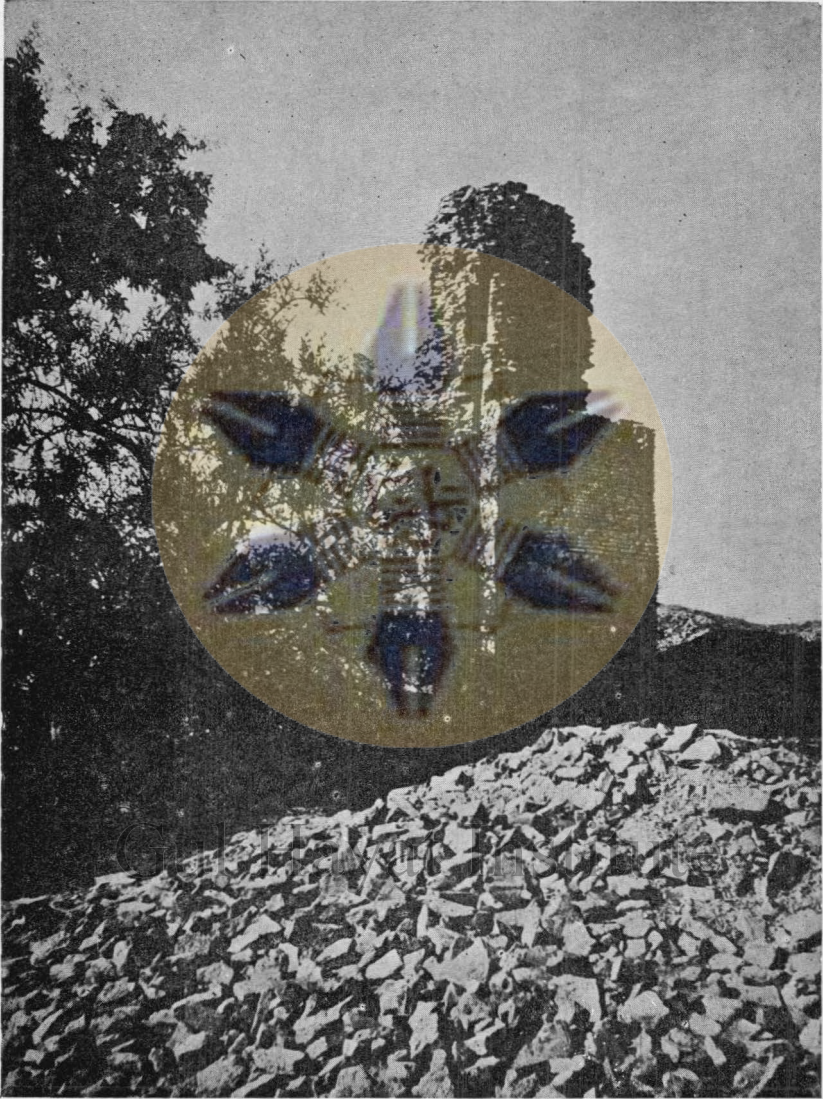
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Debal pottery remains embedded in So.l.

ANTIQUITIES



Brahmanabad—General view of the Tower.

CHAPTER VI
HISTORY

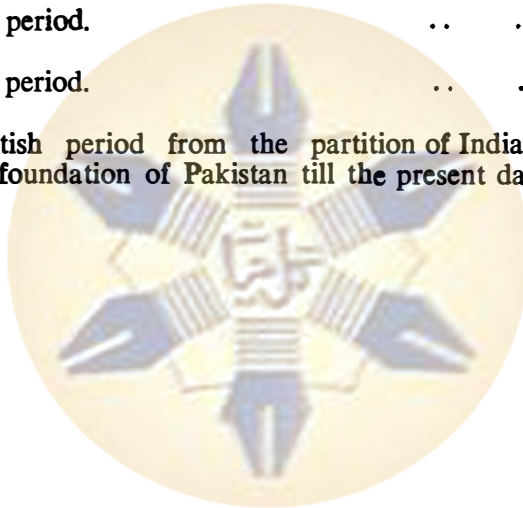
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CHAPTER VI

No adequate history of Sind exists and it is more than doubtful whether there is one single person today capable of writing the history of the Sind area with a sufficient knowledge of the complicated facts. If any history of Sind is to be written, it will perhaps need to be the work of a co-operation of scholars, some of whom will have to be conversant with Arabic, Persian, Sanskrit and Sindhi. The Sind record hardly begins before the Arab conquest in 711 A.D. Previous to that there had been a few picturesque episodes, but there is no connected account of the days before the Arab conquest. For many centuries the history of Sind may be said to be episodic and not continuous. The available local authorities are for the most part entirely inadequate. They are the work of persons who were partisan, or who were engaged in laudatory explanation of the deeds of the rulers under whom they lived. The style of these native records, chronicles perhaps they may be more properly called, is often flamboyant and racy but from the historian's point of view the works are completely unsatisfactory, and he would be a very self-confident historian indeed who could be sure of extracting from the maze of anecdotes, fairy tales, superstitions, hyperbole and pieces of utter adulation the poor and solitary nuggets of truth which may lie embedded in the mass. Abbott has put the position as regards the Sind record very fairly in his "Sind, A Re-interpretation." (1924), when he says "Sind is unfortunate in her record. Inscriptions and archaeological finds have hitherto added little to our knowledge of her past. Her written record leaves centuries untold and turns the truths of other centuries into fiction. Her geographical features by their apparent simplicity have perverted record and added mystery unsolved." If we exclude Moen-jodaro from this record of Sind history because its seals with the pictographic writing which they display have still to be interpreted and the writing has still to be read, we may commence the recorded history of Sind with the Arab conquest in 711 A.D. Sind history falls fairly conveniently into well defined periods, and in a work of this kind, where it is obviously impossible to go into historical detail in the manner of the first Sind Gazetteer of 1874 and the second Gazetteer of 1907, it will be sufficient to indicate the chief features and events of each period and to illustrate the more important of the picturesque incidents of the period by extracts drawn from such historical materials as is easily accessible. With this in mind, Sind history may be divided into the following period:—

(1) The period of Arab rule.

(2) The middle ages from Mahmud of Ghazni till the establishment of the Mughal empire over Sind.

- (3) The Mughal period.
- (4) The Kalhoro period.
- (5) The Talpur period.
- (6) The British period.
- (7) The post British period from the partition of India and the foundation of Pakistan till the present day.

As far as Sind is concerned, the second period lasted from the departure of Arabs up to the time when the Mughal Empire was firmly established. During this epoch two Sindhi dynasties ruled with a certain amount of quasi-independence, since the sovereignty of Dehli was not a very easy thing to exercise in the conditions of travel and communication which prevailed in those countries. The Sindhi dynasties were first the Sumro and secondly the Samo. This period of Sumro and Samo rule was succeeded by the Mughal period. After the Mughal period came the Kalhoro period when another Sindhi dynasty exercised a rather precarious form of independence. The Kalhoro period ended when the Talpur got control of the country. The Kalhoro period was succeeded by the Talpur period which ended in 1843 with the conquest of Sind by Sir Charles Napier at the Battle of Miani. The British period lasted from 1843 to 1947, when it ended with the partition of India and the creation of the two separate states of Pakistan and India. The last period of all, taking history up to the present day, is the post-British period from 1947, which witnessed the inclusion of Sind, first as an independent unit in the Federal State of Pakistan and then as an administrative territory, combining the areas of what had been British Sind and the state of Khairpur within the federal unit of West Pakistan. During this time the administrative capital of the territory was transferred from Karachi to Lahore.

Before we proceed to give some account of the various periods of Sind history enumerated above, a few words are necessary as regards pre-history and the Indus Valley Civilisation. The rather scanty remains of the neolithic age which have been found in Sind are dealt with in a previous chapter, under Archaeology. The Moen-jo-Daro excavations, which are now almost forty years old, have revealed the depth and the extent of the Indus Valley culture and have cast a new light on what was previously accepted as the history of north-western India. The Indus Valley Civilisation, with its chief town of Moen-jo-Daro which is situated in the Dokri Taluka of Larkana district, has been described under the subject of Archaeology in Chapter V. The dark curtain that shrouds the history of Sind from the demise of the Indus Valley civilisation till the Arab conquest, a period that stretches from possibly 1500 B.C. to 711 A.D., has been lifted for a moment by the writing of the Greek historian, Arrian, describing the expedition

and the victories of Alexander the Great in his passage through the North-Western Frontier passes down into the Indus plain. Sind had a part in this adventure and at Sehwan in the Dadu district of Sind there still remains what may possibly be a relic connected with Alexander the Great's sojourn in Sind in 325 B.C. The strange heap of decayed brick and broken earth that goes today by the name of Sikandar-jo-Killo, Alexander's fort, is very unlikely to have existed in its present form in the days of the great conqueror. The memory, however, has been retained in Sehwan. Sikandar-jo-Killo is a well-known name. Alexander the Great, who had subdued the greater part of the Punjab, started with a fleet of nearly two thousand vessels on his voyage down the Jhelum and Indus in October 326 B.C. The frontier of modern Sind must have been reached early in the following year. Musikanos, whose capital is usually indentified with Alor, the modern Aror, five miles south-east of Rohri in the Sukkur district, surprised by the rapidity of Alexander's movements, submitted. Repenting later, he revolted on the advice of his Brahman councillors. The territories of this chief were the most flourishing of all which the Greeks had seen in India. Another local ruler, Sambos of Sindemana, possibly the modern Sehwan, surrendered. Moeris, the ruler of Patalene, in Lower Sind, abandoned his capital, Patala, to the invader.

The Cambridge Shorter History of India states that Patala was an important city standing at a place where the Indus divides into two arms, probably somewhere south-east of the modern Hyderabad. The Gazetteer of 1907 says that all that is known with certainty of the position of Patala is that it was situated near what was then the head of the delta. Four centuries later in the time of Pliny it was known to the Romans as an emporium of trade. Having fortified Patala, commenced the construction of a Dock Yard, Alexander sailed down the western arm of the river to the sea. Returning to his base he explored the eastern branch near the mouth of which he passed through a lake, the mention of which raises an interesting question, whether the Rann of Cutch was then an inland sea formed by the discharge of the Indus and other rivers. In the autumn of 325 B.C. Alexander set out from Patala on his long march through Mekran and Persia. His fleet, under Nauarchos, following as soon as the south-west monsoon had subsided. The admiral was detained by gales for three weeks at anchorage which the Greeks called Alexander's Heaven. Kakrala, the island of Bibakta and other places mentioned by Arrian, are not certainly identifiable. The name of the first survives in Kakralo, a term recently applied to a region west of Shah Bunder. Alexander's hold in the province was brief. Two years after his departure, his own career came to an untimely end at Babylon and the Macedonian Empire fell in pieces. The

only immediate practical effect of Alexander's campaign in the Punjab, and Sind was the establishment in various places, of which Patala was one, of military settlements of Greeks and their allies, and the construction of a strong naval base near the mouth of the Indus. But these achievements of his adventure in the Lower Indus Valley did not last, and no memory of them has been retained, and no record of them is extant.

After the departure of the great conqueror, 325 B.C., for a period of more than one thousand years almost complete darkness descends upon the history of Sind. What few references during this long space of time have survived are connected mostly and casually with events in Upper India, including the establishment of several powerful dynasties, which exercised great authority over large portions of the Indian sub-continent, but seem only in a very partial way to have affected the area of the Lower Indus Valley. The important influences shaping the progress of Sind during this long period of time were the gradual decay in popular appeal of the Brahmanical system of religion, which in course of time had become excessively sacerdotal and ceremonious and was getting out of touch with the feelings of the common people. During the sixth century B.C., in which great religious movements took place, the doctrines of Buddhism and Jainism became established. It does not appear that Jainism had very much effect upon the Lower Indus Valley. But it is certain that Buddhism for many centuries had a profound influence upon the population of Sind, and from the Buddhist remains, which have been found in considerable quantity in various parts of the land, it is plain that Buddhism had to some extent supplanted Brahmanism, and probably particularly among the upper classes of the population, exercised a most profound cultural influence.

The other great phenomenon in this period of one thousand years of darkness which covers the historical record of Sind must be counted the invasions of Upper India by nomadic tribes from central and eastern Asia. About a century before the Christian era, the Sakas or Scythian hordes, before whom the Greek Bactrian kingdom had fallen, began to press into India. The Scythians came not to conquer, but to possess. They swept away the native inhabitants until a barrier against their further progress was erected by the kingdom of Ujjein under Vikramaditya, from whose victorious resistance to the Scythians the Hindu samvat era, B.C. 57, is supposed to date. On the east of Sind, the great desert must have constituted a barrier of another sort. We shall not be far wrong in assuming that Greek and Hindu ruling families alike were almost obliterated. Sind

became known as Indo-Scythian and to this day a large number of population is certainly Scythian and not Aryan in racial origin. Two Scythian tribes, the Jats and Meds, are mentioned as having invaded the Punjab and Sind at this time, and their conflicts disturbed the Indus Valley for centuries after. The former have not even lost their name, although they may have greatly mixed their blood. The latter seem to have disappeared at least as far as Sind is concerned, though some of the Mohana of Sind call themselves Med and it is the name of the corresponding community in Mekran. The Meds are found now in greater numbers in Kathiawar. The Scythians brought to the nations which they overcame no new religion, no higher civilisation, no nobler language. On the contrary they ultimately absorbed these from the people in the localities where they settled. Buddhism was the religion of India when their invasions began. About the middle of the first century we find Kanishka, the ruler of a great Scythian kingdom in north-east India, calling a council for the revision of the Buddhist sacred books similar to the famous council of Asoka in 244 B.C.

Some time before the Arab conquest of Sind the Brahman revival had set in and in the second quarter of the seventh century when the Chinese pilgrim, Hieun-Tsang, traversed India, he found Brahmanism and Buddhism confronting each other in portions of India adjacent to Sind. Some of these Indian states were ruled by Brahmans and some by the Khatris who may perhaps be taken to be Rajputs. All this throws some light on the situation revealed by the annals of the Arab conquest. A Hindu dynasty had then been in power for five generations, with Alor as its capital. Its dominions extended from Multan to the sea and from the desert to the hills, including that part of Baluchistan now known as Jhalawan. There were governors at Brahmanabad, Siwistan, (Sehwan) Iskudah, supposed to be Uch, and Multan. The first ruled over the country of the Lohana, Lakhis and Samma, and held the forts of Debal and Nerun. Jats were everywhere. Indian sources give no information regarding the Lower Indus Valley after the Kushan period. There are scanty and obscure references in the Arab historians to early Arab invasions of Sind in the seventh century. From these we learn that shortly before the Arabs commenced their assaults on this area of India there had been a change of local dynasty. The Rai dynasty had reigned for one hundred and thirty-seven years and comprised five kings, the last of whom was Rai Sahasi. When he died, his minister, a Brahman named Chach, married the widowed queen and succeeded to the throne, founding a new dynasty. He had a long reign and was succeeded by his brother, Chandar, and then by his son, Dahir, who perished in the Arab conquest in 711 A.D. The

Chinese pilgrim, Hieun-Tsang, who had visited Sind during Chach's reign, states that Chach was a sudra and Buddhist, which is contrary to the usual account that he belonged to the Brahman aristocracy. The point, however, may be that the conquest of Sind took place at a time when Buddhism was beginning to lose its hold and Brahmanism to re-assert its supremacy which it had for many centuries lost. The accounts of Muhammad bin Qassim's campaign in Sind seem to show that Brahmans and Buddhists were flourishing together at the time. Chach had seized the throne after marrying in 631 A.D. the widow of his master, Sahasi II, who was a Rajput, exactly one year before the death of the Prophet Muhammad. (Peace be on him.) Chach had extended his dominions and subdued Las Bela, which was ruled by a Buddhist chief. Revivified Brahmanism was by then spreading like a prairie fire. Before the death of Chach in 671 A.D. the Arab soldiers of the crescent had made more than one tentative attack on Sind by sea. Their approach by land had been retarded by the determined resistance of the Jats of Jhalawan.

Arab
Rule (I)

The century which succeeded the death of the Prophet, Muhammad (Peace be on him) symbolised the great strength and thrust of the new religion from Arabia, and it was no surprise when the determination of the Arabs to attack Sind effectively at last took concrete shape. The storm burst in 711 A.D. when Dahir was on the throne of Sind. The early part of the eighth century A.D. was the period of Islam's most spectacular military triumphs. At the same time as Tariq in Cordova was proclaiming the suzerainty of the Khalifa of Damascus in Spain, Muhammad bin Qasim was making his first permanent Muslim conquest of India in a brilliant campaign, which subdued the countries of Debal, Nerun (near the modern Hyderabad in Sind), Sehwan, Brahmanabad, Alor and Multan. The Arabs found themselves in possession of all the country between Multan and the delta of the Indus. Surely Muhammad bin Qasim must be one of the youngest conquerors in history. For he was only seventeen years of age when he was appointed to command the expeditionary force against the Hindu king, the Brahman Dahir. The reason for the onslaught on Sind was an act of reprisal for piracy or brigandage off the Sind coast. Dahir informed the Muslim Viceroy of the Eastern provinces (Iraq) of the Khalifate, Hajjaj, that he was unable to offer redress. Hajjaj decided to take immediate action in retribution.

The facts seem to be that the widows and children of some Muslim merchants who had died in Ceylon were being sent back by sea when the ship on which they were travelling was attacked and plundered. Failing to

get the satisfaction that he demanded, Hajjaj fitted up a punitive force and put it in charge of the young leader, who was his own cousin and son-in-law. Muhammad bin Qasim's force included six thousand Syrian horsemen, a camel corps and a baggage train of formidable size. In addition there was sent by sea an enormous ballista or stone-throwing catapult called "The Bride." This required the services of five hundred soldiers to operate. "The Bride" was brought into use against the walls of Debal, the seaport near the Indus mouth and about twenty-four miles south-west of where the modern town of Thatta stands. Debal was named after the huge temple, or Dewal, which flew a big red flag from its main pinnacle. There three thousand shaven Brahmans were said to attend the religious devotions of their faith. The garrison consisted of four thousand Rajputs, so the chronicle states, and the town was heavily fortified. The season was the hot, malarious autumn of 711 A.D. and after several months endeavour the walls were still unscaled. A Brahman from the temple then deserted, and informed Muhammad that the temple was deemed impregnable because it was protected by a talisman at the foot of the flagpole which stood on the temple top. Hearing this Muhammad bin Qasim called in Jawaiya, the officer-in-charge of his siege artillery. In consultation with him he decided that the trajectory of the ballista should be lowered and an attempt made to break the flagpole that stood over the talisman. The arm of "The Bride" was therefore shortened so that stones could be hurled lower. The first stone broke the pole in two and the talisman's foot was smashed. Disheartened by this event, the garrison made a sally and were driven back. The Arabs were then able to place their scaling ladders against the walls and surmount them.

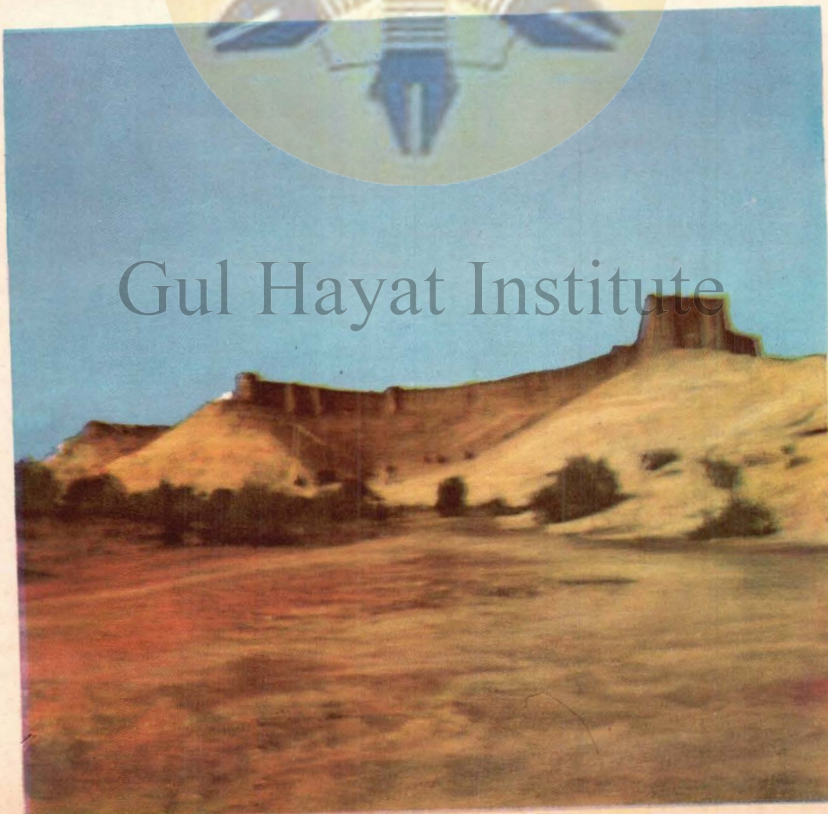
The writer of the 1907 edition of the Sind Gazetteer makes the following comment on the assaults of Sind by Muhammad bin Qasim. "Surely" he says "there never was a madder enterprise, but in less than a year half of the great Hindu kingdom over which Chach had ruled owned this young Muslim for its master and the rest soon followed." Muhammad bin Qasim, after delivering the Muslim prisoners at Debal, marched to Sehwan and got possession of it in a week, entered a fort called Seistan without opposition, walked into the open gates of Nerun and there prepared to meet Dahir." The story, is an account of a great battle which lasted for four days, is rich in those Homeric incidents of which ancient history has been so sadly shorn by modern criticism. But to be brief, the king was killed, the army scattered and Muhammad bin Qasim marched to Brahmanabad and Alor. Towards the end he went on to take Multan. Success was no doubt made easier by the wise military policy of the Arabs and his own prudence and moderation and also by the reputation which the Arabs had

earned of being always true to their word. In Elliot's "History of India as told by its own historians," Appendix to "the Arabs in Sind", the following account is given of the events after the conquest of the country by Muhammad bin Qasim. "Soon after Muhammad bin Qasim's death, things went wrong in the newly conquered province, for it is said that two years after that event of the whole country, save only that from Debal to the salt sea, little remained in the hands of the agent of the Khalifa. Many of the chiefs and feudatory princes of Sind revolted and Jaisiya regained possession of Brahmanabad, so that it became necessary to send fresh forces from Iraq against them. These punitive expeditions became frequent as time went on. For forty years, from A.D. 711 to 750, the country was more or less under the Ummayyid Khalifas, when it passed into the hands of the Abbasids. Of the thirty-seven Khalifas of the Abbasid family, Sind remained under the first twenty-one, when it passed into the hands of other rulers."

The Tuhfat-al-Kiram tells us that it was during the period of the Ummayyid dynasty that Dalurai reigned at Alor and Banbura at Bambhur in the delta. In 750 A.D. Abdullah Sifah, the first of the Abbasid Khalifas, sent an army into Sind which ousted the lieutenants of the Ummayyids and four years later the next Khalifa Mansur also sent an expedition to Hind and Sind. Idris tells us that Mansura, the first Arab capital in Sind, was founded in the beginning of the reign of the latter, 753 to 774 A.D. In the time of the fifth Khalifa, Harun Al Rashid, 706 to 808, Sheikh Abu Turab seized upon the fortified town of Tarrah in the district of Sakura, Bakura in northern Sind and other places in western parts. This man's tomb near Gujo is still visited and the dome over it bears the date 171 A.H., that is, A.D. 787. It is said that in this Sheikh's time Bambhur and some other towns were destroyed by an earthquake. The tomb is situated about eight miles south-west of Thatta between Gujo and Kohri. About the time of the Khalifa Mamun, A.D. 813 to 833, many Arab families residing at Samara emigrated to Sind, together with Tamim and his descendants, and settled down in the country. From the colony from Samara the tribe of Sumra originated and from the descendants of Tamim sprang the Thahims. When the power and influence of the Khalifas began to wane towards the end of the ninth century and the beginning of the tenth, the most distant provinces necessarily partook of the decline from which the heart of the Empire was suffering. Sind, neglected by the imperial government, came to be divided among several petty princes. The two principal kingdoms which were established after this event A.D. 871, were those of Multan and Mansura, both of which attained a high degree of power and prosperity.



Qila Aror conquered by Muhammad bin Qasim.



Kot Diji Fort—Khairpur.

According to the Cambridge Shorter History of India, the conquest of Sind had no far-reaching effects and the religion which was destined to dominate India for nearly five centuries did not penetrate beyond the frontier-tract annexed by the Arabs. The Governor of Sind invaded Cutch but the expedition was only a raid and no settlement was made. For the most part the Arab Governors of Sind maintained friendly relations with their neighbours. The states of Rajastan were protected from aggression by the Thar or Indian desert and the Muslim rulers of Multan seemed never to have made any serious attempt to subdue the Upper Punjab. The state of Mansura extended from the sea to Alor, where that of Multan commenced. It would seem to have been well cultivated and covered with trees and fields. The dress of the Sindhis was said to be like that of the people of Iraq. Alor, the capital city, was alleged to be as large as Multan, surrounded by a double wall and was the seat of considerable commerce. The revenue derived by the Arab princes of Sind appears to have been very small, sufficient to provide food and clothing and to maintain their position with decency. Under Arab rule the internal administration of Sind was left by these conquerors in the hands of the natives. Arab soldiers held lands there on condition of contained military service, but they were not permitted to devote themselves to agriculture or any other profession but their own. Much of the conquered territory was also liberally bestowed upon sacred edifices and institutions. The Arab rulers kept up regular commercial communication by means of carvans with Khurasan and with Zabulistan and Sijistan by way of Kandhar and Ghazni. There was commercial traffic by the seaport also, for much of the merchandise sent to Turkistan and Khurasan was the produce of China, Ceylon and Malabar, from which latter province most of the wood used for the construction of boats on the Indus was obtained. Horses were also frequently imported into Sind from Arabia.

The public revenue of Sind under Arab rule was derived, it would appear, mostly from the land tax. The assessment upon Sind and Multan was 11,500,000 *dirhams*, or about £ 270,000 sterling, and this is supposed to have comprised the land tax, poll tax, custom duty and other miscellaneous items. The Arab governor of Sind was, in fact, a kind of farmer-general, who bound himself to pay to his sovereign, the reigning Khalifa, certain sums set down in the public register. The land tax was usually rated at two-fifths of the produce of wheat and barley, if the fields were watered by public canals, three-tenths if irrigated by wheels or other artificial

means, and one fourth, if altogether unirrigated. Arable land left uncultivated seems to have paid one dirham per jireb besides a tenth of the probable produce. Wines, fisheries, dates, grapes and garden produce generally were also taxed. The Gazetteer of 1907 says the rates for uncultivated arable land were purely nominal, and in course of time they were greatly increased everywhere even to one half of the produce of the land, or rather according to the ability of what the people could pay. All the unconverted tribes were without exception liable to capitation tax, which from the earliest days of Arab rule in Sind was exacted with special care. "The ordinary revenue which the Arab governors were entitled to collect was derived from the land tax from the Jizia or capitation tax, from customs and transit dues, and from taxes from trades and handicrafts." The geographer, Istakhri, writing about 951 A.D., described Mansura as more fertile and also more populous than Multan. He stated that the people of Multan wore trousers and that most of them spoke Persian and Sindhi, as in Mansura. Such was the condition of life during the Muslim occupation of Sind resulting from the conquest of Muhammad bin Qasim. The power of the Arabs lasted a little over three hundred years only and was terminated about 1026 A.D. when Mahmud of Gazni, having taken Multan, sent his wazir, Abdur Razai, to conquer Sind, of whom it is related that he took Sehwan and Thatta and that he drove the Arabs, namely the officials, out of the country. Arab settlers were not disturbed. On the contrary, he appointed new governors from among them.

The Middle Ages. (II)

From the early centuries of the Christian era to well into the middle of the fourteenth century from the pullulating hot bed of Central Asia there burgeoned belligerent horde after horde of turbulent half-civilized barbarians afire with the lust to move, as the Indo-European hordes had done centuries before them, to conquer and possess. These hordes were responsible for the unsettled condition of Upper India from the time of the Bactrian Greeks in the second century A.D. to the establishment of the Mughal Empire in 1525. The distressful story of the Delhi Sultanate for five hundred years is comprised of the wild assaults upon peaceable populations in Upper India and the Gangetic plain and of the cruel dominance of subjugated peoples by the blood-thirsty leaders of these Central Asian foreigners. During this period of wild confusion Sind, as ever true to her isolation, remained outside the main current of events, but necessarily shared in a very real, though usually indirect way, in the chief movements during five centuries of wild and widespread commotion caused by the unbridled exercise of despotic power.

The hold of the Delhi Sultanate over its neighbours and tributary states strengthened, weakened, strengthened and weakened capriciously, and local rulers were often able to exert a practical, if not fully recognised, sovereignty over their own local areas. In this way Sind profited from the usurpations and the pre-occupations of the Delhi Sultans, and from time to time managed to achieve something like independence under dynasties which were largely indigenous. Thus it came about that from 1032 A.D. to 1351 A.D. the Sindhi family of Sumro ruled the country and from 1351 to 1521 another Sindhi family of Sammo held the reins of power. The Sumra are a branch of the Parmar Rajputs. They appear to have enjoyed more or less power in Sind from the eighth to the middle of the fourteenth century, and towards the end of that period were independent rulers. From the contents of a letter addressed by a Druse apostle of Sheikh Ibn Sumar Rajah Bal of Multan in 1032 A.D., Elliot in his "History of India as told by its own Historians" conjectures that, before they apostatized from their ancestral faith to Islam, the Sumra had intermediately adopted adherence to the Karmatian heresy, but they now became Sunnis, though the date of their conversion is not known. After taking Multan and Uch, Mahmud of Ghazni appointed his Wazir Abdur Razai to conquer Sind, and this was effected about 1026 A.D. But the absolute sovereignty of the country did not long remain with the Ghaznavite family, as in A.H. 423 (A.D. 1032) Ibn Sumar, the ruler of Multan, believed to be himself a Sumro, seems to have laid the foundation of the Sumro dynasty in Sind and to have governed the country with great vigour and discretion. The Sumra may possibly have recognised the Ghaznavite sovereignty of the dynasty down to A.D. 1051, or perhaps have paid tribute as an acknowledgment of fealty, but after that time they professed their independence. A Sind historian, Ali Sher, of Thatta, ascribes the origin of the Sumra to certain Arab families at Samrah who had settled in Sind in the days of the Abbasid Khalifas. It was generally agreed that the Sumra were a Rajput tribe and the names of the first rulers—Sumra, Dodo, Sanghar, Bhangar—betrayed their extraction. When they were converted to Islam is not known but there is reason to believe that before this happened they came for a time under the influence of the Karmatian heresy, nor is it clear when they rose to power. The accounts of the historians are quite irreconcilable, and there is little agreement in the conclusions to which European authorities have come. There is abundance of incidental evidence, however, that during the time of early Sumro rule Muslim rulers had recognised and confirmed local Hindu chiefs. The famous Rajah Dalurai whose iniquities brought down judgment on Alor and Brahmanabad cannot be wholly mythical. There is mention in 1221 A.D.

of a ruler named Hasrar and of Hindu temples in Debal. There is no evidence, however, that from the time that Mahmud of Ghazni expelled the Khalifa's governors and put in his own, the sovereignty of the ruler of Ghazni first and then of Delhi over the whole of Sind was utterly repudiated. That may have been because it was not worthwhile repudiating, for when Multan was the headquarters of the governor and the centre of all military and political interest, it is easy to believe that the south and east of Sind were virtually independent. At some time during that period the Sumra had become the dominant tribe and it is related by Ali Sher, the historian of Thatta that soon after the accession of Ghiyas-uddin they assembled near Thari and proclaimed a man with the tribal name of Sumro as their chief, but Ali Sher himself contradicts this in another place by saying that they were deservedly destroyed for their misdeeds by the Emperor Ala-ud-din who preceded Ghiyas-ud-din.

Mir Masum agrees with the story that the Sumra revolted about the time that Ghiyas-ud-din took possession of Thatta. Ghiyas-ud-din had no time to attend to them, but his son and successor, a renowned scholar, brilliant soldier Muhammad Shah, came to Lower Sind in 1351 in pursuit of the ringleader of a revolt in Gujarat who had found an asylum with the Sumra rulers of Thatta. As is well-known, Muhammad Shah died near Thatta and his nephew Feroze Tughlak, who succeeded him, appears to have met with no serious opposition, except from a mixed band of followers of the rebel, whom he scattered. He built a fort on the banks of the lake at Sanghar, visited the shrine of Lal Shahbaz, fixed the allowances of the keepers, appointed a viceroy at Bukkur, giving it a garrison of eighty soldiers and left for Delhi. But this was the last flicker of the expiring power of Delhi in Sind. One of the successors of Ibn Sumar was Khafif, who restrained with success several incursions of the Baluchis, the Sodha and Jareja. The rule of Ibn Sumar was one of great vigour and his authority was acknowledged from Cutch to Nasarpur. It was during his reign that the Sammo tribe came into prominent notice, having been severely punished by Khafif for robbing a tribe of Baluchis. From the time of Khafif the Sumro dynasty gradually waned in power, and at length during the reign of Urrah Mehl, the last of the line of the Sammo tribe, which had some time before come from Cutch and settled in Sind, conspired against and killed him, placing Jam Unar of their tribe on the throne of Sind. This was in 1351 A.D. Some writers have stated that the power of the Sumra was never at any time either extensive or absolute and that they can claim to rank as a dynasty only from the absence of

any other predominant tribe or power to assert better pretensions to that distinction. The Samma were another Rajput race. While all agree that the founder of the Sammo tribe was one Sam, it is not clear whether this Sam was a son of the uncle of the Prophet, or of the renowned Jam *alias* Jamshed of Persia, or whether he was identical with the person whom we know as Shem, the son of Noah. The time of their conversion is not known, but it seems probable that they may for a long time have entertained a blend of both religions like the Jarejas of Cutch, who were of the same race, and of whom the Rao himself once averred that out of two thousand Jarejas there were not three who know what their religion is. When the Samma obtained power in Sind, the rulers took the title of Jam, now borne by the Jareja chiefs of Cutch, and it is significant that while the first ruler is called Unar, the second Juna and the third Tamachi, the fourth, who had been carried captive to Delhi in his infancy, emerged as Khair-ud-din. After that the royal blood ran through a line of Salah-ud-din and Nazar-ud-din and so forth, relieved by a second Jam Tamachi, (whose rustic name has lived among his rustic people when the Ud-dins had all been forgotten.) That the Samma unseated the Sumra about the time of Muhammad Shah's death is clear enough, and also that they extended their power much more rapidly than the Sumra had done, for they were a larger and more widely spread tribe. They took possession of Sehwan and even had the audacity to expel the royal garrison of eighty from Bukkur. In 1372 the Sultan came in person to chastise them. The chastisement did not take place, however, for the Jam shut himself up, and the imperial army investing him was famished, surrounded by the inundation of water, and devoured by mosquitoes. So when the Jam offered to profess submission the Emperor was fair to accept the offer.

In 1398 Amir Timur (known to us as Tamarlane), led his Tartar hordes over the frontier and past Multan and on to Delhi itself. For five days the imperial city was given up to indescribable horrors, and what remained of it had no further concern for Sind. The Samma became nominal, as well as actual, lords of the province. The Thatta historian says that in the days of its greatest strength the province extended from the sea to Mathelo and Ubauro, and since they held the fortress of Bukkur and not Uch, this is probably near the truth. The headquarters were at Samui on the Makli hills, about three miles north-west of Thatta, and there were governors at Sehwan and Bukkur.

During the period of their supremacy, which appears on the soundest chronology to have lasted from 1351 to 1521, or one hundred and seventy years, there were according to Tarikh-i-Masumi seventeen Jams. The most famous, and probably the greatest, of

these Jams was Jam Nizamud-din, who was known affectionately as Jam Nindo. In his days the mosques were always full at the time of prayer. He was a man of action as well as of prayer, and exterminated the robbers who used to frequent the country round Bukkur, so that travellers could thenceforth traverse Sind without anyone doing harm to their persons or property. These robbers most likely were the restless Rajput and Baluchi tribes, of whom a great deal is heard of from this time. Happily for Sind Jam Nindo's reign lasted about fifty years. Jam Nindo was the fourteenth prince of the dynasty of the Samma. It was during his time that the Arghun family came to notice. The forces of Shah Beg Arghun from Kandahar had descended upon many villages in Chanduka and Sidhija when they were met by many of the Jam's troops, who defeated them so effectively that they did not venture to return during his reign. The Samma were unquestionably Rajputs of the great Jadava stock, and were probably the same tribe who were known to Alexander the Great as Sambos. They became Muslims not earlier than 1391, and their descendants are known as the Sameja and the Jarejas of Cutch. It was during the days of the Samma and their successors, the Arghuns and the Turkhans, that Thatta, long the capital, became the opulent and the magnificent chief city of Sind. There is considerable doubt about when this city was founded, and Abbott in his "Sind, a Re-interpretation" states, "To Thatta I would give a much earlier date than 1350, even than 1333, the date of the Ibn Batuta's visit to Sind. The chief authority should be reckoned the testimony of the Tarikh-i-Feroz Shah of Shamsi Siraj." Describing the defeat of the Jams at Thatta in 1362 by Sultan Feroz Shah, he writes thus: "Thatta had been a source of trouble to the sovereign of Delhi ever since the Sultan Muiz-ud-din. The splendid army of Sultan Ala-ud-din had marched towards Thatta, but the difficulty of the enterprise had rendered the action abortive. Sultan Muhammad Shah Tughlak lost his life in the same country." Here then," says Abbott, "is the evidence that in the reign of Feroz Shah, Thatta traditionally had a history that took it back to the time of Sultan Ala-ud-din (1296 to 1315), if not to the days of Debal (1182), and this evidence with that of Badaoni is the earliest reference to Thatta." An account of the Sammo rule would not be complete without some regard being paid to the greatest Sammo ruler, Jam Nizam-ud-din, who was elected by the tribe to fill the place of his predecessor. According to the Tuhfat-al-Kiram, Nizam-ud-din was the son of Babuniya, son of Unar, the son of Salah-ud-din, the son of Tamachi. Nizam-ud-din's reign was long and peaceful. It is variously given by different writers as 43, 48, 63 and even 73 years, which indicates the amount of reliance that can be placed upon the writing of the local historians. Jam Nizam-ud-din's tomb is one of the more conspicuous mausolea on the Makli hill at Thatta. He is said to have moved his seat of

government from Samui to Thatta. He was a man of letters rather than of war, and spent much of his time in the company of learned men, whom he delighted to honour. Mir Masum in writing of him said that "at the commencement of his manhood he sought after knowledge, spending much of his time in the college and cloister. His disposition was modest and happy; he was celebrated for his good, affectionate temper; he offered much prayer to God, doing great abstinence; his excellences are beyond what little can write." As so often happens in the course of history, a great man is succeeded by a son who is a wastrel and a weakling, and this was so in the case of Nizam-ud-din. His son, Feroz, was a child in the zanana when his father died. When Feroz came out of the zanana, he gave himself up to songs and dances of dancing girls and the jokes of jesters. His people the while were groaning under the repression of his Sammo officers and slaves. The days of the Sammo dynasty were indeed numbered and the strangers who were to take its place were already at the gate.

The dynasty which succeeded the Samma was the Arghun dynasty from Central Asia, a tribe of Hun origin. It derived its name from Arghun Khan Turkhan, the grandson of Halaku, who was the grandson of Chingez Khan. He commenced his rule in Sind in A.D. 1521. The first prince Shah Beg Arghun the son of Mir Zunun Arghun, defeated the Sammo army and in 1520 sacked the Capital, Thatta. An arrangement was subsequently come to between Shah Beg and the Jam, by which that part of Sind extending from Sukkur to Thatta was to remain under the rule of the latter, Shah Beg taking the country to the north of the Laki pass, but as many of the Summa were adverse to this proceeding, another engagement took place at Talti near Sehwan resulting in complete defeat of the Samma and the firm establishment of Shah Beg on the throne of Sind. It will be remembered that the Arghuns had made an attempt to seize Sind in the days of Feroz's father, but they had been driven back and defeated by the courage and determination of Nizam-ud-din. The attempt now made to possess Sind was successful and for the years that lay between the end of the Sammo dynasty and the establishment of the Mughal Empire in 1525, Sind in fact suffered the same kind of treatment as Delhi had been undergoing from the time of Mahmud of Ghazni. The end of Sammo rule and the accession of the Arghun dynasty almost coincided with the establishment of the Mughal Empire in Delhi. Indeed it was the operations of Babar at Kandhar which had ended in the capture of that place which drove Shah Beg Arghun south to try his fortune in Sind. The Arghun dynasty was short-lived. Starting in 1521, it ended in 1554, with only two rulers. It was succeeded by the Turkhans,

another foreign dynasty, with an origin similar to that of the Arghuns, who held Sind from 1554 to 1591. This period of sovereignty from end of Sammo rule to the direct control of Sind by the Mughals in 1591 is properly part of the story of the Mughal Empire and will be dealt with in the succeeding section.

The Mughal
Period. (III)

In 1526, five years after Shah Beg Arghun, himself a refugee fleeing from Babar, who had taken possession of his state at Kandhar, became the master of Sind by his victory over the Samma, Babar established the Mughal Empire of India. It is an irony of history that the empire founded by Babar is called the Mughal Empire. Babar was not a Mongol, but a Barlas Turk, who had no reason to love the Mongols, and who indeed had considered them to be the enemies of his race. The use of the word "Mongol" is therefore incorrect but the wrong use of word arises from the fashion prevalent at the time and for centuries after regarding all the wild Central Asian tribes who invaded India after the time of the Mongol hordes as Mongols also. Babar, the founder of the so-called Mongol Empire, was the fifth of the nine sons of the great grandson of Timor, who had received as his appanage the small principality of Ferghana on the mountains of Turkistan, east of Samarkand.

This Turki race successfully, and on the whole comparatively completely, ruled India for more than two centuries. Their dynasty saw the emergence of India out of the ideas and structure of the Middle Ages. Their administration laid the foundations of the first modern state in India. The Great Mughals, as we may call them, were Babar, Humayun, Akbar, Jahangir, Shah Jahan and Aurangzeb. They were all great men, possessed of many fine traits and high standards of conduct and personal dignity. Regarded as a continuous line of rulers, they showed a vast improvement over the Delhi Sultans. The Mughal Empire flourished from 1526 to 1707, when Aurangzeb died. After 1707 the Empire, though surviving was a mere wraith of its former magnificence and strength. It declined into weakness and imbecility, though several of the later emperors were estimable persons in themselves, who would have found a more congenial climate in less violent and abrupt times. The Mughals unfortunately were engaged for a great part of their best days in re-annexing and endeavouring to keep incorporated in their Empire those portions of it which had become virtually independent under Muslim governors who had found opportunity to make themselves Sultans. Akbar and Aurangzeb, particularly the latter, spent long years away from Delhi in efforts to subjugate outlying provinces and to extend imperial authority over South India. Sind did not escape this re-conquering and re-annexation when Akbar in 1592 established the direct rule of the Mughal Empire over the country.

Previous to that the sovereignty of Delhi had been recognised by both the Arghuns and the Turkhans who followed them, the Arghuns ruling as feudatories from 1521 to 1554 and the Turkhans from 1554 to 1591. Both of these dynasties were foreign and indeed belonged to much the same Turki race as that to which the Mughal emperors themselves belonged. The Arghun dynasty consisted of two rulers only, Shuja or Shah Beg Mirza and his son, Mirza Shah Husain. The latter died in 1554, after a reign of thirty-four years. He was childless and the Arghun dynasty ended with him. Another dynasty, the Turkhan, succeeded it; but it did not last longer than 1592, when the defeat of Mirza Jani Beg, the ruler of Thatta, by an army of the Mughal Emperor Akbar put an end to it, Sind being henceforth incorporated in the Subah of Multan, though Mirza Jani Beg, who subsequently entered the Imperial Service, was granted what the historian calls "the country of Thatta". Upon the whole Sind appears to have been well ruled and comparatively free from internal dissension during this time. Shah Beg's acts reveal him as a brave, bold and generous man. He invaded Sind through no lust of conquest, but because he was driven from his own Kingdom, and had to find another, as the manner of his time was, being by birth and profession a King. Having secured one, he set himself earnestly to improve it. He was a scholar and a poet and the author of several religious books and commentaries. His son was like him, similarly free from disquieting ambitions. He took Multan but gave it away, and his success in Cutch did not tempt him to extend his dominions. He was a brave and successful soldier, but by choice a scholar. The greatest calamity that overtook Sind in his time was a visit of Humayun as a refugee from Sher Shah, usurper of Delhi, when the people suffered terribly from famine brought about by the defensive desolation of the country, "scorched earth policy" as it would be called today.

The first of the Turkhans on the throne of Sind was Mirza Isa Khan Turkhan, who died in 1572 after a reign of eighteen years, and was buried on the Makli Hill. His sons had quarrelled and fought with each other during his life, and at his death the worst of them, Muhammad Baki, succeeded him against his own express wish. The historians have no language to describe the greed and cruelty of this wretch, slitting ears and noses, cutting off the breasts of women, hanging, beheading and trampling under the feet of elephants were the ordinary escape-pipes of his rage and jealousies, to say nothing of cutting off the beards of gentlemen of position. Even Sayids were not spared, travellers were put to death on principle lest they might tempt the cupidity of the conquerors by their tales. Muhammad Baki eventually committed suicide in 1584 and was buried on the Makli Hill, and

the accession of his son, Mirza Jani Beg, brought relief to Thatta. During his reign Sind again became part of the Delhi Empire. The process was gradual. Akbar wisely assumed that Sind was a dependancy and Sultan Mahmud, governor at Bukkur, as quietly admitted the assumption, and so retained his place in power. After his death Akbar set a governor to take charge of Bukkur. Mirza Jani Beg, on the contrary fought for his independence and fought well. Entrenching behind the channel of a river called the Phito, which has long since dried up, he withstood the imperial forces for a good while, and he formed and carried out the resolution of destroying Thatta, and retiring to the strong fort of Kalankot, a few miles south of it. But he had to sue for peace at last and go to the Emperor's camp. He was graciously received and confirmed as Governor of Thatta. He died a few years after in 1599, and was buried on the Makli Hill. His son, Mirza Ghazi Beg, was confirmed in his place and afterwards had Sehwan, part of Multan, and Kandhar added to his charge. Mirza Ghazi Beg was murdered in 1612 and buried in the same mausoleum as his father on the Makli Hill. He was a man of learning and a poet like his father, and both were accomplished musicians.

Sind was now a subah of the Delhi Empire and the Emperor appointed governors of his own choosing under the title of Subedar. The *Tuhfat-al-Kiram* enumerates forty of those who had office in succession during the one hundred and twenty-seven years that intervened between the death of Mirza Ghazi Beg and the invasion of Sind by Nadir Shah of Persia in 1739. It was during this period that Shah Jahan and 1625 having revolted against his father, the Emperor Jahangir, took refuge for a time at Thatta, the governor being unable to repel him. Shah Jahan, when he became emperor, ordered the famous Jama Masjid to be built: tradition says as a token of his gratitude to the city that had been his asylum in adversity. Some of the imperial governors died at Thatta and their tombs are among the most notable of those on the Makli hill. Many of these governors were mere farmers of revenue; the last three indeed were the lessees of a noble to whom the Suban had been granted as a reward. Local chiefs, such as the Raja of Dharaja and the Jam of Kakrala were actually the rulers of the country, but of them we get only an incidental glimpse. Upper Sind was under governors of the same character, one at Sehwan and one at Bukkur, and it was during this period that the Daudpota, the sons of Daud, the family to which the ruling house of Bahawalpur belongs and the founders of Shikarpur, came into power there. They trace their descent from Abbasid Khalifas through one Amir Ahmed who came to Sind via Mekran to set up a Kingdom. The Daudpota founded Shikarpur in 1617. The fortunes of the Daudpota went up and down alternatively. For a considerable time they were fighting with the Mahars and lost

Shikarpur, to regain it later. Their bitterest and most dangerous enemy later on was Nur Muhammad Kalhora, son of Khudayar Khan, the first of the rising Kalhora, who had been acknowledged at Dehli. Khudayar Khan had been appointed governor of Sibi and his son succeeding him determined to turn the Daudpotra out of Shikarpur which they held under a sanad from the Emperor's son. The only interest of these incidents lies in the light which they throw on the condition of Upper Sind under the governors appointed from Dehli. When Sind was conquered by Akbar in 1592 by the defeat of Mirza Jani Beg, Sind was in the ordinary course added to the domains of the Mughal Empire. It was provided with the administrative machinery employed elsewhere in the Mughal dominions. From the *Ain-i-Akbari* we know the essential features of the system and some of the details of its application to Sind. The extent to which Sind, up to the Mughal acquisition of it, was a unified area governed is not clearly known but it seems unlikely that Sind was a compact unit under the control of its rulers. What is certain is that Upper and Lower Sind were never definitely united until a much later day. On its annexation to the Mughal dominions the country as a whole was made part of the Subah of Multan and Sarkars were established in two places, Bukkur in the north and Thatta in the Indus deltaic region. These two Sarkars were under separate governors and the extent of their actual authority is not clearly known. For a whole century the governors of Bukkur and Thatta were appointed, first from the Turkhan dynasty and later from Hindustan by the Mughal Emperor and were members of the feudal bureaucracy, which controlled the administration. From the time of Shah Jahan to the first decade of the eighteenth century the wielders of the Mughal's authority in Sind were official sent from other parts of the empire and might only by chance be occasionally natives of Sind. The importance of the Kalhora from the time they became a political force was that the system was changed and the representative of the Emperor was native of Sind. The process was that the Kalhora began as petty feudal chief, became strong enough to be appointed governors of sarkars and in the end succeeded in getting the control of Upper and Lower Sind with headquarters at Bukkur and Thatta till, about the time of Nadir Shah's invasion in 1737, they reached a position of virtual independence.

The policy of the Mughal had always been to make the utmost convenient use of existing institutions, and to employ the local feudal chiefs as minor dignitaries with a certain amount of their personal authority retained. This was, in fact, the only way in which a feudal society, not sustained by a competent and disciplined standing army, could hope to maintain itself in distant parts. The system was sound in itself in certain conditions, of which the chief were the obedience of the local chiefs to the imperial gover-

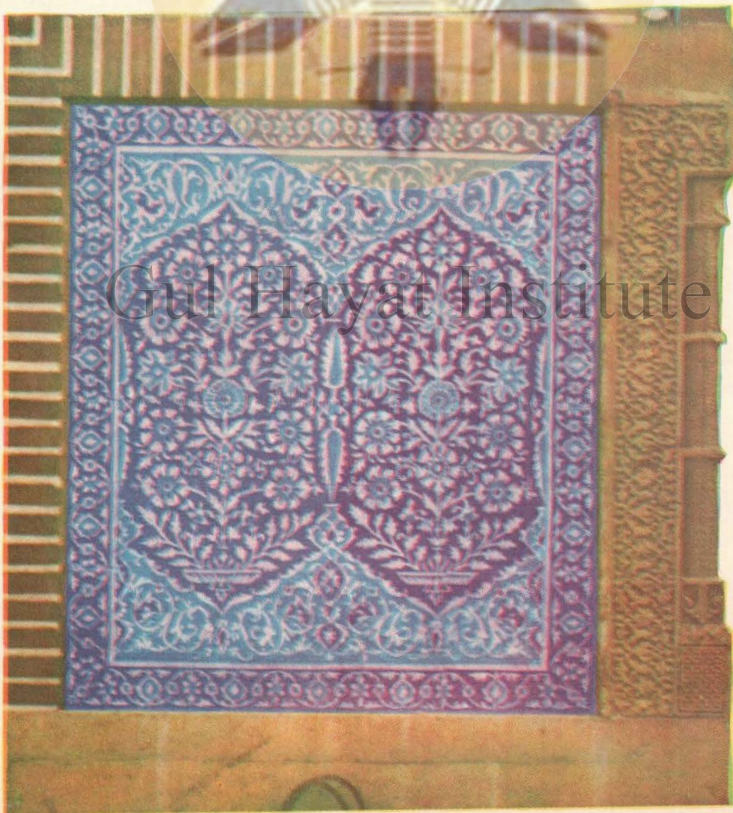
nors and the due collection of the imperial revenue. Order had, of course, to be maintained to ensure the latter, and the Mughal practice was to allow a great deal of freedom in minor and local affairs, provided these two great ends were served.

It has been stated above how the Mughal Empire laid the foundations of the first modern form of government in the sub-continent. The pioneer work of the Mughals in this respect was the basis on which the subsequent administration in the eighteenth and the nineteenth century was well and truly established. The country became for the first time properly organised on nearly modern lines. The Ain-i-Akbari, an immense work of encyclopaedic erudition, gives in great detail the lines which were followed in planning the many-sided activities of the Moghul State. During the Moghul period there is much documentary record for the historian. That record now becomes for the first time full, accurate and reasonably unprejudiced. The best way in which to understand the state of the country under Mughal rule is to give some contemporary accounts of important events which occurred during the period of Mughal supremacy. This affords a much more vivid picture of the condition of things which prevailed during the Mughal domination of Sind than the arid dynastic histories of which the usual chronicle is composed.

One of these striking pictures is provided in the flight of Humayun to Sind and the birth in 1542 of Akbar, the future Emperor. In 1538 Humayun, the favourite son and the heir of Babar, whom he succeeded in 1530, was driven from his throne in Delhi by a coup d'etat or a palace revolution. It was engineered by Sher Khan, Humayun's Afghan satrap, who was his viceroy in Bengal, and who became for three years the Emperor of Delhi under the name of Sher Shah. Humayun, as a result of this coup was destined to become a fugitive and wanderer for fifteen years. He was a gentle creature of mild character, possessed of a love for books, of which he used to carry a selection about with him on his expeditions. By 1542 he had been wandering for four years since 1538 in an endeavour to restore his fortunes, which he did not succeed in doing until 1555. By force majeure he had been driven across the desert that separates Sind from Rajputana in an effort to obtain asylum for himself and his wife. His army suffered terribly from thirst and heat on the desert march to Umarmkot where he found help from the local semi-independent Sodha ruler. This was the Rana Wairsal, who held the frontier fort. He came out to meet Humayun, kissed his stirrup and cleared the fort for his accommodation. Umarmkot is a pleasant town in a fertile, irrigated plain. It is fringed by the first of the sandhills of the southern Thar. It appears that Humayun



Shahjahan's Mosque at Thatta.



Shahjahan Mosque—Detail of Tiles.

stayed in the fort at Umarkot in some considerable state, as the records tell of commodious and luxurious tents which his retinue enjoyed. Humayun himself, however, did not rest long, as he was anxious to find more powerful support to enable him to regain his heritage. Just after he had left he was informed by a messenger who caught up with him a few days later that his wife, Hamida, had borne him a son. The exact date of the birth of Akbar, the future Emperor, is in some doubt. The Cambridge Shorter History of India states that he was born on November 23rd, 1542, whereas Rawlinson's "Cultural History of India" gives the date as October 15th, 1542. The picturesque account of the historians says that Humayun was destitute and in the desert he had about him one pot of musk, which he broke and divided amongst his attendants with the prophetic prayer that the fame of the newborn infant might diffuse itself through the world like the fragrance of that perfume. The baby's first garment was cut out of the clothes of the holy Sayid Ali Shirazi, who died thirty years later, and whose tomb is a conspicuous and noble monument on the Makli Ridge near Thatta.

In 1555 there occurred another interesting historical event of some importance because it discloses the lower politics of the day and the approach of western influences into the interior economy and politics of Sind. In 1555 Mirza Isa Turkhan, the first of the Turkhan rulers, had been but one year upon the throne, and an agreement, which he had come to with Sultan Mahmud of Bukkur as regards Upper Sind, did not last and Sind was wasted by fruitless hostilities.

In 1635 the East India Company established a "factory", as it was called, in Sind. This factory conducted business from 1635 to 1662, when profits became so precarious, as a result of the unsettlement and confusion at the time that Aurangzeb succeeded to the throne of Shah Jahan, that the Company deemed it no longer worth their while to continue business. The Company entered actually into the Sind trade with three objectives, to keep up the supply of cotton cloth for the London market, to obtain indigo and to get as much as it could of the profits of the carrying trade to the Persian Gulf and down the western coast of India. The Company was engaged in the buying and selling of commodities and was also, in fact, looking for freights and it sought to play in the early seventeenth century the part played by the mercantile marine of later generations. The Company's main depot was at Thatta with the port at Lari Bander.

In 1659 there was civil war between Aurangzeb and his brother, Dara Shikoh, the subject of contention, of course, being

succession to the throne of Shah Jahan. A vivid account of the siege has been given by Nicoloi Manucci, the physician adventurer, whom Irvine has called "the Pepys of Mughal India." The facts of the civil war in Sind can be read clearly in Sarkar's History of Aurangzeb. Manucci knew only of the siege of Bukkur. Dara, with an ever-diminishing band of followers, was pursued from Lahore down into Sind by Aurangzeb's army led in two divisions by Sheikh Misr and Saf Shikan, the former marching along the bank, while the latter took the left bank to Bukkur. The imperial army on reaching Sukkur learnt that Dara had already fled further south down the Indus, and had left in the fortress of Bukkur, much property, many ladies of his harem, some treasure, all his heavy gold and silverplate, and some of his big guns. The defence of the fortress was in charge of Dara's eunuch, Kwaja Basant, also called "Primavera" (Spring, as Basant means) by Manucci and Sayid Abdul Razak. The defenders consisted of musketeers, bowmen and barquandazes and many European gunners under Manucci. This was about October, 1659 and much of the country in the vicinity of the Indus must have been under water as a result of that year's inundation of the river. The fortress of Bukkur was invested by the imperial army, while divisions of it pursued Dara out of Sind into Gujrat almost cutting him off in a river fight near Sehwan. By Dara's orders the fortress of Bukkur was garrisoned by two thousand selected men, the best he could get, Pathans Sayids, Mughals and Rajputs and twenty-two Europeans of different nationalities and servants. Bukkur was invested by the imperial army. Manucci says, "We were shut up along with the loyal and valiant eunuch Primavera; no one could get out, no one could enter. This fortress is in the middle of the mighty river Sindhi founded upon the live rock, stones from which could be used as flints for muskets. In the middle was a cavalier (tower) overlooking both banks of the river." Dara intended to keep Bukkur as a rallying point for later eventualities. The incidents of the siege are vividly portrayed. The imperial troops turned on the fort two of the large cannons Dara had left behind in the foundry of Lahore. These guns caused considerable execution among the garrison because of the shortness of the range, a pistol shot on the west and two musket shots on the east. The garrison, however, replied vigorously with their guns, dismounted the enemy artillery, made sallies, swarmed into the enemy trenches, bombarded the towns of Sukkur and Rohri, and captured four field pieces and some baggage of the enemy. After such vigorous resistance the garrison eventually capitulated under orders from Dara.

Captain Alexander Hamilton was much impressed by the boats that sailed on the Indus. "Their vessels," he says, "are called Kisties, of various sizes. The largest can be about two hundred

tons: they are flat-bottomed and on each side cabins are built from stem to stern that overhang about two feet, and in each cabin there is a kitchen and place of exoneration, which falls directly in the water (a characteristic still of the Indus river boats). The cabins are hired out to passengers and the hold being made in separate apartments are let out to freighters, so that everyone has a lock in his cabin and apartment in the hold and had his goods ready to dispose on at what places he finds his market, and indeed in all my travels I never saw better conveniences of travelling by water".

Thatta was by far the wealthiest town in Sind in those days and the country round it was the centre of a thriving agriculture. Hamilton knew nothing of the conditions in Middle and Upper Sind, but he proves that near the centre of government the Mughal administration was within its limits not lacking in practical efficiency. It did not have to worry about equal justice between man and man, or concern itself much with the sorrows of the poor.

THE KALHORO PERIOD IV.

On February 21st, 1707, Aurangzeb finished prayers, became absorbed in meditation and then was overcome with faintness. A few hours afterwards he died. He was aged ninety. The last two years of his life had been pathetic and feeble. In 1704 Manucci described his condition: "Most of the time he sits doubled up, his head drooping, when his officers submit a petition or make report to him of any occurrence, he raises his head and straightens his back, he gives them such an answer as leaves no opening for reply, and still looks after his army in the minutest particulars, but those who are at a distance pay very little attention to his orders. They make excuses, they raise difficulties and under cover of these pretexts and by giving large sums to the officials at court, they do just what they like." In a letter to his son, Kambuksh, he said:—"My back is bent with weakness and I have lost the power of motion, the breath which rose has gone and has left not even hope behind it. I have committed numerous crimes and know not with what punishment I may be seized, though the Protector of mankind will guard the camp, yet care is incumbent also on the faithful and on my sons." The Mughal Empire did not perish with Aurangzeb, but like an old soldier, it simply faded away. In 1737 it received a lethal blow from the Persian conqueror, Nadir Shah. From that it never really recovered and remained a mere simulacrum of itself with little power until it eventually died in 1857, when after the fall of Delhi Bahadur Shah was, without full legality, put to trial for rebellion against the East India Company. He was deposed and ended his days as a state prisoner in Rangoon.

The condition in which the death of Aurangzeb left the Mughal Empire was disquieting. As the History of India edited by Sir Alfred Lyall says "He left his dominions in confusion with a formidable revolt spreading among the Marathas. His Empire was unwieldy and overgrown. At this time the struggle among his heirs brought out no successor capable of holding together the ill-joined provinces and discordant races. The free-booting companies of the Maratha chiefs soon developed into marauding armies which over-ran the central and western regions. Nadir Shah sacked Dehli in March 1739 and added one more massacre to the blood-stained annals of the ill-fated city, wrenched away from the Imperial Crown all its possessions west of the Indus and departed home, leaving the Mughal Empire in a state of mortal collapse. The barriers thus having been broken down, Ahmad Shah, of the Abdalli tribe of Afghans, followed two years later. He seized the whole of the Punjab between 1748 and 1751. Meanwhile the Marathas were spreading over central India from the south-west like a devastating flood. The Indian people were becoming a masterless multitude, swaying to and fro in the political storm and clinging to any power, natural or supernatural, that seemed likely to protect them. It was during this period of tumultuary confusion that the English and French first appeared as rivals upon the political area of India. Such was the lawless, troubled and tumultuous eighteenth century in which the Sindhi dynasty of Kalhora wielded power.

From 1701 to 1783, the Kalhora were unlucky in their time. They did little to raise the standard of public life and good government in Sind. The Kalhoro claim to have been descended from Abbas, the uncle of the Prophet. They derived their direct descent from Muhammad of Khabata, who lived about 1204 A.D., at the time when Nasir-ud-din Kabachi governed northern Sind. This Muhammad of Kohata formed matrimonial connections with several of the tributary chieftains of that country, and it is from his sons that the powerful tribes of Daudpotra claim their origin. The fortunes of the Kalhoro family remained somewhat obscure till 1558 A.D., when they revived in the persons of Adam Shah, who was at the head of a large sect of mendicants in the Chanduka pargana. Exciting the jealousy of the Governor of Multan, Adam Shah was attacked by him, his followers dispersed and he himself taken prisoner and put to death. In the 1907 Edition of the Gazetteer Aitken puts the matter thus: "The first individual of the Kalhora who stands clearly out of the mist is Adam Shah. He died at Multan probably about the middle of the sixteenth century. His body was brought to Sukkur and buried on a hill on the high road to Shikarpur, where his tomb is a conspicuous object still. For four generations

his descendants lived about Larkana, multiplying their disciples, acquiring land, increasing their influence, and fighting. Mian Din Muhammad, the fifth Sajjada Nashin of Adam Shah, fought the Panhwars who were in great force about Larkana at that time and the Daudpotra and even the Imperial Governor, and, in short, became so intolerable that Prince Muiz-ud-din marched down with a force to chastise him, and through his followers under his fierce brother, Yar Muhammad Khan, fought the Prince. He was carried away a prisoner and never returned. Yar Muhammad took refuge in Kalat for two years, when he returned with a band of Baluchi allies and began a fresh career. Entering Sind near the Manchhra Lake, he defeated the Panhwars and took Larkana and other towns. This brought the Prince Muiz-ud-din down again to chastise him, but with a wonderful result. What artifices the Mian employed to avert the Prince's wrath, or whether he really hastened to Delhi, as some historians assert, gained the ear of the Emperor himself, no one can now decide. What happened was that not very long after he was formally installed as Governor of Sibi (Sibi was then included in Shikarpur) with the title of Khuda Yar Khan. He died in 1718 and a splendid mausoleum among the ruins of his own town, Khudabad, still testifies to the place which he gained for himself and in the eyes of his generation and in his own; for he built the tomb himself. The Kalhora as a dynastic force rose very gradually into predominance. The nature of their vague and indeterminate rise would be obvious to the student who considers the general feature of the Mughal period.

As a ruling house the Kalhora may be said to date from 1736, but members of the tribe had been prominent in Sind affairs at least half a century before that date. There is no adequate history of the Kalhora. The best account of them was, in 1799, written by Nathan Crowe, an Englishman, who knew by personal experience conditions in Sind at the end of the eighteenth century; this account is amongst the records of the Bombay Government. The chief stages in the life of Kalhora power may be briefly summarised. There are five such stages:—First, the acceptance by the Mughal Emperor of members of the Kalhora tribes as viceroys or governors in Sind, a period which began in 1701. Second, the extension and consolidation of the local power of the Kalhora Governors, Dehli had by 1736 recognised them as semi-independent rules of the country. Third, after the invasion of Nadir Shah in 1739, the transfer of political sovereignty over Sind from the Mughal Empire to the Persian Kingdom, which resulted in the Kalhora becoming subordinate

to the Persian monarch and liable to pay tribute to him. Fourth, about 1747 the transference of this sovereignty from the Persian King to the Pathan Kingdom at the Kabul, consequent upon the military successes of Ahmad Shah Durani, the founder of modern Afghanistan, by which change the Kalhora became feuditaries of Kabul and had to pay tribute to that power. Fifth, the struggle between Kalhora and Talpurs which began in 1778 and lasted more or less continuously till the end of the century, a period of civil war in which the Talpurs, with the aid of the Baluchis then settled in Sind in considerable numbers, were at last able to destroy the failing powers of the Sindhi ruling family. Throughout the whole period from 1737 onwards the Kalhora were never actually full masters in their own house. They were required to pay an annual tribute and usually did their utmost to avoid doing so. They were so far successful in that by their obstruiveness and local influence, coupled with the fact that Sind was a difficult campaigning country for a power vested in Kabul and that the Afghan King himself, after the death of Ahmad Shah, showed the usual signs of weakness typical of autocracy. The tribute was gradually reduced in amount and was usually very much in arrears. In this way a gradual, but uncertain, independence was with difficulty established. The aim of all Sind policy from 1701 onwards was to make Sind independent of Mughal, Persian and Pathan, and to diminish the payment of tribute to any authority, to preserve the land as a closed terrain in which no foreigners of any sort were allowed entrance, except with the utmost difficulty. The Kalhora themselves showed no special genius for government, except that they followed a consistent policy of determined isolation and recognised the importance of irrigation works. They were the first Sindhi dynasty to wield permanent power since the fall of the Samma, the builders of Thatta, who had ruled Sind for two hundred and thirty years before the advent of the Arghuns and Turkhans from Central Asia. Their rule had therefore some elements of popularity in the countryside.

The reign of the Kalhora was interrupted by three acute spasms of civil war; the first on the death of Nur Muhammad Kalhoro in 1754, the second on the deposition of Sarfaraz Khan Kalhoro in 1775, and the third and fatal internecine conflict that was ended by the supersession of Kalhoro by Talpur. Apart from these periods of commotion and unrest in the country itself, there were continuous threats of invasion of Sind occasioned by the intransigence of the Kalhora in the payment of tribute to the suzerains of Persia and Afghanistan. Yar Mohammad Kalhoro may be regarded as the real founder of the Kalhoro dynasty. About 1701 Yar Muhammad succeeded in wresting Shikarpur from the Daudpotra, a weaver tribe who had founded it in 1616 after a conflict with the numerous tribe of Mahars then powerful

in Upper Sind, and still represented in the ruling house of Bahawalpur. Yar Muhammad made Shikarpur his court and obtained from Aurangzeb a grant of the tract between the Indus and the Nara and the right to call himself Khudayar Khan. He was not, however, content with this aggrandisement for by 1711 he had overrun the Kandiaro and Larkana tracts in addition to the country round Sukkur, so that he had claims to being the really effective power in Upper Sind. Yar Muhammad Kalhoro died in 1719 and was succeeded by his son, Noor Muhammad Kalhoro, who increased his father's dominion by adding the country of the Daudpotra, having first taken precautions to make his allegiance to Emperor Muhammad Shah, from whom he received, like his father, the title of Khudayar Khan and the province of Siwistan in 1719. The chief of Kalat, the Brahui Mir Abdullah Khan had, in the meantime, attacked the Kalhora and been ignominiously defeated, losing his own life. This still further increased the power of Nur Muhammad. When a vacancy occurred in the Government of Thatta, the Mughal Emperor, following the traditional course of giving authority to persons of local importance, appointed him as a governor of Thatta, by which act Nur Muhammad became virtually the ruler of the whole of Sind, Upper and Lower, from the deserts of the east to the rocky hills of the west. It is significant, however, as showing the curiously incomplete nature of this sovereignty that the fort of Bukkur, the strongest place of defence of Sind, did not come into the possession of the Kalhora until 1736. The invasion of Nadir Shah, however, in 1739 put an entirely different complexion upon things and removed from Nur Muhammad's mind the fear of Dehli, which hitherto he had hesitatingly acknowledged. He was emboldened to oppose Nadir Shah, and paid very dearly for his temerity, for Nadir Shah, on his return from Hindustan to Persia, invaded Sind, shut Nur Muhammad up in the fort of Umarnot and forced his submission, granting him pardon on his promise to pay a tribute of twenty lakhs of rupees. As security for the payment of the tribute, he took with him Khudayar Khan's three sons, Murad Yar, Uttar Khan and Ghulam Shah Khan, as hostages to his court, where they remained for several years. In 1747 Nadir Shah was assassinated, and these three sons, held as hostages at the Persian Court, returned to Sind. Even then Nur Muhammad had not learnt his lesson. When Ahmad Shah Durani succeeded Nadir Shah as the despoiler of Dehli, Nur Muhammad again sought to temporise about the payment of tribute. To enforce payment Ahmad Shah threatened invasion of Sind in 1754, even encamped in Siwistan, an act that made Nur Muhammad later take to precipitate flight to the desert to the east, where he died. The result was a very confused civil war between his three sons. Into the details of this civil war it is unnecessary to enter, but the effect was that from 1756 to 1758 Sind was in a pitiable condition of un-

rest, which did not terminate until Ghulam Shah Kalhoro finally emerged the victor in 1758. The troubled condition of Sind at this period, from 1754 to 1758, was merely typical of what was happening elsewhere in most parts of India. In the end Ghulam Shah Kalhoro became "the Prince of Sind", as he is called in the East India Company's letters of this period, but he was forced to acknowledge the sovereignty of Ahmad Shah and pay a yearly tribute to Kabul. During this unhappy generation, not only were the Kalhora fighting amongst themselves, but they were also engaged in a complicated political game of chess with Pathans, Kalat, Cutch and the Chief of Kakrala, who had somehow managed to retain a little petty authority of his own. Once established on the throne of Sind Ghulam Shah Kalhoro, the most capable of the Kalhora and the only one with any claim to greatness, did a little to restore some kind of order to the disturbed countryside, but he died in 1771, and was succeeded by his eldest son, Sarfaraz Khan. His senseless action in achieving the murder of Mir Bahram Khan Talpur in circumstances that scandalised the public conscience of the day, led to the final overthrow of the Kalhora by the Talpurs. The Baluchis had by this time become the strongest military force in the land. The early Kalhora had encouraged the Baluchis to settle in Sind, in order that the Kalhora might take advantage of this military superiority in the battlefield. By the murder of Mir Bahram Khan Talpur, the Talpurs, the Baluchi tribe that had come to exercise the chief power at the Sind Court, were embittered and estranged, and Sarfaraz Khan was deposed at their instance for his misrule and mismanagement. The dismissal of Sarfaraz Khan provoked another civil war, during which Mir Muhammad Khan, Ghulam Shah and Ghulam Nabi Kalhoro were successfully incompetent occupants of the Sind throne. The date usually accepted by historians as the end of the Kalhora regime is 1783, though there was a vague period of indecisive strife before the Talpurs eventually obtained effective control. For some time previous to the supersession of the Talpurs, the Kalhora had relied very considerably on the good offices of the Baluchis for the carrying out of the affairs of state. As stated above, Ghulam Shah Kalhoro was the only one of the Kalhora line with any pretensions of greatness. He won his throne by his own sword, and was much more independent of Kandhar than his father had ever been. He made a solid kingdom of Sind, and pushed its frontiers southwards to the seaboard, turning out the Jam of Kakrala and founding the new seaport of Shahbunder with a strong protecting tower. He also invaded Cutch about 1762, but being successfully resisted revenged himself by damming the Puran, so as to turn its waters into his own territories and make a desert of the fertile tract that extended from his frontier to Lakhput,

but his dominion did not include Shikarpur, which as part of the Sibi division, had been under Afghan governors since the expulsion of the Daudpotra. It was in the time of Ghulam Shah, and perhaps on his invitation, that the East India Company established a "factory" at Thatta, which was discouraged by his less enlightened son and abandoned in 1775. In 1768 Ghulam Shah resolved to find a better capital for Sind than Khudabad and fixed on Nerunkot on the left bank of the Indus, where there had been a town with the name of Nerun in ancient times. Here on high ground he built a strong fort and called it Hyderabad, which remains his most lasting monument. Here he lived for four years more and died and was buried in his capital. Of the well-known tombs to the north of Hyderabad that Ghulam Shah, though sadly dilapidated, is by far the finest and was selected by Lord Curzon as the only one that deserved to be restored and kept in repair at public expense. The full episode of the Kalhora supremacy makes very sad reading. It was certainly unfortunate for the masses of the Sind population that the dynasty of their own people, which drew its original driving force from the appeal it made to the religious predilections of the common man, should have proved so poor a substitute for the government of the Mughals.

In the 1907 Edition of the Sind Gazetteer Aitken has made some pertinent remarks. He says "The Kalhora had been in power for eighty-two years, and it is evident that during that period a permanent change had begun to be effected in the centre of gravity of Sind and the balance of the several elements of its population which was completed by the Talpurs. From a very early time the two natural centres of government had been Thatta and the fortress of Bukkur, and of these Thatta had always been comparatively free from foreign influence. At Umarkot and Kakrala and minor places Hindus rulers had held more or less independent power. The rise of the serais, the men of the upper country, as the Kalhora and Talpurs were commonly called in Lower Sind, changed all this. When they were shut off from Shikarpur and Sukkur, they extended their power southward and eastward, stamping out Hindu independence. The necessity for a more central capital followed, and Hyderabad was built overshadowing Thatta. Khudabad and Sehwan declined, but Larkana rose to importance as a frontier town facing Shikarpur.

Another new influence was the Baluchi, by far the best fighting man, as ready to fight on one side as another. He soon

became a principal element in the mercenary forces with which the rival chiefs fought each other, and when the Talpurs came into power he became supreme. The place had changed very greatly from what it was in the last stage of the Mughals. The general effect of the Kalhora policy, which was continued and indeed accentuated by the Talpurs that followed them, was that of endeavouring to keep Sind in isolation and prevent its becoming inundated by the waves of new forces which were beating on the shores of India outside Sind. The modern age was definitely at hand. The Kalhora and the Talpurs seemed to recognise this and were determined, so far as they could, to resist the forces which they disliked and which they had a shrewd idea would undermine the kind of authority on which their rule was based.

THE TALPUR PERIOD (V).

In 1777. Ghulam Nabi, brother of Ghulam Shah Kalhoro, was raised to his throne. During his rule Mir Bijar Talpur rose against the Kalhoro sovereign and Ghulam Nabi was slain in battle. Abdul Nabi Khan Kalhoro succeeded his brother, after putting his nearest relative to death, and he managed to effect a compromise with Mir Bijar Khan, which ended in Abdul Nabi being acknowledged sovereign of Sind with Mir Bijar as his minister. In 1781 the province was invaded by an army from Kandahar, but this was defeated by Mir Bijar near Shikarpur. Mir Bijar was subsequently assassinated at the instance of Abdul Nabi Khan, who afterwards fled to Kalat, the sovereignty of Sind being assumed by Abdullah Khan Talpur, a son of the murdered minister. After repeated failures to regain his throne, Abdul Nabi, through the assistance of the Kandahar King, was at length successful, but on putting Abdullah Khan Talpur to death, he was once more driven away by Mir Fateh Ali, a grandson of Bahram Talpur. Abdul Nabi made another effort to recover his kingdom, but being defeated at Halani in Upper Sind by Mir Fateh Ali, he fled first to Sewistan and afterwards to Jodhpur, where he died. This was the disgraceful, and ignominious end of the dynasty of the Kalhora. Before Abdul Nabi had given up hope, he had made an appeal to Kandahar, but the Mir had emissaries there too and they prevailed. The Afghan King, Timur Shah, closed the question by sending Mir Fateh Ali Khan Talpur a robe of honour, some Arab horses and a Sanad appointing him ruler of Sind. This appears to have occurred in 1783 from which date the rule of the Talpur may be reckoned.

Fateh Ali Khan soon found that the royal Sanad could not make him ruler of Sind. The Talpur chiefs, who had thrown off the yoke of the holy Kalhora, were not disposed to bow their necks to a mere Talpur like themselves. Fateh Ali's nephew, Mir Sohrab Khan, was foremost in asserting his independence and set up his throne at Khairpur. There was trouble with Kandhar too, for several invasions occurred during the next few years, probably on account of failure to pay tribute. Finally, in 1792 a treaty was signed as Shikarpur and Fateh Ali Khan, paying 25 lacks of rupees on account of arrears of tribute, received a fresh Sanad and a jewelled sword and an elephant, on which he rode to Hyderabad and installed himself with due pomp. The government of Sind now became a confederacy of chiefs, each with his own share independently, Fateh Ali taking into partnership his three brothers, Ghulam Ali, Karam Ali, and Murad Ali, called the Char Yar, or four friends, who ruled at Hyderabad, Mir Sohrab at Khairpur and Tharo Khan at Mirpur. The Talpurs therefore may be considered as being divided into three distinct families: first, the Shahdadpur or Hyderabad family ruling in Central Sind; second, the Mirpur or Manikani house ruling at Mirpur, and third, the Khairpur or Sohrabani ruling at Khairpur. The government of the Mirs, which began in 1783 in inauspicious circumstances, proved a period of great historical importance. The reign ended after the battles of Miani and Duabo in 1843, when the victories of Napier led to the annexation of Sind under British rule.

The Talpurs were Baluchis, and as such can hardly be called in the full sense indigenous Sindhis. The Baluchis had been settled in Sind for several centuries, but the number of Baluchi tribes which came to live in Sind increased greatly throughout the period of the Mughal and the Kalhora regimes, and by the time the Kalhora regime yielded place to the Talpurs the Baluchi tribes had become a power of great strength in the land, and it was on the stout arms of the Baluchi tribes that the Talpurs mostly relied for their position. As individuals the Talpurs were, generally, genial persons of typical Baluchi character, that is to say, they were good humoured and hospitable, and not given to cruelty and oppression. They had a great sense of personal dignity and usually managed to look the part to which, as rulers, they had designated themselves. They were intent, during their regime, on being left alone, so that they could enjoy themselves in their own way in their domains. This habit of theirs sacrificed the populace to the demands of the Talpurs for sport and exactions to enable them to accomplish their desire of amassing wealth to be laid up in jewels and arms. They had no grandiose schemes of conquest, and after they had accomplished the virtual

unification of the whole area which subsequently became British Sind, they resigned themselves to a life of indolent and by their understanding luxurious ease.

The government of the Mirs was unique. It was a kind of family co-operation without company rules or balance sheet, and with no great interest in anything except keeping Sind isolated and in collecting the revenue, which the ruling family was anxious to accumulate. The immense ramifications of the Talpur Mir family make any attempt to attribute action to any particular Mir during the whole period of Talpur rule a very arduous and difficult process. Historians have usually had to take recourse to family genealogies before any sense of what happened can be made of the forty years of real Talpur rule. The regime was peaceful, and not martial. The chief aim of the Talpurs on getting authority was to consolidate Sind, gathering up the fragments into a self-contained complete unit, and to keep it as a peaceful estate yielding the income that the members of the family divided amongst themselves. They relied for their strength and security on two main supports; first, the loyalty of most of the Baluchi clans and second, the co-operation of the privileged classes, namely the big land-owners who held arms and jagirs, great tracts of cultivable land and the religious brotherhoods of pirs, sayids, saints, fakirs and holy men. The great bulk of the Sindhis, other than the Baluchis, tolerated the regime, but did not love it. The respect in which holy men were held, a dear thing to the Sindhi cultivator, fisherman and herdsman, to some extent reconciled the mass of the people to the Mirs' authority, but did not create any feeling of loyalty to the Baluchi overlords.

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The Talpur regime was an association for the collecting of shares of revenue, which were divided between the individuals in the three branches of the family. There was no government which could be called a unity for all political or administrative purposes. For this reason the Talpurs never were able to rally full strength to meet the challenge of Napier. The regime was not popular with the populace outside the privileged classes.

The regime ended after the battle of Miani. Was Miani a great military achievement? It may be doubted. It was played up at the time as a magnificent victory for Britain, after the disaster of the first Afghan War. At the same time the new non-conformist conscience of Britain, after the demise of the Queen's "wicked uncles" the accession of the young Victoria, was inclined to be uncomfortable over the political moves and the military

coups which were consequential upon them. But the Mirs' government was no body for the waging of serious war, the Mirs were not united, the bravest of them was not present at the battle of Miani and had to be separately disposed of later at the battle of Duabo. There were no properly disciplined troops and those in the field were but poorly armed and they lacked adequate artillery. Napier was too good a soldier to allow himself to be couped up or cut off, and he knew very well what he was doing and the real character of the opposition he had to face. In the face of military incompetence, therefore, the result of Miani was a foregone conclusion. Economic conditions had changed immensely in the days of the Mirs from the state that prevailed in the eighteenth century during the Kalhora regime. Thatta declined into complete unimportance with the loss of the cotton export trade. This loss was due to the effect of the industrial revolution in Britain which created in Lancashire the chief supplier of inexpensive cotton goods in world demand. Industry in Talpur times hardly existed. In place of Thatta, Karachi became important as a seaport and killed the Indus seaports that had served Mughal and Kalhora in Sind for two centuries.

Hyderabad became the capital of the country and was enriched with same creditable architecture, the first tomb of the Mirs being added to the tombs of the Kalhora. In the huge bastioned fort, started in Kalhora times, the Mirs, that is the Hyderabad Mirs, immured themselves and lived a life of modified sybaritic enjoyment. Out side the fort towers and walls, along the line of the housetops of the banias' bazaar, there grew the amazing efflorescence of wooden goose-necked wind-funnels that gave, and still gives, the skyline of the town its unique appearance. In the little shops below the goose-necks, "manghs", as they are called in the Sindhi language, there was growing up the business of the Bhaibund brotherhood of Lohana merchants, soon to penetrate to all corners of the world as "Sind workis" and as reliable dealers and traffickers in hundis and promissory notes.

The main aim of the Talpurs was first to consolidate Sind into one unit, over which the Talpur family could exercise its powers of collecting revenue and then, after Sind had been consolidated, to keep it an isolated and petty Muslim state, guarding against what they regarded as the pernicious influences of the West then seeking entrance into north-western India. As regards the internal policy, it will be sufficient to emmerate the main events without going into details of them. In 1783 Mir Fateh Ali Khan was granted a sanad by the Afghan King Timur Shah. Trouble followed between him and his fellow Talpurs. Mir Sohrab Khan sat upon the throne of Khairpur. There were troubles with Kandahar over the payment of tribute. In 1792 a treaty signed

at Shikarpur resulted in Fateh Ali Khan's agreeing to pay 24 lakhs of rupees for arrears of tribute, in recompense for which he received a fresh sanad and installed himself at Hyderabad. The confederacy of chiefs followed thereafter, Fateh Ali taking into partnership his three brothers, who became the four friends, Char Yar, at Hyderabad. Mir Sohrab Khan ruled at Khairpur and Mir Tharo Khan at Mirpur.

In 1795, the Talpurs had recovered Karachi, which had been ceded to the Khan of Kalat by the Kalhora in compensation for the death of a member of the Kalat ruling family. In 1803 Shuja-ul-Mulk, the Afghan ruler, invaded Sind to obtain his tribute money, but he was pacified with 10 lakhs on account and a promise of the payment of 5 lakhs annually. In 1813 the Talpurs effected the capture of Umarnot, which till then had been in the nominal possession of Jodhpur, but actually had been ruled by petty Jams wielding authority over the country in the extreme south of Sind east of the Indus. In 1824 the Talpurs gained the possession of Shikarpur by a trick. Shikarpur had been before then under Afghan governors from Kandahar. The manner in which the possession of Shikarpur was achieved is interesting. Shikarpur, remaining under governors deputed from Kandahar, had grown into one of the great commercial cities, not of Sind only, but of Asia. Lying on the trade route to Sind through the Bolan Pass, it became a stopping place for caravans, and soon attracted a colony of banias, who established agencies in every commercial town in central Asia. The Mirs coveted the customs revenue of such a town and found their chance during the troubles that befell the throne of Afghanistan about this time. A rumour that the Sikhs meditated an attack of Shikarpur spread through the country at the time when the Governor had been summoned to Kandahar. The Mirs at once assembled an army under the walls of Shikarpur and cajoled and frightened the weak locum tenens into leaving the defence of the town to them. Having taken possession of it, they never gave it up, and the treatment of the town thereafter illustrated the curious system under which Sind was governed. The revenue of Shikarpur were divided between the Mirs of Hyderabad and Khairpur, each maintaining a separate governor and establishment to collect his share. By the possession of Shikarpur and Sukkur and the neighbouring territory the Mirs completed their design of making Sind one single unit under their control. Thereafter they maintained their authority in a manner which Sind had not known for centuries. The countryside was peaceful and cultivation prosperous, as is known from the numerous accounts left by European travellers in the forties of the nineteenth century.

The main contacts which the Mirs had with Britain during this period occurred in 1809, 1820, 1831, 1832, 1834 and in 1836, when Sind became indirectly and very vitally involved in the embroglio which culminated in the first Afghan war. It is perhaps desirable to give a short account of the nature of these various contacts, so that the progress of western penetration which the Mirs so dreaded can be seen in full perspective. It will be remembered that the second East India Company factory in Sind was closed in 1775. In 1799 relations were re-opened by the deputation of Mr. Nathan Crowe to Sind as political and commercial agent. Mir Fath Ali Khan promised protection and privileges to British trade, and even allowed Mr. Crowe to build a house at Karachi, but the Mir, under the influence, it is supposed, of Zaman Shah, the Afghan King, ordered Mr. Crowe to depart within ten days.

In negotiations at Hyderabad through Captain Seton in 1808 an offensive and defensive alliance was concluded. The Supreme Government, however, refused to rectify this and the next year they sent Mr. Hankey-Smith of the Bombay Civil Service to Hyderabad to negotiate a fresh treaty. A short treaty was concluded providing for the exclusion of the French from Sind and for the mutual despatch of the Vakils between Bombay and Hyderabad. The Mirs concerned in this treaty were the Hyderabad Mirs Ghulam Ali Khan and Murad Ali. Ghulam Ali had died in 1811 and a fresh treaty was concluded with the survivors in 1820. It provided that all Europeans and Americans should be excluded from Sind and that the subjects of either government should be permitted to reside in the territories of the other; also that the Mirs should restrain the raids of their subjects into Cutch and neighbouring friendly states.

At Khairpur the old Mir Rustam expressed a keen desire for a British alliance. In 1832 yet another treaty was concluded with the view of opening up the Indus to trade. Among the provisions were those that the Indus and the roads in Sind should be opened up to the merchants and merchandise of Hindustan, subject to fixed duties, but on the condition that no military stores should pass by them, no armed vessels should enter on the Indus and that no English merchant should settle in the country though he might visit it after obtaining passports. A similar treaty was at the same time concluded with the Mir of Khairpur, and this was amended in 1834 by a treaty modifying the river dues. The Sikh kingdom in the Punjab was at this time a formidable state. Maharajah Ranjit Singh had taken Kashmir and part of Multan from the Afghan, and in 1836 he invaded

Sind and threatened Shikarpur, claiming 12 lakhs of rupees as tribute. The Mirs, unable to resist him by force, accepted British mediation on the condition, that they should receive a British Agent at Hyderabad and conduct all their negotiations with Ranjit Singh through the British Government.

The events that led to the annexation of Sind are of extreme complexity and the history of them extends over the seven years from 1836, when, as is mentioned above, Sind was invaded by Maharajah Ranjit Singh, and the matter was settled only by the intervention of the British Government, by which a Resident was permanently stationed in Hyderabad. The facts in the complicated story are that Dost Muhammad on the Afghan throne was believed to be under Russian influence, which at that time the British dreaded as a sinister force on the borders of India. Ranjit Singh had claims against Dost Muhammad for territory in the Punjab. The British aim was to have Dost Muhammad replaced by Shah Shuja-ul-Mulk, who was a political refugee in India from the Afghan throne. Dost Muhammad was actually displaced for Shah Shuja, but the latter proved completely unacceptable to the Afghan people and Dost Muhammad returned. The British garrison in residence in Kabul found themselves surrounded by hostile tribesmen, and mistaken diplomacy resulted in the British population there, military and civil, not being removed from Kabul at a time when the subsidies to Afghan chiefs were cut and when Ranjit Singh had died throwing the affairs of the Sikh state into some confusion.

The result was tragic and resulted in the total destruction of the British forces in their retreat through the mountain passes by Jalalabad to Peshawar. A punitive force was prepared to restore the situation and had to move up to Kabul to do so. The question was how to do this when the Punjab was held by the Sikhs and Sind by the Mirs.

Sind was thus concerned directly with the first Afghan war and its aftermath in a very particular way. First, the passage of the army along the Indus was necessary and all the Mirs were vacillating, unwilling to help and indeed intriguing against any concession. Secondly, in 1836 Ranjit Singh had threatened Shikarpur and demanded 12 lakhs of tribute. To deal with this dangerous situation, the Mirs had called on British help, which took the form of regulations, or negotiations with Ranjit Singh and the appointment of a Resident at Hyderabad. The situation

was delicate and dangerous in the extreme, especially when Ranjit Singh died and discipline among Sikhs became disrupted. The threat of war in the Punjab against the Sikhs was considered imminent, and it was necessary to secure communications and a base in case of hostilities between Afghanistan and the Punjab.

Of the two Governor-Generals of India immersed in this intricate jig-saw of events, Lord Auckland (1836-1842) and Lord Ellenborough (1842-1844), Auckland was slow, timid and irresolute, and Ellenborough hasty, harsh and obstinate. The Cambridge Shorter History of India says: "Auckland's charming manners made official business with him pleasant, Ellenborough was overbearing and lacked the art of managing men. The Mirs had been required by Auckland to allow the Bombay troops to pass up the river and to make over the island of Bukkur as a depot on the British lines of communications. "The Mirs". says the Cambridge Shorter History of India, "were most reluctant to concede these points, but they were forced to consent, and in 1839 Karachi was occupied."

The idea that the Mirs were attacked and their country annexed simply because they were weak is scarcely tenable. The main culpability lay with Auckland and Ellenborough's responsibility was limited to his treatment of a situation which he inherited. He said that the rulers of this frontier state were engaged in intrigues which were hostile, though certainly not in themselves dangerous. Ellenborough, like Wellesley, was concerned to consolidate and strengthen the position of the East India Company. Events flowed in rapid succession since 1838, when the Kabul campaign necessitated the despatch of a body of British troops from Bombay to join the main army in the northern provinces by way of the Indus, notwithstanding the article in a previous treaty which prohibited the using of this river for the conveyance of military stores. The Governor-General, Lord Auckland, had directed that this provision be suspended at such an important crisis, stating at the same time that it would be necessary to displace those chiefs who showed any unwillingness to assist the British in an emergency. In December of that year (1838), therefore, a force under Sir John Keane landed in Sind, but found itself unable to proceed because of obstacles thrown in its way by the Sindhi Durbar in providing supplies and transport. It was only by extraordinary exertions on the part of individual British officers, under a threat of marching upon the capital of Sind, that these obstructions were at last removed. Owing to this hostile demeanour a reserve force was sent from Bombay in 1839 to be stationed in Sind and, as some opposition was shown by the Baluch garrison at Manora to prevent it landing at Karachi, that

fort was speedily secured. Subsequently a treaty was entered into with the Hyderabad Mirs. This provided, firstly, for a payment of 23 lakhs of rupees to Shah Shuja in commutation of all arrears of tribute due by them to the Afghan throne and, secondly, for the location of a British force in Sind of not more than 5,000 men, part of the expenses of which were to be defrayed by the Amirs themselves, and, thirdly, for the abolition of all tolls on the trading boats on the Indus. A treaty similar to this, but omitting the subsidy, was concluded by the Khairpur Mirs, and the fort of Bukkur was made over to the English as therein stipulated. Sher Muhammad of Mirpur was also allowed to participate in the treaty concluded with the Hyderabad Mirs on his making a yearly payment of half a lakh of rupees. The British steam flotilla on the Indus was allowed to navigate that river, not only unimpeded, but furnished with every assistance. Lord Ellenborough, who had by this time succeeded Lord Auckland as Governor-General, came to the conclusion that affairs in Sind should be cleared up and that the British forces there should not be withdrawn until the Mirs had accepted the Company's suzerainty in clear terms. He appointed Sir Charles Napier to command the forces in Sind and at the same time empowered him to conduct political negotiations with the Mirs. At this time the Mirs were in two groups governing Upper Sind from Khairpur and Lower Sind from Hyderabad. Both groups had agreed verbally to accept the treaty which Napier proposed to them, but while doing this they proceeded to collect troops with the intention of resisting. At the end of 1842 a number of the Khairpur Mirs fled to Imamgarh, a desert fortress about half-way between Khairpur and Hyderabad. It was a difficult place to reach and had the local reputation of being impregnable. Napier marched against the place in January 1843, taking the Mirs' action as a piece of defiance. On his appearance Imamgarh surrendered and the fort was promptly blown up.

Outram the Resident believed he could settle things if Napier would permit him to go to Hyderabad, where he got the signatures of all the Mirs except one. But when Outram was about to obtain a peaceful settlement, he was set upon in the streets and then attacked in the Residency on the banks of the river. For when the Baluchis heard that the Mirs had put their seals to the treaty on the 12th February 1843, they got out of hand. For the first time in all his Sind experience Major Outram was hooted and cursed as he left the fort. On the morning of the 15th the Residency building, which stood on the bank of the river and was surrounded on all sides by a wall only four or five feet high, was attacked by eight thousand Baluchis.

The sword was now openly drawn and Sir Charles Napier advanced at once. He had only 2,800 men of all arms, for a strong force had to be left in charge of Sukkur, and the enemy's

strength was variously estimated at from 30,000 and 1,00,000. Early in the morning of the following day, the 17th February, Captain John Jacob, who had been sent ahead with a party of the recently levied Sind Horse to look for the enemy, found the Baluchis strongly posted on the banks of the Old Fuleli near Miani, about five miles from Hyderabad. Major Outram had been sent forward the night before to burn some shikargahs in which it was thought they might seek cover, and as the smoke of the fires rose in the distance about nine o'clock, General Napier formed his line of battle. The result was the complete rout of the Baluchi army. The loss of the Baluchis in this action was computed at 5,000, while the British losses did not exceed 257, of whom 19 were officers. One account of the battle refers to the dispersing of what was little better than a vast mob. They had no discipline, says the narrator, and bands of twenty men rushed out at a time with no order or method, only to impale themselves on the bayonet or to be swept away by grape.

Napier's despatch gives a graphic picture of the battle.

It is not easy now to trace out on the ground the terrain on which the fighting took place as the course of the Old Fuleli has long since dried up. The present inhabitants of Hyderabad have little knowledge of the place, since they are now to very large extent composed of refugees who flocked into Lower Sind at the time of the partition of India, and these refugees have no traditions connected with Sind and know nothing of its country side. Immediately after the battle, the chief Mirs of Hyderabad and Khairpur, excluding two who were not present at the battle, waited on Sir Charles Napier and presented their swords, which he graciously returned. He marched at once to Hyderabad, of which he got possession quietly on the 19th. He kept the Mirs under a guard in a garden close to his camp, where he has been accused of treating them rather brutally. But in truth his position at this time was exceedingly difficult, for the campaign was not won by the battle of Miani.

Mir Sher Muhammad of Mirpur, stoutest-hearted of the Mirs, was not in time for Miani, but he added the fugitives from that field to his army and was now approaching with 20,000 men. Sir Napier's small force, reduced by his losses in the battle and the detachment required to keep the fort, was scarcely more than sufficient to hold his camp. But he never allowed his bearing or his measures to indicate anything but confidence and defiance. When an envoy from Sher Muhammad offering to let him leave the country with his life, if he restored all that he had taken, the evening gun happened to fire. Napier's turned his back on the envoy. He said: "You hear that sound. It is my

answer to your chief." At length reinforcements arrived when Sher Muhammad was close to Hyderabad. On the morning of the 22nd March the general marched out with 5,000 men, of whom 1,100 were cavalry and seventeen guns, and found the enemy at a village called Nareja on the duabo, near the Fuleli, four miles from the town. Mir Sher Muhammad was defeated after a battle lasting three hours.

The Mirs of Hyderabad traced their descent from Mir Hamzo, son of Hashim, and stated that they themselves were Baluchis of Arab origin. To what extent this is correct is not easy to ascertain. The Talpurs had ruled Sind with tolerable success for about forty years. The 1874 Gazetteer describes them in these terms: "The court was essentially Baluch, the style of living was strictly primitive and by no means expensive, and extravagant propensities were shewn only for arms and horses and their absorbing passion for sport, to which they never hesitated to sacrifice the finest portions of their country. So great indeed was their love for their shikargahs, or hunting enclosures, that they are said to have declared that they valued them as much as their wives and children. The costume of the Mirs was peculiar, the distinguishing feature being a rich lungi, a scarf, a Kashmir shawl or other stuff bound round their waist, a richly worked cap peculiar to the country, and a sword and belt in gold with shields bossed with the same precious material. In religion they were of the Shia persuasion.

In this brief account of Sind History, which is all that space at the disposal of this gazetteer will allow, it is not possible to describe in detail, as has been done in previous gazetteers, the form of administration of the Talpurs. What is important in that administration will be commented upon in the various sections of this gazetteer dealing with administrative departments connected with irrigation, revenue, justice, law and order and other subjects. The form of government under the Talpurs was a pure military despotism on feudal principals, of Baluchis chieftains holding jagirs, or grants of land, for rendering service to the state when necessary. They had no standing army and kept up a bodyguard of some strength. In time of war the pay of the foot soldier was equal to about three pence a day, the pay of horseman being double this sum. The number of fighting men the Mirs could conjointly bring into the field was believed to be about 50,000. Actually if military comparison is to be made of the conditions of warfare at the battles of Miani and Duabo, the fairest comparison is with the fighting on the field of Culloden, where the ill-disciplined and ill-equipped Highlanders were pitted against the discipline and the heavy artillery of the Hanoverian troops, leaving the issue of the battle in no doubt. It was a similar state of affairs which prevailed in 1843, when the Baluchi

troops, brave as they were, were equivalent to the Highlanders of Culloden and suffered the same fate.

From a report on the pargana of Chanduka by Lieutenant James, Deputy Collector, 15th December 1847, the following description of the rich rice lands in cultivation round the canals in the Larkana district throws a pleasing light upon the prosperity of what was regarded as the "garden of Sind." "Between the Ghar and the Nara," he says, "the rice cultivation is very extensive. The villages are principally raised mounds and in some cases further fortified from inundation by a ditch carried all round them. The remainder of this portion is either overrun with low shrubs or presents a desert-like appearance, where the salt manufacturer carries on his work. All the canals in most of the villages are prettily wooded. The country between the Nara and Indus differs considerably from the other two. For some distance from the first named river there is a great deal of cultivation, but the space between that and the Indus is in some places sandy waste with patches of a tall flowering grass and others a thick jungle of tamarisk and kanda. The surface too is more broken and intersected with many a natural watercourse. The lower lands, where the waters of the inundation recede, yield beautiful crops of peas, gram and barley requiring but little care on the part of the husbandman. A belt of forest encloses the banks of the Indus averaging two miles in depth, where the silvery balen, the sisam and the babul grow luxuriantly, the intermediate space being covered with a tangled brushwood. The stranger, who leaving the noble river and the cool shade of the neighbouring forests, in the spaces of which herds of buffaloes and cows find rich pasture, comes now upon the green crops of spring and now upon the grassy meadow, passing here a group of temporary huts occupied by a wandering party who had brought their cattle here for pasture, and there the more pretending village. Again entering the forest, he crosses a nearly cleared belt of ground, where the blackened and rugged stumps of babul stand ominously forth, a proof of man's influence, and forming a strong contrast to the surrounding verdure. There he meets a busy throng, the temporary occupants of a few matted huts engaged on the manufacture of reed baskets and mats, the materials of which are so plentiful."

Pottinger in "Travels in Baluchistan and Sind" has described the appearance of Karachi in 1813. "The houses inside the walls were ascertained, by natural enumeration made in 1813 by order of the Amirs, to amount to three thousand two hundred and fifty, besides which there were some straggling huts around the fort, which were not included in the calculation. The resident popu-

lation, excluding sojourners, at the Sind period had increased to 13,000 souls, which is more than one half greater than when the Mission was there in 1809. The exports of Sind are chiefly made from Karachi. Those of home produce consist of saltpeter, salt, rice, cotton, tea, oil, oil seed, shark's fins, bark for tanning, alkali, calico and felts, and from the kingdoms and provinces to the northward they bring chiefly for exportation asafoetida, saffron, horses, leather, hides, madder, musk alum, Kashmir shawls, dried fruit, diamonds, lapis-lazuli and turquoises and other precious stones, bedellium, and gums. From Khurasan, Mekran, Persia, Arabia, Sindhians have for their own consumption swords, silk, carpets, dates, rosewater, conserve, tobacco, coffee and Kalians."



Gul Hayat Institute

THE BRITISH PERIOD (VI)

(1843-1847)

FIRST STAGE**NAPIER'S ADMINISTRATION**

From these contemporary accounts we may gain some idea of the state of the country which Napier, commenced at once to alter into the model of the British policy. Napier was sixty years of age when he was commissioned to command in Sind. He was a man then of fixed and determined mind, completely ignorant of India and its peoples. He was combative, headstrong and unwilling to take advice which probably from his wholly military upbringing accounts for his prejudice against the "Politicals", that is the covenanted civil officials of the East India Company then administering such parts of India as were in the Company's control. His predilections were all for a military set-up with army discipline and an over-riding power residing with the Commander-in-Chief. The Governor-General, Ellenborough, who approved his actions throughout, had a similar preference for military over civil government.

Before the annexation of Sind, Napier said, "We have no right to sieze Sind yet we shall do, and a very advantageous, humane and useful piece of rascality it will be."

He now had the chance to make the best of the "rascality" and he seized gladly and with both hands the opportunity which had been presented to him. In four and a half years Napier ran the land on lines that have never been seriously altered since, and are still the scheme that persists a hundred years after Napier himself has gone.

Napier issued very comprehensive orders relating to all branches of administration. He divided the province into three districts: Karachi, Hyderabad and Shikarpur, each in charge of a collector with deputies, under these he placed the whole staff of Kardars, who had been employed by the Mirs, on salaries calculated at one half of their former emoluments. The collector and his deputies were magistrates as well as collectors of revenue, but their powers were very limited. Every decision of a deputy appears to have required confirmation by the collector, and the proceedings in all cases were ultimately sent to the Judge Advocate General, a captain versed in law, who, with his two deputies at Hyderabad and Shikarpur, acted as a kind of court of revision. In all cases of serious crime a preliminary enquiry was held by the collector, who then submitted the papers to the Judge Advocate General, who submitted them to the Governor, who decided whether to order a trial by a military commission, or not. The decision of even the military commission was not final, but required the confirmation of the Governor. As regards

land revenue, the rates were somewhat reduced, but the system on which they were collected appears to have remained with little alteration from it was under the Mirs. All the jagirdars who tendered allegiance in response to Napier's proclamation after the battle of Miani, numbering nearly two thousand, were confirmed in possession of their estates. Apart from these, the general policy was to discourage the claims of Zamindars and to deal directly with the occupants of land. The former rulers of the country, the Mirs, were provided for by cash pensions, amounting in the aggregate to about three and three quarter lakhs of rupees yearly, while the lands in jagir they were permitted to hold were valued at a little over one and a half lakhs.

Napier was much concerned with the military requirements of the province. The Baluchis tribes on the frontier, who had been quiet before the conquest, became so troublesome again that Napier determined to conduct an expedition against them in person. A fort had been built at Larkana where the newly formed Camel Corps, of which such great things were expected, was stationed. Detachments of cavalry had been posted at Khairo Garhi and Rhojan Khangarh; there was a whole brigade at Shikarpur. In January 1845 Napier crossed the frontier with Generals Hunter and Simpson and a force of more than 6,000 men to punish them in their strongholds. Ali Murad co-operated with 4,000 Baluchis. The Bugtis of the hills escaped, but the expedition was so far successful that the Jakh-ranis and the Dombkis surrendered with their redoubtable chief, old Bijar Khan, who thereafter remained a prisoner with Mir Ali Murad. Napier then removed the last two tribes from their own country and settled them by Jani Dero in the Upper Frontier district, where he hoped they would reform and become peaceful husbandmen. But their removal from the Kacchi plain only cleared the way for the Bugtis who resumed their depredations and at last grew so audacious that they came down in force, 1,500 of them, to within fifteen miles of Shikarpur, laughing at the terrified garrisons of the frontier forts and carried off 15,000 head of cattle. In January 1847 the Sind Irregular Horse, then stationed at Hyderabad, was ordered to the frontier under Captain John Jacob, who made his headquarters at Khangarh, a dirty little hamlet about a dozen huts with a population of twenty-four, destined to become Jacobabad.

As a result of Jacob's exertions, the Bugtis were completely broken and their surviving leaders came and surrendered at discretion. The tribe has given no trouble since. In 1845-46, civil affairs were interrupted by the first Sikh war, to assist in which Napier marched to Bahawalpur with 12,000 troops. About 20,000 more were held in readiness in Sind. They were not, however, required in the Sikh War. In October 1847 Napier left Karachi, after resigning his appointment.

THE BRITISH PERIOD (VI)

SECOND STAGE

1847-1907.

Amongst the first of Napier's acts was to organise a Canal Department under Lieut.-Colonel Walter Scott, but Colonel Scott's assistants were not engineers, and the department was abolished in 1849 without accomplishing anything. When Mr. Frere became the Commissioner of Sind, he took up the subject of irrigation again, and in 1855 Lieut.-Colonel J. G. Fife, R.E., submitted a very able report on the re-modelling of the whole canal system of the province. Colonel Fife found much to criticise in the state of the canals existing in 1855. He remarked "The canals in Sind are excavations carried away from the river in an oblique direction so as to secure as great a fall per mile as possible. They vary from ten to one hundred feet in width and from four to ten feet in depth, none of them have their heads where the river bank is permanent and one of them are deep enough to draw water from the river except during the inundation. The river has to rise many feet before the water will run into them. The general direction of the canals is often good, but there are so many intermediate awkward bends that a great part of the fall is thrown away. They are irregular in shape and irregular in slope or fall. They generally very nearly follow the slope of the country, so that in some places they have a fall of one foot per mile, in others only two or three inches. In fact, they resemble general watercourses much more than canals. In some cases they are really old natural branches of the river, kept open by annual clearance of the silt which accumulates in them during the inundation. They have all the same grand defects, the irregularity of the supply water arising from the variation of the inundation, they are still further increased from the changes in the river channel at their heads from their becoming nearly or almost partly and sometimes completely choked with silt at their mouths.

Fife laid down the principles which ought to guide all future operations for the development and improvement of canals. His principles were:—

- (1) That the existing canals should be properly cleaned and deepened at their mouths, and provided with regulators at their heads in some cases and no new canal should be made on the old pattern.

- (2) That the head of a canal should always be situated at a place where the riverbank is permanent.
- (3) That the stream of the canal must have sufficient velocity to sweep along the silt thrown in by the river.
- (4) That to this end there must be room to carry a canal along a sufficient distance at a slope a little less than the slope of the country until it feeds the land at the proper level, which would probably be less than thirty miles.
- (5) That the larger the canal the less slope is required to give it the requisite velocity.

As far as planning went he was far-seeing and courageous, and generally much in advance of the time. He forecast four lines of canals, one leaving the river at Rohri and running parallel to its left bank at a distance of about fifteen miles until it entered the Fuleli near Hyderabad, another leaving the river at Sukkur and running parallel to the right bank until it entered the Western Nara; the third and fourth leaving the right and left banks respectively at Jhirrak. The last of these was ultimately to reach Karachi.

The first of these schemes was of alarming magnitude and was not adopted. It was revised again in 1891, but rejected by the Sind Irrigation Commission. In its remodelled form, however, it was to emerge as the Rohri canal, which is the largest canal operating under the Sind barrage system. By the end of the century the growth of the Irrigation Department, called the Department of Public Works, necessitated the creation of ten districts under the executive engineers, namely, the Begari, Shikarpur, Nara, Western Nara, Karachi, Northern Hyderabad, Central Hyderabad, Fuleli, Jamrao and Eastern Nara. In fifty years Sind was completely transformed by this vast irrigational development, although the canals were still inundation canals and dependent upon the caprice of the river, but to see what was achieved the amount of cultivation in 1874 and in 1905 can be compared. It is then found that there was an increase in cultivated land per annum during this period of approximately $3\frac{1}{2}$ per cent. Irrigation is a subject which is dealt with separately in another chapter of this Gazetteer, but for the purposes of history a few remarks must be made on what was achieved in the improvement of the main canals in the fifty years which succeeded the regime of Napier. For this purpose the following canals have been selected for brief mention. The Desert Canal, the Begari Canal, the Western Nara Canal, the Mithrao Canal, the Fuleli Canal, the

Eastern Nara Canal and the Jamrao Canal. The Desert canal takes off from a dhandh or back-water of the Indus six miles east of Kashmore, five miles south of the Punjab frontier. It runs for a distance of eighty-two miles. In 1905 the average annual cultivation on the Desert canal was about 1,90,000 acres. It was practically all on flow. The Begari canal leaves the Indus thirty-three miles North of Sukkur and for fifty three miles forms the boundary between the Sukkur and the Upper Sind frontier districts. This canal existed at the time of the annexation and, as its name indicates, it was made by begar, that is, forced labour. The enlargement and extension of the Begari was the first irrigation work pressed on the attention of Mr. Frere in 1851 by John Jacob, who had already induced the notorious freebooter, Jamal Khan Domki, to set to work upon it with all the Baluchis under his control. The Begari canal is a purely inundation canal ceasing to flow as a rule early in January. In 1905 the average cultivation upon the Begari canal was 276,310 acres. The Eastern Nara, commonly spoken of as a natural branch of the Indus, does not appear ever to have been so in the ordinary sense of the term. There is no doubt that the Eastern Nara marks the course of the Hakro, or lost river of Sind, which at some time subsequent to the Arab conquest abandoned its ancient bed and poured its flood into the Eastern Nara or Indus. Upon Mr. Frere's advice a survey of the valley was undertaken in 1852, and it was discovered that more spill water escaped from the Indus to the Eastern Nara than had previously been believed, but that owing to the sandy nature of the valley and especially to numerous immense hollows in the desert, the water, except when a very large flood occurred, was entirely absorbed. Dams were immediately constructed which diverted the stream from the sandy hollows. The effect was magical. In three years the revenue rose from Rs. 8,000 to Rs. 81,000. In May 1859 the Nara supply channel from the Indus at Rohri was opened. This was a cutting twelve miles long leading from the river to the Eastern Nara. The Eastern Nara is now a perennial stream and navigable throughout its length. Including the supply channel its total length from Rohri to the point where it discharges into the Dhoro Puran is two hundred and seventy-six miles, but the stream is maintained, for the purposes of irrigation to a distance of two hundred and sixteen miles only. The aggregate length of the Eastern Nara canals is three hundred and seventy miles, their branches one hundred and thirty-two miles. The annual cultivation in the 1904 to 1905 figures is 275,873 acres, of which eighty per cent. is under flow.

The Western Nara is a natural and very tortuous channel by which a portion of the Indus waters find their way to the Manchhar Lake and so back again into the main stream near Sehwan. The distance from the head of the Nara to the Manchhar is

eighty-three miles in a straight line, but one hundred and fifty-three and a half miles measured along its course. In 1905 the total length of the Nara and all its branches was two hundred and sixty-six miles and the area irrigated by it, taking an average of the last three years, was 206,687 acres, of which 169,939 were flow, 36,748 by lift. In 1836 the Fuleli was nothing more than a channel utilised by the river in the inundation. In 1857 the head of the canal was improved by removing sand bars, widening contracted portions and excavating the channel to a regular gradient. In 1858 a new supply channel nearly five miles long was cut from the river at Jamshoro to the Fuleli and completed in 1861. In 1858 various works for the improvement of the main channel of the Fuleli and many regulators were constructed. The Fuleli in 1904 to 1905 was a perennial canal ninety-eight miles in length. The length of the Fuleli system was one thousand and sixty-eight miles and the average cultivation was 303,512 acres, of which about two-thirds was under flow irrigation. The history of the Mithrao canal is interesting as an instance of a canal constructed through a desert plain where there was no labour available on the spot, where water, even for drinking purposes, was difficult to procure and where, when the canal had been constructed, there was a small resident population. The commencement of the work was sanctioned in 1857-1858. The construction proceeded slowly and it was practically completed as an irrigation work in 1879. The main canal is ninety-three miles long. The average cultivation for the three years ending 1904-1905 was 150,811 acres, of which all but about 20,000 acres was on flow. This great canal takes off at the 136th mile of the Nara from the Makhi dhandh, a natural depression and banked as a reservoir, and discharges into the Kara Kun, a lateral off-shoot of the Nara. The Jamarao canal issues from the Eastern Nara at mile one hundred near the junction of the boundaries of Khairpur, Nawabshah and Thar Parkar districts. The suitability of the spot as the head of the large canal was first noticed in 1857 by Mr. Barnes, of the Sind Irrigation Department. The commencement of the Jamrao scheme was delayed by the consideration of the much more ambitious project involving the construction of a large canal from Rohri to Hyderabad, and it remained in abeyance from 1872. The work on the canal did not begin till November, 1894 and the canal was formally opened by Lord Sandhurst, the Governor of Bombay, on May, 24th 1899. The main canal is one hundred and seventeen miles in length. It is furnished with regulators at intervals of about ten miles, to assist in the distribution of water. The distribution of water is provided by a system of minor canals which take off at selected points above the regulators. The supply in each is controlled by a sluice, or regulator, where the canal leaves the parent stream. The watercourses have been constructed by the Irrigation Depart-

ment and are aligned to command to the best advantage the land which they serve. Canal managers watch the management of the water, not only of the main canal, its minors and its tributaries but also on to the very fields themselves. By this means rotation is enforced and the people are enabled to cultivate a larger area than would be possible were they left to themselves. The Jamrao is a perennial canal in the fullest sense of the word, supplying water for both the kharif and the rabi season. Two-thirds of the Jamrao tract were surveyed according to the squares system adopted from the Punjab. Villages are divided into squares of sixteen acres each, except where they are broken by roads, village sites and similar obstacles to symmetry. The occupant is bound to surround his square with a bano or earthen ridge, and to subdivide it by similar ridges into petty numbers of one acre each. The latter are the units of assessment. Each square receives water from a definite watercourse and may not take it from any other. In 1904 to 1905 the area under cultivation on the Jamrao was 265,262 acres. The Jamrao system is the first completely scientific and modern canal in Sind, and the example which it offers was useful for the planning that in a later generation made it possible for the conversion of the irrigation area of Sind, so far as the level of land allows, from inundation to perennial flow.

In the Pre-British days the language of the Court was Persian, which was not understood by the populace. The language which the common people spoke was Sindhi, which had not yet a fully established and accepted script. The Hindu traders, who alone had some claim to a little education, used Sindhi, but for them it was written in the Devanagari character, which is not understood by Muslims, and the literacy of the Hindu trading classes was due largely to the need for keeping business accounts. As regards Muslim education, the only system prevailing was that of the Maktabas or schools attached to the mosques. In 1853 the number of small schools of this kind in the Karachi, Hyderabad and Shikarpur collectorates was reported to be over six hundred, though the figure is certain to be very inaccurate and probably is an under-estimate. Education was not greatly sought after by the common people of Sind, and for long, except in the towns there was no great cry for the establishment of schools. The policy of the government was to encourage private enterprise in education and grants were made and were given to all private institutions conforming to prescribed courses of study. The great mass of the population still remained uninterested in educating children and the prejudice was particularly strong in respect of the education of girls. There was no regular educational service staffed by a continual

supply of qualified educational officers till 1887, after Mr. Giles had been asked to report upon the whole condition of education in Sind. In July, 1887 Mr. H. P. Jacob was appointed Educational Inspector in Sind, and from that time the department was continuously administered by officers of educational experience. Notwithstanding, education had still a long up-hill climb to establish itself in popularity with the agricultural masses, who, finding that reward for labour in the fields had risen with the extension of efficient working canals, displayed little enthusiasm for taking their children away from the fields in which they worked. Statistics, such as they are, of educational institutions in the country are not particularly gratifying. In 1864, the number of institutions was 64 and the number of pupils 2,440; in 1874-1875 institutions numbered 230 and pupils 40,229; in 1884-1885 there were 375 educational institutions and 24,159 pupils; in 1894-1895 the number of institutions was 1,616 and the pupils numbered 62,595. In 1904-1905, though the number of institutions shows a drop, which is not easily explicable, to 1,396, the number of pupils under instruction rose to 69,555. In 1904-1905 there were only 4,467 girls receiving instruction. The prejudice against female education, especially amongst Muslims and most amongst the Baluchi tribes in the north, remained exceedingly strong. An Arts College had been founded in Karachi in 1887. In 1907 there was a Medical School in Hyderabad turning out candidates for the Subordinate Medical Service; there was an Engineering Branch in the Dayaram Jethmal Sind College in Karachi; and there were agricultural classes in Hyderabad.

In this historical survey of the second period of British rule in Sind, a period which was characterised by almost complete peace and general security, only two events are worth chronicling here. One was the rebellion of the Hurs in 1895 and the other was the outbreak of plague in 1897. Both merit short notice here. Some account of the organisation of the Hurs will be given in the Chapter dealing with "The People of the Country". The Union of the "Hurs," as they like to call themselves, is probably unique. There is certainly no other union like it in the history of the sub-continent. In fact, the Hurs present a fascinating sociological study, on which so far very little work has been done. They were a union, a brotherhood, a kind of freemasonry, a fanatical organisation and a religious congregation.

Bubonic plague was first recognised in Sind on the 8th December 1896, when a Brahman cook in Karachi city was found with unmistakable symptoms of it. He died the next day. More cases occurred and on the 29th the Medical Board declared the plague to be epidemic in Karachi. The population in the stricken areas took panic and fled in large numbers from the places where the

plague was finding many victims. This was the natural reaction of an ignorant and illiterate people, who concealed their sick and removed them to surrounding villages, thus helping the plague to spread. The mortality in the whole province was not severe, and bears no comparison with that of the influenza epidemic of 1918, which caused so many deaths that the natural increase of the population was affected for a whole decade. The total number of cases in Sind was, 6,420 and the deaths 4,829. In Karachi the monthly statistics from December, 1896 demonstrate the general progress of the disease from the start to its climax and decline. These figures show for December 1896, 59 deaths, for January 1897, 743, February 995, March 864, April 538, May 167, June, 23, July 9. Upper Sind and the desert enjoyed practical immunity from plague since the first year, except in 1905 when there were 19 cases in Sukkur, 28 in Larkana and 73 in the Upper Sind Frontier.



Gul Hayat Institute

THE BRITISH REGIME IN SIND (VI)
THE THIRD AND FINAL PERIOD FROM 1907 TO 1947.

Mainly Political.

Despite the troubles of a war in South Africa the twentieth century opened quietly and gave no indication at first of its revolutionary character, which was to bring about two world wars that changed the attitude of Britain towards colonies, dependencies and protectorates, and greatly accelerated the demand for nationalist self-expression in countries which felt they had gained sufficient experience to enable them to run their governments for themselves. In the sub-continent the first signs of political unrest and the growth of nationalist feeling manifested themselves in Bengal. Sind remained backward politically, but began to take some small notice of political conditions about the end of the First World War. This was the time of the first civil disobedience movement, Satyagraha, "a grasping of truth," as it was provocatively called by Mr. Gandhi. This had repercussions in Sind, almost wholly amongst the Hindu Amil and Lohano communities alone. Their aim was to force the police and the executive authorities into a false position and create situations where rioting and resisting mobs made the use of force necessary, and so threw further fuel upon the spreading fire of discontent.

The Muslim population of Sind remained almost totally aloof from Mr. Gandhi's agitation. The attempts of the Hindu-run Indian National Congress to present the agitation as an all-India one supported by both Muslim and Hindu failed utterly in Sind. Muslims were almost completely antagonistic to Mr. Gandhi's arguments and appeals. They regarded Mr. Gandhi first and foremost as a Hindu bent on creating discontent in order to replace the British Government by Hindu swaraj.

During the period between the two world wars, that is between 1918 and 1939, two events of importance for this account of Sind history deserve mention here: the first is that of the influenza and epidemic which raged in an extremely acute form in Sind at the end of 1918. This catastrophic pestilence destroyed a very large number of people in the country and affected the natural increase of population for a decade afterwards, the census figures for 1921 shewing the full effects of this great epidemic. The second event which requires notice was the completion of the barrage over the river Indus at Sukkur, named the Lloyd Barrage after the energetic Governor of Bombay, then Sir George Lloyd. This noble work was completed in 1932 and began functioning immediately. It was a colossal achievement, which altered

at once the economy of Sind and proved to be a wonderful form of protective insurance against the unreliable yield of crops that had depended previously upon the working of inundation canals alone. In 1935 preparations were made for the separation of Sind from the Presidency of Bombay, and on the 1st April 1936 Sind became a separate province with a governor of its own, the first since the days of Napier, and an elected Legislative Assembly of sixty members.

The thirties were a period of acute financial crisis and of agricultural distress due to the low market prices for commodities prevailing throughout the world at the time. In 1939 the Second World War broke out and brought a host of new problems for Sind to face. World War II ended the slump of prices. The Lloyd Barrage, after a difficult inaugurate period, began to pay handsome dividends, from the proceeds of which Sind was able to provide itself with some magnificent new buildings, the Legislative Assembly Buildings, the Dow Medical College and the beautiful and dignified Government House, which took the place of the unsatisfactory building originally erected in the days of Sir Charles Napier. When America entered the World War, Karachi became practically an American base. In 1942 the Quit India movement of Mr. Gandhi, which was launched because of the failure of his "individual civil disobedience campaign" that had been meant to impede the war effort of India, created great disorders over India, (particularly in the areas where the Indian land communications of the armies fighting Japan lay.) In Sind there was no trouble of that kind, but the unsettled and turbulent actions of mobs throughout India had their effect in encouraging the Hurs once more to break out into a kind of open rebellion, which included the sabotage of railway trains. This troublesome rebellion was not put down until a special force had been created for the purpose.

Subsequent political events which took place in the later days of the war included the Cripps Mission, the Cabinet Mission and negotiations for the future constitutional arrangements for India. An account of these, however, is more appropriately assigned to the constitutional development of Sind, about which something has been said in Chapter XIX of this Gazetteer. With the end of the war, in 1945, a whole host of fresh political problems and anxieties arose. These difficulties and anxieties were finally resolved in the decision to grant full independence to the sub-continent after it had been divided into the two states of Pakistan and India. Under the new arrangement Sind became an

independent provincial and federal unit with its own Governor and Legislative Assembly in the independent State of Pakistan, being put on the same footing as the other federal units possessing Governors and Legislatures of their own, namely, the Punjab, the North-west Frontier province. These three units formed, with Baluchistan and the States of Khairpur, Bahawalpur and a few minor ones, West Pakistan, which with East Pakistan (Eastern Bengal) comprised the whole Federal Government of Pakistan.

Although the difficulties of the change-over were greatly affected by the flight of the educated Hindu classes from Sind when Sind became a state in the Muslim polity of Pakistan, there were enough officials to ensure that a sufficiency of others could be trained for the work of administration. The existence of this governmental frame was indeed vital to the new country. Partition brought with it problems that might have proved intractable and could have landed Pakistan into chaos. Sind, of course, played a minor part in the great progress of events, but the experience it was able to deploy was typical of the age and the generation and the traditions of its people. The governmental plan which was adopted was built on the foundations that British rule bequeathed to it. It proved quite a practicable matter to adapt that plan in detail to the particular needs of the changed conditions.

The growth of political consciousness in the emergence of national, as contrasted with nationalist, feeling in Sind during the last forty years of British rule cannot be understood without reference to the political history of India during the time. In order to place a true picture before the reader, it is necessary to give a short account of the history of the two national political movements in India during the eighty years that preceded the transfer of power. Mr. Gandhi cannot be omitted from a description of the political awakening of Sind between the end of the nineteenth century and the date of the transfer of power from Britain to India and Pakistan. He limped across the bickering stage of Indian politics, like some haggard Colossus building up by his fasts, his sitting dhurna, his weekly prayer meetings, and his days of silence, his wayward exits from and entrances into politics a tradition which endeared him particularly to the masses of the Hindu population, who formed the basis of his strength. It was by his reliance on this strength fairly centred on the adoration of the Hindu masses that he felt himself sooner or later in a position to challenge the solidity of the British Raj by methods which invariably proved troublesome, often dangerous and, in the end, effective. He never had more than a minute following of Muslims

amongst his believers. The reason why is plain enough. He stood for a state of things abhorrent to believers in Islam. His technique of rebellion was an extraordinary mixture of behaviour compounded of the wildness of the Irish fenians, the nihilism of Tolstoy, and the intransigent civil obstructiveness of Thoreau. From Thoreau indeed he borrowed the phrase "civil disobedience", which became the chief weapon in his political armory for a period of thirty years. His intellectual make-up was deeply Hindu. He had a profound and sincere desire to reform Hindu society into a less illiberal system than that which had been evolved from the Hindu conception of caste in the body politic. Whether he was a great man, or not history alone will decide. The present age is in no position to pass a cool judgment. He was certainly a man of power. Independence, however, would have come just as well without him, and probably just as quickly.

Whatever Mr. Gandhi's success as the expeditor of Indian independence, the progress of his campaigns to attain it had done more than anything else to embitter feelings between Hindu and Muslim over every part of India and had made completely impracticable the ideal of one united India. British politicians for a whole generation failed to see these evident signs of the times; obvious enough they were to observant officials in India. With a blind obstinacy, the British Parliament never faltered in this. The object was completely unattainable as soon as Indian nationalism had got properly into its stride, which it had done in advance of the second Government of India Act of 1936. No one with an accurate knowledge of Indian history could ever have imagined that Muslims would enter a political unity ruled by adherents of religious beliefs so different from their own and so foreign to their own traditions and social ideas. Yet year after year British politicians ploughed the barren sands with assurance and complacency. There was to be a rude awakening under the duress of a second world war, which altered the will of the British people to hold India any longer in a tight political subservience. But no British politician saw the light till the twelfth hour, an amazing example of how optimistic belief can blind intelligent men to the real significance of events happening before their eyes.

The Indian political drama moved quickly through the Minto-Morley Reforms that brought Indians on to the Viceroy's Councils to the Montagu-Chelmsford Reforms, ending in the Government of India Act of 1920. This piece of legislation established dyarchy in the province, but not in the centre. There followed in the troubled days of the twenties and thirties civil disobedience, satyagraha, and the agitation against the Salt Act.

The Round Table Conference of 1930 brought some slight respite. The second Government of India Act of 1936 made the provinces self-governing and instituted a democratic system of elections on a wide franchise, but left the centre still a focus of dyarchic ideas. These measures did not satisfy extreme Indian opinion. In 1940, Mr. Gandhi started individual civil disobedience, and in 1942 he promulgated the Quit India Campaign.

Mr. Gandhi had always selected his moments for pressure on the British Government with supreme skill and expert timing. The civil disobedience movement of 1920 coincided with the depression, the economic slump and the disillusionment at the end of World War I. The Salt Satyagraha of 1930 was started just after the Wall Street crash in 1929 and was contemporary with the beginning of a worldwide slump which lasted for a decade and kept agricultural prices at a low level, bringing great distress to agricultural workers. (The individual civil disobedience campaign of 1940 was contemporary with the bleakest stage of the war against Germany, and the "Quit India" Campaign of 1942 was launched at the very time when the Japanese armies looked like crossing into Assam and Eastern Bengal).

At the beginning of the twentieth century Sind was completely unconscious of politics and felt no interest in them. Yet politics had been real in India for a generation. In 1885 the Indian National Congress had been founded by an Indian civilian as a mouth-piece for the expression of liberal ideas and for an orderly discussion of improvement, from the Indian point of view, in the manner of government India. It remained uneventful till 1907, when a split was created in the Surat session. The difference between moderate and extremist elements proved fundamental and in the end the extremists captured Congress and its machinery. In 1920 it passed into the hands of Mr. Gandhi. In 1927, it declared independence as the goal of India. In the 1928 session the Congress had agreed to accept dominion status if it were granted before the end of 1929; but in 1929 Congress desired assurance that dominion status would be the basis of discussion at the Round Table Conference. In 1929 it declared that its aim was purna swaraj. In 1930 Congress itself endorsed the civil disobedience movement of Mr. Gandhi. In 1934 civil disobedience was withdrawn and Mr. Gandhi retired from Congress. But he remained its practical dictator. From 1936 to 1939 the Congress acted more or less constitutionally and formed governments in several provinces. In 1939, on the outbreak of war, the Congress withdrew its ministers from provincial governments and gave supreme command to Mr. Gandhi, who started another civil disobedience

movement against the war effort. This was confined to individuals; but twenty-five thousand Congress leaders took part in it. In 1942 the Congress rejected the proposal of Sir Stafford Cripps brought out by the War Cabinet to enable negotiations to be carried on with the Indian political parties. In August 1942 the Quit India Campaign was begun and resulted in widespread disorders over most of India. In 1942 Mr. Gandhi had declared that communal unity could come only with removal of "the third party", that is, British rule. Writing in the "Harijan" in June 1942 Mr. Gandhi said: "I claim to be amongst the oldest lovers of Hindu-Muslim unity and I remain one even today. I have been asking myself why every whole-hearted attempt made by all, including myself, to reach unity has failed, which failed so completely that I have entirely fallen from grace and am described by some Muslim papers as the greatest enemy of Islam in India. I have come to the reluctant conclusion that the two communities will come together almost immediately after British power comes to a final end in India. If independence is the immediate goal of Congress and the Muslim League then, without needing to come to any terms at all, all will fight together to be free from bondage. When the bondage is done with, not merely the two organisations but all parties will find it to their interest to come together and make the fullest use of the liberty to evolve a national government suited to the genius of India."

This version was not shared by Muslim India due to past experience reflected by the anti Muslim policy of congress.

During this time Muslims kept completely aloof from the disturbances and violence ceased in the spring of 1943. In 1944 Mr. Gandhi addressed Quaid-i-Azam Muhammad Ali Jinnah, the leader of the Muslim League on the need for communal unity, and in September, 1945 there was an interim agreement which allowed the formation of a national government at the centre with representatives upon it of the Indian National Congress and the Muslim League. This national government was still in power up to August 1947, when the transfer of sovereignty from Britain to India and Pakistan was effected. Such is an account of the development of political agitation and consciousness from the point of view of the Indian National Congress, but the appeal of this was almost entirely to Hindus. Muslims were little affected by the particular resolutions passed from time to time. Which according to the Muslim version fulfilled the aspirations of the Hindu majority resulting in their domination over Muslim majority areas placing their existence in a perilous conditions. Owing to the fact, however, that the Hindus

in Sind were mostly concentrated in the towns and engaged in trade and commerce, Mr. Gandhi's propaganda had quite soon a very appreciable effect upon them. Most of the political agitation which ensued in Sind from 1919 onwards was due to the activities of political agitators and propagandists in the Hindu community, and it was during this period that feeling between Hindus and Muslims in Sind gradually became more tense. In fact, political agitation in Sind from 1920 onwards was largely concentrated in the towns. Outside the towns the population was almost wholly Muslim and took no interest in Mr. Gandhi's propaganda.

The Muslims in India as a whole had been very backward in interesting themselves in politics, but in 1906 they began to realise that some action was necessary, in view of what was happening in the India National Congress. In 1906, therefore, the All India Muslim League was formed. In 1916 it became sufficiently strong to enter into agreement with the Indian National Congress in the Lucknow Pact. With the Montagu Chelmsford Reforms Muslims became more and more politically-minded and began to aspire to a greater share in the control of the administration and government posts. In 1928 an All Party Muslim Conference attempted to organise Muslims into an influential body more effective than the League, and in 1934 an attempt was made to consolidate the community by concealing the split with the Muslim League. But in 1935 the Muslim bodies converged into a powerful organisation of Muslims on the eve of the first elections to the provincial legislatures under the Government of India Act. In 1940 at Lahore the Muslim League adopted a resolution demanding the partition of the country between Hindu and Muslim India. In 1941 the creed was changed into a demand for secession. The League became more powerful in 1941. Whereas the Congress categorically withheld its co-operation from the war, the Muslim League abstained from taking any such attitude.

Muslim individual members were in favour wholeheartedly of aiding in the prosecution of the war and this the League tacitly permitted. In 1939 the Muslim League passed a most important resolution which read: "While Muslim India stands against exploitation of the people of India, and has repeatedly declared in favour of a free India, it is equally opposed to domination by the Hindu majority over the Muslim, Christian and other minorities and a vassalisation of Muslim India, it is irrevocably opposed to any federal objective which must necessarily result in a majority of community rule under the guise of democracy and parliamentary system of government. Such a constitution is totally unsuited to the genius of the peoples of the country, which is composed of various nationalities and does not constitute a national state. The Lahore resolution of 1940 set out the idea

of Pakistan. It announced: "It is resolved that it is the considered view of this session of the All-India Muslim League that no constitutional plan will be workable in this country or acceptable to the Muslims unless it is designed on the following basic principles, namely, that geographically contiguous units are demarcated into regions which should be so constituted with such territorial readjustments that may be necessary; that the areas in which the Muslims are numerically in the majority, as in the north-western and eastern zones of India, should be grouped to constitute independent states in which the constituent units shall be autonomous and sovereign and that adequate effective and mandatory safe-guards should be specifically provided in the constitution for minorities in the units and in the regions for the protection of their religious, cultural, economic, political, administrative and other rights and interests in consultation with them; and in other parts of India where the Muslims are in the minority adequate effective and mandatory safeguards shall be specifically provided in the constitution for them and other minorities for the protection of their religious, cultural, economic, political, administrative other rights and interests in consultation with them." The Cripps offer in 1942 gave Indian provinces the right to choose whether they would join any union, or stay out and form their own states.

The Cripps offer was rejected by the Muslim League for reasons which are important. The objection was "the Mussulmans, after twenty-five years of genuine efforts for the reconciliation of the two major communities and the bitter experience of the failure of such efforts, are convinced that it is neither just nor possible in the interests of peace and happiness with two peoples to compel them to constitute one Indian union composed of the two principal nations, Hindus and Muslims, which appears to the main object of His Majesty's Government, as adumbrated in the preamble of the draft declaration, the creation of more than one union being relegated only to the realm of remote possibility and is purely illusory. Further, in conclusion, the Committee wish to point out that the position of the Muslim League has been, and is, that unless the principle of Pakistan's scheme, as embodied in the Lahore resolution of March 1940, which is now the creed of the All-India Muslim League, is unequivocally accepted and the right of the Mussulmans to self-determination is conceded by means of a machinery which will reflect the true verdict of Muslim India, it is not possible for the Muslim League to accept any proposal or scheme regarding the future." At the Karachi session of the Muslim League in 1943, Quaid-i-Azam Muhammad Ali Jinnah, asserting that the Hindus were responsible for holding up the progress of the country asked; "Can we Mussulmans of India accept Akhand Hindustan Hindu raj over the entire sub-continent? Is it possible to expect Muslim India to agree to Akhand Hindustan and to Hindu

raj in the continent? This is their proposal. They have not given up their dream. On the other hand they talk of independence. Whose independence? I have repeatedly warned you that when they talk of independence they mean the independence of India and the slavery of Muslim India. If the Hindus, owing to their obsession or dream or cussedness, put obstruction in the path of freedom of both and insist upon the freedom of one and the slavery of the other, I ask you 'Who are responsible for holding up the progress of the country except the Hindus?' In April 1946, when the British Cabinet Mission was sojourning in Delhi, Quaid-i-Azam Muhammad Ali Jinnah convened an All-India Legislators' Convention attended by about three hundred and sixty members of the various provincial legislatures, including Sind's. The following resolution was unanimously adopted by the Convention: "Whereas in this vast sub-continent of India one hundred million Muslims are the adherents of a faith which regulates every department of their life...educational, social economic and political—whose code is not confined merely to spiritual doctrines, and tenets or rituals, and ceremonies and which stands in sharp contrast to the exclusive nature of Hindu dharma and philosophy, which has fostered and maintained for thousands of years a rigid caste system resulting in the degradation of sixty million human beings to the position of Unouchables, creation of unnatural barriers between man and man and superimposition of social and economic inequalities on a large body of the people of this country, which threatens to reduce the Muslims, Christians and other minorities to a state of irredeemable helots socially and economically, and whereas different historical backgrounds, traditions, cultures, social and economic orders of the Hindus and Muslims have made impossible the evolution of a single Indian nation inspired by common aspiration and ideals, and whereas after centuries they still remain two distinct major nations, this Convention of the Muslim League Legislatures of India—Central and Provincial—after careful consideration, hereby declares that the Muslim nation will never submit to any constitution for a united India and will never participate in any single constitution-making machinery set up for the purpose, and that any formula devised by the British Government for transferring power from the British to the peoples of India which does not conform to the following just equitable principles calculated to maintain internal peace and tranquility in the country will not contribute to the solution of the Indian problem: First, that the zones, comprising Bengal and Assam in the north-east, and the Punjab and the North-West Frontier Province, Sind and Baluchistan in the north-west of India, namely Pakistan zones, where the Muslims are a dominant majority, be constituted into a sovereign independent state and that an unequivocal undertaking be given to implement the establishment of Pakistan

without delay.” All the participants in the Convention took the pledge: “I do hereby solemnly declare my firm conviction that the safety and security and the salvation and destiny of the Muslim nation inhabiting the sub-continent of India lie only in the achievement of Pakistan, which is the one equitable, honourable and just solution, of the constitutional problem and which will bring peace, freedom and prosperity to the various nationalities and communities of this great sub-continent.”

This was the position which was firmly held and maintained in the arrangement which resulted in the creation of Pakistan as a sovereign state in the British Commonwealth on the 14th August 1947. A study of the policies of the Indian National Congress and the Muslim League as given above makes perfectly clear the manner in which the Muslim population of Sind became interested in politics and aware of a national consciousness which had previously been lacking. The Hindus had a long start and from 1919 had been according full support to all the propaganda, hartals, processions and acts of civil disobedience which had been promulgated by Mr. Gandhi's campaigns. The Muslims in Sind throughout took no part in these acts, and in developing their own political consciousness in Sind behaved with law-abiding correctness, gaining political experience through the functioning of the Legislative Council and the policies of the Government of Sind. When the peculiar political conditions of Sind are borne in mind, namely, that trade and commerce were almost the complete monopoly of the Hindu population, and that the Hindu population formed a majority in all the largest towns of Sind, and that since the days of the Gandhi propaganda campaigns these Hindus had been supporting the movement for the independence of India on the lines of Gandhi's ideas, it is not surprising that communal tension in Sind became serious during the last twenty years of British rule.

THE POST-BRITISH PERIOD (VII)

FROM THE PARTITION OF INDIA IN 1947 TO THE PRESENT DAY
(1958)

Writing the story of Sind's experience in the eleven years of its association with Pakistan is hardly work for the historian. It is something that would better be performed by a journalist or a chronicler of events. The historian must look at things through the species aeternitatis and such an attitude towards event is not possible for a person who is living in the midst of them. It takes years before the pattern which directs the flowing design can be drawn out and appreciated. Despite, however, the difficulty of continuing the history of Sind from 1947 to the present-day, some attempt may be made to show how Sind has fared in this strange new world which came to birth from the 14th August 1947.

In the political discussions of 1946/47 it had proved impossible to obtain agreement either on the Cabinet Mission Plan, or any other plan that could preserve the century-old unity of India. The British Prime Minister, Mr. C. R. Attlee, on June 3rd 1947, announced in the House of Commons that the British Government proposed to introduce legislation at once for the transfer of power that year on the basis of dominion status. The majority of the representatives of the provinces of Madras, Bombay, the United Provinces, Bihar, the Central Provinces, Assam, Orissa, and the North-West Frontier Province and the representative of Delhi, Ajmer-Merwara and Coorg had in the meantime been endeavouring to evolve a new constitution as invited to in the Cabinet Mission's plan. On the other hand, the Muslim League Party, including in it a majority of the representatives of Bengal, the Punjab and Sind and also the representatives of British Baluchistan, had decided not to participate in the Constituent Assembly. There was considerable dissatisfaction in the North-West Frontier Province, where owing to the weightage given to Hindus and Sikhs in 1935, the Congress had been able to get an uncertain majority, but it had visibly lost the support of vast majority of Muslim inhabitants.

On the 4th July, 1947, the Indian Independence Bill, which provided for the establishment of two independent dominions of India and Pakistan, was introduced in the House of Commons, and on July 18th 1947 it received as an Act the Royal Assent. Lord Mountbatten, who succeeded Lord Wavell as the last of the Viceroy was accepted by the Congress Party as Governor-General of the Dominion of India and Quaid-i-Azam Muhammad Ali Jinnah became the Governor-General of Pakistan. On the 14th August, 1947 the Union Jack, which flew on the public buildings of Sind for one hundred and four years, was pulled down. In its place there flew the green flag

with the white crescent which signified the new State of Pakistan. The future of Sind was, therefore, linked with Pakistan, to become soon an Islamic republic. When Pakistan was constituted, Sind remained an independent unit within the Federation of Pakistan; it had its own Governor and Legislative Council, only now it had become a provincial unit and returned members to the Central Constituent Assembly. The first Governor of Sind under the new constitutional arrangement was Mr. Ghulam Hussain Hidayatullah.

Sind had had its own Governor and Legislative Council from 1937 and the emergence of Pakistan. The Indian Independence in the matter of politics and in national sentiment, and had gained some experience in the working of democratic parliamentary institutions. The first Governor of Sind had been a Bombay civilian, Sir Lancelot Graham, who previous to his appointment as Governor had been for years the chief legal advisor to the Government of India in Dehli. During the war a notable governor was Sir Hugh Dow, who succeeded Sir Lancelot Graham. The writer of the article on Pakistan in the third edition of Everyman's Encyclopaedia says of Sind that it is noted for instability and faction, a view which may be substantiated by a perusal of the proceedings of the Sind Legislative Assembly during the ten years between 1937 and the emergence of Pakistan. The Indian Independence Act of 1947 became law on July 18th of that year. Thereafter momentous events succeeded each other in bewildering order. On August 8th Karachi became the capital of what was to be in a few days the new State of Pakistan. On August 11th Quaid-i-Azam Muhammad Ali Jinnah was elected President of the Pakistan Constituent Assembly. On August 17th the findings of the Boundary Commission, presided over by Lord Radcliffe, on the partition of Bengal and the Punjab, were announced. The award took away the Muslim majority district of Gurdaspur for India enabling her to have an access to the Jammu and Kashmir state populated overwhelmingly by the Muslims but ruled by one Hindu Maharaja. Publication of the Commission's findings precipitated an outbreak of violence, murder and bloodshed in Jammu and Kashmir states besides Punjab and other places. Vast numbers of panic-stricken fugitives were pouring east and west over the dividing line of the bisected Punjab. On October 22nd a rebellion broke out in Kashmir against the unpopular Dogra ruling house. On December 19th Lord Mountbatten, the first Governor-General of the new dominion of India, took the salute at the farewell parade of the last British troops to leave New Dehli. On December 24th fierce fighting broke out in Kashmir between Indian troops on the one side and the local insurgents and the invading Muslim frontier tribesmen on the other. The fighting was eventually slowed down to a stop on the

onset of wintry conditions in Kashmir. Early in 1949 the Kashmir problem was referred to the United Nations Security Council by the Prime Minister of India, Pandit Jawaharlal Nehru, and afterwards an armistice was arranged in Kashmir early in 1949, and an agreement was reached for the reception of a United Nations Commission to arrange a plebiscite under the American Admiral Nimitz as Chairman, whether Kashmir should belong to Pakistan or to India.

On September 11th, 1948 there died at Karachi Muhammad Ali Jinnah, founder of Pakistan on whom the grateful people of Pakistan had bestowed the title of Quaid-e-Azam. The Encyclopaedia Britannica Year Book for 1949 says: "The burden of troubles caused by partition fell heavily on his shoulders. There was the mass migration of Muslims into Pakistan and of Hindus and Sikhs out of it, the dispute with India over Junagadh, Kashmir and Hyderabad and the general responsibility for setting up an administration in two widely separated areas which had once been governed from New Delhi. Mr. Jinnah's health broke under the strain. He was succeeded by his chief Muslim League assistant, Khawaja Nazimuddin, who came from East Bengal." Sind was not affected directly by the dreadful disorders in the Punjab, but Sind as a frontier region with the new Union of India found itself involved in colossal problems consequent upon the mass immigration of destitute refugees over its borders. The immigration of refugees and the emigration of Hindus completely altered in a few months the conditions of Sind. Particularly vital to the running of the country under the new dispensation was the departure of the greater part of the Hindu population, for in Sind Hindus had provided most of the government officials, including almost all those holding higher appointments. Hindus were the mainstay of the trade and commerce of the country, and its sole bankers and financiers.

When Sind became a provincial unit in the federal state of Pakistan it lost to the centre its capital of Karachi as Punjab had lost Delhi to Government of India in 1911. The railway communication between Sind and India over the Jodhpur Bikanir railway line at Khokhrapar was now cut in an effort to stop the enormous numbers of refugees who were pouring over the desert of Sind on the east. Ill-feeling between Pakistan and India in those days was acute.

The refugee problem which Sind had to face was immense requiring skilled organisation for the provision of food, water, employment, education, hospitals and public health. Five years after the establishment of Pakistan, helpless refugees continued to pour over the Sind frontier at Khokhrapar.

What Sind has been doing for these and kindred problems of destitution is more fully described in the chapter of this gazetteer

dealing with development, rehabilitation and planning. Immense progress has been made in almost every department of official activity in which the Sind authorities are concerned. Other sections of this gazetteer will make clear what this means. Despite all these difficulties of a very arduous type, irrigation has been pressed on with commendable despatch. The existence of the great Sukkur Barrage has vastly increased the resources of the country. But the authorities, not content with this, have now added in 1954 a second barrage at Kotri, an account of which is in the chapter on Irrigation. This Barrage will add another million and a half acre to the amount of land cultivated annually on perennial irrigation, supplying water to an area that was not covered adequately by the Sukkur Barrage system. In addition to the Kotri Barrage, plans are well ahead for the construction of a third Barrage over the Indus at Gudu about fifty miles above Sukkur. The object of this Barrage is to bring perennial water to those areas of Upper Sind which have hitherto lain outside the scope of the Sukkur Barrage and of the existing efficient inundation canals. When in the course of a few years the Gudu Barrage is functioning fully and its services added to those of the Sukkur Barrage and the Kotri Barrage, Sind will display one of the greatest engineering and irrigational wonders of the world. When all subsidiary canals and these three Barrages are functioning more than nine and a half million acres of land in Sind will be under perennial irrigation. This is almost all the land that can be irrigated by flow irrigation in the country. Such areas as can not be reached by flow water from the hundreds of canals in existence present a problem that has not yet been faced, as the land untouched by irrigation is sandy, stony, salty or of such elevation that water would have to be pumped on to it, in order to bring the life-giving fluid upon which alone agriculture can flourish. The energy and initiative displayed in the construction of those three enormous irrigation works are due to a realisation on the part of the authorities that if Pakistan is to fill its place in the modern world, it needs industry, and that to support industry a large growth of population is necessary, and with a growth of population there will be an insistence upon an immense increase in the agricultural output of the country. For the achievement of this aim, Sind can afford the greatest assistance as the land now being brought under agriculture for the first time will provide a supply of food grains, like wheat and rice, for the sustenance of human beings, and a supply of cotton for the manufacture of cloth, to clothe them.

In 1953 the Government of Pakistan came to an arrangement with the states within its territory. The policy followed was more or less than on the lines on which the Union of India dealt with the Indian Princes. The matter has been well put by the writer on

"India" in the third edition of Everyman's Encyclopaedia: "The creation of Pakistan meant that somehow or other the ticklish problem of the abolition of paramountry had to be solved. Britain could not leave paramountcy to Pakistan and the Union of India as an inheritance". Pakistan like the Union of India had to solve the main problem in its own way. The writer in the encyclopaedia referred to say that realism demands the admission that the continuance of the states as strongholds of a picturesque mediaeval feudalism and despotism had become an anachronism that could not long have resisted the democratic forces germinating throughout Pakistan. The states simply had to conform to the general political pattern. As far as Sind was concerned the state affected was Khairpur, which geographically and linguistically forms a part of Sind, and indeed was separated from it only by political events in the time of Napier, who recognised Mir Murad Ali Khan Talpur as a ruler in virtue of his submission to the Britain regime. Napier allowed him to retain the territory and the powers which he had possessed as a ruling Mir.

The disappearance of Khairpur as an independent state has greatly simplified the administration of the Sind Area, and enabled complicated questions relating to irrigation and land settlement to be dealt with on a common basis of principle and agreement, a state of affairs that was not before easily realised.

One Unit. After the establishment of Pakistan in August, 1947 it was felt that it would be administratively beneficial if the different provinces in the Western Zone are united into one single province known as West Pakistan. The reasons were partly economic. It was found that some of the provinces namely, North-West Frontier Province and Baluchistan, would not be able to maintain their administrations with their own meagre revenues and would need financial aid for running their administration. So the integration of various units in Western Zone was suggested by Sir Archibold Rowlands, who was invited to advise on the financial arrangements in the new country. Even apart from the financial side, West Pakistan is one geographical region depending for its economic prosperity on the Indus and its tributaries. At the time of Partition numerous administrative units existed in the area, but there was no rational basis for these units and they were the outcome of the accidents of history. Sind was conquered by the British, when the nearest British territory was the distant province of Bombay, to which it was joined. After the construction of North-Western Railway, which had its outlet at Karachi, there was a proposal to join Sind to the Punjab, but it was opposed by powerful Bombay interests. The former provinces of the Punjab and North-West Frontier Province constituted a single province from the British conquest of these areas in 1849 until they were separated in 1910

by Lord Curzon. The proposal to merge the administrative units in West Pakistan had a historical, geographical and political background, and offered obvious advantages. After the establishment of Pakistan, it was found that while East Pakistan was one single unit (Sylhet, which was formerly a part of Assam having almost invisibly merged into it) Western Pakistan had its administrations, including provinces and states. This created many problems, and a unification of the area was necessary even to evolve some equitable constitutional arrangement.

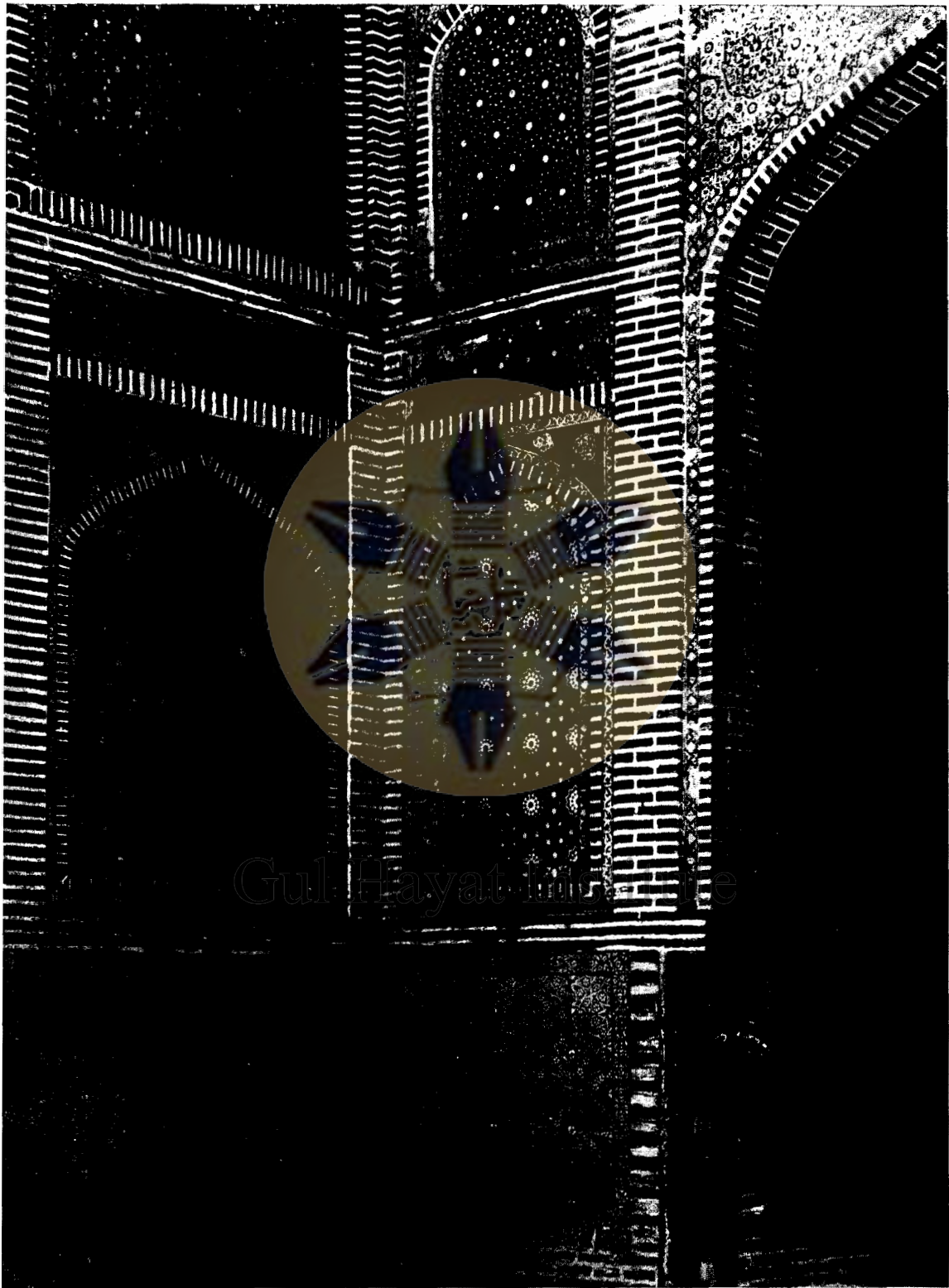
These factors were considered by the former provinces in the Western Zone and the Provincial Legislative Assemblies of North-West Frontier Province, Sind and the Punjab adopted resolutions on November, 25, November, 30 and December 11, 1954, respectively in support of the One-Unit plan. It was also thought advisable to deal with the question of the princely states at the time of this major administrative re-organization, and as a result of negotiations carried on with them, suitable resolutions were adopted by the Legislative Council of Khairpur State, Municipal Committee of Quetta and the Shahi Jirga of Baluchistan, and the Council of Rulers of Baluchistan State Union. The Bahawalpur Legislative Assembly was the first to pass a resolution recommending the unification of West Pakistan. Accordingly the Governor-General of Pakistan promulgated an order on December 17, 1954, establishing a Council for the administration of West Pakistan, which was composed of the representatives of various provinces and states. This Council for Administration was to investigate, discuss and make recommendation upon matters relating to the constitution of West Pakistan as a single administrative unit, and in particular with regard to the formation of a common Secretariat for West Pakistan, the organization of various departments functioning under the Secretariat, the integration of existing Provincial and State cadres of services and other matters incidental to the constitution of West Pakistan as a single administrative unit and the co-ordination of the administrative policy and actions to that end. The various committees of the Council of Administration of West Pakistan submitted their report in February, 1955 to the Government and terms for re-organization of administrative set-up were recommended.

On September 15, 1955 the Constituent Assembly of Pakistan passed a resolution in favour of integrating various provinces and states of western zone into a single province of West Pakistan comprising of former area of Punjab, Sind, North-West Frontier Province (including states and tribal areas) Baluchistan State Union (including states) and Bahawalpur and Khairpur States. The new province came into existence on October, 14, 1955.

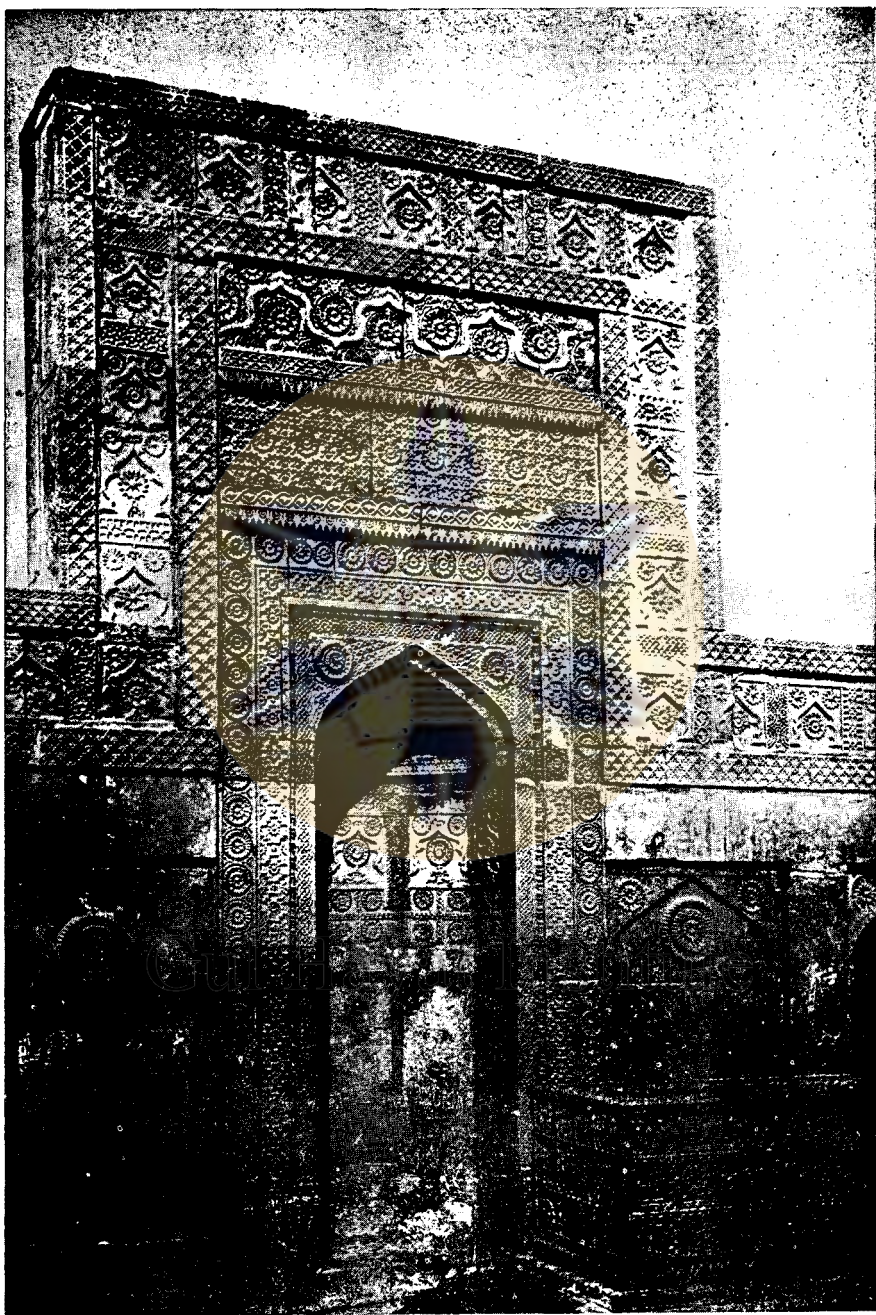
In the new set-up 12 Divisions and 52 Districts headed by Divisional Commissioners and Deputy Commissioners respecti-

vely were created. Karachi also became a part of the West Pakistan Province and was made into a full-fledged Division. While the entire area in West Pakistan has become an administrative unit, under one Governor and with a single Legislature, there has been a complete overhaul of the administrative machinery, with large-scale delegation of powers to the divisions. In the present set-up the Commissioner is the pivot of the new administration and is in general supervisory charge of the administration in his Division. He is the final appellate authority in revenue cases except where on a point of law a second appeal lies with the Board of Revenue. The Commissioner is the Chairman of the Divisional Council. A district as in the past, remains the basic unit of administration and the Deputy Commissioner is the administrative head of the District. He is the Chairman of the District Council which includes District Officers representing various government departments serving in the district and representatives of Local Bodies. In order to have a common policy and a uniform standard of justice in matters of land revenue administration and land tenure the highest court of appeal in revenue cases is the Board of Revenue. The Board of Revenue also functions as the chief revenue authority exercising supervisory control over revenue officers and subordinate revenue courts in the province. The existing revenue laws in force in the various provinces and states are being unified to be made into one revenue law. A common Secretariat for West Pakistan with its headquarter at Lahore was created under one Chief Secretary.

There is a single High Court of Judicature in the whole province to ensure uniform standard of justice. The High Court has its seat at Lahore but it has permanent benches at Peshawar and Karachi. There is also one Public Service Commission in the entire Province to deal with service matters of the entire Province,



Shah Jahan's Mosque at Thatta (Showing interior Tile work).



Mehrab—Tomb of Isa Khan Tarkhan, Thatta.



Arms of Mir Nasir Khan Talpur.

CHAPTER VII
POPULATION

Gul Hayat Institute



Gul Hayat Institute

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CHAPTER VII

POPULATION.

The Census of 1951 showed that the people of Sind region (inclusive of Khairpur) numbered 4,928,057 having increased from 4,404,908 in the preceding ten years. The percentage of variation in the population during the last fifty years is shown in the table which follows:—

Population.
Main
Features.

	Percentage of variation in population.					Percentage of net variation 1901 to 1951.	Absolute density per sq. mile*.					
	1901 to 1911	1911 to 1921	1921 to 1931	1931 to 1941	1941 to 1951		1901	1911	1921	1931	1941	1951
Ex-Sind and former Khairpur State	8.4	—9.1	18.1	15.5	11.9	50.5	58	63	37	68	78	87
Sind region	8.2	—8.8	13.2	14.3	12.4	49.8	61	66	60	71	18	91
Former Khairpur State.	12.3	13.6	17.6	34.6	4.5	60.3	33	37	32	38	50	53

The comments of Mr. Slade, the Census Commissioner for Pakistan in 1951, on the variations of population in Sind region during the period from 1901 to 1951 are that with the exception of the 1911-21 decade in which the influenza epidemic of 1918 and 1919 caused heavy mortality in former Sind this region has shown a fairly steady rate of growth during the last fifty years. After the loss of 9 per cent. in population in 1911-21, Sind recorded a great increase in the following decade when it gained 18 per cent. This steep rise is believed to have been mainly due to the influx of labour employed in the construction of the Sukkur Barrage most of the people having come from outside the region. In the 1931 decade Sind region increased its population by 14 per cent. and in 1941 and 1951 by 12 per cent. The irrigation projects can be expected to cause growths of this order to be maintained and probably in the coming decade.

Divided by sex the population showed 2,709,260 males and 2,218,479 females. The reason for the disparity between the male and female populations has been the subject of much speculation by Census Superintendents and Census Commissioners. The phenomenon is a familiar one in most parts of Pakistan but it cannot be said that any fully satisfactory explanation of the disparity has yet been reached. The two tables which follow show the population of males and females in thousands for the urban and rural areas respectively and the percentage of males and females in the urban and rural population respectively.

	Area. Sq. miles.	Population.		Urban.		Rural.		Per Sq. mile.
		Male.	Female.	Male.	Female.	Male.	Female.	
Ex-Sind and Khairpur	56,447	2,709	2,219	387	313	2,322	1,906	87
Sind region	50,397	2,532	2,077	375	303	2,157	1,773	91
Former Khairpur State	6,050	177	142	13	9	165	133	56

*The above figures do not include Karachi and Kutch area.

Percentage of males and females in urban and rural population.

	Sex.	Total Population.	Urban Population.	Rural Population
*Former Sind and Khairpur	Male	54.9	55.3	54.9
	Female	45.1	44.7	45.1
Sind region	Male	54.9	55.3	54.9
	Female	45.1	44.7	45.1
Former Khairpur State	Male	55.5	57.0	55.4
	Female	44.5	43.0	44.6

Proportion
of
Sexes.
Accuracy of
Statistics.

Commenting on this demographic phenomenon the Provincial Superintendent of Census, Sind, in 1951, Mr. Gul Hassan M.I. Abbassi says that he thinks there has been no serious failure to enumerate young girls but it is also true that in Sind as well as in Khairpur there are certain families in which the custom prevails of keeping all females from infancy to old age concealed from all persons except those who according to Muslim law are within the prohibited degrees of consanguinity. These families may have concealed some of their females from the enumeration but the number of such families is in every district very limited. "I feel therefore" says Mr. Abbassi "on the whole that whatever inaccuracy there is it cannot be of serious significance as far as the total enumeration by sex is concerned." Mr. Slade, the Commissioner of Census for Pakistan in 1951, speaking on this matter says "The persistence of this disproportion in all censuses and in all localities suggests that the excess is indeed a reality. On the whole, therefore, there is a tendency to under-enumerate females but it does not account for the whole disparity, and is probably less in the 1951 Census than it has been before. In the use of sex ratio figures as a safe basis for comparison with the past, when the tendencies were undoubtedly present and perhaps on a higher scale, one must look to other reasons for the main cause of the disparity. Apart from the question of the under-enumeration of women a number of factors probably contribute to the disparity. Immigration on a scale which has produced a similar excess of males in some other countries during the early stages of their development cannot be the underlying factor, though it undoubtedly contributes to regional variations. One cause of the lack of balance between the sexes might be that more male births than female are occurring over the years. This is difficult to confirm in the absence of complete and reliable information on births classified as to sex. Although birth registration figures of the sub-continent in the past years have generally shown an excess of male births, it is believed that the proportion of female births which was not registered may have been somewhat higher than male births, the births of daughters being more likely to be ignored in this respect. It is of interest that in the 1951 Census of Pakistan male infants reported under one year of age numbered 104 for every 100 females of the same age. In Sind and Baluchistan region the sex ratios are the same, namely, 1,220 and 1,215 males respectively

*The Statistics do not include Karachi and Kutch area

per 1,000 females. In the Punjab and North-West Frontier regions the ratios are 1,152 and 1,120 males per 1,000 females respectively. These ratios differ very widely from those of most countries in the world, although in several Muslim countries there are small deficits of females, for example Jordan has 1,154, Algeria 1,018 and Turkey 1,011 males per 1,000 females. Elsewhere it is more usual to find a deficit of males. U.S.A. has 988 males per 1,000 females and England only 934.

Divided by religion the population in 1951 consisted of 4,457,951 Muslims, 141,387 caste Hindus, 323,120 Scheduled Castes and 2,884 persons of other religions. Briefly we may say that nine-tenths of the people of Sind and Khairpur region are Muslims, 3 per cent. are caste Hindus and 7 per cent. are Scheduled Castes. The number of Christians, Zoroastrians, Jews and others is negligible. The following statement shows the remarkable disparity in the percentage of Muslims and Hindus in the two Censuses of 1941 and 1951.

Religion

	Muslims.		Caste Hindus.		Scheduled Castes.		Others.	
	Variation.	Percent.	Variation.	Percent.	Variation.	Percent.	Variation.	Percent.
Sind region	11,49,687	38.3	-7,22,348	-84.3	1,05,140	48.9	25,666	-90.6
Former Khairpur State	55,115	21.7	-38,754	-84.2	1,247	-28.7	1,493	87.

The statement shows a remarkable increase in Muslims and decrease in Hindus occasioned by the large scale exodus of Hindus and influx of Muslim Muhajirs as the result of the Partition of India in 1947. In Sind region the Percentage of Muslims has increased from 73.2 to 90.1 and that of Hindus has decreased from 20.9 to 2.9, the percentage of Scheduled Castes which was 5.2 in 1942 has risen to 6.9, the Percentage of other religions has gone down from 0.7 to 0.1 chiefly due to the migration of the Sikh population, and many Christians are reported to have left the region. Except Thar-Parkar district, which is 61.8 per cent Muslim, and the Hyderabad district, which is 91 per cent. Muslim, all districts are over 95 percent. Muslim. While Muslims have increased by 38.3 percent., the Hindu population has gone down by 84.3 percent. A large increase of 60 percent in Muslims has been recorded in the Hyderabad district which shows a decrease of 95 per cent, in Hindu population. Thar Parkar shows an increase of 54.5 per cent. in Muslims and nearly the same percentage of decrease, 54.6, in Hindus. Nawatshah has lost 95.1 percent of the Hindu population and has gained 50.4 percent, of the Muslim population. Larkana and Dadu have each lost 92 per cent, of Hindu population and gained only 18 and 25 percent, respectively of Muslim population. Scheduled Castes have increased by about 49.0 percent. A large increase of 66 percent, in them is recorded in Hyderabad district and 63 in Tharparkar district. The Census of

* The above Statistics do not include Karachi and Cutch area.

1951 recorded, amongst other religions, 670 Buddhists, 1,953 Christians, 28 Parsees and 12 of miscellaneous, mostly Sikhs. The comparative figures in the 1941 Census were for Buddhists nil, for Christians 2,632, for Parsees 117 and for miscellaneous religions, mostly Sikhs, 25,580.

The chapter on "Race, Caste and Tribe" in this Gazetteer volume has dealt in some detail with the main aspects of racial and tribal distribution in Sind region. The remarks in the 1907 Gazetteer are on the whole accurate up to the time of 1947, when the partition of India occurred and Pakistan was formed. Up to that time it was correct to say that the most important Musulman races, tribes or castes were Samma, Baluch, so-called Arabs, Muhana, Sumra Jat, Brahui, Pathan and unspecified Sindhis. Baluchis were few in Tharparkar; but were distributed generally elsewhere Brahuis were most numerous in Karachi, Jacobabad and Shikarpur. Muhana and Jats are mostly confined to central and southern Sind areas and are most numerous in the Delta. Samma and Sumra were gathered chiefly in the fertile central districts. Arabs and Pathans were resident in Hyderabad, Sukkur and Shikarpur. The chief Hindu castes were the Vania, including all Lohana whether Amil or Bania and Bhatia, Dheds, Bhils, Kolis, Rajputs. Brahmans were an insignificant number. The Vania and Brahmans were generally distributed; but Rajputs, Dheds and Kolis and other low caste Hindus were found generally in Thar Parkar and the adjoining parts of the Hyderabad district.

Racial Elements.

The mixed nature of the population of Sind region should be evident enough from what has been said on Archaeology and History in previous chapters of this Gazetteer. Of the population today, apart from the great change brought about by the influx of Muslim refugees from India, called Muhajirs, and the flight of the vast Hindu caste population, it is possible to say that three main elements in the Sind region population can be separated with some distinctness; these are the Rajputs, the Baluchis and the Sindhis proper, including in the last term Jats and Muhana. The Rajputs appear to have been the predominant race of the Hindu kingdom which Muhammad-bin-Qasim subjugated in 711 A.D. They have never ceased to infiltrate into the region from the east. Whether the Sind Rajputs are purely of Aryan stock and descendants of the Kschatrya, a warrior caste of ancient Hindustan, may perhaps be doubted, though it is tolerably certain that primarily there is some strain of the pure Aryan stock in them. The Rajput tribes which were in the country when the Arabs invaded it became Muslim centuries ago, but the more recent immigrants, such as the Sodha, are Hindu still. The Baluchis, who form the second element, were the ruling race at the time of the British conquest, and for centuries before it had invaded the former province constantly from the west. Between these two lies the third element, the sons of soil, who remained and toiled and suffered while the East and West contended for dominion over them.

In them we may recognise the descendants of the ancient Hindu peasantry, or of the Scythian hordes who overran the country from the first century before the Christian era, or of these and other elements inextricably blended. They are all Muslim now. Perhaps we should class with these the Lohana, for that class was certainly in the country when the Arabs came; but none knows whether the present Lohana of Sind region, are partly the posterity of such of them as contrived to evade proselytisation, or are all later immigrants from the Punjab region. Besides these three chief elements there are others plainly distinguishable, low caste Hindus and aboriginals from the east, of whom Kolis, Dheds and Bhils are the chief; tribes and families, which priding themselves on descent from the Arab conqueror, have nursed their genealogies and kept themselves distinct; Afghans and Mughals, who came in the train of some conquerors, and remained; and many more. To these elements has now been added heterogeneous mixing of people displaced from India and seeking refuge in Sind region of West Pakistan.

The extent to which the population has been varied by this influx of foreigners can be gathered from some of the statistics recorded in this Gazetteer relating to the effect of the irruption of the Muhajirs into all forms of Sind region life. It is probably correct to say that not even in the turbulent days of the Arab conquest, or in the wild confusions of the Delhi Sultanate and its inefficient suzerainty over Sind region has there been as great a disturbance of the indigenous population of former Sind as occurred in 1947 and subsequent years with the displacement of huge populations throughout Indo-Pakistan sub-continent caused by the political and economic effects of partition. Of the total population 4,925,342 of Sind region including Khairpur 4,244,913 or 86.2 per cent were enumerated in the 1951 Census as born therein, 4,164,244 or 84.6 per cent. were born in the district of enumeration and the remaining 80,699, or 1.6 per cent., in other districts of Sind region. Hyderabad district received the largest number of internal immigrants with 18,605 people born in other districts. Next to Hyderabad, Nawabshah had 17,234 persons born in other districts. Tharparkar district received 11,771 people born in other districts. In the remaining districts the migration of people between the districts was very small and needs no comment. As a rule migration was between adjoining districts. 119,240 persons born in Baluchistan area and other regions of Pakistan were enumerated in Sind and Khairpur region. They represent 2.4 per cent. of the total population of Sind and Khairpur region, among them the largest number 45,668 from the Punjab region and 41,232 from former Baluchistan, both of which adjoin Sind region. There has been a regular flow of people especially from the two adjoining regions of Baluchistan and the Punjab, into Sind region since the Sukkur Barrage came into

operation. Persons coming from other areas of Pakistan have more or less settled permanently in Sind region. There are however, nomadic tribes from Baluchistan region as also from, the former North-West Frontier Province which visit Sind region generally during the cold weather. They work mostly as labourers, and a few of them live on trade. 571,117 persons or 11.6 per cent. of the total population enumerated as Pakistanis in Sind and Khairpur region were born in India or in the disputed states. Over 1 lakh of persons come from each of the provinces of the Punjab (Indian side) Uttar Pradesh and Rajputana states. The following table shows the extent of inter-regional migration* in Sind region:—

Other regions	Born in Sind region enumerated in other region.	Born in other regions Censused in Sind region.	
		Number.	Per cent of population of Sind.
Punjab and Bahawalpur region	7,270	45,658	0.93
Baluchistan region	2,251	41,232	0.84
N.W.F. region	978	9,337	0.19
Karachi	14,565	9,066	0.18
East Pakistan	171	250	0.01
Disputed States of Junagarh and Manavadar, Hyderabad State and Kashmir	..	13,657	0.28
Total	25,235	1,19,210	2.43

The distribution in Sind and Khairpur region according to the 1951 Census of persons born in India is shown in the following statement.

Province of Birth	Number of Persons.	Percentage of Total Population of Sind region.
Ajmer	26,005	.53
Bombay	8,799	.18
Delhi	15,259	.31
Punjab (India)	1,65,655	3.36
Punjab States and Agencies	33,921	.68
Madhya Pradesh (C.P. and Bihar).	11,496	.25
Uttar Pradesh (U.P.)	1,17,273	2.38
Bombay State	20,556	.41
Rajputana States and Agencies	1,38,406	2.83
Other	20,069	.4

*The figures do not include statistics relating to Cutch. Editors.

The total number of Muhajirs returned in Sind region including Khairpur in the 1951 Census was 550, 291, which is 11.7 per cent. of the total population. The Muhajirs account for nearly all the 5.57 lakhs of persons who were born in India. The total number of non-Pakistanis enumerated in Sind and Khairpur region was 2,715 of whom 2,288 were Afghan Pawindas and 344 were Indians, leaving only 83 nationals of other countries. While Sind region was a part of Bombay Presidency up to 1936, the Census tables of 1931 do not show the birth places of its population separately from the Bombay Presidency. Before the 1941 Census Sind region had become a separate province, and therefore a separate census unit, but the tabulation was not fully completed and the birth place table prepared showed the districts only for person born in the former province, in the rest of sub-continent and other countries of the world, Karachi city having in 1947 been separated from Sind region. In 1941 2,08,000 people, or about 5 per cent., of the total population of Sind region were born elsewhere in the Indo-Pakistan sub-continent. There has been an increase of only 1.3 per cent. in the home-born population, but the element of the population born elsewhere in the sub-continent has increased by nearly 217 per cent. This is due to the exodus of Hindus, a large number of whom were born in Sind region and the influx of Muhajirs. This important transfer of population is the outstanding feature of the population movement since 1931. As the most important transfer and change in population took place after 1947, that is in the decennial period between the 1941 and the 1951 Censuses, it is necessary to show the variation in birth place between 1941 and 1951. This is given in the statement below:

*Districts.	Total Population			Born in Sind region			Born in India			Born in other Countries of World.		
	Year.			Year.			Year.			Year.		
	Variation Per cent.			Variation Per cent.			Variation Per cent.			Variation Per cent.		
	1941	1951		1941	1951		1941	1951		1941	1951	
Sind region including	44,04,908	49,25,342	11.8	41,88,853	42,44,913	1.3	2,13,545	6,76,670	216.9	2,510	3,759	49.8
Khairpur	40,99,121	46,05,934	12.4	38,88,610	39,44,302	1.4	2,08,001	6,58,146	216.4	2,510	3,486	38.9
Sind region	3,89,380	4,16,673	7.0	3,82,459	3,87,388	1.3	29,614	29,074	339.6	307	211	-31.2
Dadu	7,58,748	8,92,296	17.6	7,05,761	6,69,496	5.4	52,883	2,22,524	320.6	99	275	177.8
Hyderabad	5,84,178	6,86,743	17.6	5,44,434	5,63,069	3.4	32,243	1,22,563	212.6	501	1,021	103.8
Nawabshah	5,11,208	5,01,538	1.9	4,93,228	4,62,116	3.3	17,179	1,39,120	127.7	801	302	-62.3
Larkana	6,92,556	7,31,842	5.7	6,72,293	6,24,706	9.1	19,712	1,07,013	442.9	551	125	-77.3
Sukkur	5,81,004	7,30,121	25.7	5,16,993	6,17,222	18.4	63,909	1,17,118	83.2	100	781	681.0
TharParkar	2,78,013	3,01,863	8.6	2,78,013	2,92,552	5.3	8,456	12,069	42.7	151	141	6.7
Thatta	3,04,034	3,44,858	13.4	2,95,427	3,32,648	12.6	5,544	18,524	234.1	..	273	..
Jacobabad	3,05,787	3,19,408	4.4	3,00,243	3,06,611	0.12	..	..	..	..	..	..
Khairpur	..	..	..	..	..	..	..	..	..	..	..	..

*The figures given in table do not include Karachi and Cutch areas. Editors.

To conclude, Sind and Khairpur region have already received some comment in this chapter. The statement below shows for each decennial period since 1901 the percentage of males and females in the population of Sind and Khairpur region separately. *

Year	*FORMER SIND		KHAIRPUR	
	Male	Female.	Male.	Female
1901.. ..	54.8	45.2	54.6	45.4
1911.. ..	55.0	45.0	54.3	45.7
1921.. ..	55.7	44.3	55.5	44.5
1931.. ..	55.9	44.1	55.0	45.0
1941.. ..	54.8	45.2	55.0	45.0
1951.. ..	54.9	45.1	55.5	44.5

Persons interested in examining further this question of the disparity of the sexes in the Sind and Khairpur region population can be referred to pages 79 and 80 of the 1951 Census Report for former Sind and Khairpur.

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Population.
Marital
Statistics.

The Census of 1901 showed that 51 per cent. of the people of Sind region were unmarried, the census of males being 57 and that of females 43. Celibacy is not esteemed in Sind region more than in the rest of Pakistan. In 1951 the age groups have been rearranged in a manner showing the proportion of married, widowed and divorced in the chief age groups for which these statistics are important. These age groups were fixed in the 1951 Census as from 10 to 29 years, from 30 to 39 years, from 40 to 49 years, and from 50 to 59 years. The reasons why these particular groups have been so arranged have been explained in the Census of Pakistan in the light of the circumstances found prevailing in 1951.

*The figures in table above do not include the statistics about Karachi and Cutch area. Editors.

Marital status per 10,000 of the population of each sex in age groups as shown below for Sind and Khairpur region.
(Figures for Females are in lower lines).

Age	Sex.	Married			Widowed and Divorced.		
		Muslims.	Hindus.	Scheduled Castes.	Muslims.	Hindus.	Scheduled Castes.
10—29 ...	M	36.9	33.6	30.8	1.8	1.3	1.3
	F	65.4	66.2	63.4	1.8	2.0	2.0
30—39 ..	M	79.4	75.2	86.0	6.4	6.5	6.5
	F	90.8	85.8	88.5	7.6	13.6	11.1
40—49 ..	M	82.8	73.3	86.5	10.0	14.7	9.1
	F	79.0	67.9	72.1	20.1	31.7	27.6
50—59 ..	M	81.1	66.5	83.4	15.0	25.5	14.9
	F	57.9	45.4	51.3	41.2	54.3	48.3

The Provincial Superintendent of Census Sind in 1951 remarks "The total number of married males is 1,083,632 and that of married females 1,052,597, the excess of married males is therefore 31,035 the ratio being 50.7 to 59.3. In a predominantly Muslim region like former Sind the number of married females should be greater than that of married males, because a Muslim can under Muslim Law have more than one wife, and many men actually do have two wives or more. It appears, however, that many people coming to Sind region from other areas have not brought their families here, and for that reason, and it was so even in 1931, the number of Muslim married males exceeds the number of the married females. The total proportion of divorced persons in the total population is 0.06 per cent., whereas the proportion of widowed is about 7 per cent., and the female element in it exceeds the male in all age groups up to 30. The difference is very notable and is doubtless caused partly by the higher age of marriage among men and partly by the frequency with which widowed men remarry. There is no bar to the remarriage of widows, but it is not so common as in the case of widowers. Comparing figures for the different religious communities it has been noticed that widowed persons represent a much higher proportion amongst the caste Hindus due to this prohibition of widow remarriage. As mentioned above, the rate of divorce is

very low. In fact, divorce is resorted to only when the differences between the parties have created so wide a gulf that the united efforts of responsible persons of the neighbourhood cannot bridge it.

Population.
Age structure.

The age structure of the population of Sind and Khairpur region is discussed in the following paragraphs. Mr. Slade, the Census Commissioner for Pakistan in 1951 remarks that the inaccuracy of age returns has been discussed in many past census reports. The basic difficulty is that most of the people have no clear ideas at all about their ages, and the enumerators are faced in nearly every case with the necessity of making a rough guess from the appearance of the persons. It can be imagined how unreliable the information becomes when it is a matter, as it is regarding most women and many other members of the family, of making an estimate by cross-examining the head of family without seeing the persons at all. The difficulties of estimating the census statistics of age were very much the same in 1951 as found at the time of the 1931 Census and as explained by Dr. H.T. Sorley the Superintendent of Census for the Bombay Presidency of which Sind was then a part. He mentions the most reliable grouping of the population would be in age groups 0 to 20, 20 to 50 and 50 onwards. The 1951 figures have been subjected to careful investigation and they are thought to be fairly reliable in groups of ten years except for the group 10 to 29. The following table shows the structure of the Sind region population as regards age for males and females for the age groups 0 to 9, 10 to 29, 30 to 39, 40 to 49, 50 to 59, and 60 and over.

Age and Marital Status.
Sind and Khairpur region. (000's)

MUSLIMS

Age Group.	Total.	Males.	Females.	Married.	
				Males.	Females.
Total ..	4925	2707	2218	1084	1053
0—9	1422	735	686	1	2
10—29	1792	942	800	307	523
30—39	672	376	296	299	268
40—49	473	274	199	227	156
50—59	282	168	114	135	65
60 and over ..	284	162	122	114	38

Sind and Khairpur region

(000's)

HINDUS

Age Group.	Total	Males.	Females.	Married.	
				Males.	Females.
Total	141	79	62	30	28
0—9	38	20	19	..	..
10—29	52	30	22	10	15
30—39	18	10	8	8	7
40—49	15	9	6	6	4
50—59	9	5	4	4	2
60 and over	9	5	4	3	1

Sind and Khairpur region.

(000's)

SCHEDULED CASTES

Age Group.	Total.	Males.	Females.	Married.	
				Males.	Females.
Total	323	174	150	65	64
0—9	108	55	53	..	..
10—29	116	64	52	20	33
30—39	44	24	20	21	18
40—49	27	15	12	13	9
50—59	14	8	6	6	3
60 and over	14	8	6	6	2

Changes in the age structure of the population of Sind and Khairpur region since 1901 are displayed in the statement below.

(Figures for Females are in lower lines).

Age Group (Years).		Sex	Census Years ¹					
1901 to 1941	1951		1901	1911	1921	1931	1941	1951
All Ages ..		M	100 ²	100	100	100	100	100
		F	100	100	100	100	100	100
0—10 ..	0—9	M	28.8	27.6	27.0	27.0	32.7	27.0
		F	31.0	30.1	29.9	30.0	35.4	30.8
10—40 ..	10—39	M	51.6	52.8	53.4	55.6	51.2	50.7
		F	48.4	50.3	50.3	53.5	49.4	49.5
40—60 ..	40—59	M	15.5	15.6	15.4	14.4	13.6	16.3
		F	15.7	15.0	14.9	13.2	12.3	14.2
	60 and over	M	4.2	4.0	4.3	3.1	2.5	5.9
		F	4.9	4.6	4.8	3.3	2.9	5.6

The provincial Superintendent of Census remarks on the 1951 statistics that the figures are naturally affected by the exchange of population. The 1941 figures are based on a 2 per cent. sample count but although this should not significantly affect the accuracy of these percentages the figures seem to be out of line, particularly the children. Previous to 1921 the pattern seems steady. The 1931 figures probably reflect the influx of people of working age consequent upon the irrigation schemes, and in turn this influx may possibly also be a factor in the higher figure for children in 1941. In 1951 the proportion of the people over forty seemed to be getting back to the level of the pre-Barrage period although the 1951 figures for the proportion of persons over sixty are not so far above anything previously reported.

Notes ¹. Figures from 1901 to 1941 are inclusive of the population of Karachi.

². Details may not always total 100 per cent. owing to rounding.

Population
Karachi.

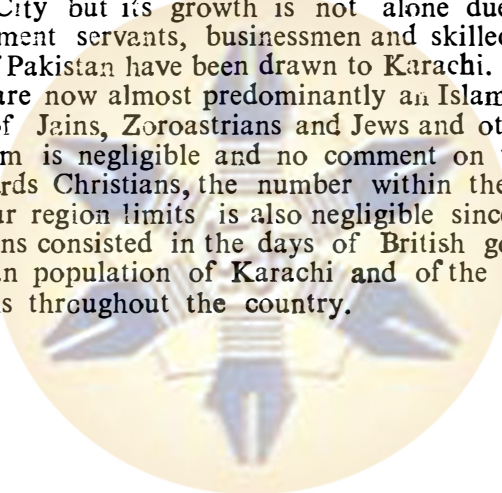
Until 1947 Karachi city was an integral part of former Sind. In August 1947 on the emergence of Pakistan Karachi became the Federal Capital and the area of the Federal Capital was detached from Sind region. Some small reference is necessary at this stage as regards population problems connected with the former Federal Capital area. From a population of 1.4 lakhs in 1901 the Karachi area rose to over 4.4 lakhs in 1941 but increased tremendously when it became the national capital for some years. The enumerators reported over 11 lakhs of population in 1951 and even this is believed to be a slight under-statement. The population of Karachi now consists of refugees to the extent of more than 50 per cent. The rehabilitation of this element, their welfare and housing have a most important bearing on the future rate of growth. The city, however, is developing very rapidly and, although it cannot expect to increase at the rate of the past decade, there would appear to be every prospect of a continuing rise in population. Karachi has been the lodestar which has attracted the large majority of those refugees from India who are accustomed to town life. Of the total population of the Karachi area in 1951, 55 per cent. consisted of Muhajirs as compared with 11.2 per cent. of Muhajirs in Sind and the Khairpur region. This means that in 1951 more than one person in every two was a refugee and in Sind region the refugees were slightly more than one in every ten of the population. The following statement shows the growth of Karachi city and port from 1881 to 1951.

Census year.					Total.	Population.	
						Increase.	
						Persons.	Percent.
1881	..	..	..	..	68,332	..	..
1891	..	..	..	..	98,195	29,863	43.7
1901	..	..	..	..	1,08,644	10,449	10.6
1911	..	..	..	..	1,40,511	31,867	29.3
1921	..	..	..	..	2,01,691	61,180	43.5
1931	..	..	..	..	2,47,791	46,100	22.9
1941	..	..	..	..	3,59,492	1,11,701	45.1
1951	..	..	..	..	9,05,781	5,46,289	152.0
1961	..	..	..	..			

Population figures are for the Municipal Corporation Area.

This statement shows the progressive rise in the population of Karachi city including its cantonments since the Census of 1881. The variation in the last decade is phenomenal. It is particularly impressive when one realises that previous to the partition of India

the majority of the population of the city consisted of Hindus and Sikhs most of whom have migrated to India. This serious loss of population was, however, far more than replaced by the vast stream of incoming Muslims who in the 1951 Census classed themselves as Muhajirs (refugees) from India. This tremendous and rapid development has almost all occurred since 1947. It is not only due to the unique status Karachi has acquired as the capital city of the new state but also to its position as the port of West Pakistan and the principal centre of commerce. Karachi now is in the same rank as far as numbers of inhabitants are concerned as Athens, Birmingham, Glasgow, Milan, Melbourne and Montreal. Muhajirs from India now account for more than half the total population of the City but its growth is not alone due to their arrival. Government servants, businessmen and skilled workers from all parts of Pakistan have been drawn to Karachi. Sind and Khairpur region are now almost predominantly an Islamic tract. The population of Jains, Zoroastrians and Jews and other recent sects of Hinduism is negligible and no comment on these is necessary. As regards Christians, the number within the present Sind and Khairpur region limits is also negligible since the majority of Christians consisted in the days of British government of the Christian population of Karachi and of the British troops on garrisons throughout the country.



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TYPES OF PEOPLE



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Palla Fisherman on Indus near Bakkur.

CHAPTER VIII
RACE, TRIBE AND CASTE

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RACE, TRIBE AND CASTE

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CHAPTER VIII

RACE, TRIBE AND CASTE

The ethnology of Sind region is in as parlous a case as is the ^{Ethnology.} scientific study of the culture of the palaeolithic and neolithic ages. Very little work has been done, and up to date no authoritative book has yet appeared dealing satisfactorily with the origin of the people who now inhabit the lower Indus valley. The Indo-Pakistan sub-continent has from the beginning of time constituted a receiving ground for all manners of diverse cultures. Rawlinson in his "Cultural History of India" says that many attempts have been made to present a reasonable conspectus of Indian ethnology, but these have hitherto been hampered by an incomplete knowledge of the distribution of physical characteristics and even more by a tendency to confuse ethnic type and language. Linguistic terms, such as Dravidian and Aryan, have been applied to ethnic units. "Recently however," he says, "a German anthropologist, Baron E. Eickstedt has evolved a coherent theory of Indian anthropology, which there is reason to believe will with due addition as knowledge advances, stand the test of future research. In von Eickstedt's view there are no Aryans and Dravidians, though there are Aryan and Dravidian languages and cultural usages. Von Eickstedt's theory as set out in Rawlinson's book does not appear to be very helpful as regards the ethnic composition of the people of the Lower Indus valley in West Pakistan.

No specimens of the earliest forms of man have been found in the sub-continent, and it is impossible to say with any certainty who the original inhabitants of sub-continent were. Some recent advance has been made in dealing with this complicated question of anthropology in the Census Report of 1931, especially Volume I, India Part III, Ethnographical, which deals with the racial affinities of the peoples of the Indo-Pak. sub-continent. This report was carried out by Dr. B.S. Guha, Anthropologist to the Zoological Survey of India. Dr. Guha is in full agreement with the view that the problems of ethnography should be settled by the physical characteristics of various human types and not by the association of these types, or any mixed portions of them, with the speakers of different languages. It may be accepted that to talk of Dravidian and Aryan as racial types is logically and physically unsound. What is needed is to discover the racial characteristics of the people who talked and talk the languages which we now call Dravidian and Aryan. The work of Sir Herbert Risley is now out-of-date since Risley's classification of racial types did not fully recognise the need for the separation of a racial type from a language.

In Guha's Report on the Ethnography of India in Volume I of the Census of India, 1931, seven main racial types recognised in the population of sub-continent today are set out. Of these seven types only four may be said to have much relevance as regards the people who inhabited, and inhabit now, the Lower Indus valley in West Pakistan. These four types are described by Guha as: (1) A short statured, long headed element with high cranial vault but faintly marked supra-orbital ridges and broad, short but orthognathous face, with medium lips,

prominent nose, long, but with alae moderately spread out, giving a mesorrhine index, (2) A brachycephalic element of medium stature, and flattened occiput but having high head and not infrequently receding forehead, face short and orthognathous but somewhat broader, nose long and highly pitched but quite often arched and convex, (3) A long-headed strain with comparatively lower and longer head and tall stature, possessing a long face and prominent narrow long nose; (4) A short, long and moderately high-headed strain with often strongly marked brow ridges, broad short face, mouth slightly inclined forwards and small flat nose with alae extended, hair wavy to curly, skin dark chocolate approaching black. In the absence of a fully satisfactory terminology the present writer will use the terms "Dravidian" and "Aryan" for want of anything equally succinct and distinctive, but readers should bear in mind that these terms "Dravidian" and "Aryan" must be taken in dealing with ethnology in this section, as meaning the racial tribes of the speakers of Dravidian and Aryan languages. In the case of Dravidian it is clear that more than one distinct racial type is included. An attempt will be made to clarify the position which the varying racial types occupy in the general ethnological scheme.

The only scientific work in anthropology and craniology that the present writer has seen on the population of the Lower Sind Valley is that which is mentioned in Dr. Guha's Census Report of 1931 referred to above. There it is stated: the measurements taken by Sewell and Roy on the Sindhi Mussalmans and Brahuīs comprise 100 adult men of each group. The Co-efficients of Racial Likeness between the two is 7.57 0.18. In individual characters, the chief differences lie in stature, the auricular height, interorbital breadth, orbito-nasal breadth, nasal length, length-breadth index, breadth height index with 6.77, 36.54, 29.08, 15.31, 11.98, 10.03 and 37.34 as the values of respectively, showing that the Sindhis in comparison with the Brahuīs are slightly taller, rounder headed and possess a longer nose. The vault of the head, however, is higher and the inter-orbital breadth greater among the Brahuīs. These figures while indicating a racial association between the two, also suggest the substratum of a long and high-skulled race with broader nose among the Brahuīs. It has been suggested by close observe is that the Brahuīs have absorbed the blood of the intruding Baluch so much that at the present day they are hardly distinguishable from the latter. While this may be true in general, the statistical analysis reveals the persistence of the primitive dolichocephalic strain among them in a greater degree than in their Sindhi neighbours. The values of the Crude and Reduced C.R.L's between the Sindhis and the Sikhs are 49.81, 0.25 and 57.78 0.29 respectively. Comparison of individual characters shows that nasal index, bizygomatic breadth, bigonal diameter with 284.89, 141.57, 59.52, 38.96, 29, 30, 41.9 and 21.71 respectively. As shown by these figures, the Sindhis compared with the Sikhs are broader headed, shorter in stature, have a more round face and broader nose and are certainly racially divergent. It would seem, therefore, that the racial alignment of the

Sikhs and Punjabis is with the people living north and west rather than with those of the Lower Indus valley who disclose a different racial strain. The conclusion which Guha reaches is that in Sind region an intruding brachycephalic race seems to have superimposed on the original long-headed population from South Baluchistan.

Sind region has, of course, shared in the great racial migrations of prehistoric times. Of these there seem to be three, or perhaps four, main instances. The first, we may call the pre-Dravidian, the second, the proto-Mediterranean, the third, the Dravidian and fourth, the migration of an Alpine strain. Comment on these may now briefly be made. The early home of the modern types of man has not yet been satisfactorily located, but it may provisionally be placed along what is now the Sahara, Mesopotamia and Arabia. Men and vegetation flourish easily in temperate or tropical zones, and it is believed in the glacial epoch of the pleistocene period a belt of cyclonic storm lay over these zones. The Sahara, now a vast desert, was then a grassland. Peake and Fleure believe that the early type of man spread from these regions. "Among the people who retained the unlengthened head with the ancient prominent jaws and with spirally-curved hair, we may mention the Andamanese. If we construct the distribution of land and water with the coast line, at the present 100 fathoms or thereabout Sumatra, Java, Borneo and Palawan would form a hooked peninsula attached to the sub-continent and this will help us, to understand their spread to these regions. Whether they spread from the supposed cradle of modern man or not, we start with a dim perception that several millennia before recorded history there was a dark negroid race of low culture characterised by a physical type of very short stature, low forehead and flat face and nose". This race may be termed the pre-Dravidian. An important crisis occurred in the early history of man when the northern ice-cap over Europe retreated and the climatic belts that lay over the Sahara followed it. The grasslands over the Sahara began to dry up. This resulted in the migration of the animals to more favoured regions and of the hunters who followed and hunted them.

Mr. C.S. Venkatachar, from whose account of the migration of castes and tribes into the central part of the sub-continent I have relied in these last remarks, says that these hunters largely lived on small game shot with bows and arrows and supplemented their diet by digging up edible roots with hoes and flint. These people we may designate as proto-Mediterranean. These proto-Mediterraneans constitute the first of the racial strata in the central parts of the sub-continent and it is these whom we call the Munda tribe. After the migration of the proto-Mediterraneans another racial drift occurred at a later time. Climatic changes and the pressure of population, probably in the area which Peake and Fleure call "The Fertile Crescent", advanced with the Mediterranean race, the Dravida-speaking

people, who passed through Baluchistan region and the Indus valley, down Gujarat, into the Deccan and the southern part of India. This Mediterranean race possessed a higher culture, and its migration led to a more pronounced, advanced civilisation, and the Dravidian civilisation of the south is believed to have drifted further east. To the north-west in the Indus valley a distinct and elaborate culture was also thriving. Venkatachar says that whether this culture had a provincial form in the Gangetic valley and whether Dravidian man was responsible for it are questions for which an answer must still be awaited. If the origin of the god now called Shiva or Mahadeva. can be traced to the Indus Valley civilisation, it is worth noticing that the Bhils, Savaras and Korkus all trace their origin to Mahadeva. As Venkatachar remarks "it is possible that this tradition may be a Hindu idea latterly acquired."

The fourth racial drift into the Indo-Pakistan sub-continent in prehistoric times is that of the Alpine race. Along the west coast of the Indo-Pakistan sub-continent there is a concentration of what is known as the brachycephalic Alpine type. Where the descendants of these four racial types exist in the sub-continent today it is possible to study their physical features by examination of the skulls, and this has been done to some extent in various areas by craniologists. The picture is, however, far from complete. With the next great racial invasion of the sub-continent, that of the Indo-Europeans, and when the racial origin of the many types of human beings who have entered Sind region during the course of recorded history are borne in mind, it will be realised how composite and complex is the racial composition of the Sindhi people. The latest great mixing occurred after the partition of India in 1947, which has pronouncedly affected the demographic condition of Sind region. The partition of India was followed immediately by the departure from Sind region of almost all the trading and administrative Hindu classes, and in place of them there poured into Sind region vast numbers of persons uprooted as a result of the communal disorders from their homes in Upper India, Western India, Central India, and Kathiawar. These were refugees of Muslim faith who, fearing for their lives and security, fled from India, where their families had lived for generations. They poured over the frontiers of Sind region in an endeavour to establish themselves in a new country and amongst strangers. The result of this vast incursion was that these Muslim refugees now form about one-ninth of the total population of Sind region and they have greatly disturbed the balance as between Sindhis and non-Sindhis in the urban and rural areas of former Sind alike.

Composite
Population

Whether the composite character of the Sind region population is any more complicated than that of the modern Germans, Italians,

Spaniards, French and Britons may be doubtful, but the composition is certainly complicated enough. This will be clear, if from the history of former Sind attention is devoted to the many different races and types of men who have entered the country in the days of recorded history. The present writer in Appendix F of the Bombay Presidency Census Volume for 1931 has suggested a method by which the racial history of Sind region could be investigated and understood. He there proposed an ethnological and anthropological examination. The following system he considered desirable. The people can be divided into : (1) The Pukka Sindhi tribes of Sammat, Jat, or Rajput origin, (2) others comprising (a) Baluchis, Brahuīs and Pathans (b) Serais (c) other miscellaneous entrants, Muslim and Hindu. Sind history reveals several clearly defined periods: (1) The early, up to the Arab conquest, (2) from the Arab conquest to the Muslim invasion of Upper India, (3) the Middle Ages from the Muslim invasion of Upper India till the fall of the Sammo power, (4) the Middle Ages from the fall of the Sammo power to the establishment of the Mughal Empire, (5) the modern period from the establishment of the Mughal Empire till the British occupation of Sind and (6) the modern period from the British occupation till the establishment of Pakistan and the present day. Each of these periods has distinct characteristics which can be traced more or less clearly in the demographic character of the Sind region population. Muslim entrants into Sind area can be classed under the following categories: (a) connected with the hierarchy of Islam, (b) connected with the governing power as rulers, soldiers, attendants, usurpers, (c) traders, (d) agriculturists, shepherds and nomadic pastorals.

This Gazetteer includes a list of the chief races and tribes as disclosed in the Census of 1931, the last census in which a serious attempt was made to identify and enumerate the many brands of people who classify themselves under individual tribal, caste and occupational names. As however even this list, lengthy as it is, would not exhaust the subject, the present writer has added some notes upon many important sections of the Sindhi population, these sections being chosen because they throw much light upon the probable formation of the Sindhi peoples as they exist today. Speaking generally, we may say that the nature of the Sindhi population can be described with tolerable accuracy if account is taken of the Sammat tribes, the Jats, the Rajputs, the Serais, the Baluchis, the Brahuīs, besides Afghans and Mughals and the labouring and wandering Hindu tribes found today mostly in the Thar Parkar district. The present writer has, therefore, decided to give some description of those Sindhis who go by the names of Sumro, Sammo, Brahui, Jat, Muhano, Sayid, Bhil, Lohano, Khwajo. No attempt has been made to follow the procedure adopted in the 1907 edition of this Gazetteer, in which a large number of tribes

and castes, Muslim and Hindu, has been enumerated and described in considerable detail. If up-to-date information on these matters is required today, such information will be obtainable only by special enquiry and research, which sooner or later ought to be undertaken.

**Census
Tabulation.**

Anthropologists and sociologists today will probably deplore the fact that the example of the 1931 Census was not followed in 1941 and in 1951. In 1941 the census was held during a critical stage of the Second World War. It coincided with a strong political demand from the educated classes of the sub-continent that the census should no longer take account of tribe and caste, as enumerating the peoples of the sub-continent in this way was proclaimed as being against the principle of unification, which was at that time a most powerful political influence. The 1951 census, which was held under the auspices of the Government of Pakistan and took place in a period of great stress and strain caused by the refugee problem, took no account of tribe, race and caste. The anthropologist and sociologist today is, therefore, deprived of an instrument which might have been of supreme value in appraising the ethnological trends in Sind region. In the 1941 census, however, there was a small sampling dealing with tribe, race and caste. It is due to this that the Census Superintendent, Mr. H. T. Lambrick, was able to contribute material of great sociological interest about the Brahui population of former Sind. Apart from work done in connection with the Census, during the British period the only authoritative account of the Muslim races found in Sind, Baluchistan regions of West Pakistan and Afghanistan was written by Sheikh Sadik Ali Sher Ali Ansari, Deputy Collector in former Sind. This work is of great value and contains much information unobtainable elsewhere. But this report was written before 1901, so it is now sixty years old. Though a reprint of it was brought out in 1954 by the former Sind Government, much of it will have to be corrected in the light of the knowledge of two subsequent generations. Some important extracts from Sadik Ali's report are, however, valuable today and have been incorporated in this edition of the Sind Gazetteer.

The general description of the Sindhi population given in the 1907 edition of this Gazetteer is still accurate enough, except for the fact that since 1947 the population has undergone a somewhat drastic alteration with the precipitate flight of the various 4 classes of Hindus into the territory of the Indian Union and the emigration of vast numbers of Muslims from that India. Subject to this qualification, however, the description in the 1907 edition may be accepted as true today. "Perhaps", says Mr. Aitken, "no part of the sub-continent has a population of such mixed origin as Sind. But three of the principal elements may be separated with some distinctness; these are the

Rajputs, the Baluchis and the Sindhis proper, including in that last term Jats and Muhanos. The Rajputs appear to have been the predominant race of the Hindu kingdom which Muhammad Bin Qasim subjugated in 711 A.D. and they have never ceased to invade the province from the east. The tribes of them which were in the country when the Arabs invaded it, for example, the Samma and the Sumra, became Mussulmans centuries ago, but the more recent immigrants, such as the Sodhas, are Hindu still. The Baluchis, who form the second element, were the ruling race at the time of the British conquest and for centuries before it had invaded the province constantly from the west. Between these two lies the third element, the sons of the soil, who remained and toiled and suffered while the East and the West contended for dominion over them. In them we may recognise the descendants of the ancient Hindu peasantry, or of the Scythian hordes who over ran the country from the first century before the Christian era, or of those and other elements inextricably blended. They are all Mussulmans now. Perhaps we should class with these the Lohana, for that caste was certainly in the country when the Arabs came, but no-one knows whether the present Lohana of Sind region are partly the posterity of such of them as contrived to evade proselytisation, or are all later immigrants from the Punjab region. Besides these three chief elements there are others plainly distinguishable, low caste Hindus and aboriginals from the east, of whom Kolis, Dheds and Bhils are the chief, tribes and families, which priding themselves on descent from the Arab conquerors, have nursed their genealogies and kept themselves distinct; Afghans and Mughals, who came in the train of some conqueror, and remained; and many more.

Something must be said about these Rajput clans. Venkatachar in his work referred to earlier in this chapter said that there was a difference of opinion as to the rise of the various Rajput clans and a certain amount of fiction still persists that the Rajputs are descended from the ancient Kshatriyas. It requires some stretch of imagination and credulity, he states, to believe that the Rajputs of Malwa are descended from the Kshatriya kings of Avanti of the early Buddhistic times, ignoring all the kaleidoscopic changes of more than two millennia. The generally accepted historical view is that some of the renowned clans, like the Parihars, Solankis, Chauhans and Parmaras, have a foreign origin. In the early history of the sub-continent three definite irruptions of the foreign barbarians have now been recognised. They are, in order, of the Sakas, the Yuechi or the Kushans, and the Huns. It is not known definitely how far the first two have contributed to the composition of the Rajput clans, but the Huns together with the allied swarms decidedly have. The aristocratic sections among the foreigners became the ruling clans, while the others in course of time became the cultivating classes, like the Jat or the Gujar. In former Sind the most likely thing

Rajputs.

is that the Rajput elements became thoroughly mixed with the autochthonous inhabitants of the Indus valley, and belonged not to the ruling classes but to the lower social levels of the Rajput clans.

Sammo

The Samma as the chief of Sammat tribes deserve first mention. The Samma are believed to be a branch of the Yadar Rajputs and have been settled in Sind region from time immemorial. Sammanagar on the Indus was their ancient capital and is probably represented by the modern Sehwan. When they seized the supreme authority in the fourteenth century, their first capital was Samui, a few miles north of Thatta. The Lakha and the Sahatas mentioned in the Chachnama are Sammo tribes. With the exception of a few Sahtas, the Samma are now all Muslims. In the 1901 Census the number of Samma recorded was 732,897, in 1931 the number enumerated was 101,501, which is completely fantastic as an under-enumeration. Since then there has been no other enumeration. Sadik Ali says that the Samma claim a large proportion of the Muslim population of former Sind and are almost entirely engaged in agricultural pursuits. About their origin different accounts are given. The author of "Tuhfatulkiram" says that the Samma are either descended from Abu Lahab or Abu Jahal, uncle of the Holy Prophet, or from Jamshed, a well known king of Persia, or descended from Noah through Shem by some other line. In the "Tarikh-i-Firishta", Sammo is said to be a descendant of Jamshed. These genealogies are, however, fanciful, and Sadik Ali believes that the answers are that the Samma were Hindus connected with the Hindu rulers of former Sind before its conquest by the Muslims. He thinks little of popular account which says that the real expression is "Samunhon" (face to face) meaning that their ancestors came face to face with Islam and embraced it, and so on that account "Samunhon" proves that Samma, the founder of the tribe, was not a descendant of one of the uncles of the Holy Prophet and did not come to Sind region during the time of the Arabs when they invaded and conquered it. Sadik Ali devotes more than twenty pages to his account of the Samma, of which he gives the names of no fewer than seven hundred and ninety-eight separate sub-divisions, many of them the names borne by large numbers of Sindhi cultivators today. The 1931 Bombay Presidency Census says that the name "Samma" is used specifically (1) for a particular tribe and its paros; (2) the dynasty from that tribe which once governed Lower Sind and built Samui and Thatta, (3) that nowadays it is used chiefly in the form Sammat, comprising seventy-five per cent. of the specifically Sindhi tribes, now known to have come from the former Punjab and be not of Baluch, or Arab, or Pathan origin. It is highly unlikely that all these were ever really sub-sections of the Sammo tribe. Some are clearly sections of

Rajput clans; probably the Samma too were of Rajput origin, or at least status, though perhaps not pure. Sammo tribes may be considered generally to have been the followers and supporters of the Sammo dynasty, and probably of equal status and similar origin. Even the Sumro are sometimes said to be Sammat. The Chachnama mentions Sammo, Jat, Lakho and Lohano as pre-Arab tribes in the Indus valley of nomadic and barbarous habits who were crushed by Chach, the Brahman King of Alor. At present the Samma, calling themselves such, are almost all in east and lower Sind region and also in Bahawalpur. They occur only sparingly in upper Sind tract.

Sumro

The "Tuhfatulkiram" says that the origin of Sumro is not known, but the Sumra were the children of the soil and were probably descended from Sind, the first inhabitant of the province who was a brother of Hind and son of Ham, third son of Noah. The genealogy given in the "Tuhfatulkiram" is fanciful. Another historian says that Sumro was the name of a descendant of Tamim Ansari, and became the ruler of former Sind in 583 A.H. The dynasty of Sumro rulers in former Sind is well-known and the dissensions and wars which took place between Dodo and Chanesar Sumro are sung at every festive meeting in Sind region. They had founded a line of small towns and hamlets extending over a distance of 25 kos from Shakha-pur a small village in Taluka Jati, to Rahimki Bazar and beyond that to Thar Parkar. The towns and hamlets were called Sumranjun Maryun, the storied houses of Sumra, which were all constructed of brick and stone. Heaps of stones and burnt bricks are still lying on their old sites. This line of towns extended along the border of the river Indus, the abandoned course of which is still in existence and is the only fertile strip of land running through a plain of salt-covered land. The government of the Sumra was overthrown by the Samma in 752 A.H. The majority of Sindhi carpenters, dyers, washermen and indigo-dyers are Sumra, according to Sadik Ali. The tribe has no separate branches like the Samma but all call themselves Sumra. Sadik Ali, however gives the names of forty-three separate septs. The 1907 edition of the Gazetteer says that the Sumra are a branch of the Parmara Rajputs, who appeared to have enjoyed more or less power in former Sind from the eighth to the middle of the Fourteenth century and towards the end of that period were independent rulers. Elliot conjectures that, before the early Sumra apostatised from their ancestral faith to Islam, they had intermediately adopted the tenets of the Karmatian heresy. They are now Sunni Muslims but the date of the conversion is not known. In 1901 the number of the Sumra was 102,753. This shows that they are a much less numerous community than the Samma who displaced them as rulers of Sind in Middle Ages. The 1931 Census of Indo-Pakistan sub-continent says that the Sumra in Bahawalpur are very often blacksmiths, carpenters,

boatmen and barbers. In Upper Sind region they are usually dyers or washermen, and this is true also of Sadiqabad and Bahawalpur so that Khatri is reckoned as Sumro or a paro of Sumra. The Sumro tribe is generally said to be Sammat. The Sumra are probably semi-Rajput if not wholly so.

Baluch. A tradition prevails among the Baluch tribes that they came from Aleppo through Baghdad along the border of the Persian Gulf to Mekran, whence they spread into the Indus valley. They say they were expelled by Yazid, the second Umayyid Khalifa (680-684 A.D.) and that they settled for a time in Kirman before proceeding to Mekran. The tradition is supported to some extent by the similarity between the names of Baluch tribes that settled in Sind and those borne by certain tribes in Syria at the present day. But it is futile to trace the Baluch to any single stock. The tribes and sub-tribes are of various and mixed origins. In his report on the Muslim tribes of Sind region Sadik Ali has enumerated the following as the chief Baluchi tribes namely the Rind, the Dombki, the Jakhrani, the Laghari, the Lashari, the Chandia, the Karmati, the Korai, the Jatoi, the Burdi, the Khosa, the Jamali, the Umrani, the Bugti, the Mari and the Mazari. After the Sammat tribes the Baluchis constitute the most important element in the population of Sind region today. In the 1941 Census the enumeration showed the number of Baluchis as 749,000, but it appears that the proportion of the Baluchi population in the total population of Sind region continues to grow. In 1941 the Baluchis totalled roughly 23 per cent. of the total Muslim population of the country. For the remarks which follow on the Baluchis in former Sind the present writer is indebted to the Census Report of 1941 by Mr. H. T. Lambrick. According to this the tribes which may be held to belong almost exclusively to Sind region are the Talpurs including Nizamani, Chandio, Buledhi and Karmati. Of these the Talpurs and Buledhis have for many years been split up into entirely independent sections. The Talpurs in the circumstances of their rule in former Sind have long abandoned the traditional Baluch tribal organisation, but this retains much of its vigour in each of the Buledhi sections under their respective chiefs. The Chandio and Karmati tribes on the other hand, have always recognised a single chief though the former are scattered throughout the region, the Tumandar is kept in touch with his tribe every where through their local Mukhadims. Generally speaking, however the Baluch tribes in Sind region have not retained an organisation, comparable with that still in force among their neighbours in Baluchistan region, in which each tribe has been in occupation of homogeneous tracts of land for centuries. Mr. Lambrick has noted a tendency for Baluch tribes in Sind region to lose their cohesion and for Mukhadims of sections to set up as independent sardars. This has been noted in respect of the Buledhi. Another

Instance is the Jamali tribe, which is very numerous and widely scattered in former Sind. This has one sardar in Dadu district and another in Nasirabad Tahsil in former Baluchistan, each claiming his predominant position while the Gabols have two sardars both living in the same place. The system of Phori, by which every tribesman contributes something for the benefit of his chief on occasions such as marriages or death ceremonies still followed in many tribes. Among many tribes the ancient custom of not allowing females to inherit land continued prior to the promulgation of Family Laws during the present regime. The provisions of the shariat in this behalf were sometimes nominally complied with by giving a female a share with the assurance that, she will make it over as an absolute gift to her brother or other male relative. The marriage rule among Baluchis continues to be a marriage as close in the family as possible outside the prohibited decrees. The ideal marriage is for a youth to marry his father's brother's daughter; failing first cousins he will turn to remoter relatives and in the last resort to a family of the same paro or clan. Marriage beyond the paro is almost unknown among families of equal status. In addition to this general endogamy, there is occasional hypergamy, that is a Baluch of position will often marry a Brahui or Sindhi woman, but the very poorest Baloch would not give a bride to a non-Baluch. The history of their race, both in Sind region and in the countries first occupied, affords many examples of the strictness of this rule. To prevent the continuance of blood feuds between families which have thus fallen out it was in the past customary for the Jirgas to recommend an exchange of marriageable girls between them, and in some cases when a marriageable girl was not available on one side it bound the family concerned to betrothe their next born girls to a boy of the other party. In these arrangements family, section and tribal responsibility was enforced.

The Baluchis are a brachycephalic race, and anthropologists should take into consideration the universal prevalence of the custom of aiding nature to produce the desired shape. A Baluch mother will let her baby spend much of the first six months, of its life, when the bones of the skull are still pliable flat on its back with the head resting on the hard ground, from which position the child is prevented from rolling over. The effect is to flatten the back of the head to an enormous, absurd degree, and by this means it is thought a broad forehead and wide spaced eyes, which are held in great esteem, will be produced. The great majority of Baluchis in Sind are Zamindars and Haris. Particular tribes or sub-tribes, however, depend more on their livestock than land; for example the Lunds of Dadu district ply camels for hire and the

Kapris, the Maris of Thar Parkar, graze sheep and goats. Most of the Baluchis located in the western hills and in the Kachhi under them, gain their livelihood from their flocks and herds rather than from land which in these tracts is unirrigated except for a minute portion watered by hill streams. The Baluchis who are dependent on flocks and herds for their living do not in general sell them, which is contrary to their traditions; though this custom is no longer observed by those in the vicinity of such places as Karachi. Many of the hill Baluchis eke out their livelihood by selling mats of pish (dwarf palm) and the women in many parts of Sind region weave falasis and camel trappings for sale. The Baluchis in former Sind have always been a warlike and turbulent race and from the Middle Ages a great part of the armies of the Sind rulers consisted of Baluchis.

The Bugtis are a trans-frontier hill tribe which gave great trouble to Napier at the time of the annexation of Sind. In 1847 a raiding party containing half the fighting men of the tribe was intercepted and almost annihilated by Lieutenant Merryweather, after which the chiefs surrendered and with about two thousand of their followers were settled in lands near Larkana. Many of these however returned to their hills where their chief still resides. The Buledhis who were settled mostly in the Upper Sind frontier region (Now Jacobabad District) were another tribe that gave great trouble in the early days of the British annexation of Sind. The Bugtis formerly infested the jungles of Burdika existing mainly by plunder and gave much trouble for some years, but under the management of General John Jacob they soon became orderly and peaceful. The Dombki was one of the most warlike of the trans-frontier tribes occupying lands in eastern Kachhi where their particular chief still resides. Most of them now are found in the Larkana, Sukkur and Hyderabad districts. The famous chief, Daria Khan, belonged to the Jakhrani tribe which gave Napier so much trouble. He was forgiven and granted a jagir, but for his part in the war of independence of 1857, was deported to Aden and died there. The Khosa were described by General John Jacob as plunderers, cultivators, soldiers or shepherds according to circumstances. They supported the Kalhora and so were out of favour at the time of the Talpur when many of them roamed over Thar Parkar and Kutch areas in the thirties. The Marri was a powerful predatory tribe which has its home in the Marri hills where its chief resides. The tribe appears to have grown out of mixed elements. The Talpur Mirs came of it. A large number of Marris settled in central Sind tract long ago, but they retained little connection with the original stock. The Chandia settled mostly in the Sukkur, Larkana and Hyderabad districts. This tribe was for many generation so influential in the country about

Shikarpur that the whole pargana was known as Chanduka. After the conquest of Sind the Chandio chief Wali Muhammad, was allowed to retain his jagirs over Ghaibidero, Mirzapur and Khari Ustilla measuring one and a half lakhs of acres, which were afterwards secured to his son Ghaibi Khan, and to his heirs by a sanad, subject to the British Government seeing fit and to the payment of a Nazrana exceeding Rs. 2000 on each succession.

According to the 1907 edition of this Gazetteer the Brahuīs are the most numerous race in former Baluchistan. To them the ruling families belong. They distinguish between themselves and Baluchis calling the latter Narui that is lowlander. Mason thinks that Brahui may be a corruption of “Ba-rohi” meaning literally “of the waste” so the two names may contrast with each other like “highlander” and “lowlander.” Other consider “Brahui” to be an eponym from “Braho” which is a common contraction for “Ibrahim”. There has been much speculation as to the origin of this strange tribe whose language, Brahuiki, has no affinity with Baluchki, being considered by the best authorities to belong to the Dravidian stock. The three largest of the Brahui tribes are by themselves classed as “Jadgal” which means “Jat”, while in Mekran Brahuīs are commonly called Kurd and their language Kurdi. They are Sunnis, but it is stated that they have no sayids, Pirs or mullas among them, and are much less bigoted than Baluchis. They do not differ from the latter notably in dress or customs, except that their women are particularly fond of indigo, a colour which Baluchis will not wear. The Baluchis look down upon them. Of their origin Sadik Ali says “Like the Afghans, Brahuīs also appear to be Beni-Israelites and shared the same fate as the ancestors of the Afghans during the reign of Nebuchadnezzar, the King of Babylon. About 600 B.C. they took refuge in the mountains of Baluchistan in which they still live, and were afterwards called Brahui because the name of their first ancestor was Brahim. In Sind and Baluchistan region “Ibrahim” is commonly pronounced “Brahim”, their first ancestor being nicknamed Biraho. His descendants were called Brahui which means descendants of Biraho. Another account says that they came from Halab (Aleppo) and settled in Baluchistan. Among them a man by name Mir Ibrahim Khan, being the headman, was made the chief. It appears that they had settled in Halab after the flight of their ancestors from Jerusalem, during the reign of Nebuchadnezzar, and were not original inhabitants of Arabia. The Brahui women all wear the gagha (gown) but there is one peculiarity which maintains a great distinction between the two tribes. The Brahui women are very fond of dark indigo coloured gowns which they wear constantly, whereas both sections of the Baluch tribes never use any cloth dyed in indigo, or of any other

black colour in Upper Sind and Baluchistan regions. Sadik Ali remarks "I have often noticed the similarity between the dress of Brahui women and that in pictures of Georgian girls, and from this similarity I have often been led to believe that the Brahuīs originally came from Georgia as their language not in the least coincides with the Afghan or any Baluch languages. The Brahuīs took refuge originally in two ranges of mountains called Serawan which means a range of mountains at the top and Jhalawan which means a range of mountains at the bottom. They have always been under the sway of two distinct chiefs.

The number of persons of Brahui race recorded in former Sind in 1941 was 82,326. But there is great difficulty in establishing a correct figure of the Brahui population, owing to the fact that they are nomadic in a peculiar way. The Brahuīs who have been enumerated in Sind region have always comprised a number of temporary migrants in addition to permanent settlers. There are three types of this immigration: periodic, semi-permanent and permanent; and the main difficulty arises over the enumeration of the periodic immigrants, since immigration usually takes place at a time when the census is held and the nature of the semi-permanent resident in former Sind difficult to determine, as it is seen that many Brahuīs who intend to stay only temporarily in Sind region eventually make their home there permanently. Mr. Lambrick says that it is in fact difficult for enumerators to elicit from these people, who are in general and suspicious, what their movements are likely to be, and, as they often remain in the same encampment for several months of the cold weather, enumerators must have succumbed to the temptation to record their details of the same period and in the same enumeration pads as the household population in the vicinity. Another difficulty that confronts enumerators is that more and more Brahuīs tend to become semi-permanent immigrants. They will stay in Sind for one hot weather, perhaps two or more, first intending to return to the hills when they have saved enough money, and then rather turning their thoughts to devoting it to buying land in Sind region. Such people still live in temporary shelters or tents, but they are no longer seasonal immigrants so it is very difficult to distinguish them from the latter.

At each decennial census since 1901 the Baluchistan region authorities have noticed with concern the growing tendency of their people, and particularly the Brahuīs, to

settle in Sind region, but so far the loss of Brahuīs from Baluchistan region to Sind region has not yet been clearly demonstrated in detail owing to the difficulties mentioned above. Mr. Lambrick thinks that the only satisfactory method of determining the extent to which migrants are settling in former Sind will be to station enumerators on the routes which they follow, namely, the Bolan, Mullah, Harbab and Phusi passes, for the months of October and November and again in March and April to count the number going down and the number coming up. The people of the different Brahuī tribes generally camp in separate places, or if settling together in former Sind they build separate villages. This applies also to sections and sub-sections of tribes. The inhabitants of a particular valley in Jhalawan if belonging to the same section, or sub-section, would probably journey and remain together while in Sind region. They usually travel complete with their tents, gidāns, beds, grindstones, cooking apparatus, spinning wheels and all household belongings on bullocks and donkeys. On these beasts of burden are also carried children, old and infirm members of the family, kids, lambs and puppies unable to keep up the march, and chickens. The Brahuīs almost always take their women and children on their migrations, but a few generally stay in their own country to look after those cattle which are not brought into Sind region and the crops which they leave to ripen. They camp either in their gidāns (blanket tents) or in shelters which they build out of brushwood or grass mats, remaining in each place for so long as the men can find work and moving on when it is finished.

Brahuiki is a Dravidian language, or the remains of a Dravidian language isolated in a sea of Pakistan-European tongues and this had led anthropologists to believe the Brahuīs represent either an original migration of a Mediterranean race into southern Baluchistan region and lower Sind area, or that they are the residue of the great Mediterranean invasion which produced the Indus Valley civilisation. It is quite certain that there has been close communication between the lower Sind valley and the country where the Brahuīs live, and that for thousands of years possibly there has been intermarriage between Brahuī and autochthonous Sindhi races. Dr. Guha in his anthropological enquiry printed in the 1931 volume of the Census of India has shown that the Sindhis in comparison with Brahuīs are slightly taller, rounder headed and possess a longer nose. The vault of the head; however, in the case of Sindhis is higher and the interorbital breadth greater than among the Brahuīs. These figures, while indicating a

racial association between the two, also suggest the sub-stratum among the Brahuīs of a long and high skulled race with broader nose. It has been suggested by close observers that the Brahuīs have absorbed the blood of the intruding Baluch so much that at the present they are hardly distinguishable from the latter. While this may be true in general, the general statistical analysis reveals the persistence of the primitive dolichocephalic strain among them in a greater degree than in their neighbour. The Brahuīs who are permanently settled in former Sind, are zamindars, cultivators, engaged in camel transport, blacksmiths and kalaigars, or labourers. The seasonable immigrants engage chiefly in levelling Sindhi zamindar's fields by means of keens for which they bring their oxen, working in rice-husking factories, harvesting, and other casual labour. They often establish regular relations with zamindars and employers of casual labour in particular localities and come for work there year after year. The women make and sell pish mats and also spin goats' hair and wool weave falasis, khurzins, for sale. In the neighbourhood of Karachi Brahuīs have long been well established at Mangho Pir, Malir, Darsana, Gharo and Landhi. Karachi's demand for garden produce and milk is ever on the increase and transport by motor lorry has by no means superseded the camel. The trade in pish (dwarf palm) between southern Jhalawan and Karachi also continues to flourish and its transport is almost exclusively carried on by Brahuīs. The increase in the number of Brahuīs in the Nawabshah and Thar Parkar is also notable. These districts are beyond the ordinary range of the seasonal immigration, and there can be little doubt but that the demand for harris, for factory labour and for camel transport occasioned by the development of the Barrage canals is attracting permanent Brahui settlers. There is already a nucleus of land-owning Brahuīs in the Nawabshah district, and in Shahdadtal Taluka of the Larkana district. Mr. Lambrick found that many Brahuīs had purchased small-holdings of Barrage land on a family basis and were considered to be efficient cultivators.

Sayids.

The Sayids are the heads of the hierarchy of Islam and in former Sind they are regarded with an enormously superstitious reverence. The 1907 edition of the Gazetteer says the term "sayid" means "chief" and is applied exclusively to the descendants of the holy Prophet's grand sons, Imam Hasan and Imam Husain. Sayids are, therefore either Hasani or Husaini. The Census of 1901 records 10,607 Hasani and 25,613 Husaini Sayids in Sind. When the heathen Mongols were devastating the Muslim kingdoms in central Asia, many pious and learned Sayids found refuge in Sind. Others followed later and settled in Sehwan, Bukkur or Thatta, whence their descendants spread being greatly favoured by most of the rulers, especially the Talpurs. Sadik Ali classifies the Sayids into the Quraishi-al-Hashimi, the Hasani Sayids and the Husaini Sayids. The Quraishi-al-Hashim means those

Quraish who were the descendants of Hashim, the grandfather of the Holy Prophet in the direct line. The descendants of Hashim are called "Quraishi-al-Hashimi" and all other descendants of Fihr are called "Quraish." The Quraishi-al-Hashimi are placed first as the Holy Prophet was descended from that line, and this tribe is considered by all Muslims in the world to be the noblest of the tribes. Branches of the Quraish-al-Hashimi as given by Sadik Ali are Sayid, Alawi, Bani Abbas, Jafari, Uqauli Kalhoro and Kalwars but the connection of the Kalhoro and the Kalwars with the direct Arab line is more than doubtful. Sadik Ali gives two branches of the Hasani Sayids in former Sind: (1) The Hasani, (2) The Jilani or Gilani. Gilan is a province in Persia and Jilani Sayids are so called as their great ancestor lived in the province of Gilan. The pirs of Ghotki in the Rohri area and of Ranipur in the former Khaipur State are Jilani Sayids. Sadik Ali enumerates the Husaini Sayids of Sind as follows: Husaini, Bukhari, Matiari, Lakiari, Rizawi, Shirzai, Shukrullahi, Mashadi, Mazindrani, Mirkhi, Urezi, Amirkhani, Shamsi, Khurasani, Musawi, Masumi, Astrabadi, Wajhuddin, Mushwani, Lodini, Taran and Kahiri. Of these Sayids the Bukhari claimed to have come from Bukhara in Asiatic Turkistan, the Matiari lived in Matiari, a village in the Hyderabad district; the Lakiari came from Arabia and lived in the mountains when they arrived in Sind, as "Lak" means a pass through the mountains, or else they settled in Laki in the Dadu district; they are also called Lakawi. The Rizawi are descended from Imam Musa Riza; the Shirizai came from Shiraz in Persia; the Mashadi from Mashad in Persia; where Imam Raza is buried; the Mazindrani came from Mazandran, a province in Persia; the Mirkhi and the Urezi came into Sind from Afghanistan; the Amirkhani came from Delhi to Thatta, the Shamsi are descended from Shah Shamusddin of Multan; the Khurasani from Khurasan in Persia. The pirs of Kingri are said to have come from Khurasan and so are called Khurasani; the Musawi are descended from Imam Musa Kazim: of Baghdad (Kazimain) the Astrabadi came from Astarabad a city on the Caspian Sea; the Taran claim to be descended from Imam Ali Riza; the Kahiri say they are the descendants of Imam Musa Kazim. The Sindhi tribes which claim to be the Quraishi are the Shaikh, Siddiqi, Tunia, Pirzada, Daudpota, Shujrah, Naich and Bhaya. The Shaikh Siddiqi call themselves such on account of their descent from Hazrat Abu-Bakar Siddiq, the first Khalifa. But Tunia, however, is Sindhi and belongs to the Sammo tribe. Daudpotra, to which tribe the ruling house at Bahawalpur belongs, generally follow the profession of weavers, and belong to the Sindhi Sammo tribe. The Shujrah, the Naich and the Bhaya all say that they are descended from the Arabs, but they are considered to be indigenous Sindhis.

The term Khojo is a corruption of "Khawaja" which means Khojo. "master or "superior person". The Khoja were originally a single

body, but about seventy years ago they split into two factions called the Panjaibhai, and the Pirai. The Panjaibhai faction is the more orthodox body, and look upon the Agha Khan as the representative of the Prophet, being his descendant through Hazrat Ismail Bi-Imam Jafar Sadiq or the incarnation of God Himself. The spiritual head of the Ismaili Sect is called the Agha Khan. The present Imam of the Community is Prince Karim Agha Khan. The Pirais, on the other hand consider the Agha Khan merely to be a pir or religious head of their community, and nothing more. The number of Pirai Khojas in Sind region is infinitesimal, practically the whole community in Sind region belonging to the sect of the Panjaibhai. The Khoja are descended from Lohana in the former Punjab, who embraced the Ismailian form of Shiasim in the fifteenth century, and were probably mixed with the refugees from Persia. The Pirais, profess a creed which approximates to Shia orthodoxy. They meet for prayers in a building called the Mumbur. They do not bestow their alms upon the Agha Khan, having abjured their allegiance to him or being ex-communicated. The Punjaibhais are followers of the Agha Khan as the vice-regent of the unrevealed Imam, to whom they pay their Zakat. Their headman is called a "Mukhi" and Persians well versed in their creed are known as "Bhagats." They offer their prayer in the Jamaikhana, or lodge. The Khoja wear or shave the beard as they choose and the Pirais generally prefer to retain it. Their moustache is not shaved. Early marriages are not regarded with approval. Sadik Ali, who quotes as his authority the communication made to him by leading members of the Panjaibhai Khoja in Karachi, states that the Khoja were originally Hindus belonging to Kashmiri Chak Hindus and the Bhatias, and they were converted about five hundred years ago by Sayid Sadraddin Shah, a Sufi in the former Punjab, who was held in great respect by the above classes of Hindus. Sadraddin Shah was not connected with the family of the Agha Khan the present religious head of the Khoja community by lineal descent, but is alleged to have been the disciple of his ancestor Shah Nizar. He is said to have gone to Persia and to have paid a visit to Shah Nizar, who was then a minor under the guardianship of Sayid Hasan Shah, and the twentieth in the line of successors from Hazrat Ali, the first Imam. The Khoja are, as a class, engaged in trade and commerce, in which they are very expert. Their services in this respect are of the utmost importance to the present-day Sind region, which after the partition of India, lost all its expert Hindu trading classes. In some places the Khoja are landowners and cultivate land. They pay one-eighth of the share of their profits to the Agha Khan because their ancestors had agreed to pay that share at the time of their conversion. The septs of Khoja belonging to the Panjaibhai sect in former Sind are the Mumnai, Pirwani and Tejani

The number of Khoja in Sind region is not known as, they have not been separately enumerated, but in the 1931 Census they were 5,196 males and 5,038 females a total of 10,234, of whom 8,434 are resident in Karachi.

Jat.

The word "Jat" which has been transliterated into English "Jat" really represents two distinct words in the Sindhi language the first is Jat with the soft Sindhi "t" Jat, and the other is "dayat" spelt with the soft English dental "t". The words are different in meaning, but have become inextricably confused. The Jats as a tribe are Sindhis, most probably of Scythian extraction. The Jats were settled in the earliest time of which a record exists in Nudha in modern Kachhi, whence they appear to have wandered to the south of Sind where they are now most numerous. There the geographer, Ibn Haukal, found and described them in the tenth century. They were breeders of camels, for which their country was famous. They have retained the same occupation to this day and give their name to it, so that the term is colloquially equivalent to the term "camel man". There were 77,920 Jats enumerated in the Census of 1901, the number today is not known. Before the Arab conquest the Jat tribes were sternly repressed by the Brahman Kings and the Arab governors seemed to have followed the same policy. After the Baluch invasions had begun, Baluch chiefs and Mughal rulers alike in Sind applied the term "Jat" indiscriminately to all the Sindhi population of the Indus valley. Eventually in most parts of Sindh the term "Jat" ceased in popular parlance to have any racial significance, and came rather to have an occupational significance as camel man. Perhaps the reason for this may be that in the armies of the sixteenth, seventeenth and eighteenth centuries in Sind the fighting men were mostly Rajputs from Rajputana and the desert, or Baluchis and Mughals, whilst the local population supplied the transport. When the Kalhora and the Talpurs came down from the south-west Punjab region the Baluchis of the former Punjab and the Serais who came with them to Sind region must have brought with them a large number of camel men of tribes known to the Baluchis as Jats who had settled in Bahawalpur, Dera Ghazi Khan and Multan. These, like the Baluchis from the former Punjab, settled in Sind region where most of them still retain their Lahnda speech. Some of these camel men were men of broken Baluchi tribes who had fallen in the social scale, or from clans of the Baluchi tribes whose names they bore, for example, the Lashari. But there were other tribes in Lower Sind area at least commonly known as Jats, and consisting mostly of camel drivers, or camel breeders, who speak

Sindhi and who evidently have either lived from the earliest times in Sind region. The Jats of Jati prefer to be called Malikani, and, if they admit the name of Jats at all, hastily disclaim any connection with any other Jats. On other hand, the Khanani Jats of Guni, though they do not pretend any relationship with the Malikani Jats, say that they look on the latter as their sardars. Sadik Ali says that the derivation of the word "Jat" is unknown and that, owing to the opening and extension of railway lines in former Sind, many settlements of Jats have disappeared and the number of camels has decreased. Many Jats are now converted into ploughmen, and Sadik Ali names no fewer than ninety-two separate septs of the Jat clan. He says it may be noted that the Kaheri call themselves Sayids in some places and in other places they are shown to be Jat. Six of the Baluch septs are cited by Sadik Ali as being known as Jats. Two Brahui septs are called Jat and also there are seven septs of Samma who are called Jat. Sadik Ali says the cause of these variations is the association of certain septs with septs of other tribes. Their descendants after some generations forgot their real tribes or septs and assumed the names of the tribes with which they have been living, or of the profession which they had been following.

In the 1941 Census it was attempted to obtain separate figures for Jats, the tribes associated with camel breeding and camel transport and to leave the Serais and other Jats, namely, those not so connected, out of consideration. The Census Superintendent, Mr. Lambrick, remarked that the term "Jat" has indeed dropped out of use among the tribes to which it was formerly applied, and they and the Serais differ so little in their economic and social life from the Sammat and other Sindhi Muslim tribes that there would be no justification for attempting the most difficult task of distinguishing them. On the other hand, a certain interest attaches to the Jats, in view of their association with camel transport which continues to be of immense importance in the rural economy of Sind region, particularly the Barrage area, in spite of the development of rail and motor communications. It seems, therefore, that Mr. Sadik Ali's prognostications about the effect of rail communication in Sind region on the number of Jats in employment have been proved to be without much foundation today. The Jat tribes in the delta of the Indus have given their name to Jat Taluka, and may be considered indigenous and probably amongst the oldest inhabitants of former Sind. The Malikani section wander about the taluka [with herds of female camels, remaining in one spot only for so long as there is sufficient grazing in the vicinity. Their encampments are known as wandhs and consist of huts made of grass matting. These people are exceedingly primitive in their customs. They

live almost entirely on their she-camel's milk and hardly ever eat bread, or even drink water, incredible as this may seem. They sell the male calves of their camels at fairs but it cannot be said that they really depend for their livelihood on breeding for the sale of them. This tract in the delta of the Indus must be particularly suitable for grazing camels as their favourite khabar grows profusely everywhere, and the areas under cultivation are very restricted. The language of these Jats is considered to be Siraiki, but their dialect is peculiar and merits investigation by philologists. It would hardly be intelligible to the Sindhi-Siraiki speaking people of north-eastern Sind region. Tribes such as the Lashari, in addition to the Jiskani and many more are scattered all over Sind region and are ordinarily engaged in camel transport, though some work on the land. They generally have permanent villages, where their families stay, while the men spend most of their time transporting grain from place to place. Some contract with merchants or Government servants for their transport work over a period of time. Others move from place to place, picking up loads wherever they can. Thus Jats belonging to Kotri Taluka will be found as far east as Nawabshah and as far north as Larkana. Almost all Jats speak Siraiki among themselves, though they use Sindhi in dealing with their clients. Many of them also speak Baluchi, having been associated in former days with Baluch tribes as their camel drivers. The women and occasionally the men of the Jat tribes weave falasis out of camel hairs, with which they mix goat-hair and wool. Like the Baluchis, Brahuis and the majority of Sind Muslim tribes, the Jats are accustomed to mould the shape of their children's heads in infancy.

Both Herodotus and Ktesias write of the efforts of Darius the Great about 512 B.C. to make secure the boundaries of his empire. In the course of these operations Darius annexed the Indus valley and the auriferous hill country of Kafiristan and Kashmir, as well as Dabistan on the Indus. From this point he conducted several campaigns against the Sakas or Scythians. He also had the course of the Indus explored by the Carian captain, Skylax of Carianda, who navigated the Indian Ocean back to Suez and wrote an account of his voyage in Greek. It would appear from this, therefore, that the Scythians, if they were not then in the Lower Indus valley, must have been threatening the country of the Indus with such power as to induce Darius to make these great efforts to subdue them. If, as is commonly believed, the Sindhi Jats are Scythian by origin, it seems that their residence in Sind region can be pushed much further back than the period of Indo-Scythian dominance which happened during the time of Kaniskha the Kushan ruler of the northern part of the Sub-continent. In the

time of the Periplus (70 A.D.) the Scythians are described as already settled in the Indus valley

Mohano. The derivation of the name "Mohano" is uncertain but it denotes the Mussalman fishing caste in Sind region with all its numerous divisions on the seacoasts and inland. The Mohana of Mekran are called Meds and that name is not unknown in Sind, though it seems impossible now to trace the continuity of these with the Scythian Meds who lived on the banks of the Indus a thousand years ago. The Mohana are said to be the same as the Mallah of the former Punjab. In the south-west of former Punjab there are Mohana so-called and the Mallah have at least one sub-section in common with the Sindhi Mohana, namely, the Manjari. The Mallah is an occupational caste. If Mallah is the same as the Malloi mentioned by Plutarch as the tribe which offered stout resistance to Alexander the Great on his voyage down the Indus, then these people have been established in the Indus valley for at least three hundred years before the Christian era. They have all the looks of an autochthonous people and in general the colour of their skin is much darker than that of most of the indigenous Sindhis. Mr. Covernton thought that there was very little authority for identifying them with the Mohana and Miano of Kathiawar, or even for supposing that the names are related, the only support being the word "Miani" used in Sind region for a village or Mirbahars. The fishermen and boatmen of the Nal Lake in Kathiawar are very like the Sindhi Mohana in every way, in appearance and in habit, and they manage flat-bottomed craft on the Nal exactly as the Mohana manage them on the surface of the Manchhar Lake in Sind region. Postan refers to the Mohana being called "Minia" or "Mana", though Mr. Covernton does not regard Postans as a very reliable guide. On the other hand, the map of the Periplus showing the Lower Indus valley has a town called Minanagar on the delta of the river Indus and one of the tribes of the Serai is called Mina.

Serai. The term Serai is now applied to a large class of people who came down from the former Punjab and settled in Sind region especially in the Larkana tract of the old Shikarpur district. The term Mohana is also used in the south-west of former Punjab, and there also as in former Sind they are commonly called Mirbahars, another occupational designation which means "lords of the sea or water." It is more than probable that the Mohana as a race are earlier than the Jat or Samma, and may well be descendants from some of the original inhabitants of the Lower Indus valley from the time of Moen-jo-Daro. Sadik Ali, who gives the names of two hundred and fifty-four septs of Mohana, says that their origin is not known, whether they were originally, Hindu or some other tribe. Their profession is either to pay

boats, or to catch and sell fish, but since the construction of the protective embankments along the river, which have stopped the overflow of the Indus and closed the source of refilling the large lakes and dams which were the breeding places for fish in former Sind, many Mirbahars and Mohana have had to throw down their nets and give up their fishing rights, and take up the plough instead. Except for one sect called Dagori in Lower Sind region and Jhabir in Upper Sind, no sept of the Mohana tribe catches crocodiles and tortoises. In the 1901 Census the number of Mohana returned was 107, 383. In the 1931 Census the number had risen to 124,420, but the 1931 figures are almost certainly wrong and must be an under-statement as the number of females is much too small for the population being enumerated with fifteen thousand fewer females than males. It may be concluded, therefore, that the number of Mohana in 1931 considerably exceeded one hundred and twenty-five thousand people. There was no separate enumeration of Mohana in the Censuses of 1941 and 1951.

The above concludes a short account of the chief elements in the Muslim population of former Sind and Khairpur. Many important tribes and clans have been omitted, but the index of Muslim clans and tribes in Sind region will supply much information on the general tribal constitution of the Sind region and Muslim population. This index which has been taken from the 1931 Census Volume of the Bombay Presidency is printed as an Appendix to this Gazetteer.

Before any description can be given of the Hindu population in former Sind and Khairpur today, it seems desirable to make some general observations relative to the growth of population in the last sixty years and the drastic demographical alteration which came about with the formation of Pakistan and the partition of the sub-continent in 1947. The population of former Sind rose from 3,074,613 in 1901 to 4,608,514 in 1951; this was an addition of population of 1,534,901, population percentage increase of 49.8. The corresponding figures for Khairpur are for 1901 199,313 and for 1951 472,137, being an increase in population over the sixty years of 272,824, which is equivalent to 136.88 per cent. The variations in population and the density during the last fifty years have been given in Statement 3K on page 30 of Volume VI of the Census of Pakistan, 1951. Taking Sind region as a whole, that is including Khairpur, the percentage variation in population was as follows: from 1901 to 1911 an increase of 8.4, from 1911 to 1921 a decrease of 9.1, from 1921 to 1931 an increase of 18.1, from 1931 to 1941 an increase of 15.5, from 1941 to 1951 an increase of 11.9. The percentage of net variation from 1901 to 1951 is an increase of 50.5. The density of population per square

Hindus.

mile was in 1901: 58, 1911: 63, 1921: 57, 1931: 68, 1941: 78, 1951: 87. It will be noted that for every decade, except that from 1911 to 1921, there has been a percentage increase in population. In the decade 1911 to 1921 there was a decline of population in Sind and Khairpur region and in every district. This was due to the influenza epidemic of 1918, to which reference has been made elsewhere in this Gazetteer.

The other great demographical phenomenon affecting the population of former Sind and Khairpur was the partition of the sub-continent in 1947. The Census Superintendent in the report referred to above comments on the remarkable increase in the number of Muslims and decrease in the number of Hindus occasioned by the large scale exodus of Hindus and the influx of Muslim Muhajirs. In former Sind the percentage of Muslims increased from 73.2 to 90.1 and that of Hindus decreased from 20.9 to 2.9. The percentage of the scheduled castes, which was 5.2 in 1941, has risen to 6.9. While the Muslims have increased by 38.3 per cent. since 1941 to 1951 the Hindu population has gone down by 84.3 per cent in former Sind. The details of this remarkable phenomenon are given in Statement 3 N on page 34 of the Census Report of 1951. Therein it is shown that the Muslim population since 1941 increased by 1,149,687, equivalent to 38.3, while the Hindu population of caste Hindus fell by 722,348 equivalent to 84.3 percent. As regards the scheduled castes there was an increase of 105,140 in the decade from 1941, equivalent to a percentage increase of 48.9. These are the figures for Sind. For Khairpur the corresponding statistics are: the Muslim population increased by 55,115, equivalent to 21.7 per cent., while the caste Hindu population fell by 38,754, equal to 84.2 per cent. In 1947 the huge numbers of Muslim refugees from India who rushed into Sind region occupying the place of the departed Hindus, were given the name of Muhajirs, which was defined in the Census instruction as follows: "a Muhajir as defined in instructions to enumerators is a person who has moved into Pakistan as the result of partition, or of a fear of disturbances connected therewith." The number of such persons. Muhajirs, recorded at the Census of 1951 was ascertained according to the statement made by each individual. The total number of Muhajirs recorded in former Sind was 540,278 and in Khairpur 10,013. Statement 3 R in the Census Report shows the total number of Muhajirs and their distribution in urban and rural areas respectively. The statistics show for Sind region a total number, of Muhajirs 540, 278, of which 344,720 went to urban areas, equivalent to 63.9 per cent. of the total and 195,558 went to rural areas, equal to 36.1 per cent. of the total. The corresponding figures of Khairpur were 10,013, of which 4,889

went to urban areas, equivalent to 48.2 per cent. of the total, and 5,124 went to rural areas, equivalent to 51.8 per cent. of the total. The enormously complicated sociological and administrative difficulties which were caused by this huge disturbance of the population of the country are matters which receive detailed treatment in the portion of this Gazetteer connected with the social and administrative matters.

The Hindus enumerated as Primitives numbered 104,365; a break-up of this figure shows 67,963 Bhils and 36,402 Mahadev Kolis. The Hindu population of Sind region therefore, falls roughly into three main classes: the advanced trading and commercial classes, of whom the Lohana constitute the most important element; the Intermediate Hindus where the main element consists of Kolis with a slightly higher standard than the Mahadev Kolis who were classed among the Primitive. The Rajputs form an important element in the Intermediate Hindus of former Sind. The Primitives consist almost wholly of Bhils and Mahadev Kolis. The short notes that follow will deal with Lohana and their kindred tribes, the Brahmans, the Intermediate Kolis and the Rajputs, and, amongst the Primitive, the Bhils.

The 1874 Gazetteer, in speaking of the Lohana, says of the Vaishya, Vanio or Bania castes there is one great family, the Lohano. It is as usual divided and sub-divided almost ad infinitum, but the distinguishing features of the race are still sufficiently prominent. To treat of the Lohano caste is to describe the main body of Hindus in former Sind. The Lohano wears the thread of the twice born, though he is a very imperfect specimen of the Vaishya race. He eats meat, drinks spirits and will not object to fish and onions. Some are followers of the Vishnavite faith; others worship different incarnations of Shiva and his consort. Some again are of the Sikh faith while others venerate the River Indus God and his Wazir under the respective names of Zind Pir and Uderolal. Their devotions are neither frequent nor regular; they generally content themselves with attending the Mela, Jatra, Darsan, different kinds of religious fairs and meetings. The Lohana may be divided into two great classes according to their several occupations: first the Amils or Government servants and secondly, the Shaukars, Hatwara, Pokhwara, that is the merchants and shopkeepers and the agricultural classes. The derivation of the name Lohano and their caste is obscure. Their desire to establish Kshatriya lineage is doubtless responsible for the theory advanced by some Lohana that their ancestors were warriors. In the Census Report of 1901 they are classed under the great trading caste of Banias and in Sind region some of those who were engaged in trade are called Bania. But Sir James Campbell regards them and the Bhatia as distinct tribes from the Bania. They are numerous in Cutch but a large proportion of those in former Sind have

Lohano.

come from the Punjab. Lohana possess a remarkable aptitude for business and education. Under the Kalhoro and Talpur rulers Lohano officials, who were termed Amils, filled many, including some of the most important appointments in the civil service. The adoption of this profession though it exposed them to many insults and humiliations quickly conferred on the families concerned a superior status. This they signified by differences in dress which their descendants never lost. These people now form a hypergamous sub-division of the caste. They will take brides from but will not give brides to the other Lohana. The chief occupations of the Lohana are trade and money-lending and government service, with which they now largely combine land-holding. Bania as mentioned above and Bhaiband and Kirar are names by which they are also known. They form an endogamous caste with a great number of exogamous sub-divisions. In religion they are mostly Nanakshahis, though some are Daryapanthis and a few are goddess worshippers. A smaller number again are Vallabhacharis. Their diet is influenced by their religious profession, but the majority have no objection to meat, except beef, or alcohol. They burn their dead, but children dying under twenty-seven months are buried. Lohana are constantly mentioned in the Chach-Nama and other histories of the Arab Conquest, usually as a tribe of Jats, or else in close combination with Jats and Lakha and also in the same breath with Samma and Sahtas. Their headmen were ranas and their capital was Brahmanabad, or Bambanah or Bahmannih. Though apparently non-Buddhists they were much under the influence of Buddhists and especially their chief Agham. The usual view is that the Sindhi Lohana originally belong to the former Punjab, while the Kutchi Lohana belong to the Cutch area and to the Indian territory of Kathiawar. Many of the sections of Sindhi Lohana have the same names as of those of the south-west region of former Punjab. One legend of the Arora represents them as coming from Lahore. It seems possible that the Arora represent a section of Sindhis who moved north into the south-west of former Punjab, and the Sindhi Lohana might be another section of them who moved back to Sind region later. If so, the separation must have taken place in very early times, for the distinction between Lohano and Aroro is now clear cut. The Sindhi Lohano looks on himself as of a different caste from the Kutchi Lohano and he also regards himself as equally distinct from any Hindu of the southwest of former Punjab. There are Hindu Sahtas in former Sind who presumably preserved their identity and religion throughout the Muslim period, and a priori it would seem likely that if the Lohana were Sindhi by origin some at least of the present Lohana have never left Sind region. There are Hindu Punjabi families in almost all the towns, sometimes but rarely, called Punjabi Lohana. They usually call themselves only Punjabi and mostly claim to have come from the former Punjab, mostly perhaps via Sukkur in the past three

hundred or four hundred years. They do not talk Multani at any rate in Lower Sind region but many of them still retain some connection with the Multan district, for example, some have a traditional connection with certain shrines in that district.

Out of the hundred and twenty-six names of Lohano Nukhs or sections, twenty-seven bear names which are also borne by Arora sections in Punjab, and some others resemble Arora sectional names. A considerable number of Aroro sectional names end in the Sindhi termination "jo", for example, "Lahijo, Patrejo, Sarejo," whereas the Lahnda and Punjabi genitive ends in "da", so also do the Lohano sectional names, for example, "Dangejo, Torejo." The common worship of the river God "Uderolal" by Arora and Sindhi Lohana also suggests that they are ancient inhabitants of the Indus valley and not mere immigrants from Hindustan. The Gujarat Lohana, however, also practise river and, watter worship. If their worship is the same as the cult of Uderolal it seems to point to Sind and the Indus valley as the original home of both the Arora and the Lohana, whether of Sind, including Kutch or Gujarat.

The Lohana derive the name from "Lal", a son of Shri Krishana a Hindu deity of Ayodhya. Alike in some ways to the ex-Sind Lohana are the Sind Bhatias, who are found chiefly in Thatta, Hyderabad and Rohri, but otherwise are scattered throughout Sind. These Sind Bhatias trace their origin from Yadav Vansi, to which stock Shri Krishna belongs. The Nukh names given in Appendix F. of the Bombay Census 1931 are prefixed by the word "rai." They seem to derive their origin from personal names, from occupational names, and from territorial names, indeed there is a proverb that these names take after "kam", "nam" and "gam" that is work, personal name and village. The Bhatias themselves claim to be Bhati Rajputs of the Yadav stock, who were the ruling tribe in Jaisalmer, but this is very doubtful. They are one of the great trading castes. In Sind they are enterprising traders and a few are in government service. They form an endogamous caste with eighty-four exogamous sub-divisions. They are Vishnavites of the Vallabhachari sect and mostly vegetarian.

Another of the Hindu trading caste is the Sahta, of which the 1901 edition of this Gazetteer says. "The caste is interesting on account of the possibility of its being a remnant of the Sahta sept of the sammo tribe which has resisted conversion to the Muslim faith. The Sahtas themselves, while claiming Rajput origin are supposed to derive their name from the village of Sahiti, in the Naushahro Taluka, in which they were settled formerly. This is not a probable explanation. They are traders, land-holders and Government servants, and in religion mostly Vishnavites. They take brides from but do not give daughters to other castes. They refuse mutton, fish or spirits and in their customs resemble the Lohana.

Sahta.

**Scheduled
Castes.**

In 1941 the Hindus for census purposes were divided into scheduled castes and others instead of the old division of Hindus into Advanced, Intermediate and Backward. In 1931 the depressed classes, which correspond fairly closely with the scheduled castes were not shown separately in the Table for Religion, but appeared in Table XVII, Caste, Tribe, Race or nationality. The tribes of the 1931 Table XVI—Religion—were primitive people who were understood to worship animalistic deities distinct from the Hindu pantheon. The tribes in the 1941 community table are in Sind exclusively Thakurs, who were classified as a primitive aboriginal caste though there would be equal justification for including the Bhils, Kolis and similar peoples of eastern Sind area. The depressed classes in the 1931 Table XVII amounted to 99,551 and included Menghwars, Bhangis, Machhis, Mahars and Dheds and a few others. The same castes were enumerated as scheduled castes in 1941, but their numbers were found to have nearly doubled, reaching the figure of 191,634. The Census Superintendent in 1941 remarks that, leaving aside possibilities, of more or less accurate record, it may be assumed that a considerable number of Menghwars at least recorded in Sind were immigrants from Marwar and northern Gujrat countries which for some years past have suffered from scarcity. The number of persons enumerated as Rajputs in the 1931 Census in Sind region was 22,761. The exact character of this population and its constitution are difficult matters, as Rajputs in Sind who were classified as intermediate Hindus in the 1931 Census certainly bear little resemblance to the superior Rajputs connected with ruling houses in Rajputana, and the evolution of the clans calling themselves Rajputs today is confused and difficult to understand. But it seems that when the Indo-European invaders seized power in Upper India, the aristocratic sections among them became the ruling clans, whilst the others in course of time became the cultivating classes, just like the Jats and Gujars. Some of the clans are supposed to have sprung from Hinduised aboriginal elements. They were a restless and vigorous people, constantly seeking for new settlement. The quest for settlement set in train a widespread migration of clans over a large part of Upper India. When two thousand years later northern India was conquered by Muslims a further migration of these clans took place.

Speaking of this aspect of things, Mr. Venkatachar in his account of the migration of castes and tribes into central India says: "Driven everywhere from the fertile plains by the victorious onslaught of the forces of Islam, the Rajput clans had perforce to seek shelter in inhospitable and inaccessible places and this led to their closer contact with the primitive tribes. It is often felt that the Aryans were responsible for the subjugation and degradation of the pre-Aryan peoples. That was perhaps true in the plains, but in the less accessible parts the latter maintained a good deal of independence and again extended their rule and power

over those portions of which they were dispossessed. The conqueror was soon absorbed and a mixed culture arose with Aryan characteristics predominating. We should rather look to the period of Rajput settlement for the disintegration of tribal areas, for the disappearance of certain aboriginal tribes, and for the formation of Hinduised aboriginal castes. It is very likely that something of this nature took place in the desert areas bordering Sind in the Middle Ages, and that the present Rajput population of Sind which is not in the educated category, is the result of the mixing of Rajputs with the indigenous inhabitants of the Indus Valley”.

A large number of the Rajputs in Sind are in Tharparkar, where the Sodha were for some centuries the dominant race. According to their own tradition they came from Ujjain about 1226 A.D., under the leadership of Parmar Sodha, who after hard fighting got possession of Umarkot and established himself as a rana there. Even under the Talpurs the Sodho landlords retained important revenues and privileges, such as the right to levy a cess on Hindu marriages and to be fed by banias free of charge when travelling. They retained the Rajput custom of giving their daughters in marriage to other castes, and the beauty of Sodho women is celebrated in song and story, while even Baluch sardars have not disdained taking Sodho wives. The men are landowners and cultivators, but they also enter private service. In religion they worship Shiva. Besides Sodha there are in former Sind Rajputs of the Rathor and Solanki tribes.

In the 1931 census Kolis were classified as Intermediate Hindus and the Sind Kolis falling into the intermediate category were described as “Kolis of Sind” and “Koli, Others.” The exact category of Kolis, Mahadev Kolis, was classified with the Primitives, who will be dealt with when the Bhils are considered. The number of Kolis enumerated in the 1931 Census for Sind region was 60,562 and this number rose to 101,456 in 1941. They are resident mostly in the Hyderabad and Tharparkar districts and are a great and ancient race which is now chiefly settled in Gujrat (India). According to their own legends they are descended from the Meds of Sind region but clear traces of a Rajput connection appear to be found among them. The caste is an endogamous division. With them marriage, except in the case of a young girl, is not allowed. In former Sind Kolis work generally as day labourers. Their diet consists principally of bajri and rice, though meat and alcohol are freely taken when obtainable. They worship the Hindu gods and goddesses and some belong to the Swaminarain and other sects. The Census Report of 1941 speaks of the Kolis as cultivators and labourers. Of the three main divisions, the Parkaris are mostly regular haris and the Mewasis and Waghers are coolies and agricultural labourers. Some collect lac, the resin from the babul tree. Since the Barrage canals opened, Kolis have tended more and more

Kolis

to settle on the land instead of wandering about doing cotton picking, earth work and similar labour. In 1941 it was noted that Hindu Zamindars in the Hyderabad district had lately encouraged them to become their haris. The Kolis are accepted in Sind region as true Hindus. They speak Gujrati, Thareli or Cutchhi, mainly the former, and live in their own villages. Where these are permanent they effect the round beehive type of construction for their house, and like the Bhils they marry within the caste, but outside the nukh. As a class the Kolis are but little educated and are regarded as being just on the fringe of Hindu society. They still bear many marks of being a primitive race, possibly with affinities with the aborigines of India.

The Comparative Population figures of Muslims and Hindu Communities in former Sind are as under:—

Year.	MUSLIMS.	HINDUS.
	Per cent.	Per cent.
1901	76.2	23.4
1911	75.1	23.8
1921	73.4	25.6
1931	72.8	26.1
1941	73.2	20.9
		includes scheduled castes
1951	90.1	2.9 } Caste Hindus 6.9 } Scheduled castes.

5.2

TYPES OF PEOPLE



A Sindhi woman wearing wedding dress



Typical Sindhi-showing caucasian features

CHAPTER IX
CULTURE

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CHAPTER IX

CULTURE

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CHAPTER IX

CULTURE

The Sindhi Language

The Sindhi language is the most valuable cultural heritage that the country possesses. In the area comprised of the old Province of Sind and the State, now district, of Khairpur it is spoken by the vast majority of the population. In the sphere in which it is predominant Sindhi is spoken in remarkable purity and with complete grammatical accuracy by all classes of persons, educated and uneducated alike. The language is an old one and admirably adapted for its purpose, which is primarily the means of communication of a rustic, agricultural and herding people for whose transactions it is completely apposite. With the break-up of the old order of things socially and politically in the area where the Sindhi language is predominant, changing conditions are showing up in a way that was not important before the inadequacy of the language to express the wealth of new ideas current in the twentieth century.

Modern study of the Sindhi language is clearly handicapped by the absence of scholars with the scientific training which is now regarded as indispensable. Such scholars as Sind produces at present learned in their own language are for the most part insufficiently trained in subjects like comparative philology, history of language, semantics and hermeneutics. Dr. U.N. Daudpota, who died in 1958, was the only Sindhi scholar of considerable stature of his time, and he has done very valuable work in the exposition of the language and literature of former Sind. His interests are, however, largely confined to Islamic, that is, Persian and Arabic, influences and the culture based on these. Important influences today are affecting the outlook on the Sindhi language even within the bounds of Sind and Khairpur region. These influences are varied and can be classed as political, sociological and literary. The chief political influence is the popularisation of Urdu as one of the two national languages of Pakistan.

The main sociological influence now affecting Sindhi is the influx of large numbers of Urdu-speaking peoples entering Sind and Khairpur region as muhajirs.

In the Census of 1951 of the total population of 4,928,057 persons, 3,917, 836 gave Sindhi as their native language, that is, 79.5 per cent. of the total population; 680,816 gave Urdu, 13.8 per cent.; 495, 482 Baluchi, 10.1 per cent.; 172,280 Punjabi, 3.5 per cent.; 74,089 English, 1.5 per cent. 17,599 Pushto, 0.4 per cent. 12,184 Persian, 0.2 per cent. 2,339 Arabic, 0.05 percent. 924 Bengali.

0.02 per cent. Besides the nine main languages printed on the census slips for enumeration in 1951, the following languages were reported as mother tongues:—Gujarati 97,659, that is 2.0 per cent. of the total population, Rajasthani 69,374, 1.4 per cent.; Brahui 22,460, 0.5 per cent. Miscellaneous languages reported were:—Hindi 523 persons. Unclassified 184 persons, Tribal tongues of the North West 107, South Indian languages 70. Gujarati has been imported by muhajirs. Rajasthani is the mother tongue mostly of the Scheduled Castes and of some muhajirs, and Brahui of South Baluchi tribesmen. Marwari and Siraiki, which are dialects of Rajasthani and Sindhi respectively, have each been claimed to be the mother tongue of over 60,000 persons who are included in the totals of the principal languages. The distribution of the languages in Sind and Khairpur region is given in the statement below which shows the proportion of speakers in the populations of the districts of former Sind and Khairpur.

Persons per cent. of population claiming each language as mother tongue.

Language.	Dadu.	Hyderabad	Larkana.	Nawabshah.	Sukkur	Thar Parkar.	Thatta	Jacobabad	Khairpur
Sindhi	76.1	68.8	77.2	69.2	79.0	64.4	95.6	64.5	89.0
Urdu	4.0	20.4	4.9	11.3	12.0	9.9	1.2	1.8	2.8
Baluchi	17.1	3.8	14.8	10.4	4.8	5.4	2.0	30.9	3.3
Punjabi	1.9	2.2	.5	6.2	1.9	6.5	.4	1.2	
Gujrati	.2	3.7	.4	1.1	.7	6.6	.4	..	..
Rajasthan	..	.7	..	1.1	.7	6.6	..	.1	.6
Brohi	.4	..	2.0	.2	.6	.1	..	1.1	..
Pushtu	.2	.2	.1	.3	.3	.5	.3	.4	.2
Persian	..	..	..	0.1	..	.1	..	..	..
Others	..	.1	..	..	..	..	..	..	..

As regards languages imported by muhajirs the Census of 1951 revealed the following chief languages in order of numerical strength:—Katchi, Urdu, Punjabi, Gujarati, Sindhi, Pushto, Rajasthani, Baluchi, Hindi, Persian, Arabic, Bengali, English, Kashmiri and other unclassified languages. Out of the 5.5 lakhs muhajirs the number claiming Urdu as their mother tongue was over 4 lakhs. Punjabi was claimed as the mother tongue of over 70,000, Gujarati of over 15,000, Sindhi of nearly 4,000, Pushto of 1.5 thousand. Sindhi, which is the principal language of the province shows a 5.3 per cent. decrease in the number of its speakers as against 11.9 per cent. increase in the total population. This change is due to the exodus of Hindus of most of whom this language was their mother tongue. Languages commonly read and written are

Sindhi, Urdu and English. The number of readers of the other languages is insignificant, being less than 0.3 per cent, of the population. Sindhi is read by 7 per cent. and written by ever 6 percent of the total population. Urdu is read by 2.4 percent and written by 2.2 percent of the total population. The percentages of readers and writers of English is 1.0 per and 0.9 per cent, respectively. Sindhi as the principal language of the former province has the highest percentage of readers and writers in every district, Dadu district having the highest and Tharparkar the lowest. In towns Dadu records the highest percentage. Hyderabad shows a very low figure and Mirpurkhas town the lowest. The reason is that a large part of the population of Mirpurkhas and Hyderabad consists of muhajirs who have not yet learned to read and write Sindhi. The majority of the readers of Urdu are in Hyderabad, Thar Parkar, Sukkur and Nawabshah districts where the greatest concentration of speakers from Urdu speaking portions of India and other places have congregated.

The chief authoritative work on Sindhi is found in Volume VIII, Part I, of "The Linguistic Survey of India" in the volume dealing with Sindhi and Lahnda. The Sindhi language belongs to the north-western group of the Indo-Aryan family. On the west Sindhi is bounded by Baluchi, an Iranian language with which it has a distant affinity and by which it is little influenced. In the north it is bounded by Lahnda, with which it is closely connected. Lahnda is spoken not only to the north of Sind region but also side by side with Sindhi by more than one hundred thousand immigrants scattered all over Sind region. Although closely connected with Lahnda, Sindhi, except in the extreme north, is little influenced by it, and such influence is almost entirely a matter of vocabulary. On the other hand, the neighbouring Sindhi has much influenced not only the Lahnda as spoken in former Sind, but also the Lahnda of the south-western region of former Punjab spoken near the Sindhi frontier. On the east Sindhi is bounded by the Marwari dialect of Rajasthani. There are several forms of speech which are mixtures of Sindhi and Marwari in varying proportions. Sindhi and Marwari belong to different groups of Indo-Aryan vernaculars and, therefore, do not merge into each other through intermediate dialects. The mixed dialects are rather what may be called mechanical mixtures. On the south and south-east Sindhi is bounded by various dialects of Gujarati. Gujarati, although a member of the central group of Indo-Aryan vernaculars, has at its base an old lost language of the outer circle of these vernaculars, of which Sindhi is also a member. This lost language was therefore, akin to Sindhi, and when in the south and south-east we come across Sindhi in contact with Gujarati we find a free intermingling of the two languages and the formation of what is a real dialect of Sindhi in the various forms of Kachi. Lahnda and Sindhi form together a north-western group of the Indo-Aryan vernaculars and also possess many characteristics

that connect them with the Dardic languages of the North-West Frontier and especially with Kashmiri. The Dardic languages are spoken by the numerous tribes between Kashmir and Afghanistan and on the south slopes of the Karakorum and the Hindu Kush mountains. The Dards are an Indo-European people once Buddhists but now mostly Shi-ite Muslims. The Dardic languages are descended from the north-Western prakrit and are distinguished from the other Indo-Aryan languages of Indo-Pakistan sub-continent by the preservation of the Sanskrit consonant groups and by other archaic features. In the modern Dardic languages little or no distinction is made between cerebral and dental letters. In the Thali dialect of Lahnda "d" is often changed to "ḍ" with a dot, so also "s" "t" and "d" vary often between "ṭ" with a dot and "d" with a dot. Examples from Hindi are "taba" "Sindhi" "tamo" or even "tramo" (copper); Hindi "dena" but Sindhi "ddian" (to give). The ancient Prakrit grammarians stated that the same change occurred in Vrachada Apabhramsa prakrit from which Sindhi is derived. Now most Indo-Aryan vernaculars drop a "t" between two vowels. This frequently is not the case in Lahnda and Sindhi. Thus Sindhi "pito" (drunk) but Hindi "pia", Sindhi "chhuto" (touched) but Hindi "chhua" Sindhi "kito" or "kio" (done) but Hindi "kia" Sindhi "suto" (asleep) but Hindi "soa".

As showing the relationship between Sindhi and the Dardic languages and as evidence of the old age of the Sindhi language the treatment of double consonants derived from the Prakrit is important. In most of the sub-continental vernaculars one of the double consonants was dropped and the proceeding vowel lengthened in compensation thus the Sanskrit "bhaktah" (cooked rice) becomes "bhatu" in Apabhramsa Prakrit and thence "bhat" in most languages. In Punjabi however this is not the case and also in Lahnda. Here the double consonants persist and there is no necessity for compensatory lengthening so that we get in Punjabi and Lahnda "bhatt". But the case is different with the Dardic languages and in Sindhi. Thus Kashmiri has "but" and Sindhi "bhat". This is a very important point and goes back to very ancient times even to the date of the inscriptions of the Emperor Asoka 250 B.C. and most clearly shows the connection between Sindhi and the Dardic languages. The plurals of the Sindhi personal pronouns are based on the same originals as those of the corresponding words in Lahnda and the Dardic languages. The use of pronominal suffixes is extremely common in the Dardic languages as well as in Sindhi and Lahnda as Kashmiri "moru-m" Lahnda "mareu-m" Sindhi "marya-m" (struck by me - I struck). In the formation of the passive voice the Dardic language "shina" makes it by adding "ij" to the root; "shid-emus" (I was striking) and "shid-ij-emus" (I was being struck). Similarly in Sindhi the passive is formed by adding "ij" with a short "i" as "mare-tho" (he strikes) "mar-ij-etho" (he is being struck)

Sindhi has one important peculiarity which it shares with only one or two other Pakistani languages that every word must end in a vowel. The Prakrit grammarian Marken Deva stated that the Apabhramsa Prakrit spoken in Sindhi was called Vrachada. It is from this that Sindhi is derived. According to the usual computations Sindhi has four dialects: the Standard or Vichholi, Seraiki, Thareli and Lari, Seraiki as a dialect of Sindhi has no real existence but two other dialects Lasi and Kachi are to be added to the list. Peculiar to Sindhi are the letters "bb" "jj" "dd" and "gg" and transliterated by Grierson as double "b", double "j" double "d" with dots and double "g" respectively. They are pronounced with a certain stress prolonging and somewhat strengthening the contact of the closed organ and are in fact sounded as double letters and so pronounced in other parts of country but occur even at the beginning of words—"dubbal" (weak), "ajj" (today), "jjayo" (born), "waddo" (great), dditho" (seen). These are really the only double letters in Sindhi.

Sindhi shares with Kashmiri and Lahnda the use of pronominal suffixes. In Kashmiri they are attached only to verbs and in Lahnda apparently only to nouns and verbs. But in Sindhi they are attached not only to nouns and verbs but also to postpositions. They are employed exactly as in Persian and Hebrew and can be used for any case; "nenu-um" (my eye), "maryu-m" (I struck), "sandu-m" (of me, mine or my). Pronominal suffixes of the nominatives are "maryu-s" (I was struck), "marind-e" (thou shalt strike). Suffixes of other cases are "piu-m" (my father), "sanu-s" (with him), "ddim" (give to me). Suffixes of the case of the agent are used only with the past tenses of transitive verbs—"mary-ai" (he struck), "mary-au" (they struck). As in other Indo-Aryan vernaculars the past participle of a transitive verb is passive in meaning, thus "maryo" (struck-not having struck)/ so that with the tenses formed from the past participle the subject to the verb must, as in Hindi, be put in the case of the agent. In Sindhi the number of irregular past participles is far more than in any other language of the East, and in this respect it ranks with Lahnda and Kashmiri. The number of irregular past participles in Sindhi is computed by the Linguistic Survey of India at 128. The complexity of the pronominal suffixes with the Active Verb is shown in the following examples: "maryo-atha-m" (I have struck him), "maryoatha-w" (you have struck them), "maryo-ho-m" (I had struck him), "marihuau" (they had struck her), "mari-hundiam" (I may have struck her).

The Panjab is the meeting ground of two entirely distinct languages, the Dardic parent of Lahnda, which expanded from the Indus valley eastwards, and the old midland language, the parent of modern Western Hindi, which expanded from the Jumna valley westwards. In the Panjab they overlapped.

Lahnda may be described as a Dardic language infected by Western Hindi, while Punjabi is a form of Western Hindi with Dardic. Sindhi on the contrary shows a much more clear relationship to the Dardic languages, being protected from the east by the desert of western Rajputana. Sindhi does not merge with Rajasthani. Such border dialects as exist are mere mechanical mixtures.

The north-western group is a member of the outer circle of Indo—Aryan vernaculars. The members of this outer circle are the southern language, Marathi; and the eastern group of languages, Oriya, Bengali, Bihari, Assamese. The only forms of speech that show any close relationship to the languages of the north-western group are the three Pahari languages. They have, like Sindhi, a basis connected with the Dardic languages. The immediate predecessor of Sindhi was an Apabhramsa Prakrit named Vrachada according to the grammarian Markendeva, who has given a few particulars. He mentions Vrachada Paisachi as spoken in the same locality and lays stress on the fact that the Kekaya Paisachi is the principal form of that Sanskrit. In Gandhara there are two famous rock inscriptions of the Emperor Asoka, about 250 B.C., at Shahbazgarhi and at Mansehra which are couched in what was then the official language of the country. This was a dialectic form of Pali distinguished by possessing several phonetic peculiarities that are still observable in the Dardic languages and in Lahnda and Sindhi.

The Sindhi language abounds in Arabic and Persian words which, contrary to the usual rule in Indo-Pakistan sub-continent and Central Asia, constitute the common, not the learned names of things, as “jabal” (hill), “basar” (onion), “abu” (father), “thum” (garlic), “shai” (thing), “kul” (all). Pure as well as corrupted Sanskrit words perfectly unintelligible to unlearned natives of the Peninsula are perpetually occurring in Sind region as “sain” (sir), “kukkar” (cock), “jas” (victory), “apar” (endless). Hyderabad is the model and the language spoken in the Vichholo or middle country, of which it is the social centre, is pure Sindhi. From Thatta southward the dialect of the Lar or Low Country prevails, of which the most notable peculiarity is the dropping of the letter “h” even in the aspirated consonants. There are also many peculiar words in use being spoken in Cutch and Thar. The three northern talukas of the Hyderabad district are called Uttar and the dialect Utradi which resembles Shikarpuri. Hitre and “Kithre” take the place of “hithe” and “kithe”. In Shikarpur besides such differences of pronunciation there are a good many words in common use which portray the influence of Urdu, such as “dhobi” instead of “khathi” for a washerman and “bhangi” instead of “shikari” for a sweeper. In this region here is also a distinct dialect in use known as Jatki or Saraiki, that

is the language of the north country, which is common to it and part of the former Punjab, and is regarded by Sindhis as a dialect of Punjabi. It is spoken chiefly by the Jats and some of the Baluch tribes, like Rinds and Lagharis and by the Abassis. There is another more or less distinct dialect called Tharili spoken by nomads and wild people of the Thar desert. It appears to be compounded of Sindhi, Marwari and other ingredients. The tongue of Ubauro, which has become proverbial for corruptness, is perhaps only an extreme form of this. Many Baluchis use among themselves the Balochki language which has been described as Persian disguised under a corrupt and unaccountable form of pronunciation, but is really a distinct language belonging to the Iranian branch of the Aryan group. The Brahuis very generally use their own Brahuiki, a tongue of the Dravidian stock. But all the rest of Baluchis and Brahuis understand and can speak Sindhi. Afghans, Marathas and Gujratis speak their own language among themselves. Urdu is generally understood in large towns and English has come into general use among educated people, even for their private correspondence. The Arabic Sindhi alphabet, a modified type of the Persian script, is universally employed now in writing and printing Sindhi. But the banias, who since 1947 have largely left Sind still cling to the nagari stenography known as Bania, or Hindu Sindhi, for all purposes of business. A few old-fashioned persons keep up the practice of corresponding in Persian.

The Sindhi language is a language of a simple and rustic people living an unsophisticated life and familiar with the sights and sounds of the countryside, where agricultural pursuits, pastoral occupations and nomadic wanderings are all part of the scheme of life. Some forms of expression Sindhi can do extremely well. It is also wonderfully fitted for expressing feeling of reverence, devotion and religious ecstasy. For the simple and primitive laughter of country folk it provides also a very satisfying means of expression. There are many humorous short songs composed in a medium that exactly harmonizes with the subject matter. Languages of this kind are usually rich in proverbs and Sindhi is no exception. Many collections of Sindhi proverbs infected with Persian influence have been made. From them one can gather the amount of pithy wisdom, homely humour and succinct sententiousness which is part of the life of the people. Many Sindhi proverbs are cast in the form of jingles. A few examples of Sindhi proverbs are worth recording here:—qarz waddo marz—debt is a great fret (literally illness). Der pia, durust thia—slow and steady wins the race. دیر آید درست آید yar uho, jo auke men kam ache— a friend in need is a friend indeed.—kamaliyat khe zowaliyat —the best of things must perish. ہر کمالے را زوالے jesin sas, tcsin aus—where there's life there's hope. An example of simple humour rather on the line of Aesop's Fables is the Sindhi saying karo munh kutte jo,

rab ko na milio——the dog had his face blackened, (*i.e.* was disgraced) and he didn't get any of the soup. And another is ve-i sanghan khc, kan b kapa-i a-i—(the camel) going for horns had his ears lopped off—Be satisfied with what you have got. For epigrammatic wisdom one may cite ghane zaliyan, ghar n hale; ghane mursyan, har n hale—too many women, home's a sorrow too many men, there's not a furrow. Too many cooks spoil the broth; or jhairro wan, thairro phar——as the tree, so the fruit. Like father, like son. As a sidelight on rural life there is— jite har, tite ghar.—where's the plough, there's the how, literally, where the plough is there the house is. Another example is bhaggo gharro dun dun kare——a cracked bell gives a dull sound. There is a vast field for sociological enquiry into the sayings of the Sind countryside, but owing to the absence of interest and the lack of scholarship in forme: Sind very little has been done in exploring this fertile field of human experience.



Gul Hayat Institute

CULTURESindhi Literature.

The statement in the 1907 edition of the Gazetteer, with which the section on literature commences is somewhat too sweeping. It says "Until near the end of the eighteenth century, when the Talpurs had come into power, there was scarcely such a thing as vernacular literature in Sind region, the Sindhi language could scarcely, in fact, be called a written language at all. Persian held the place once held by Latin in Europe as a language of science and letters. In connection with that fact there is another worth noting, whether it be regarded as cause or effect, namely that there is scarcely a composition of that time extant of which the author was a Hindu, or even a native Sindhi in the strict sense. The historians, poets and philosophers were all descended from the invaders or immigrants from Persia, Afghanistan or Central Asia and the time when Sind was under the Arghuns and Tarkhans was the Elizabethan age of its literature. Dividing that literature under the heads, history, theology and poetry, we may take history as far the most important since without the Sindhi historians we should have known little of the history of Sind."

A somewhat clearer and more balanced view of early Sindhi literature is given by Dr. U.N. Daudpota, the distinguished Sindhi scholar, in his "Survey of Sindhi Literature" which he wrote for the brochure "Sind People and Progress" published by the former Directorate of Information, Sind, in 1954. The publication of this brochure was one of the estimable achievements of the Sind Provincial Government in the last days of its life before it became merged in the political unit of West Pakistan in 1955. Dr. Daudpota remarks "Like all other world literatures, Sindhi literature as well begins with poetry. The people of Sind were not barbarians when Sindhi poetry came first to be sung and written. With its conquest by the Arabs they had forgotten their past traditions but their minds were thoroughly imbued with the teachings of Islam and were further enlightened by sufistic influences, so the earliest specimens of poetry that have come down to us are tinged with religious and mystical sentiments and are didactic in content. At first cautious and halting and devoid of imaginative flights, it grew in volume and music until it found its proper vehicle in the sonorous and pathetic verses of Shah Abdul Latif of Bhit which are distinguished by their rhythmic flow, richness of thought and beauty of expression." It is not necessary to follow in this Gazetteer Dr. Daudpota in his detailed comment on the various literary figures in the early history of Sind literature. Very little of this work has really survived.

One prominent name in the early history of Sindhi literature is that of Sayid Abdul Karim, or Shah Karim of Bulri (1537-1623), "who", says Dr. Daudpota, "might fittingly be called the morning star of Sindhi poetry. His poetry is not very extensive in

ange as it consists of only ninety-one couplets, two triplets and one verse. Their scope and subject matter are not doubt limited, but they are an intensive expression of a fervent soul to whom poetry and music were the very life of its being. Rough and rugged though they are, they are not without feeling and intrinsic beauty. They are terse and pithy and contain moral adages and mystical truths. In them the couplet, or dohira, which was further developed and perfected by Shah Abdul Latif nearly a century later, reaches its culmination. The accounts in pure Sindhi without much of a mixture of Arabic and Persian words indicate that Sindhi was capable of expressing deep and recondite thoughts independently of other languages". Shah Abdul Latif of Bhit (1689-1752) must be considered the only gem of purest ray serene which in four hundred years has been cast up upon the shore of Sindhi literature. The poverty of Sindhi literature before Shah Abdul Latif was the result of the late emergence of the Sindhi vernacular as a vehicle of literary expression. While Islam was setting its authoritative seal upon the structure of thought in all-Muslim India, most of the inspiration came from the great Arabic and Persian tradition. The Emperor Babar was profoundly contemptuous of the merits of India. It was not surprising that Urdu was regarded till the late seventeenth century a tongue unfit for the gems of poetic inspiration. The courts used the Persian language. Persian was the medium of literary expression. Learned men wrote in Arabic, and Persian.

Shah Abdul Latif cannot be called conspicuous for any great originality of thought, but he expresses supremely well a species of religious philosophy current among the better educated men of his time.

The very competent Sindhi scholar, Mirza Kalich Beg (1855-1929), has written much of the conditions of Sindhi literature in the seventeenth and eighteenth century. In his "Old Sind" he has given some account of the learned men of Thatta during the period of its greatest splendour. The learned men of Mughal and Kalhoru Sind do not make a company imposing in achievement, though their number is not small. The learned works were concerned mostly with religious disquisition, with the duties of the true Muslim, with annals, chronicles and histories as then understood and with verse on the Persian model. But these authors some of whom were erudite and highly cultivated people, wrote in Persian and Arabic and not in the language of the countryside. In a land where the Muslim theocratic theory prevailed so strongly it was inevitable that religion and education should go hand in hand, as most of the learned men of old Sind were Sayids, Kazis, Mullahs or persons concerned in one way or another with the teachings of the holy Quran and the exposition of the Muslim faith. They certainly gained all the learning they possessed from the maktabas and madressas presided over by mullahs, akhunds and ustadhs. The

Memons, a class of Muslim hailing originally from Cutch area, were remarkable for their interest in learned things. "They have produced", says Burton, "many very learned men and done much to introduce the religious sciences into this country." Mirza Kalich Beg gives long lists of famous names associated with the light of learning in Thatta during its days of glory. The standard of their learning and the quality of their scholarship are now difficult to determine because they have left few relics of their work. Of poets and writers there is a formidable list containing many names. Poetry, astronomy, medicine, philology, dialectics and similar learned subjects were the topics of discourse. The chief centres of learning were Thatta, Matiari and Rohri, places famous for the residence of sayids and holy men attached to tombs, mosques and shrines. It was characteristic of much of the learning of those days that the writers belonged largely to families that had immigrated into Sind region. They were not Sindhis by birth. During the days of the Arghuns, who preceded the Mughals, and even earlier Sind proved a favourite home for learned men of this type. Both the Afghans and the Mughals showed a tendency to encourage a settlement of men of this character who were further attracted by the reputation which former Sind had gained for its Sufi philosophy and its Sufi exposition of Muslim doctrines. The age of the Arghuns or Tarkhans was specially notable for the entrance of this kind of intellectual aristocracy who spoke and wrote, however, a language that was intelligible only to the learned intelligentsia. It could have had but little effect upon the unlettered cultivator class who knew of Arabic little beyond what they learnt at the mosque for their daily religious devotions, and who used neither Arabic nor Persian in their daily speech. It is certain that in its heyday Thatta was a great centre of erudition and learning. "The city of Thatta is famous for learning and theology, philology and politics, and they have about four hundred colleges for training up youth in these parts of learning. I was very intimate with a sayid who was a professor of theology and was reckoned a great historian. He asked me one day if I had heard of Alexander the Great in my country." The only inference that can reasonably be drawn from Hamilton's account is that Thatta had a large number of maktabas and seminaries frequented by students and presided over by men learned in Islamic teaching. The chief kinds of serious poetical composition cultivated by Sindhis have been madahs munajats, marsiyahs, kowars and lanats.

The first are praises of God, the holy Prophet of Islam and the Saints; the second are religious hymns per se; the third are elegies generally concerned with the martyrdom of Hazrat Imam Hassan and Hazrat Imam Husain; the fourth are compositions which deal with the moral virtues and the vices of mankind.

Of the lighter forms of composition Sindhi boasts fatehnamas or songs of victory, kafis or wais, a form of amatory verse, lighter

couplets and sunyaros or love messages. Other lighter and amatory verse of Sind can be shown to have a closer resemblance to Persian than to Arabic models and to possess a local character. This is only to be expected of such forms of composition in a Muslim land that for several hundred years had had a self-contained individuality of its own. Of Shah Abdul Latif, Dr. Daudpota writes:—“His poetry is like a diamond with many facets and treats of all manner of subjects, mystical, spiritual, didactic, romantic and lyric. But in all these forms the poet’s mind is attuned to His Maker, to whom all things ultimately return. It is instinct with the pangs of separation, the yearning of the loving souls, the heart’s desire to be one with the Infinite and is patriotic to the core. It depicts the natural beauty of Sind’s earth and skies and describes the majesty and awe of its mighty river. Apart from its edifying content it rings true of the aesthetic sense and is replete with all the charm of imagery. It is rendered all the more melodious by the rhythmic footfalls of alliteration which never cloy. It is also the depository of the Sindhi language and so long as it lives, Sindhi language and literature will also live. “With Shah Latif,” he adds, “the couplet attains a perfection scarcely matched by any later poets who have tried to imitate him in this genre of poetry. Shah Latif was also the originator of another species of verse, namely the wais or kafi which was further elaborated by his successors and became highly artistic in the hands of Ramadan, the potter, Ahmad Ali Nur Muhammad, Misri Shah and others.”

The quality of the poetry in the Risalo, which is what the collection of Shah Abdul Latif’s poems is called (“Risalo” meaning literally the arranging or setting out in ranks, like the ranks of a regiment), is very uneven in quality, passages of bathos mingling with excerpts of pure lyric beauty and the ecstatic expression of devotion. But unevenness in quality is a characteristic of great poetry everywhere and poetry lovers know how to avoid the banal and seek the divine. Despite the depth and sincerity of the mystic philosophy of the Risalo, it is doubtful whether the poems would have attained their verwhelming popularity had it not been for the fact that several of the best-known of them are written round folk stories current in the former Sind countryside. The religion of the Risalo is thoroughly Islamic. God has at least thirty-four different appellations, several of them from the list of the Ninety-Nine Names of God. As we have seen already, the poems are loved by all classes in Sind region. The chief reason for this is the convincing manner in which they retell some well-known stories of the kind that would appear in children’s fairy books in England. There are half-a dozen such stories, five of them concerned with the tales of lovers and the sixth about a minstrel and a king. The telling and retelling of these stories occupy most of the modern Sindhi books on the poetry of Shah Abdul Latif. There seems to be no end to the number of publications which recount in simple language the tales of the Sindhi lovers. Some idea of the sublime



The tomb of Shah Abdul Latif Bhitai.



Mosque—Shah Abdul Latif at Bhit.

in the poetry of Shah Abdul Latif may be gathered from the following short excerpts from the “Sur Kalyan” :—

“Who dull existence would conserve?
For no such aim the lover strives.
One breath from the Beloved’s lips
Is better than a thousand lives
And can this skin and bone of mine
Compare with the Beloved’s wine?”

In the “Sur Asa” occurs :—

“Strange habits have mine eyes
To trade with others’ pain,
Love’s conquest they have made
Where burden brings no pain.”

In the “Sur Bilal”, which is a poem of deeply religious beauty, there occurs the verse :—

“Live on, Oh Sweet One, live.
May mine ears never hear.
An evil word of Thee,
Of thee who didst appear
But yesterday to grace
My soul’s unworthiness.”

In a pure lyric strain, in the following two verses from the great tale of Suhini and Mehar are found these words, in which Suhini proclaims the joy with which she hears from the further bank of the Indus the tinkling of the bells of her herdsman lover tending his cattle beyond the running waters. In an ecstasy of joyous delight she exclaims:

“Oh sisters! how the tinkling bell
Has set my limbs to sprightly dance.
To stranger-folk how may I tell
The love that doth my heart entrance?
With arrow that hath pierced my heart
My herdsman lover sends me joy.
The bells that make my senses start
In gladness do my soul employ.”

It is poetry of this quality that entitles Sindhi people to claim that here in scattered passages exists poetry that can claim equality with the best poetry the world has ever seen. Shah Abdul Latif has had no real successor.

Dr. Daudpota says that the Kalhoru period (1657-1783), constituted the golden age of Sindhi poetry and is mostly dominated by the verse called “bait” “The same period,” he says, “is also distinguished for the composition of Mathnawis, the chief among

them being "The romance of Lailah and Majnun" which has been handled with consummate skill by Fazil Khalifa Abdullah Nizamani. The Talpurs were tolerant Shiites and did not persecute anyone for his creed. Nevertheless, they appreciated the glorifications of the Imams and Ahl-i-bait (members of Holy Prophet's family) and other 'alids which gave rise to elegiac poems called marsiyahs which were raised to the highest pitch by Sayid Thabit Ali Shah (1740-1810). Sachal Sarmust (1737-1829) may be regarded as the outstanding poet of the Talpur period. His poetry, according to Dr. Daudpota, though extensive in range and typical by itself, cannot come up to the level of Shah Latif's verse. His kafis and ghazals (odes) are unrivalled in their own way. Although a hafiz of the Quran and learned in Islamic law he dabbles in the extremes of exaggeration, surpassing even Mansur-al-Hallaj in his blasphemies, and on this account his poetry is not liked by the generality of orthodox people. Speaking of the British period (1843-1947) Dr. Daudpota marks a renewed interest in the domain of poetry which, however, "eschews the old rhythmic measure of the Sindhi song, so characteristic of her great poets, tending more and more to the adoption of Persian verse forms and thereby losing its originality, vigour and spontaneity. It becomes a thumb-rule for poetasters."

The 1907 Gazetteer noted that the education of the country by British methods called forth a plentiful crop of literature of a different order: school books and translations—mere adaptations of English works, of course, predominate. Some useful work has been done in dressing in Sindhi garb samples of good things from Sanskrit and Persian literature. Mirza Kalich Beg has been especially fertile in these departments and had also produced a number of original works, while he has laid those who do not know Sindhi under obligation by translation into English of the Chachnama and "A History of Sind", which is a translation of selections from the Tarikh-i-Masumi and the Tuhfat-al-Kiram. The new education also brought Hindus into the field, among them Mr. Dayaram Guidumal, Mr. Lilaram Watanmal, Mr. Kauromal Wadhmal and many others who gave their countrymen both translations and original compositions. Of present-day poetry Dr. Daudpota points out that the younger generation of poets, though following the Persian verse forms, have struck out a new path in the matter of choosing their subjects. They have developed new forms of poetry, such as quintets, sestets, octets and other strophic poems with varieties of metre and rhyme. They manifest considerable artistry and try to fascinate by the witchery of their words. The thought content is also rich and varied. None of the poets whom Dr. Daudpota mentions in the above survey of Sindhi literature can really be considered anything but ordinary, and none of them show a spark of the genius which blazed in the verse of Shah Abdul Latif.

It is characteristic of the present age when so many new elements have sprung to being and when the diversity of the world has been made real to stay-at-home people in every land that the ideas which animate present writers of Sindhi literature are new and to the more orthodox believers heretical and dangerous. But this is in keeping with the tide of opinion now surging through Pakistan, a tide that threatens to carry away with it much of what was thought estimable and beautiful in the works of the past. In nothing is the alteration in the content of thought at the present-day more evident than in the development of Sindhi prose. Dr. Daudpota says that the earliest specimens of Sindhi prose are to be found in the moral apophthegms of Abdur Rahim Girhori. The preachings of Shah Karim and Khawaja Muhammad Zaman were originally in Sindhi prose. But the high-brow taste of their disciples turned them into Persian and Arabic respectively. The early prose works were literal translations from Arabic and Persian and retained the same structure as the original. Mirza Kalich Beg is described by Dr. Daudpota as the doyen of Sindhi literature. He is an indefatigable writer of prose, whose wide learning was displayed in a number of diverse works written in a pleasant and straightforward style. The late Dr. H.M. Gurbuxani, who died in 1947, was the master of a vigorous style. Dr. Daudpota says that his "Nur Jahan" and his introduction to the "Shahjo Risalo" have become classics and will continue to delight the thoughtful reader, and that the late Principal S. C. Shahani will always be remembered for his social novels "Bilu Khokhar" and "Tarani jo Abhyas" which, though inspired by the writings of Thomas Hardy and others, marked a new era in novel-writing in Sindhi.

One of the most characteristic signs of the liveliness of prose writing in Sindhi today is the regular appearance of a number of well produced and skilfully written magazines which contain articles dealing with a multitude of subjects of interest to intelligent people today. A good example of this new enterprise is the illustrated journal "Nai Kheti" which deals mostly with agricultural topics. This is a new departure from the conservatism of the past, and shows that even in a country that is still, for the most part, rural and unsophisticated, movements of modern thought are permeating everywhere. Dr. Daudpota says it is an encouraging sign that Sindhi prose is now acquiring that plasticity and naturalness which augurs well for its future. "We can look forward," he says, "to its efflorescence with confidence and hope."

So far attention has been devoted to literature in the pure sense, meaning by that, mostly poetry and, in more recent times, modern prose. But it is in history perhaps, apart from the Shah jo Risalo, that Sindhi writers have gained most distinction. As Mr. Aitken says in the 1907 Gazetteer, "Without the Sindhi historians we should have known little of the history of Sind." While it is true that the Sindhi historians cannot be called skilled and

scientific to the extent that would satisfy modern scholars and students of the events of the past, it is nonetheless true that they have been able to provide vivid pictures of the past and that their writings are informed with no little expertise. The earliest history by a Sindhi writer is the one commonly known as "The Chachnama" from Chach, the Brahman king of Sind, who ruled in the middle of the seventh century A.D. It professes to be a translation of a much earlier Arabic work of unknown authorship. The translator was Ali, son of Hamid, son of Abu Bakar Kufi, an alien who after many wanderings, had settled in Uch during the reign of Nasiruddin Kabacha in 1216 A.D. Of this work Elphinston, the editor of "The History of India as told by its own Historians," says that though loaded with tedious speeches and matters ascribed to the principal actors, it contains a minute and consistent account of the transactions during Muhammad-Bin-Qasim's invasion and some of the preceding Hindu reigns. The next history is "The Tarikh-i-Masumi" or "Tarikh-i-Sind" by Mian Muhammad Masum, a native of Bukkur, who rose to considerable power and fame in the days of the Emperor Akbar, and whose minaret is the most conspicuous object at Sukkur, where his descendants still live. His book was written in 1600 A.D. and contains a history of Sind from the Arab conquest to his own time. It is the fullest account of the whole period that we possess. Captain G. Malet, once British resident at Khairpur, produced a literal English translation of it. "The Tarikh-i-Sind" is a most copious account of Sind history; but it does not go beyond the defeat of the then ruling house of Sind by Akbar in 1592 and the capitulation of Mirza Janibeg of Thatta. Muhammad Masum wrote his "History of Sind" for the improvement of his son's mind and has filled the story with reputed miracles of saints and holy men to such an extent as greatly to depreciate the value of his work for scientific historians. "The Tarikh-i-Tahiri" composed about 1621, is a history of the period from the rise of the Sumra to the death of Ghazi Beg Turkhan. The last part is very full, being concerned with events in many of which the author's father had a share. But it is confused and inaccurate. "The Tarikh-i-Tahiri" takes the reader down to 1621 to the death of Mirza Ghazi Beg by poisoning at Qandahar. The book has occasional passages of considerable historical interest and is written in a picturesque and attractive style. "The Tarkhannama" is a genealogy and history of Arghuns and Tarkhans compiled, from "The Tarikh-i-Masumi" without acknowledgement and some other sources, by Sayid Jamal Shirazi in 1654-55. "The Tarkhannama" is indebted considerably to "The Tarikh-i-Sind" and "The Tarikh-i-Tahiri" and is devoted mostly to the praise of Mirza Muhammad Saleh Tarkhan, who paid obeisance to the reigning Mughal Emperor and was rewarded with various preferments, including first the Subedari of Thatta and later the Subedari of Gujrat for his helpfulness to the Mughal Emperor. The work is of little historical value. "The Tuhfat-al-Kiram" is a work in three volumes, of which the last constitutes, according to Elliot

the most comprehensive and consistent history of former Sind that we have. It was completed not earlier than 1774 A.D. by Alisher Kani of Thatta, and so includes all the conflicts that attended the expulsion of the Kalhora by the Talpurs, but narrates them of course in a manner calculated to be pleasing to the Talpurs. "The Tuhfat-ul-Kiram" is the most pretentious historical work by an inhabitant of Sind region. It purports to be a general history down to the author's own time in three books and the third book deals especially with former Sind. There is considerable historical material in "The Tuhfat-ul-Kiram". The work carries the history of former Sind down to the death of Mir Sarfaraz Kalhoro and appears to have been finished about A.D. 1773. "The Beqlar-nama" is the anonymous work dedicated to Amir Sayid Kasim Beqlar, of a family from Tarmiz in Samarkand which had settled in Sind region in the time of Shah Hussain Arghun, and after settlement in former Sind married into the Bhati tribe of Sindhis. The book was finished probably about 1628 and is historically of little value. The chief interest is in the minor affairs of the Tarkhan house with particular attention to the marauding expeditions of Raja Rana of Umarkot, into whose family the author married. It is occupied mainly with court scandal and the public events, great or small, in which the author's patron played a part. It was written about the same time as "The Tarikh-i-Tahiri." The Fatehnama is a metrical history of the beginning of Talpur rule written by one Muhammad Azim of Thatta and dedicated to Mir Fateh Ali Khan.

Apart from history, works on theology or religious philosophy were very numerous. Besides religious teachers, many of note in other ways devoted their leisure to this kind of composition. The Arghun kings are said to have written commentaries and other religious books. But little is known of such of these works as may still be extant, except among Sayids, Moulvis and other Muslims who combine piety with learning. As stated above, apart from Shah Abdul Latif, the historians are the chief literary men of former Sind.

CULTUREMusic.

Apart from its poetry, Sindhi music is perhaps its greatest cultural achievement. "The Ain-i-Akbari" describes the music of Sind region as "kami" (amatory). The country has always had a large number of capable performers of the kind of music which it likes. During the middle ages, particularly in the times preceding the Moghuls, Sind was famous for its musicians and its minstrelsy. Like Indian music generally, Sind music has suffered greatly from its remaining a closed system in the control of professional performers and musicians who have kept the practice of it by traditional methods in their own hands. As a result of the failure to develop harmony, musical instruments in Sind are generally of a very simple type quite incapable of producing the effects of such developed and intricate instruments as the organ, the piano and the variety of instruments which, when played together make possible orchestration on a grand scale. These defects of the music are being gradually realised today. A strong movement has arisen to rescue music from the hands of the professional musician, or minstrel class, who have hitherto preserved it as an almost magical field of their own, to introduce general scales and notation which will enable anyone to write down melodies and perform them for himself and to explore the possibility of extending harmony in music. But there is no unanimity of view in these matters. Thus while the professional minstrel, who is usually of poor education and is often indeed illiterate possessing merely a certain dexterity in performing on his simple instrument, has lost a great deal of the respect in which he used to be held, a general knowledge of music is still hindered by the absence of a common written notation. The taste of the public is, moreover, becoming debased by the adoption of the hand-blown harmonium tuned to the European major and minor scales and also by the excruciating cacophonies of incompetent brass bands playing garbled version of European tunes.

There is no distinctively Sindhi School of music. The broad facts about Indian music have been made clear by Clements in his "Introduction to the Study of Indian Music." Indian music belongs to two great groups, the Hindustani prevalent in the north and west of sub-continent and in the Deccan, and the Karnatic prevalent in the south and east. "Many scales," says Clements, "are common to both and the general aspect of the two systems is apparent from the scales which are first taught to beginners. In the west the scale is the same as the just major scale of Europe, in the south it is a chromatic scale. The melody types which are called "ragas" are developed under a system from the melodic schemes into which all the tunes of music fall." The classification of these melodic

schemes follows a highly sensitive system which has been described by many authors, but by none so clearly as the famous early orientalist, Sir William Jones.

The poems in the Risalo of Shah Abdul Latif are all set to melodic forms of ragas. The poems of the Risalo are sung to rags and ragnis of the generic types. These types have many local variations. Many of the Mughal ragnis to which some of the surs of Shah Abdul Latif are sung are Sindhi variants of Hindustani generic forms. In his commentary on Shah Abdul Latif Mirza, Kalich Beg has classified the rags and ragnis according to the system of Indian music. He finds six forms of rag, namely Barvo, Malkus, Sri, Megh, Hindol and Dipak, with their accompanying ragnis, 'sons' and 'associated relatives', extending to a very considerable number. There is thus nothing distinctive in the music of Sind region. The instruments employed are chiefly the yaktar, the sitar, the saranji, the tambur and the various kinds of pipes and drums employed elsewhere in Pakistan. The bina, or vina, is hardly ever seen. The professional musicians are drawn mostly from the minstrel class which is held in low esteem. There are many capable amateur performers. There have always been such because Sind has long had a reputation for proficiency in musical execution prevailing amongst all classes. Burton remarked that the people were very fond of music and singing, to which the natural rhythm of the language offered much aid. Of the peculiar native form of poetical and musical composition Burton cited the "Fatehnama", or "Song of Battle", composed by Langahs and resembling in vigour productions of the old Arab poets, the kafi or wai, generally amatory, the bait or couplet sung to the tambur or guitar, the dohira accompanied on the dohad or kettle-drum, and the sanyaro or amorous missive, sung to the music of the nai or pipe and particularly popular among the wilder clan people.

To what extent melodies claimed to be indigenous Sindhi tunes are really such cannot be established on evidence. The evidence is not easily available. What is certain is that long before the time of Chach, since the early centuries of the Christian era, Hindu music must have been dominant in the native strains of Sind. During the Arab conquest the life of the common people was not much disturbed and no great changes in the musical taste can have occurred. The Sumro and Sammo dynasties were Hindu in origin. It is, therefore, safe to say that till the era of the middle ages of Sind history the music of Hindustan must have been the prevalent music in Sind. That it continued to prevail thereafter is proved by the manner in which music was applied by the poet, Shah Abdul Latif himself to the intensely Sindhi verse of the Risalo. If there are many surs, rags and ragnis that can be called particularly Sindhi, these must be merely vocal improvisations on the general melodic scheme of Hindustani music, in the same manner as even today new melodic schemes within the framework of

standard models are continually being devised. Indian and Pakistani music in general lends itself very easily to this form of adaptation and improvisation. It is, therefore, necessary to produce evidence that the so-called Sindhi indigenous melodies were not born in this way. Where of course genuine Baluchi, Brahui or Afghan melodies have played their part to that extent Sindhi music must have a mixed origin. Dr. N.B. Baloch's thesis that indigenous elements play a large part in Sindhi music needs to be corroborated by practical and historical evidence which may be difficult to find. Dr. Baloch has been of great assistance to the compiler of this Gazetteer in dealing with this subject of music. The following are quotations from an article which he contributed for the purposes of this work. "Interest in the classical Hindustani," says Dr. Baloch, "as well as the indigenous music in Sind reached its height in the sixteenth century during the reign of the Tarkhan rulers, Mirza Jani Beg and his son, Mirza Ghazi Beg. Both the father and the son were great patrons of poets like the famous Talib Amuli and others, and of numerous musicians who invented new musical forms, naghmas, and a variety of tunes. Both the rulers were accomplished musicians themselves. Their capital Thatta was a rendezvous of renowned musicians, and a contemporary author Sheikh Farid Bakhri writing in Zhakirat-ul-Khawarin has described it as a place of mirth and joy of which the very atmosphere was saturated with music. According to him 'the music of Tambur and Dholki resounded from every house in Thatta.' Dr. Baloch draws attention to the importance of sufism in the development of the music of Sind and cites the two sufistic systems which have been employed. These are the Suhrawardy tarika and the Qadri tarika. Of the former he remarks that the great saint, Bahauddin Zakaria of Multan, founded the tarika. As he was buried in Multan, his numerous followers from Sind had to undertake a long and arduous journey to visit the Saint's mausoleum. The followers' love and yearning for the Saint found expression in typical verses of the baita, which were in turn sung by groups of pandhis, or the followers travelling on foot, in a peculiar style which came to be known as dahr. The murid's call for help to or praise for his murshid became the accepted theme of a dahr which, when sung to the accompaniment of instrumental music probably gave rise to a new indigenous ragni, 'Dhanasuree.' As regards the Qadri tarika, in it instrumental music was strictly forbidden and, therefore, vocal music became popular. This placed greater emphasis on alhan (tones) and ahlyan (an indigenous term signifying the mode or form) which characterised to some extent the vocal music of the followers of Pir Pagaro. Their way of singing is a distinct one and is popularly known as "jamait-jo-raga." "Many such varieties of ragnis were developed in Sind; for instance the Sindhi Bhairvin, the Sindhi Baruvvo or the Sindhi Tilang, the Kedaro (Sindhi-Kidar), the Sindhi Pilo, the Sindhi Manjh, the Sindhi Dhannasuree and many other varieties which," says Dr. Baloch, "are distinct from their

prototypes and contribute to the wealth and originality of our National Pakistani music. "Besides these," says Dr. Baloch, "there are other ragnis which, so far as I understand them, are entirely Sindhian in origin, such as Joag, Kohivaree, Rano, Pirbhati, Dhannasuree, Larao and others. All the Sindhi melodies conform," says the same writer, "to the heptatonic scale of seven basic tones, each of the five or these, excepting the first kharj or "sa" and the fifth pancham or pa, is further divided into two parts, komal (soft) and tiwar (hard). Thus in all there are twelve notes, the agreeable permutations and combinations which result in a number of different melodies. "This scheme," adds Dr. Baloch, "is the one employed in the classical Hindustani music, the first or foundatonal tone (which presumably means the dominant) of this scale is known as the kharj which is denoted as sa". My own analysis of the various surs of Shah Abdul Latif as they are being sung today at Bhitshah on three nights a week, on Sundays, Tuesdays and Fridays shows that generally Shah's rags or surs (melodies such as Kalyan, Kohyari) and others have the fifth tone of the classical scale, that is pancham "pa" as their basic tone. "In this characteristic Shah's rags," says Dr. Baloch, "have an affinity with middle eastern (Arabic) music. The instrumental music of Sind has even greater claims to originality. Firstly, such instruments as yaktaro, the nadd, the surando, the kumachee and the al-gurza in their present form are probably peculiar to Sind. Also the murli which, in Kathiawar, Gujrat, Rajputana and some other parts of Bharat is used only by snake-charmers for the purpose of their profession, has become an instrument of music par excellence with some of the professional Sindhi players. Of these instruments the nadd and surando are the instruments of Kohistan, or the western hilly region of Sind. The naghma and lahra are the two important components of the 'music of the mountain' played upon these instruments. Some of the famous 'mountain tunes' that I know of are : the Wisal, the M'adhoor, the Zehmar, the two varieties of Moro, the Zeelgat, the Brohi Leero, the Mykran, the Shahap and the Dastan. All these are sweet swift melodies which have a peculiar rhythm and swing of their own".

It is unfortunate that no serious attempt has yet been made to gather the numerous country songs sung throughout Sind and have them published in a compilation such as was made by Sir Walter Scott for Scottish music in his books on "The Minstrelsy of the Scottish Border." It is feared that if this work is not taken in hand soon it will be difficult to recover many of these old songs since members of the younger generation do not show the same interest in them as their fathers and grandfathers did.

Arts.

As remarked above, former Sind's chief cultural contributions have been in the fields of language, poetry and music. The graphic arts have never been strongly represented and there has been no school of painting like the Mughal School or the Kangra School. There is, however, a kind of mural decoration which still exists though the art is dying out. This is stucco work, chirolis, and the painting on it. The stucco is made from the gypsum found so plentifully in former Sind and the worker moulds it with his finger nails or the simple tools of wood available around him. Sometimes the surface of the stucco is left unsculptured and painted in water-colours by a class of artists known as 'Kamangars'. The pictures consist generally of representations of flowers, birds and beasts as the Sindhi artist is apt to conceive them. But the colours are bright and permanent and the result is effective. This kind of decoration used to be much in vogue amongst both Muslims and Hindus in their houses. Examples of it may still be seen, mostly on tombs, where some considerable skill is often shown in moulding ornaments and in decorating them with designs depicting for the most part vases and flowers portrayed in a conventional and stylised way and in loops and whorls and variegated curves.

Sind has always been famous for the variety and skill of its cottage industries; but an examination of these belongs more to the economy of the country than to a study of its culture. The cottage industries of former Sind produce a variety of articles in which utility and beauty are found. As on the whole they are the results of expert craftsmanship, it will for the purposes of this chapter be sufficient to indicate only those characteristics of some of the Sindhi cottage industries which appeal to persons interested in artistic and cultural development. The cottage industries are of course today in Sind, as in most parts of the world, in a decayed condition, and this has caused some concern to the Government of the country, which, in the first Five-Year Plan 1955/1960 of the Government of Pakistan National Planning Board, has taken note of the problem and is devising various means to assist the cottage industry in Sind, as elsewhere in Pakistan. The Five-Year Plan says "If small industry is to survive and prosper in the face of increasing competition from large industry, it stands in need of technical guidance. A first step in the provision of such guidance should be the development of improved processes of production and the design and construction of the types of equipment that such processes will require. This should be the task of research and development institutes for small industry".

In the past the quality of Sind region cottage industry impressed travellers by the variety and the excellence of its products. This was particularly so in the sixteenth, seventeenth and early eighteenth century when Sindhi textiles were considered a valuable products much in demand in many parts of the world outside Asia. Indeed the East India Company in the seventeenth century was largely employed in the purchase of Sindhi textiles for sale across the sea. Father Manrique, the Jesuit missionary, who made a trip down the Indus to Thatta in 1641, speaking of Thatta says: "It is a very rich city for several reasons, because of the great fertility of the land in that principality in foodstuffs of all kinds, especially wheat and rice, also of the vast quantities of cotton collected there, from which, over two thousand looms, rich cloths of various kinds are woven and exported to many parts of Asia, as well as to Portugal. There is also a species of silk in that country from which excellent taffetas and taffecerias (tapestries) are made, and other cloths would also have been manufactured had there been good handicraftsmen. The region also abounded in cattle, especially buffaloes which are so numerous, and many ships are despatched to various ports laden only with their hides. From these they manufacture the lovely leather which the Portuguese style "Sind leather" ornamented with back-stitch work in various coloured silks in fine designs, lined and finished off with fringes of silk at the ends. These leathers are used to cover tables and as hangings in reception rooms, as well as for beds, as they are very soft and cool in summer. From these leathers they also make very quaint and rich trappings for horses. In this city they manufacture besides rich back-stitch quilts and the excellent mattresses called "Sind mattresses." Spinning, dyeing and weaving of silk was at one time the industry for which Sind was more celebrated than any other. In the palmy days of Thatta its looms for the weaving of shawls and lungis were said to number five thousand, and up to the time of the British conquest, when Thatta had utterly decayed, silk still held an important place in the trade and industry of the country, a fact of which there is abundant evidence in the reports of several officers. Lieutenant Postans, writing in 1840, enumerates among the goods brought to Shikarpur by carvans from Qandhar, raw silks of six different qualities from Bukhara, Herat and Yazd, and the following dyestuffs: rodung or madder, saffron, safflower and musagh, that is a dye prepared from walnuts, also a tinsel thread for embroidery. The silk he says was spun and dyed at Shikarpur and then sent to Sukkur, Rohri, Khairpur and as far as Sehwan and Thatta to be woven. Captain Hart, reporting in the same year on the trade of Karachi, mentions among the imports raw silk from Bombay and Muscat, and dyes, cochineal and rodung. But among the exports are lungis and mashru to Muscat. Lungis, the rich scarves which are mentioned by early travellers in Sind as the most distinctive articles in the dress of the Mirs, which were at that time worn by every man of position, are now going out of fashion,

while other silk fabrics can now be imported cheaper and better than any handloom weaver can make them. Nevertheless, silk weaving still goes on in Karachi, Thatta, Rohri, Jacobabad and other places. The fabrics now consist of garbi, mashru and lungis. Garbi and mashru are fabrics of silk and cotton, strong and rather rough in texture; like most Indian and Pakistani silks they are made in lengths of about thirty yards with a width of three-quarters of a yard. Garbi, which is sometimes called tussore, but is not made of tussore silk, is much used for trousers by well-to-do women of both communities. Mashru is good for cushion covers, quilts and many other purposes. Lungis being intended for use as turbans, scarves or waist-bands vary in length from eight to twelve yards. They usually have the woof of cotton and the warp of silk, while the ends are always fringed and embroidered with gold and silver thread.

Embroidery was another art which was carried on with great skill in the rural districts of Sind. Embroidery in silk or gold and silver thread, was in great demand at one time for the decoration of shawls, coats, caps, ladies shirts and children's trousers. Professional embroiderers were all Mussulmans and some of them still survive in Hyderabad, Shikarpur and other towns. Persons who wish a garment embroidered take it to them and pay for the material and the labour. Learners begin in early childhood and go through a regular curriculum. Pupils of the lowest class sit in a row on the floor, tortuously twisting, stretching and bending back the fingers of the right hand with the left till they have reduced them to the condition of guttapercha. Then they are promoted to the second class and each gets a piece of coarse cloth and a needle which is like an awl with a short wooden handle. The task is to prod the cloth as fast as he can. In the next stage he gets a thread to his needle; when the whole course is completed, the rapidity with which he will work out the most intricate pattern of flowers and leaves will be astonishing. Whether the professional embroiderer can be saved is very doubtful. But the art has now taken root in domestic soil and employs the leisure of hundreds of women. This kind of work in the form of slippers, cushions and table-cover is well-known everywhere. It exhibits the variety and elegance of design which are characteristic of all Sind region work. Another interesting variety of the embroiderers' craft is found where one would not look for it, namely in the desert of Tharparkar. The women of these parts greatly affect petticoats of chuni which is the coarsest cotton cloth dyed red and deeply embroidered with silk in many colours with little bits of looking-glass let in. This is made in widths of about eighteen inches, so it takes three widths one above the other, to make a petticoat. But the uppermost need not be embroidered.

The other two artistic crafts in Sind region deserving mention in this chapter are lacquer-ware and glazed pottery. The art of lacquering wood is one which has not deteriorated, though the numbers of

workers have diminished. This kind of work is sold all over the country as Sind work "bokkus" in the form chiefly of round boxes fitting one inside the other, all beautifully lacquered in red, yellow, black and green. Many other colours besides red, yellow, black and green are employed, and many exceedingly pretty articles made, such as vases, cups, candlesticks and rulers. But the principal indigenous application of the art is to the glorification of bedsteads and of those swinging cots and cradles which are found in the home of every prosperous Sindhi gentleman. The work is commonly spoken of in Sind region as Hala work because Khanot in Hala is the principal centre of the industry. But it is carried on in other places and there are even peripatic lacquerers. Kashmir in the Jacobabad district is noted for a special kind of ware with a black ground in a pattern in fine silver lines. The best wood for this work is that of the white poplar, bahan, and that of the tamarisk, lai, is also employed, and even babul. The article, having been turned in the lathe and polished, is put back in the lathe, which is a common wooden implement employed by all local turners and worked by means of a bow. It turns swiftly while the lac is pressed hard against it. The lac is the produce of Sind and is prepared for this purpose by being mixed with various pigments and melted, together with wax and sulphur, and cast in flat cakes which have the consistency of artists' dry water-colours. When one of these cakes is pressed against the rapidly whirling wood the heat generated by the friction melts the cakes slowly, so that the surface is covered with a layer of it. The first layer put on is, of course, that which is to be the ground colour. On this the worker next proceeds to engrave the intended design with a sharp iron tool. He has no scroll, or even a copy to follow. It is all freehand drawing of the design in his own head. When this is done the piece goes into the lathe again and is wholly coated with another colour, which is no sooner put on than it is rubbed off again with a wet rag and sand till the ground colour reappears. But the second colour remains in the engraved pattern. This process has to be repeated as many times as there are colours in the design. The mottled pattern so common in nests of boxes is produced by using a stick of much harder lac for the second colour without any previous engraving, moving it about irregularly as the lathe turns. It indents itself into the lower layer of softer lac, and when most of it has been rubbed off with sand a mottled pattern remains. Another method which is employed in the beautiful bronzed-ware is to put two different layers of lac of different colours and engrave the design deep enough to make the lower appear. The whole is then smoothed with an oiled rag while a pan burning charcoal is held near it. For bronzed-ware the surface of the wood is always coated with tin by simply painting it with melted glue with which a small quantity of tin has been blended, and then polishing with a smooth stone instrument.

The glazed tiles of Sind region are justly famous. Several hundred years ago, when the art was at its best, the mosques and tombs were covered with this beautiful material. The art is still practised today. But the skill is not what it was, although a few craftsmen are able to produce work which can compare favourably with the best of the tiles produced in the days of the Mughals. Until comparatively recently the tile work was exclusively architectural consisting of tiles painted in dark and light blue with large geometrical patterns for wall surfaces, finials for the domes of tombs, the Muslim profession of faith painted in bold Arabic characters for tombs, panels and various sizes of lintels and doorjambs and the like. The colours used are a dark blue from cobalt and a very fine turquoise from copper. The biscuit and ghost firing is done in one operation. That is the article is made in clay, sun-dried, covered with glaze and painted at once. The art of making bricks and tiles like those on the tombs on the Makli hill or in the mosques at Thatta has been lost. After two centuries these ring like metal and show edges as clean as the wooden bricks in a child's box while the enamel remains as transparent as on the day when they were made. But the Sind region pottery of the present day is difficult to carry without breaking and flakes and chips when exposed to the weather. The designs are very various and almost always artistic and beautiful; but the material is mere earthenware. The clay now used is the silt of the Indus and it undergoes little sifting or preparation of any kind. Firing is done in an ordinary kiln, and ten hours are considered sufficient. In addition to the blue and green there was in the old bricks a fine buff tint which is imitated at the present-day by mixing cobalt with a red pigment which is perhaps red ochre. There was a fine blue-green tint, the recipe for which is lost. Many other colours are used now. Hala is the chief seat of this craft but it is carried on at Nasarpur, Guni, Thatta and perhaps other towns. Wood-carving is an art which also is disappearing. Many of the old houses have doors of the most intricate carving usually in floral designs and the same type of work can still be seen on the prows of the Indus boats. As boat-building is now disappearing as an industry it is likely that the art of carving will vanish with it.

CULTURE AND MODE OF LIFEMode of life.Dwellings.

The climate of Sind is favourable to open-air life and large sections of the population, especially in the Delta, live under movable shelters of reed mats or of brushwood and thatch. In a country where rainfall is meagre and where the sun is for most of the year very strong and piercing it is often more pleasant to remain outside under shelter and shade than in a stoutly built dwelling. There is a deficiency of stone in most parts of the country. So where substantial buildings have to be put up they must be of brick and brick which is burnt in kilns. But in Upper Sind region which has a very low rainfall, most houses are built of earth and brick dried and hardened in the sun. In 1842 Von Orlich, writing of conditions in Lower Sind, said: "All the houses here are built of clay. They are scarcely twenty feet high, have flat roofs, from which a kind of ventilator sometimes rises and the airholes supply the place of windows. Long continued rain would destroy these huts and sweep away entire villages." Centuries before the Arabic writer Al Idrisi noted that in Debal the houses were built of clay and woody and Pottinger, speaking of Thatta in the early nineteenth century remarked: "The houses here are built on a plan that I have never met with in any other country as the walls are made hollow by small pieces of stick being nailed across each other from the outer edges of a small frame of wood. These bits of stick are usually from eight to sixteen inches long and placed diagonally so that they form a very strong frame on both sides, which is plastered over with mud or mortar and has the appearance of a solid wall. Some of the buildings are actually on this principle of three or four stories high with flat heavy roofs which is a proof that they are very strong." It is only in the old and settled towns that there are many buildings of brick.

Former Sind is largely still a rural and pastoral and nomadic country, and the majority of the inhabitants have little desire to live in or possess substantial brickbuilt buildings. Some scorn even so much as shelters of reed mats and live under trees; but the ordinary villager has a low hut consisting of mud or wattle walls and a roof of thatch with a hedge round it enclosing his cattle-shed which is also his reception room when friends call. In an emergency the cow will share his own hut with his family. His furniture consists of a cot or two, a mat, cooking pots and a hookah. From this the transition is gradual to the house of the zamindar, built of sun-dried bricks with a flat roof. It consists of a living-room (sufo), with one or two side rooms which serve as box-rooms and also receive the overflow at night if the family is large or there are married sons. There should, if possible, also be a kitchen (rando), in

default of which cooking must be done in the sufo, a store-room (saman ji kothi), bathroom and privy. The last is almost a necessity to Muslims in towns and large villages. But the most important thing of all is a surrounding wall (kot, or alam panah) enclosing a courtyard (agan). Inside it a shed will serve him and his family till he can afford something better. But to live with any appearance of respectability a householder requires also an otak, or drawing-room, in which he may receive male visitors and pass the hours of the day. This is a separate building and contains the best furniture he has; cots with lacquered legs, swinging beds, perhaps even a chair or two. The houses of the wealthier men are distinguished by ample accommodation and more grandeur along the same lines. The residence of a great zamindar or of a pir often has a castellated outer wall and several substantial buildings within. On the other hand, many Baluchis have a superstitious fear of living in a solid building lest it should fall in on them, and for this reason, however wealthy they may be, they sleep and live in thatched sheds. The family of the Mir of Khairpur adhered to this practice almost to the end. With the rise in the whole standard of living which is observable amongst all classes in former Sind, houses of burnt pukka brick, and even stone, are becoming more common in the large villages than they were, and corresponding improvements appear in the arrangement and furnishing. Double-storied houses are still rare and they are apt to be resented by neighbours, the privacy of whose purdah they menace. In rural houses of the old type windows are regarded as superfluous; but ventilators through the roof (mangh, or badgir) are very common and almost a necessity in the areas up to which the sea breezes reach. Flat roofs are not much used for sleeping, except in the north. Little of what has been said above applies to the large towns in which the houses are much more substantial but necessarily of several stories and are crowded closely together owing to the timid centripetal tendency of banias and shopkeepers. The people whose means admit of it seek single-storied houses with courtyards and the rich have many fine houses in Hyderabad and Karachi.

Such is the account of dwelling-places in former Sind given in the 1907 Edition of the Gazetteer. There has been on the whole very little change since that time, except that after the period of agricultural depression, which ended about the commencement of World War II, a great improvement occurred in the income of persons working and living on the land and this improvement had the effect of increasing the amount of money which agriculturists were prepared to spend on the provision of more substantial buildings than those prevalent in the days of the great agricultural depression, which lasted for about twenty years from the end of World War I. In the riverain districts the conditions over most parts of the country are still not very different from those observed by Lieutenant James in his account of the Chanduka, that is the Larkana district, more

than a hundred years ago. He said: "The houses are of mud with flat roofs, and those of the poorer classes are of tamarind wood covered with mats and boughs and, where procurable grass. Many villages are comprised almost entirely of dwellings of the latter description, little if any distinction being observable between the sheds of the cattle and its owners. In the low land the villages are raised and sometimes also have a ditch all round them as a guard against the waters of the inundation. Those which are the residences of chiefs or big zamindars and Government officials have mud fronts with a tower at each corner and in almost all the villages is to be seen the watch-tower which served as a place of defence for the inhabitants if suddenly attacked by predatory bands." Pottinger in his account of Sind region in the early nineteenth century says "A large part of the population lived in wadhys, which were collections of hovels built of straw and wattles and some plastered over with mud. From Karachi Bunder to Sehwan, on the western bank of the river all the dwellings, except those in the immediate vicinity of the Indus, are of this construction. The population of these wadhys seldom exceeded six or seven hundred. But there is one called Kahorani, forty miles south west of Hyderabad, which is stated to contain four thousand souls." Generally the climate of Sind makes it possible for large sections of the population to continue to live in tolerable comfort in what would seem to more advanced peoples a most uncomfortable kind of dwelling. Except in areas able to periodic flooding, the climate is rarely so severe as to make residence in these ramshackle and easily constructed contraptions of grass, reeds, branches and thorns an unpleasant way of passing one's time when not out at work in the fields or in herding flocks of cattle, buffaloes, sheep goats and camels. It would be absurd, therefore, to believe that the Sindhi peasant housed in this way is an unhappy and ill-provided-for creature. He is actually quite satisfied with his housing conditions, and it is only when he leaves the fields and comes into the towns that he has any idea that another kind of dwelling would be better. The only substantial buildings that he sees in his rural village today are the school, the dero of the tapedar, the local revenue official, and, if the village is big enough, the dispensary, as these buildings are usually constructed of pukka brick

Dress.

As the great majority of the Sindhi population is agricultural and rural and spends most of its time in the open-air, the question of dress is not one to cause much thinking as to the suitability of, or the need to change the uniform. In fact, the Sindhi cultivator and the Sindhi herdsman is most conservative in the matter of dress and the great changes which the last fifty years have seen in all directions throughout the country have had very little effect upon the clothing of the agricultural classes, whether zamindar or hari. It is well that this should be so, since most of the clothes worn are the product of the cottage industry of Sind region. The fact that a large agricultural population exists, and is content to clothe itself in the materials furnished by the village handlooms is a good thing, since whatever may happen to imports of cloth, the Sindhi agriculturist is not affected.

"In the dress of a Sindhi, whatever his creed, social position or sex may be, there are two indispensable garments, trousers (suthan) and a shirt (peheran); and the shirt is worn outside the trousers. Perhaps trousers is not the right word: drawers would be better, or "pyjamas," for they are fastened with a cord of many colours, ornamented, even bejewelled: the making of these is an industry in former Sind. It must also be noted that the shirt, which varies greatly in shape and size, becomes sometimes what would be better described as a vest, or even a compromise with a jacket. The indigenous trouser varies much in material and colour, but not in shape. The Baluchi "bags," narrowed and gathered in at the feet, are the fashion for all. The poor man's are of cotton dyed with indigo (unless he is a Baluch, who abhors indigo), the rich man's of silk, or cotton and silk, and white coloured, or in some cases black. The shirt, usually of thin white muslin, opens on the right breast if the wearer is a Mussulman and on the left if a Hindu: its sleeves are wide and cuffless. Over this the Muslim likes to wear a fancy waistcoat (kurta) of velvet, or embroidered silk, over which he may, or may not, wear a long coat, of any material according to taste. The true Baluch puts on over all a long white smock reaching to his ankles and gathered in at the waist, and no visible coloured garment except a poshtin in winter. Sindhi zamindars also wear warm coats in winter of broadcloth or tweed, sometimes brocaded or trimmed with gold lace or silk. Finally all classes wear a kind of scarf, which may be used as a "kummerband," or thrown about the shoulders like a Scotch plaid, and has multifarious conveniences. If made of silk, with a border perhaps of gold thread, it is a lungi for a prosperous Sindhi if of white cotton, a bochkan. A coloured one such as Hindus affect is a dupatta. Shoes are universally worn in Sind region, those of the upper classes are often coloured and variously ornamented, those of the poor plain. Those of women are slippers described thus by Sir Richard Burton. "A leather sole destitute of hindquarters, whose

tiny vamp hardly covers the toes, its ornaments are large tufts of floss, silk, various coloured foils, wings of green beetles, embroidered, or seed pearls sewed upon a bright cloth ground."

An increasing number of educated men are adopting a shirt (kamis), coat and trousers approximately more or less to the European pattern of those articles; so that in large towns it is rare to meet a man of any position who is dressed quite like an oriental. The lungi bochkan and dupatta are gradually being banished by this change. Shoes have very generally conformed to the European pattern and socks are getting common. The Sindhi hat itself appears to have gone into and out of fashion very capriciously. Lieutenant Pottinger found the Mirs of Hyderabad in 1809 wearing stupendous turbans in the morning, from 2 to 2½ feet in diameter and consisting of 80 yards of fine gauze. But they put on the Sindhi hat at other times and a form of it, as appears from pictures, was the ordinary headgear of the Baluch soldiery.

Women wear, in addition to the two indispensable garments, a covering for the head (rawa), which takes the form indoors of a thin veil. The Brahui women's shirt is a gown of blue, or red, material going down to the feet, a most unbecoming costume for any woman, the effect of which is not improved when the enamelled iron bowl out of which she takes her meat and drink is worn on the head for a cap. The Gujerathi and Marwar bodice, which leaves the back bare, is of course very common in region Sind.

Finally it must be remembered that here are in former Sind many races and many peculiar sects with as many varieties of non-descript costume. The clothes described above are the conventional dress of the major part of Sindhi population. The difference between the upper and lower classes shows itself in the material rather than the pattern of their clothes. It must also be remembered that poverty cannot be in the fashion. A peasant's wife has little need for a chadar. A poor man puts on what he can afford to buy, it may be the cast-off raiment of an alien, and he wears it until it drops off him. There is an incredible trade in old clothes from Europe.

Ornaments are as indispensable to a Sindhi woman as clothes. The foremost in importance is the nose-ring (nath), which to a married woman is like a wedding ring, never to be removed while her husband lives. Nose-rings are of many forms, some suspended from either wing of the nose, some from the middle cartilage. They are large, sometimes ponderous, but the weight is borne by a plait of hair let down over the forehead. Smaller rings, such as girls wear, are called bula. Ear-rings are also various: the whole rim of the ear is sometimes pierced so that from a dozen to twenty

little jingling ornaments may fringe it. These also require support, which is afforded by fine silver chains attached to the hair. Necklaces, a frontal ornament for the hair, (chindi or tiko), rings on the fingers and toes (mundi, and bandra), bracelets, anklets and armlets (kangan, kari and banhrakhi), with an amulet (tawis), which may be on the arm or suspended from the neck, complete the decoration of a well-dressed lady. The glass bangles so commonly used elsewhere in Pakistan are unknown among Sindhis and the complete sets of thick ivory rings that sheath the whole arm, are being discarded by women of Sind region. Toe-rings and anklets are also going gradually out of fashion. Both these are of silver as a rule and bracelets also. For the others gold is to be preferred and jewels are very much to be desired, but that is a question of means.

Sindhis commonly shave their heads for cleanliness and coolness, but Baluchis let the hair grow long and those of the hills like to have it falling over their shoulders. Pathans grow a military moustache and shave their chins, and the Khojas have partly retained their ancestral custom in this matter.

The fez has gone completely out of fashion. The Sindhi hat which is a magnificent but somewhat ridiculous item of headgear has gradually gone completely out of use altogether. If worn at all now it would be only in durbars where formal dress is prescribed. The Sindhi woman of the better class showed no inclination whatever to be attracted by the variety of women's clothes cut in modern fashion and on European lines which are now available for her in most of the larger towns.

Gul Hayat Institute

Mode of Life.Food.

The account in the 1907 Gazetteer of the food of Sindhis is substantially true today. The Oriental is as conservative over food as he is over clothes and, though with the great changes in the countryside in the last fifty years, and especially since the coming of the motor bus and the greater freedom of movement from the villages, some changes are inevitable, these changes have not affected the basic system on which the majority of the population take their nourishment. The changes which have occurred are mostly in the direction of increasing the number of teashops, of lemonade and soda-water stalls even in the villages and in the consumption of large numbers of sweet biscuits, which are now produced by factories within the country itself. In addition to these, it is feared there has grown an increasing demand for the cheapest forms of boiled sweets, and it is not unusual now to find in small villages advertisements for biscuits and mineral waters. But the partaking of these commodities is usually a part either of travel on short journeys, or of passing an idle hour or two in the village with friends. There is no sign yet that the rural population of Sindhis as a whole is aware of the great modern movement which advocates a balanced diet and the consumption in proper form of the various vitamins that medical science today claims are necessary for full health.

The food of the people generally is simple. The agrarian classes eat the grain which is principally produced in the part of the country to which they belong. Thus *juari* and *bajri* are the staple food of those classes over a large part of the region, but are displaced by rice in the region of the Delta and in the rice-growing parts of the Larkana, Sukkur and Jacobabad Districts, while wheat is generally preferred by those who can afford it. Those who are well off do not use *juari* and *bajri* at all. Wheat, *juari* and *bajri* are eaten in the form of unleavened cakes, *i.e.*, "chuppatees," (Sindhi *mani*, or *roti*) made savoury with a little vegetable and spices, or curds and whey, or ghi, and sometimes flesh or fish. Rice is boiled and eaten with some similar accompaniment, or made into pulao with meat. All classes eat flesh, fowl and fish. With the Muhanas of the coast fish is the staff of life rather than rice; with the rustic inland the flesh of the goat may be indulged in once a week, with the nomad of Thar Parkar wild ducks and other game are the favourite animal food, abundant at one time, but scarcely obtainable at another. The wandering Jats subsist very largely on the milk of their camels and the Baluchis of the Kohistan on that of their goats and sheep. The diet of the upper classes, is of course more varied, including pulses, fruit and sweetmeats, as well as more vegetables than the poor can afford. The standard of living is said to have risen very much of late, meat being a daily item with many who would in former times have

had it only once in the week. There are ordinarily two substantial meals in the day, one (manjhand) some time before noon and another (Rat) at 8 or 9 in the evening; but of course every man's habits in these matters have to suit his work. It is a common practice also, especially among the middle and upper classes, to take a light meal early in the morning corresponding to "choti hazri". A drink of warm milk some time after the evening meal is considered beneficial. The use of tea is common, though not yet by any means universal, and it is at the early morning meal that it is generally taken, especially during the cold season. Coffee, strange to say, is scarcely used at all. Smoking is all but universal, the hookah, often of enormous size, with a straight stem several feet in length, being the usual implement. The biri is also smoked by some classes and the cigarette, and even the cheroot, are coming into fashion.

It may be asked how the average Sindhi spends his day. In almost all classes the wife has to do most of the work in the house; it is she who rises early, fetches water, grinds the corn, cleans the rice, washes the clothes, milks the goat, serves her lord with his meal, minds the children and very generally adds to the family earnings by taking part in such outdoor work as reaping, cotton-picking, scaring birds, driving the camel, to say nothing of semi-domestic occupation like gathering sticks and making Cow-dung cakes. Relaxation comes in the periodical religious festivals and fairs and in the festivities which signalise births, marriages and deaths in a little community. Many Muslims, if their occupations permit of it, observe the Sabbath on Friday, when they have their weekly bath and go to the house of prayer. Those whose position or occupation allows them more leisure, spend it chiefly in seeing their friends and talking, with perhaps a little card-playing or music thrown in. If he is very religious, the Muslim begins the day with his ablution, prayers and reading of the Holy Quran; then indulges in social intercourse with his family or friends until he goes to his work. After that is over social intercourse begins again and proceeds until dinner and bedtime to the accompaniment of the hookah, of course, and perhaps a draught of bhang. It does not follow because a man has leisure that his wife has. Respectability may forbid her to go out for water but otherwise she has all the usual household duties. But in wealthy houses where servants are kept the women are said to lead idle lives. They are much occupied in fancy needlework and many Muslim women are as regular in their devotions as men, and even read the Quran. A step higher in the social scale finds a gentleman as a man who does no work. A wealthy jagirdar, or zamindar, of the olden times regard hunting, hawking and cock-fighting as the proper occupations of a man of rank, and his way of thinking is not obsolete with those who can afford it when not engaged in any of these pursuits, a gentleman of position sits in his reception hall and smokes and talks, or else plays cards and enjoys the performances of musicians and dancing girls.

But, after the indispensable morning ceremonies of cleaning his teeth and performing his religious duties, he is content to sit in his shop until near midnight with only one interval for his bath, breakfast and post-prandial nap. Amils in service or others who have regularised their business employ their leisure time before and after it in attending places of worship, if religiously inclined, and in chatting, smoking or playing some game like chess. With Hindus it is a religious duty to bath daily and most observe this, both men and women.



Gul Hayat Institute

Amusements.

In former Sind, as in the rest of Pakistan, it is a general truth that grown men do not play games. Ideas of decorum and dignity, tend to close this outlet for such superfluous energy as the climate of Sind region permits. These ideas are fading, and youths of the coming generation are growing up with a healthy appetite for active games. The playing of team games and regular courses in physical exercises are now part of the curriculum of the schools, even the primary schools in villages. The influence of the British way of life in the popularisation of team games is having a considerable effect, especially since Pakistan has been able to produce some of the best cricketers, tennis players and hockey players in Asia. Cricket, hockey and association football are now becoming conspicuous features of most villages, and in the popular movement to encourage social activities in villages through some common centre, it is likely that more and more boys and young men, and even young girls, will take part in organised games. There are, however, indigenous games which are played everywhere. The Bilharo is a rough kind of "prisoner's base," in which the challenger calls upon his opponent to come to try to seize him. The attacker makes violent efforts to grab the challenge, while the challenger uses no little force in attempting to ward him off. The compiler of this Gazetteer has seen in some of the village games common in rural Sind region a challenger hit so hard on the bare chest by the hand of his attacker that blood was drawn. Gili Dakar is "tipcat" and Tizi a form of "hopscotch." Dogboys and syces' children play marbles in the alleys. At the appropriate season young and old yield to the seductive pleasure of kite-flying. The strings of the kite are smeared with powdered glass and rival flyers aim to cut each other's strings and bring their kites to the ground, which imparts an excitement to the sport unknown in Europe. But the prime amusement of the adult population is wrestling, malakhro. This corresponds in popularity and in local excitement to the football matches in Britain. Great crowds are attracted, particularly if world renowned Pakistani wrestlers are on view. Wrestling matches are held on holidays and Fridays, and they are a feature of all fairs. Big men maintain famous wrestlers and get up matches. It is a common thing for one village to vie with another, exactly as one football team in Britain contests a match against its neighbouring rival. The best wrestlers are said to be Shidis, negroes. Malakhro is a kind of catch-as-catch-can wrestling in which a win is obtained by throwing the opponent on the ground, so that, perhaps even for a second, both shoulders are touching the soil. The matches do not usually last long and the winner, after throwing his opponent, prances with a high hopping step round the arena holding up his hand in triumph. As the wrestlers wear big baggy trousers and spend a great deal of the preliminaries in seeing that their trousers are properly adjusted, the wrestling match as a spectacle gives cause for not a little amusement. After wrestling the next national

sport in popularity is cock, partridge and quail fighting which combines excitement with gambling. Cocks are bred in Sind region of the kind known in England as Indo-Pakistani game, the most obstinate fighters in existence. Grey partridges are caught young and become wonderfully tame. If they turn out prize-fighters they are worth much money. The black partridge, a much lovelier bird, is of no use as a fighter since his spurs are not hard, like the grey partridge's, but soft.

Music is a favourite recreation and some well-to-do men retain minstrels for their entertainment. The universal craving for music is supplied by the strolling ballad-singer, the piper and drummer at weddings and festivals. The favourite instrument as an accompaniment to song is the surando, which Sir Richard Burton has described as "a rude form of the violin with four or five sheep-gut strings which are made to discourse eloquent music by a crooked bow that contains half the tail of a horse." It appears to be an instrument of Baluchi origin. The yaktaro, or one wire, is a simple gourd guitar known all over Sind region. The murli is an embryo bagpipe with an air-reservoir made of a gourd and the nar is the common straight pipe. There are many others. With the rustics dancing is also a favourite amusement and the Sindhis have some pretty dances. The nach retains its place amongst Sindhis as a ravishing delight. Of indoor games chess (shatranj), which is said without any evidence to have been invented in Sind, is popular, and there are some good players of it to be found. Dharo, or chaupar, a game played with dice on a board, or rather a cloth, and several games played with cards, (which afford opportunities for gambling,) are common. Among country people setting and solving riddles is a favourite pastime. All Baluchis are passionately devoted to field sports and in the days of the Mirs the shikargahs, or game preserves, which occupied the banks of the Indus almost from Sehwan to Thatta, were places of inviolable sanctity. The Baluchis were extraordinarily skilful in the use of their matchlocks. Colonel Pottinger tells of larks and other little birds hit unerringly with a single ball at 50 or 60 yards. Another weapon with which they made marvellous practice was a bow of horn with blunt-headed arrows, which were discharged so as to hit the bird not with the point, but transversely. The love of sport still pervades the whole population, but the clearance of the jungles and the wide-spread destruction of the game have left very limited scope for the indulgence of it. Many of the Zamindars are keen sportsmen and good shots with a rifle, but few are expert with the shot-gun. When the compiler of this Gazetteer was serving as Deputy Commissioner of the Upper Sind Frontier, now Jacobabad district, he had many talks with Sardar Abdul Rahim Khan Khoso, who spent most of the year in the pursuit of game. When game was not available in Sind, he went to Rajputana and other adjoining parts of India, and said that

in an average year he shot no fewer than ten thousand cartridges from his shot-gun. He was an excellent shot with the weapon.

The Mirs and wealthy Zamindars were also and still are devoted to falconry, which they have brought to as great a perfection as it ever attained in England in its palmiest days. The hawks and falcons chiefly used were :—

Yellow-eyed, or short-winged, hawks.

The Goshawk, the Sparrow and the Pakistani Sparrow hawk.
Black-eyed, or long-winged, hawks.

The Peregrine Falcon, the Shahin Falcon, the Saker, the Laggar Falcon and the Red-headed Merlin.

The Baz, or female goshawk, is the mostly highly prized by falconers of all hawks. It is caught in the Himalayas, or Khorasan, Iran and is worth, when trained, a very large sum of money. It is used to kill houbara, kites, herons and ibis, but is especially trained to kill hares. It is thrown from the hand, as are the Sparrow hawk and the Shikra. These, especially the former, are chiefly used for killing partridges. The Shikra is a resident bird and very common and cheap, while the other is a cold season visitant. Of the falcons none (except perhaps the Shahin) compares with the Peregrine, which is trained to strike herons, cranes, storks and wild duck. The Chargh, a larger bird, is used, like the Goshawk, after hares and is sometimes trained even to assist dogs in the chase of the gazelle, which it strikes boldly on the head and face. The dogs are greyhounds from Kalat, where they are carefully bred. No attention appears to be paid to the breeding of dogs in former Sind. The Shahin falcon is very highly prized and is used after florican, stone-plover, houbara and partridges. The Laggar is the only one of the falcons above-named, except the tiny Turumti, which is not much esteemed, but it gives good sport with crows.

Some of the Mirs used to employ cheetahs for the running down of buck. The compiler of this Gazetteer has, about thirty years ago, attended a cheetah hunt in which two cheetahs were released in pursuit of a buck, which they managed to catch. Horse-racing is another sport, of which Baluchis are passionately fond. The annual races at the Horse Show at Jacobabad are attended by excited crowds. But the quality of the racing and the calibre of the mounts are not usually very high. Horse-racing offers, of course, a very popular opportunity for gambling.

MUSLIM CUSTOMS.

The ceremonies connected with the epochs of human life, birth, marriage and death, amongst Sunnis and Shias, are essentially the

same. The ceremonies connected with entrance into life and the Muslim faith are three, viz., naming, shaving the head (*akiko*) and circumcision (*khutno*).

Naming. As soon as possible after the birth of a child the father, or in his absence an uncle or other elderly relation, repeats in his or her ear call to prayer, "Allah is great," in order that the name of God may be the first sound that it hears in this world. Immediately after this the father gives it its name.

Shaving. On the 7th, 14th, 21st, or on the 40th day, the child's head is shaved with some curious ceremonies which appear to be symbolic of a sacrifice of atonement. Two goats without spot or blemish are sacrificed in the case of a boy, one in the case of a girl. Then the flesh of them is cooked and distributed among relations and friends, but the bones are preserved unbroken and solemnly buried in a selected spot (*sometimes within the house*) along with the hair of the child. The hair is first weighed against silver or gold, which is given in charity. The relations present at the ceremony wave money round the child's head and this (*called ghor*) becomes the barber's fee.

Circumcision. No age is prescribed for circumcision. Rarely it is performed on the 6th day after birth, but generally when the child has grown to boyhood. Poor people are tempted to postpone it on account of the expense. On the day of the ceremony the boy is dressed and garlanded and taken round to town, on horseback if means permit, to the sound of drums. Then the rite is performed by the barber in the presence of relations and friends. The barber's fee is placed by the father under the boy's right foot, in addition to which he gets the boy's old clothes and the whole, or part of, any money (*ghor*) which friends may wave for luck round the boy's head. In the north there is a curious custom of averting mischance during the operation by making the anxious mother stand with a millstone on her head while a male relative pours water on it. The precautionary intention of this practice would seem obvious, but in the south it is varied by making the father stand instead of the mother, with his feet in water and the holy Quran on his head. After the recovery of the patient, i.e., on the 11th day, it is incumbent on the father to feast a wide circle of relations and friends, which may cost even a humble man 50 or 100 rupees, while the rich can spend thousands on it. But each guest is expected to bring a small money present (*pahat*) and a popular man may find his expenses recouped in this way.

Marriage. When a young Mussulman in Sind region desires a wife he seeks first within the circle of his own family connections or, failing, that within his own tribe. If he goes outside of it, he must marry beneath him, for no self-respecting father will give his daughter to a tribe which is socially below his own. The daughter of a Sayad can marry only a Sayad and so on down the ladder. Of course the young man cannot act in the matter himself. The

go-between is usually a woman of good repute; if a Sayad, so much the better. When it has been ascertained through her that the father of the girl in view is well disposed, an offer is made and usually has to be repeated once or twice; for it would not be becoming to seem to jump at it. Then on an appointed day the bridegroom, with his father and mother and a family party and a band of musicians, proceed to the house of the bride carrying sweetmeats and presents. When they have seated themselves, the men with the men and the women in the women's apartment, the barber's wife is sent to the former with a tray of sweetmeats and a pot of milk. When they have eaten and drunk and established mutual cordiality the fatihah or opening chapter of the holy Quran is recited, all with raised hands and the betrothal (mangno) is complete. The nose of the bride is pierced for the ring which she will wear at her wedding, unless she belongs to one of the few tribes who do not wear that ornament. After this it is considered a little dishonourable to break off the match and the two families continue to exchange presents by way of keeping up the entente cordiale. But matches are sometimes broken off, especially when the betrothal of a boy and girl has been arranged in their infancy, or before their birth. Many lawsuits spring from this cause. However early the betrothal may have been, the marriage ceremony is not usually performed among respectable people until the girl and boy have arrived at adolescence: it is earlier in villages than in towns and is apt to be hastened by the anxiety of a fond mother to see her son "settled". *The approach of the wedding day is indicated for perhaps a month before-hand by pipes and drums and merrymaking. A week before the event the beautifying and sweetening of the bride (wana-wah) begin. She keeps to her own room, wearing a veil sent by the bridegroom and is fed on Churo, "an unleavened cake of wheaten flour made into dough with clarified butter and mixed with brown sugar, a bilious mess, popularly supposed to increase the delicacy of the skin". (Sir Richard Burton). The barber's wife attends her daily, bathes her, rubs her with wheat flour and oil, blackens her eyes with kajjal (lamp black), dyes her lips with musag (walnut bark) and her palms and soles with mendi (henna). Three days before the wedding the bridegroom is similarly prepared by the barber and then taken round the town on show, on horseback if they can afford it. The feasting of the friends and relations begins after this. On the evening of the wedding day the bridegroom is again groomed by the barber and dressed in clothes presented by the bride's father, while the bride is apparelled and arrayed in the presents of the bridegroom; then the bridegroom's party proceed to the bride's home, where a Nikah-khawan is present. Three of the nearest of kin on the bridegroom's side and three on the bride's take an*

*Census returns show that the majority of girls, of classes taken together are married before the age of ten, but possibly all betrothed are returned as married.

official part in the ceremony, one being termed the "vakil" and the others witnesses. The ceremony is simple and begins with the time-worn questions, "Will thou have this woman?" and "Wilt thou have this man?" repeated three times and duly responded to in the affirmative. Then the marriage settlements are made and duly recorded by the witnesses, after which the Nikah ceremony is performed. After the wedding there is the nocturnal procession through the town, and then the party returns to the bride's home, where amusing ceremonies, not enjoined by religion but sanctioned by custom, are gone through. The most indispensable of these is (matha-mer), the knocking together (gently) of the heads of the bride and bridegroom by a married lady of the family as they sit opposite each other, she to the east and he to the west, with a pillow between them. The ruinous expenses of a marriage, apart from the Haq mehr which the bridegroom is bound by religious law to settle on the bride, consist chiefly in the feasting and the numerous presents which the father of the bridegroom is required to make to relations and friends on peril of losing his character as a gentleman. The guests contribute something towards the feasting expenses by the small money presents which they all bring, as they do at a circumcision, and the wealth expended on presents is kept, as far as possible, from going out of the family by the common practice of exchanging brides. When a girl of one family has married into another, some male relation of hers obtains a wife from her husband's family in return. So the marriage gifts are mutual and the money spent on them is not quite lost.

After her marriage a woman is supposed to visit her parents every Friday till her first child is born. There is no bar to the marriage of divorced women or widows. Among Baluchis infidelity in a wife is not dealt with by divorce, but by killing her and her paramour. This is regarded as the only way in which the husband can redeem his tarnished honour, and so strong is the feeling on the subject that it has been found necessary to provide for a modification of the action of the criminal law in dealing with crimes of this nature among Baluchis. The pardah system prevails among respectable Families in Sind region, and certain sects, the Sayads, Mughals and some Baluchis, Talpurs particularly, are extremely jealous of letting their women be seen; but the working classes go about with perfect freedom and do not take as much trouble as any ordinary Maratha women does to veil their faces from a passing stranger.

Death—

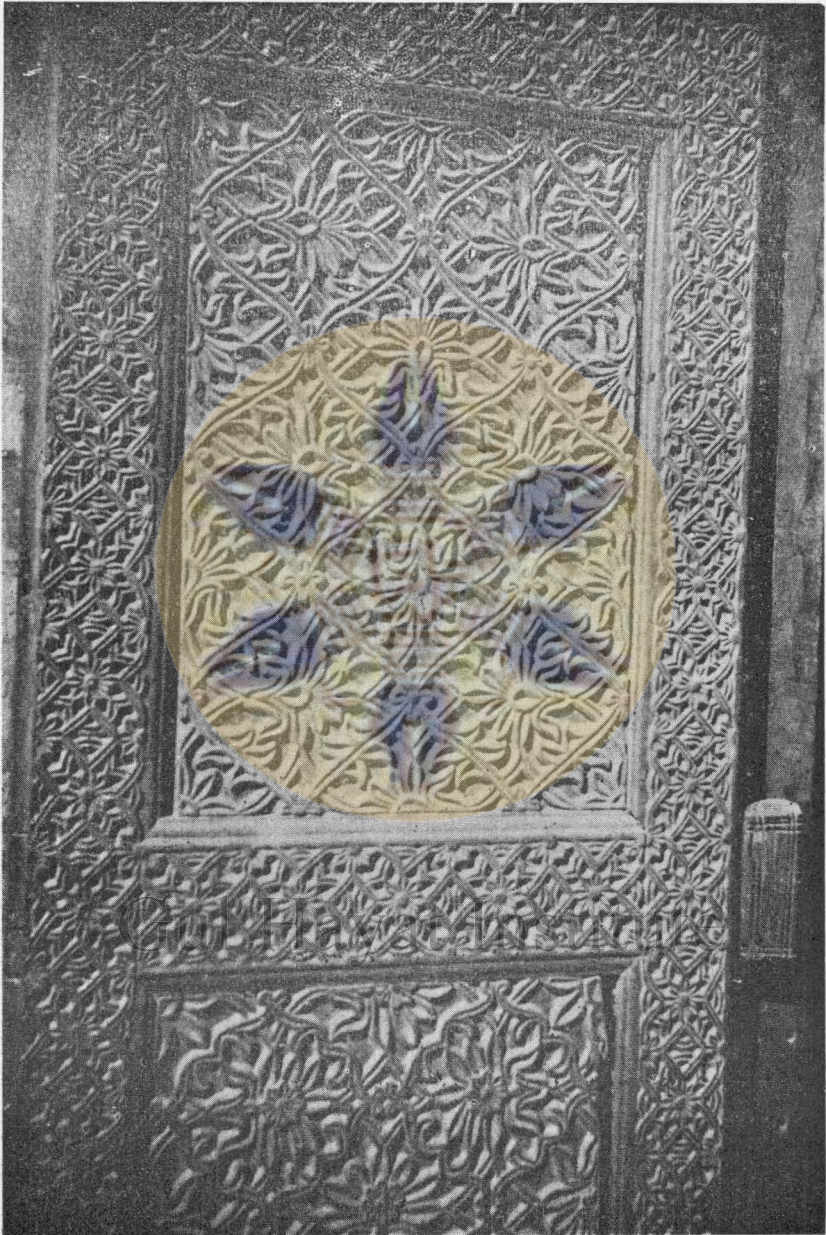
When a Mussulman is at the point of death a few drops of honey are dropped into his mouth and relations standing round him read appropriate passages from the holy Quran and repeat the creed and prayers for forgiveness. It is considered a sad thing to die where there is no one competent to do this. After death the eyes and lips are closed and then the body is carefully and

thoroughly washed by a ghassal, or Mulla whose particular office it is, after it is wrapped in a shroud called kaffan. Rosewater and perfumes are sprinkled over it and it is laid on a bier and covered with a shawl, a copy of the holy Quran being placed at its head. The bier is carried to the burying ground by four of the nearest kinsmen of the deceased and followed by the mourners, reciting Kalima, In the grave a hollow is dug, into which, after all present have prayed for the peace of the soul, the body is laid on its side, with the face towards Mecca. On the third day "Soem" feast is given at the house of mourning, after prayers and the reading of the Quran. The same thing is sometimes repeated on the tenth day and other days, but a feast to all relations on the fortieth day is usually the conclusion of the period of mourning. Rich men employ Mullas to read the Quran at the grave for forty days and after that sometimes for years the memory of the departed is kept up by praying and reading on occasions at his tomb, but in any case the Barho, or anniversary ceremony, one year after the death, must be observed.

The ceremonies of the Khojas. Borahs and Memons differ in many points from those described above.



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Wood-work—Door at Bubak.



Wood carving—Indus River Boat.



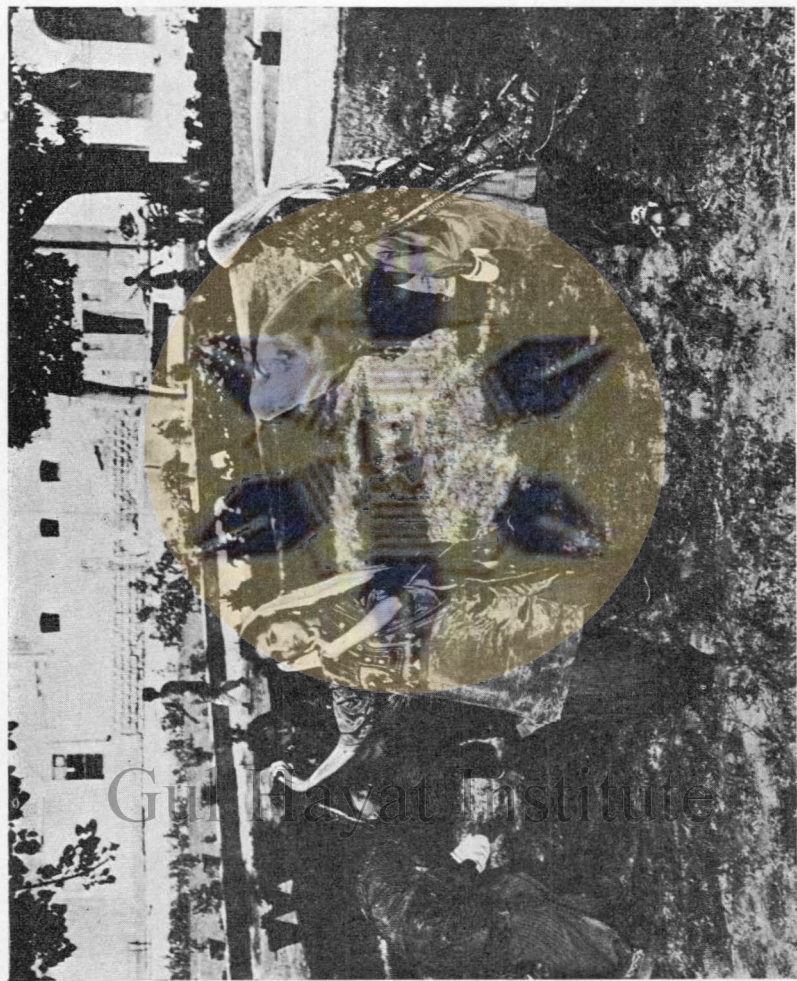
Stone carving—Tomb at Rohri



Sindhhi Wrestlers

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TYPES OF PEOPLE



A Sindhhi folk dance.



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CHAPTER X

PLACES OF INTEREST

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CHAPTER X

PLACES OF INTEREST

The Indus valley civilisation has been described in general terms in the Chapter on Archaeology in this Gazetteer. The uncovering and interpreting of the Indus valley civilisation represents perhaps the greatest archaeological event of the twentieth century, since the real meaning and extent of this civilisation was not appreciated until the opening up of Moenjo Daro in 1922. Interpretation of this civilisation is still to a great extent a matter of conjecture and in respect of the script it raises a problem where no definite conclusions can yet be reached on the evidence so far collected. Kramer's recent work on "The Sumerians" published in 1956 perhaps indicates the line which offers the most reasonable approach to an understanding of the nature of the influences which affected the Indus valley civilisation. Up-to-date about sixty sites have been uncovered and of these the majority are in Sind or in the neighbouring territory of Bahawalpur. This civilisation extends over a distance of one thousand miles between Rupar at the foot of the Simla Hills and Satkagan Dor near the coast of the Arabian Sea, three hundred miles west of Karachi. Of the two large cities representative of this civilisation, Harappa and Moenjo Daro, only the second is in Sind. The civilisation seems to have been very like that of Sumer with capital commercial cities and numbers of satellite towns, trading and defence posts. Up-to-date only two large cities, probably the heads of city states, have been unearthed, but there may be more awaiting discovery as the wider extent of the civilisation is revealed. Typical of the civilisation of Sumer and the Indus valley are the cylinder seals and the inscriptions written in a pictographic script which, as far as Moenjo Daro is concerned, seems similar in type to the earliest forms of the cuneiform. The three chief sites of the civilisation which have been investigated in former Sind are Moenjo Daro itself, Chanhu Daro and Amri. Something will be said about these three places.

Indus
valley
civilisation

The Moenjo Daro ruins are about nine miles by road from the Dokri railway station. Dokri is on the Kotri-Sukkur section of the North-Western Railway, two hundred and sixty-seven miles from Karachi and five hundred and thirty-four miles from Lahore. The nearest district headquarters is Larkana in the Sind region of West Pakistan. The locality of Moenjo Daro is not particularly attractive or interesting. It is a flat salty waste adjacent to the Indus river which, if care is not taken to separate it by means of embankments from the Moenjo Daro site, is likely at some time sooner or later to inundate all the excavations. In actual fact the exposure of the ancient brick has led to its rapid deterioration in the windy and salt-laden air of the locality, and if it were thought necessary to preserve the excavations in their present condition

the best way of achieving this for the use of posterity might be to cover them up again, and so stop the erosion caused by the salt-laden air.

The cultural problems that have been raised by the discovery of the Indus Valley Civilisation are three: One, who were the people of Moenjo Daro and the Indus Valley at the time the civilisation was flourishing? Secondly, where did they come from? And thirdly, what was the nature of the writing which has been found on the seals and in what language are the inscriptions recorded? First, as to the people, the skeletal remains which had been found indicate racial types and the animal remains show something of the kind of conditions in which man and domestic animals lived at the time. Secondly, as to the origin, Kramer's recent study suggests that the influx, or invasion, whatever it was, of people into the Indus valley has similarities with the influx of the Sumerians into Lower Mesopotamia. The developed Sumerian state resulted as a fusion of the intruders, who were probably Alpines from Transcaspia or Transcaucasia mixing with the local population, probably Mediterranean in race, forming two streams one from Iran and the other from the west, largely Semitic in origin.*

*Sumerians were not Semitic either in origin of character or language. The following references will suffice in this regard.

(i) The new Universal Encyclopedia-Vol. XIV-P. 7849 under caption 'Sumer'

"Their inhabitants, who called themselves "the black headed people", spoke an agglutivative tongue not related to semitic or Aryan languages, and invented the art of writing in simple pictographs which evolved into the cuneiform script".

(ii) The new Universal Encyclopedia-Vol. V.P. 2510-under caption 'cuneiform writing':—

"The earliest users of cuneiform were the Sumerians, a long extinct Mesopotamian people of uncertain ethnic and linguistic affiliations. (*They were non-Semitic and Non-Indo-European*). From them the script passed to the semitic peoples of Mesopotamia (Babylonians and Assyrians).

(iii) Please also refer to the above Encyclopedia Vol. II, P. 825.

(iv) Also refer under the caption "Babylon" and also 'Book of knowledge, Vol. I, P. 845 under caption 'Babylon'.

(v) Also above-cited Encyclopedia Vol. XIII P. 7321 under the caption 'Sargon'.

"His reign, in which *Semitic Akkadian replaced Sumerian as the official language* and Akkadian dress and methods of warfare came into fashion marks a turning point in the history of ancient Mesopotamia".

(vi) The concise Encyclopedia of Archaeology Edited by Leonard Cottrell-1960 P. 449 under caption 'Sumerians'.

(vii) The concise Encyclopedia of World History-Edited by John Boile 1958 under caption "The Neolithic Revolution and the Foundation of Cities" P.22.

(viii) The Near East in History, Phillip. K.H. Hitti - 1961 P.32,

Eventually a predominantly Semite stream took command in the kingdom of Akkad. Kramer puts Sargon, who represents the most flourishing period of the kingdom of Akkad, about 2350 B.C. Moenjo Daro was flourishing roughly from 2500 B.C. to 1500 B.C. the length of the time being determined by the levels of building which took place over successive generations. These levels number seven, and the virgin soil on which the first one was built has not yet been reached. The developed literary form of the cuneiform writing of Mesopotamia was at its best during the time of Sargon, so that the developed cuneiform of Mesopotamia is about contemporary with the Moenjo Daro script. As regards this script and the language in which it is written, investigations indicate that the number of characters which it employed can be reduced to not more than two hundred and fifty different symbols. According to Stuart Piggott this argues that the script is in a late stage of its development. "For", he says, "if we turn to Mesopotamia for analogies we find that the early dynastic Sumerian script employs about nine hundred characters. The number in the Uruk period syllabaries is believed to be something like two thousand". He adds that one of the most striking proofs of the essential stagnation of the Harappa civilisation is the fact that there is no development at all in the script throughout the whole history of the long occupation of the great cities. No inscription containing more than twenty or so symbols has been found and with such scanty material it is difficult to see how decipherment can ever occur. There is some consensus of agreement amongst scholars that the language reads from right to left, though the practice of boustrophedon which occurs in early Greek may possibly be detected in a few of the inscriptions. Stuart Piggott's conclusion is worth recalling. He says that Harappa's script is unique, intrusive and without descendants. Its relationship to the ancient scripts of Mesopotamia is likely to be analogous to the Egyptian system of writing. It is wholly different from anything known in Sumer but perhaps inspired by it as far as the idea of representing a spoken language by a fixed set of symbols goes. In the condition in which we know it, the script is pictographic, but not a primitive pictographic script, as it has developed beyond the early stage of pictographic writing. Unlike the cuneiform of Mesopotamia, it has not progressed beyond a certain stage and seems to have remained static for about one thousand years. It is probably not much beyond the pre-literary cuneiform of Sumerian. The conclusion seems to be that if Sumerian is at the basis of the Moenjo Daro script, and this is not a wild supposition, then the Indus valley script was crystallised at an early stage and probably had become a local variation of an early form of the writing; perhaps a form that was developed amongst the mixed populations of the Indus valley at the end of the third millenium B.C. The language in which the script was

written could be something which derives ultimately from the Sumerian language, or it could be a local fusion of what was spoken by the mixed population of the area when the intruding elements from Iran and western Europe met the Mediterranean peoples who had been for some time domiciled immigrants from the West. In the latter case the language might well belong to the same family as the modern Dravidian languages of the Sub-continent.

Moenjo
Daro.

The human skeletal remains found at Moenjo Daro are rare. In Sir John Marshall's work on "Moenjo Daro and the Indus Valley Civilisation" the following remarks have been made on the skulls found: (1) Proto-Australoid race-3 skulls. There is a very close agreement between the present skulls from Moenjo Daro and the recent extinct Tasmanian race and the prehistoric homo-neanderthalensis in Europe and North Africa, the cranial capacity being between 1,400 and 1,500 cubic centimetres; (2) The Mediterranean race-skulls 6, 7, 9, 10, 19 and 26. This type of skull is considered to represent the true Mediterranean race, and the examples from the present collection agree well with the Nal skulls from Baluchistan region and skull No. 4 in Buxton's account of the Kish remains. Amongst the data we possess we have evidence of one sort or another regarding the living height of three individuals belonging to this kind, namely, one man and two women. The male was about 5'-4½" the women were considerably shorter than this, measuring respectively 4'-9½" and 4' 4½". (3) The Mongolian Branch of the Alpine Stock-skull 13 (b) 3. The skull is quite characteristic, and for the purpose of comparison we have given both side and face views of a Naga skull. The close correspondence between the two leaves no room for doubt regarding the racial origin of the individual. (4) Alpine—4 skulls. It seems probable that all four skulls of this group belong to the Alpine race. Beyond that it is impossible to go, and we are not in a position to determine to which branch of the Alpines they may have belonged. From this scant evidence it is not safe to come to any conclusion as to the make-up of the Moenjo Daro population; but perhaps from the fact that the Mediterranean race skulls are more numerous than other types and that the second type most numerous is Alpine, it may be reasonable to infer that the Mediterranean and the Alpine races were the most important elements in the Moenjo Daro population. This would coincide with and support the belief that the Moenjo Daro people were descendants of Alpines similar to the Sumerians mixing with Mediterranean peoples already domiciled in the Indus valley mingled with a western stream of Semitic origin coming through Baluchistan, linking up the cultural relations of Sind and Baluchistan. The pre-Indus Amri pottery strongly suggests infiltration from the west into the Indus valley.

As regards the animal remains found at Moenjo Daro, Dr. Sewell, in Sir John Marshall's volume on "The Indus Valley Civilisa-

tion" says that in all he was able to identify without doubt no less than thirty-seven species, or if we include the polyzoan and the sponge family living in the mollusc fasciolaria and the anatinid mollusc living in the coral, thirty nine different species of animals in the collection. Several of these are, of course, domestic or semi-domestic animals; others, however, are wild animals that probably inhabited that part of the country either at the time when Moenjo Daro was a flourishing city, or at some later period when the city had been destroyed. It is further stated that from the measurements given it is abundantly clear that the Moenjo Daro dog comes extremely close to the Anau dog and that both are nearly related to, if not actually identical with, the palaeolithic *canis pontiagini* on the one hand and the present-day *canis familiaris* (variety dingo) on the other. It would, therefore, appear to be probable that the Anau and the Moenjo Daro dogs on the one hand and the dingo dog of Australia and the Pakistan pariah on the other possess a common ancestry that can be traced back to the palaeolithic *canis pontiagini* of Russia. It has further been remarked that the very considerable frequency with which the remains of *bos indicus* have been met with during the investigations indicates that the inhabitants of Moenjo Daro at one stage or other of their history maintained large herds of this animal. In quite a large number of cases the teeth indicate that the animal from which they were derived was young. For instance in the case of third molars there has been little wearing down of the tooth surface; while in a few instances this tooth has only just been erupted. This would indicate that the inhabitants slaughtered these animals for food.

In the Memoirs of the Archaeological Survey of India No. 48 "Explorations in Sind" compiled during the British Period, Mr. N. G. Majumdar makes the following remarks: "The explorations undertaken by the present writer link up the zone with the chalcolithic civilisation in Sind directly with the areas surveyed by Sir Aurel Stein in Southern Baluchistan. The northerly-eastern limits of this civilisation are as yet unknown but it is clear that in Sind it extended in the south-west almost to the shores of the Arabian Sea. The settlements of Arangi and Amilano in the west and Tharo Hill near Gujo in the east form the base of a triangle having its apex at Limo Junejo in the north the people whose culture we are surveying lived in this region in the valley of the Indus, as well as on the high land of the belt stretching north to south beyond its right bank. The sites discovered in this area fall into two categories: namely, places where the people actually inhabited and those where they carried on the flint knapping industry so characteristic of the age to which they belonged. Evidence of this industry has been discovered at several sites, for example at Tharo Hill, at Bandni, at Malir and in the hills of Rohri. From the present situation of Amri, Chanhudaro, Lohanjo Daro, Moenjo

Daro, it is possible to imagine that anciently too these stations existed not far from the Indus. It is, however, likely that the course of the river followed a somewhat different curve, bringing it much nearer to Chanhru Daro than at present, though its general direction remained very nearly the same. Living in a flat riparian tract the Indus people could find almost unlimited scope for agricultural pursuits, like the Egyptians in the Nile Valley, or the Sumerians and Babylonians in the valley watered by the Euphrates and the Tigris. But the Indus people must have been a prey to the inroads of their less fortunate but more sturdy neighbours from the hills and moreover, were subject also to the devastations wrought by the Indus. In a hilly region the scope of agriculture was necessarily very much limited. The two sources of water which they could command were the natural springs and the rains. The spring water must have been then, as now, diverted through artificial channels and brought over to the verge of the cultivated land. It is only natural, therefore, that settlements should have grown up as they did at places within easy reach of the torrent beds and the springs and the channels emanating from them. This explains why the people chose to build at sites like Pokran, Ghazishah, Dumb Buthi. Bandni and Chauro which are far away from the Indus. Most of these places in the hills have houses perched on eminences and so they are better protected than those of the Indus valley and besides these highland were beyond the reach of the flood water of the Indus. But the people on the whole were obviously much poorer as compared with those living in the wide expanse of the Indus plain. Wealthy cities like Moenjo Daro could not possibly have developed in mountain passes without having the advantage of a rich fertile soil, the gift of a great river like the Indus. It is, however, possible that the conditions were somewhat more congenial in that age than they are now. The country was blessed with a greater rainfall and consequently with better prospects for agriculture. This evidence is furnished by a large number of street drains and the rainwater pipes discovered at Moenjo Daro and the universal use of burnt instead of sun-dried bricks in its buildings and the representations on the seals of the tiger, the rhinoceros and the elephant who favour a moist climate. Some significance should also be attached in this connection to the preponderance of vegetation motifs on the painted pottery at Moenjo Daro and other contemporary sites of the Indus valley. It may therefore, be safely concluded from the archaeological evidence available that Sind like Baluchistan, Seistan, Transcaspia and Central Asia has been subject to continuous desiccation, though to a more limited extent. The stations of prehistoric culture discovered in this region were very closely situated to one another forming a chain as it were running parallel to the Khirthar Range. In none of the sites again has been traced any sign of re-occupation after chalcolithic times. At present no permanent human settlement exists in the neighbourhood of any. Judging from the large number of stations existing in such a narrow compass, this part of the country must have been much more densely populated than it is now. To

the west of the Khirthar and the River Hab in the Jhalawan, Mekran district of Baluchistan Sir Aurel Stein has discovered a similar chain of prehistoric sites, and in some of these he has been able to detect clear evidence of desiccation. Putting these facts together it seems plausible that one of the reasons for the desertion of the sites in western Sind was the appearance of a drier climate, and due to this circumstance or another, people gradually moved towards the rich, food producing lands of the alluvial Indus country.

Chanhu Daro is situated within 4 miles of Dadu, or, 220 miles from Karachi in the Dadu district. Chanhu Daro is one of the smaller sites which have been excavated in the Indus valley. The extant remains cover an area of 1,000 feet by 700 feet. Its interest in archaeology is as a complement to Moenjo Daro as a satellite outpost in the agricultural land on which the commercial life of the metropolis was based. The importance of Chanhu Daro is that it fills in the picture of the civilisation which has been discovered at Moenjo Daro. The work of Majumdar on this site is valuable and the transactions of the Archaeological Department of British Government of India show what has been found. In the course of his excavations Majumdar dug two trenches 16 feet in width at right angles to each other which were carried to a length of 150 feet and 700 feet respectively, and dug down to a depth of 7 to 12 feet. The nature of the debris in the two trenches showed that the structures that once stood here must have been composed chiefly of sun-dried brick. Burnt brick was found only in a few fragmentary brick walls and in the masonry wall discovered about 6 feet below the level of the plain and 13 feet below the surface of the mound. Like the wells of Moenjo Daro, the well which has a diameter of 3 feet 6 inches, is built of wedge shaped bricks. The excavation reaches in places to a depth of 12 feet and as even at this level pottery is found in plenty, it was evident that the virgin soil lay much lower down. Near the well, only about a foot below the ground level, was discovered a large pointed vase and after its removal other similar vases were found resting just below it. Over four hundred objects were recorded from these two trenches, all the antiquities being of the same type as those from Moenjo Daro. Another trench 80 feet long and 12 feet broad, was cut in mound 1, dug to a depth of 7 to 8 feet. The remains of burnt brick structures, including a few walls and a drain which were cleared in the course of this digging provided distinct evidence of two stages of occupation. About one hundred antiquities were recovered from trench 3. Some of the selected finds from Chanhu Daro are (1) beads—5 steatite discoid plates, (2) half of a plain, convex cornelian bead, eight shaped design and white on both sides; shell objects, bangle fragments,

a ball incised with concentric circle designs; section of a chank shell, steatite seals; seal with two lines depicting pictographs with parts of the back white; seal with pictographs in three lines with parts of the back white. The symbols include the shield and two human figures holding bow and arrow and ibex to the right; seal-white, the pipal tree device-no pictograph or animal figure embossed at the back; a cube with trefoil design on five faces, egg-shaped design on the other face in which is fixed a copper pin, decoration white on orange ground; terra-cotta figurines and toys; terra-cotta toy chariot-wheel; 3 terra-cotta toy chariot fragments-one was painted with cross hatchings in red; a terra-cotta bull with head painted in red and neck pierced with a hole; a terra-cotta mother goddess figurine; a terra-cotta bird, body painted with cross hatches; a terra-cotta unicorn pierced with a hole in the belly; a terra-cotta monkey pierced with a hole. Amongst the pottery were vases, cups; one painted vase had a hachured pipal leaf, ovolos and wavy lines in the upper band and squares within curved sides in the lower in black on dark red slip; a painted vase of similar design to the above but in the upper band figures replace the pipal leaves and ovolos-decoration in black and red, dark red slip; a Mace head of alabaster; chert flakes, chisels and spearheads. The most important discoveries from the trenches of Chanhu Daro were the tree seals. The shields and sign occurring on one of them is interesting as it occurs here for the first time. One seal depicts only the pipal tree. No other example of this type from Moenjo Daro and Harappa is so far known although this tree occurs itself on a number of specimens.

Amri

Amri is another site in Sind which has yielded valuable finds. is another of the small, satellite settlements of Moenjo Daro situated in the agricultural belt. Amri is a station in the Dadu district on the Kotri Habibkot branch line of the North western Railway 175 miles from Karachi. 67 miles north of Kotri and 45 miles south of Dadu.

Amri has been an important discovery because it seems to occupy a vital place in the study of the history of pottery of the kinds which appear in Baluchistan region and in the Indus valley of the Moenjo Daro period. Excavations in Amri revealed two levels: one prior to Moenjo Daro and one contemporary with the later Indus Valley Civilisation. Its importance is that it throws light on the possible origin of elements in the Indus valley population, tracing their progress through the peasant communities of Baluchistan, possibly confirming the view that the ultimate composition of the Moenjo Daro people was the result of the peasant infiltration leading to the supersession of the original immigrants

Very likely a fuller examination of the pottery of Baluchistan and Iran and its comparison with the strains found in Amri and similar sites will provide the most fertile method of investigating the origins of the Moenjo Daro culture. It is in Amri that possibly the most important of Majumdar's work has been done. Majumdar records: "The following week during Christmas we returned to Amri and commenced digging on mound No. 2 at the spot where the chert-flakes had been found. When in the presence of Mohammadan graves on the top of the mound, as is the case in the vast majority of sites in Sind, we had to proceed with great caution and confine our operations only to a narrow area as far away from the graveyard as possible. The first trench measuring 50 feet long by 12 feet broad was sunk midway. The pathway was associated with chert-flakes and cores of which fifty were collected. To determine that this new type of pottery lies also outside the mound, that is below the alluvium, a trench 2 measuring 35 feet long by 26 feet broad was dug to the east of mound 2. This new trench revealed within a foot of the surface the remains of a stone built structure. A wall 2 feet in width belonging to the structure was found standing to a height of about 4 feet and was followed up to a length of 30 feet. Along its eastern face the foundations of a number of small rooms were exposed and heaps of nodules or gravel evidently used for the foundations were cleared in the course of the digging from the bottom of the walls. Here once more we were on the same stratum as that encountered at the bottom of trench 1, a fact that became evident when a layer of black soil reappeared, and with it the polychrome or bichrome pottery, of which two hundred and fourteen specimens were recovered from this area. Trench 2 was deepened 4 to 5 feet and all the pottery and associated objects were discovered within 2 or 3 feet from the surface of the trench. Although no complete pots were discovered in the earlier stratum, it appears that many of them were open vessels of beaker and tumbler types. That the two classes of wares from Amri are fundamentally different will be manifest even from a casual examination of the respective fabric and decoration, and we shall probably be justified in assuming that they represent two different cultures, of which the later one is contemporaneous with Moenjo Daro. In decoration and colour scheme, as well as in fabric and style, the early pottery from Amri seems to belong to the same class of wares as that discovered at Nal in the Jhalawan area of the former Kalat State excavated by Mr. Hargreaves. The following examples of this and kindred wares are now known from a number of other sites in Jhalawan, Mekran, for example, Kulli, Mehi, Badrang-damb, Kargushki-damb, Pak, Awaran and Nundara. The stratification of mound No. 2 at Amri is suggestive of the fact that Nal was earlier than Moenjo Daro and not the contrary, as some scholars have imagined. The pottery from the earliest stratum of Amri, therefore, serves as a link with some of the Prehistoric, shall we now say pre-Indus, sites in southern Baluchistan, and at the same time

furnishes a valuable clue as to the relative age of these sites. The sequence of the two classes of Sind pottery is a matter, of great importance, as with it is indirectly linked up the dating of the Nal culture which appears to have been essentially different from that of Moenjo Daro, that is to say, from the Indus Civilisation. The ceramic remains at Nal and Nandara, kindred sites in former Baluchistan which show a geometric style, form a distinct group by themselves, related more or less to the pale wares of Seistan and the various areas further afield. On the other hand, the fabric of the typical black and red pots representing a mixture of geometric zoomorphic and plant forms from sites in northern Baluchistan, like Dabarkot, form another group included in this zone of pale pottery. This zone can be affiliated directly to the cultural zone of the Indus. Likewise the pale wares of Sind which bear family likeness to the potteries of Kulli and Mehi and also to some extent of those of Nal and Nandara in Baluchistan must be reckoned as an intrusive element in the Indus valley. This kinship probably supplies also the requisite clue for the determination of the order of sequence of Nal in ceramic history. While there are no sufficient grounds to assume a wide difference in age between Amri, Kulli and Mehi on the one hand, and Nal and Nandara on the other, we find in the former group the beginning of a ceramic phase which is more pronounced and in fact, fully developed; in the latter the polychromy of Nal and Nandara having as its background the bichrome technique of the early Amri-Kulli-Mehi group. It can further be shown that some of the patterns at any rate appearing in the Kulli-Mehi ware, for example, bowls, fishes and the pipal leaf representations, had become more stylised at Nal. It is also possible that the omega motif on the Nal and Nandara pottery is the inverted schematized form of a device appearing in the pottery of Kulli and Mehi. Sir Aurel Stein's classification of certain sites in Baluchistan has led him to the conclusion that Kulli-Mehi ware belongs to a later or an earlier epoch than that of Nal. Reviewing again this stratigraphical evidence collected by me in Sind, the Amri class of pottery should be regarded as earlier than the pottery of Moenjo Daro. There is no doubt whatsoever that a particular form of decorative art as illustrated by the Amri pottery travelled from one country to another during the pre-Indus or early Indus period. Commercial intercourse, such as that attested by the discovery of the Indus seals in Persia and Mesopotamia would not alone suffice to explain this circumstance, nor would it explain adequately the occurrence of a figure closely resembling the Sumerian hero god, Ibani, on some of the Indus seals unearthed at Moenjo Daro. The people themselves must have migrated, carrying with them their own cults and traditions and also their particular mode of vase painting to which they had been hitherto accustomed, reminiscences of which have been

preserved in the sundry objects in Sind. But it is not easy to decide whether the migration started from the east or from the west. As regards the Indus people those who inhabited Harappa and Moenjo Daro, it can be said at once that they came from outside India, although some of their objects certainly show points of technical resemblance to those of Persia, Mesopotamia and Transcaspia of the chalcolithic period. Many of the articles in the arts and architecture of the Indus people have a distinct stamp of individuality which favours the conclusion that, whatever may have been their ultimate origin, they must have been settled in Sind for centuries, and it was here that their civilisation reached its final stage of development.”*

Mirpurkhas contains the ruins of the most impressive Buddhist memorial in former Sind. Mirpurkhas, is upon the line of rail connecting Hyderabad with Marwar Junction, and is forty-two miles East of the former Place. It is a town of comparatively modern date, having been built in 1806 by Mir Ali Murad Talpur. The place came into the hands of the Manikani Mirs about 1793, when the country was divided up between the different members of the Talpur family. It was the chief town of Mir Sher Muhammad Khan Talpur, who fought at Dabba (Duabo) with Napier's Army in 1843. About half a mile to the north of the town there is an ancient site, extending over about thirty acres, covered with mounds, over the surface of which brickbats and potsherds are thickly scattered. Very little excavation is sufficient to show that these mounds represent the sites and ruined foundations of very old building of sorts; and the occurrence of very large bricks of an early pattern and make, together with numerous fragments of small dagobas, make it pretty certain that the site was that of a Buddhist establishment. The place is now known as Kahujo Daro. The Buddhist stupa found in this place was excavated by Mr. Cousens in 1909 and 1910, and the district gazetteer for the Tharparkar district compiled by Mr. J. W. Smyth, in 1919 has an account of the actual opening of the stupa. It is not necessary to repeat that account here. Instead there will be given some extracts from Mr. Cousen's work "The Antiquities of Sind with Historical Outline" describing some of the more important features of these Buddhist remains in Mirpurkhas. Mr. Cousens remarks that kalar had already attacked parts of the walls and most of the images of the Buddha, but in the western niche on the north side it was found encrusted to a depth of half an inch with an efflorescence

* At Amri, besides the river Indus in Sind, French archaeologists under Monsieur J. M. Casal have carefully explored the site from 1959 to 1962 which, appreciably more than four thousand years ago preceded and later shared in the great Indus civilization. Apart from the evidence of the Amri culture which antedates the Indus civilization, continuation into later cultures of Jhukar and Jhangar has also been established. Please refer to Pakistan Quarterly, Special Number, 1967-P. 197-201.

of crystals which had to be carefully chiselled away, hot water failing to dissolve it. This salt has been found to be composed of gypsum, sodium sulphate, sodium carbonate, organic matter and sand, of which gypsum forms nearly 89 per cent. At either end of the west wall on the face of it there had been very large panels or niches, the sills only remaining with the bases of the two flanking pilasters which framed them in. "Between these large panels," says Mr. Cousens, "and the shrines there were two smaller panels one on each side both of a peculiar shape; that in the north holding a small image of the seated Buddha whose hands are broken off, while that on the south side has been mostly destroyed. He wears his robe over both shoulders in the same manner as in the other images in the large niches, and is seated upon a lotus with a background made up of flame-like leaves spreading out from the back of the body all around. The eyes are quite shut, the upper and lower lids meeting. The arms have been broken off from the elbows: they were probably placed in the lap, but of this it is impossible to be certain, as there appear to be no fractured surfaces upon the upturned feet or legs to show that they had been in contact with them anywhere except at the toes of the right foot. Being moulded in clay, they may not have been so intimately connected with the rest of the body as they would have been had the image been carved in stone. It is possible the hands may have been raised in front of the breast in the teaching attitude."

"A considerable amount of the buttressing and fallen debris round the stupa remained undisturbed by us: we merely removed sufficient to lay the walls bare. In the debris were found carved bricks in a great variety of patterns, and of very superior workmanship, so much so as to merit the term terra-cotta being applied to them. Among the designs were found several forms of the key pattern or Greek fret; indeed, Greek influence, in ornamental details, is very apparent in several of the very few fragments retrieved by us and, in this respect, connects the work closely with that of the Indo-Greek remains at Gandhara."

"Two more medallions were unearthed being the image so frequently found; this is supposed to represent Kubera; and several square tiles with grotesque faces. From the number of tiles, with the face as shown in the right lower corner of the illustration, it would seem that there must have been at least one whole string-course of them. The so-called Kubera image, both here and elsewhere, might very well be the conventional way they had in those days of representing the donor, or person who provided the money for the construction of the work upon which it appears, the money bag which he holds in his right hand indicating this. I do not think that we necessarily take it as the image of the god of wealth. A few fragments of the capitals of the pilasters, which were placed at intervals around the tower, such as are seen on the Thal Mir Rukan were recovered."

“There is littlenow left to give us any clue to the original shape of the stupa, but by comparing the little there is with what we know of other stupas, it is not difficult to imagine the outline of the complete building. To begin with, sufficient remains to show that the lowest part of the structure was a great square basement, 53'-6" from corner to corner of the plinth, rising, in its ruined state to a height of 14'-6". Allowing for missing mouldings above the capitals of the pilasters, the basement was at least 17'-0" high. Upon this rose a cylindrical tower, with domed top, to about the same height as its diameter, about 37 or 38 feet, thus leaving a flat terrace around the base of the tower, and on the top of the great basement, to serve the purpose of pradakshina or circumambulation. This would give a total height of about 55 feet, or about as high as the square of the basement at the ground level. Like Thal Mir Rukan, the tower was probably decorated with one or more bands of pilasters, numerous string courses, and mouldings of sculptured or moulded bricks. When complete the dome was possibly crowned with a wooden umbrella.”

“There were three images of the Buddha on each of the three faces of the basement, the north, east and south. Of these nine, seven were in position when I uncovered the walls. Two were missing, namely, one from the niche on the south side of the central, one on the east side, and one just round the corner, east of the centre on the south side.”

“All these images, which are about half life size, are seated cross-legged in the meditative attitude (dhyanamudra), with both hands in the lap, one upon the other with palms upwards. The Buddha is represented in some, seated upon a lotus and in others upon a four legged stool. The images had all been painted, those of the Buddha having red robes and a golden coloured complexion, with black eyes and hair; and, for this purpose they appear to have been covered with a thin egg-shell layer of very superior clay before baking. His body is fully clothed with an ample robe which covers both shoulders and hangs in folds. Under the robe he appears to wear trousers, the legs of which are very clearly shown beneath the bottom of the robe. The end of the robe, in front, hangs down over the seat under him; and both arms, to the wrist, are covered. In all images, save one, the hair is of the short curly kind; in the exception, in the eastern image on the north side, it is represented straight, and dressed back from the front. Between the eyes, in most of the images is a small circle to indicate the urna, one of the Buddha's special marks denoting enlightenment (bodhi). As it is a grooved ring and not a protuberance, possibly some metallic button was attached. The knob (ushnisha) on the top of the head is present, though not very prominent. The ear lobes are long and pendulous, and the eyes in some are fairly open, while, in others they are half closed. Behind the head is a decorated nimbus, alike in all except the straight-haired image where instead of a circular band of square and round lotuses, it has a scroll band of conventional leaves.”

"The clay tablets which we found in the fallen debris out in front of the west face, some 6 feet above the original level, and therefore of later date than the original building, were all in unburnt clay. They show that the stupa was an object of worship or reverence after it had become ruinous. They are of different sizes varying from $1\frac{1}{2}$ " to 6" in their greatest length, for they are mostly oval in shape. Some have an impression of Buddha seated cross-legged with the right hand pointing downwards in the witness attitude (bhumisparsa-mudra) representing him at the moment of enlightenment (bodhi), the foliage of the Bodhi tree being shown over his head. Others have him seated in the European fashion, with the legs hanging down, and hands before the breast, in the preaching attitude (dharma-chakra mudra), delivering his address in the Deer Park. The robe is not shown very distinctly, but on some the mark of its edge is shown from the left shoulder to the right waist, and thus, unlike the older images on the walls, it leaves the right shoulder bare as we find it in such sculptures as those in the Ajanta Caves and elsewhere in the peninsula. Many of the tablets have, instead of an image of Buddha, representations of very attenuated Burmese-looking dagobas—one, three, ten or more than a hundred being impressed on each tablet. The last are circular tablets, and the dagobas are arranged in rows, which being small, make the tablets look like sample cards of little screws, of different sizes, standing on their heads."

"With these tablets were found about 36 copper coins, which had evidently been placed there as offerings with them. They were but round lumps of verdigris within which was found a much corroded copper core, upon many of which were portions of Arabic inscriptions. Some had the four leaved flower upon one side, from which, as well as from the letters legible, it is easy to identify them as coins of the early Arabs in Sind such as have been described in the account of Brahmanabad. The position in which these tablets were found, and the Arab coins, would seem to show that offerings were made at the Stupa after the advent of the Arabs in Sind, in the early years of the eighth century. The moulds for the tablets were probably fashioned after old patterns; and we must not forget that heavy copper coins would naturally sink through soft debris much more easily than clay tablets, so that the coins may have joined them from a higher level of a later date. The unbaked and soft clay tablets would indicate that there were Buddhist priests, or samanias there to make them in exchange for the pilgrims' money offerings; the copper coins lying there unappropriated would tend to show that, when the few pilgrims who visited the place dropped them there, the stupa was deserted, and there were no priests to gather them up."

"The statue slab found in the central shrine on the west face of the stupa is very interesting and curious. On digging out the core of brick buttressing, with which the cell had been filled, this slab, which measures $30\frac{1}{2}$ inches high by $12\frac{1}{2}$ across, was found standing

upon the floor leaning, against the north wall. The feet were broken off and were not found. The statue appears to be the portrait of some male person of note, and reminds one very forcibly of the portrait statues of Vanraj at Anhilvad-Pattan in almost the same pose, and those of Tejpal, Vastupal and others in the Dilwara temples of Abu. It is not a Bodhisattava, or it would have had a halo round the head, and would have been in other respects more like those images as we find them elsewhere. The figure is standing full to the front, resting upon the right leg; the right hand, raised almost to the centre of the breast, holds a small lotus flower, while the left rests flat upon what appears to be a wallet slung loosely round his waist and hanging from his left thigh. He is not, as is so often seen in such figures, grasping a knot of his garment. His clothing is simple in the extreme, and is just such as one sees on Jain worshippers as they enter their shrines for worship; it seems to be but a single waist-cloth whose folds hang to the back on the left side. It is possible that there is an under garment, the ends of which are seen across the knees; or they may simply show the inner folds of the one cloth. He wears an elaborate head-dress, arranged in rows of horizontal curls, from underneath which bunches of vertical curls fall upon each shoulder. There can be little doubt, I think, that this is a wig, and similar wigged figures may be seen in one of the Buddhist caves at Aurangabad; these are not uncommon in early statuary. The statue has been painted: the complexion was "golden" or wheat-coloured; the waist-cloth which, though scanty, is rich, was red, while the wig, eyebrows, pupils and moustache were black. I am inclined to believe that the statue represents the builder of the stupa, the wallet or money bag under his left hand indicating the source of the funds. If so, this would account for the image being left with the stupa, it not being a sacred image.

"Taking everything into consideration, I cannot see how this Mirpur Khas stupa can be ascribed to a later date than A.D. 400: it may be earlier. It is probable that it is a reconstruction of a ruined one formerly erected under Asoka's orders, and, possibly to contain a relic of the Buddha and other relics—the spoonful of ash being put into the bottle at the time of its reconstruction. But, of course, this is pure surmise. The fact, however, remains, that the sites of what were once monasteries surround the stupa. The trenches from which the bricks of the walls of one of these have been removed, give us a plan very like those of some of the Gandhara monasteries.

This stupa was not an isolated building of its kind in Sind, for we have of the same period, judging from the remains of the sculptured brick which adorned them, the stupas of Thul Mir Rukan near Moro, Depar Ghangro near Brahmanabad, Sudheran jo-dhado near Tando Muhammad Khan, and the one near Jarak. In his examination of the Sudheran-jo-Daro, a ruined stupa

near Tando Muhammad Khan in the Guni Taluka of the Hyderabad district, Mr. Bhandarkar came to the conclusion that the original stupa cannot have been later than the time of Kanishka about A.D. 100, and he adds "We shall not be far wrong if we assign it to the beginning of the Christian era". Speaking on this point Cousens says, "If we accept this for this stupa, we must also accept it for Mirpurkhas, Thal Mir Rukan and others of similar construction and decoration in Sind. General Haig thought that Sawandi which is near that place, is mentioned in the legends of the "Mujmal at Tawarikh" as having been built by the King of Kashmir during an expedition to Sind. Sawandi was a great Buddhist establishment and Cousens says that he has identified it with Depar Ghangro, where he remarks "I found that the large mound was the ruin of a stupa. This then was probably what the Kashmir King is credited with having built. The king referred to, I gather, was Kanishka, who alone among the Kushan Kings has left a name cherished by tradition and famous far beyond the limits of India. His dominions included Sind."

Aror.

Aror or Alor was the capital city of the Aror Kingdom of Sind in the seventh century A.D. It is not known when it was founded; but as it seems to have survived for a century or two after the Muslim conquest of Sind in 711 A.D. it probably was in existence for five or six hundred years. "The Chachnama," also known as "Tarkikh-i-Hind", describes the capital Alor, as a town adorned with various kinds of royal buildings, pillars, gardens, fountains, streams, meadows and trees and situated on the bank of the river called Mihran. Alor was sited on the banks of the lost river of Sind, about which there have been so many theories. In the map illustrating Thomas Pennant's quaint and learned view of Hindustan, 1798, this river is shown as rising in the Himalayas east of the Sutlej and flowing down past the town of Umarkot into the Gulf of Cutch. It is there called the Ghaggar river, which may be a corruption of the Hakra, the name still applied to parts of the ancient bed. Long after it ceased to be an independent river, its bed under the name of the Nara (=Nala) served as a channel by which the flood waters of the Indus were guided down to the Dhoro Puran, the ancient channel of the Indus, and so into the Kori Creek.

The ruins of the ancient town of Aror, or Alor, lie about five miles to the south-east of Rohri, near the Eastern Nara Supply Channel. At the time of the conquest of Sind by the Arabs under Muhammad Bin Qasim in A.D. 711 Aror was the capital of Sind and the residence of King Dahar. The Arabs made their capital at Mansurah and Aror continued for more than two centuries as a Hindu town. It then disappeared. The legend of King Dalu

Rai of Brahmanabad has been pressed into service to account for its fate but there is little doubt that it gradually declined when the Indus ceased to flow past it about the middle of the eighth century. The name is written Al-Rur by some of the Arab geographers, and if the conjecture is right that the "al" was the Arabic article and the name of the town was Rur, then it seems probable that the inhabitants removed to a new site on the new course of the river and carried the name with which it survives as Rohri. Some water, not doubt, remained for a long time in the old river bed and some habitations on its banks, since there are ruins of a mosque attributed to Alamgir (Aurangzeb), as well as the tombs of two Sayids, Shakar Ganj Shah, and Khatal-ud-din Shah, the former of whom is said to have been a contemporary and friend of Lal Shahbaz whose famous tomb is at Sehwan. There is an annual fair in his honour. The ruins occupy hilly ground over-looking the old bed of the river which is still quite traceable. Old bricks of the very large kind are found, and after rain, coins have been unearthed. They are barely recognizable as such and little appears to have been made of them. The road from Rohri passes over a bridge which was at one time assumed to be much older than it probably is. The Superintendent of the Archaeological Survey supposes that it may have been built about the same time as Alamgir's mosque.

According to the Tuhfat-al-Kiram a Hindu dynasty ruled in Aror for one-hundred and thirty-seven years up to the time when Chach, a Brahman, and native of Alor who was employed by the Hindu Raja, Rai Sahasi II, as his assistant, to whom Chach became chamberlain, and principal minister, fell violently in love with Suhandi, the wife of the King. When the king died Chach usurped the throne. According to the Tuhfat-al-Kiram this event happened in 622 A.D. The earliest history of Sind in the Chachnama presents a vivid picture of conditions in Sind from that time till the disappearance of the Hindu dynasty following the conquest of Sind in 711 A.D. by Muhammad Bin Qasim. In the bed of the river which once flowed near Aror two stones are set up, it is supposed, to mark the ancient course of the Indus, then known as the Mihran. The city is reported to have been built of pakka brick and stone on a rocky hill having its walls then washed by the Indus; and it seems probable that the change in the course of the river, caused, it is presumed, by an earthquake took place some where about 962 A.D. (Hijra 341). Though it was the capital of the Hindu Rajas who governed Sind for several hundred years, no specimens of Hindu architecture have been found there. Excepting a few puerile legends, little else is known relative to this city since no record of any moment exists concerning the time between the invasion of the Sub-continent by Alexander the Great and the conquest of Sind by the generals of the Khalifas. The Tarikh-i-Masumi

states that the city of Aror was captured by Muhammad Bin Qasim Sakifi about A.D.711 (Hijra 93), the then reigning Hindu Prince, Rai Dahir, being killed in the assault. Mr. N.G. Majumdar in his "Explorations in Sind" from the Annual Report 1929/30 of Archaeological Survey of India, examining the site of Aror, noted "There is a cluster of small mounds just to the north-east of the village of Aror along the Junjee road which are locally known as Garhi Gor, their maximum height being not more than 8 feet. A trial trench in one of these brought to light a number of carved bricks of the early medieval period, that is the seventh or eight century A.D., and the common belief that this part of Aror represents the pre-Arab Hindu city was corroborated. About 3½ miles to the south of Rohri is the village of Hakra, between which and Aror flows now the Nara supply channel. In 1855 Captain Kirby reported in connection with the excavation of this canal, "In excavating the great Nara Canal we occasionally came upon detached masses of brickwork and at length at a depth of about 10 feet below the surface of the ground the foundation of a very large number of houses were laid bare. Among these ruins were found a number of articles made of brick clay, such as drinking cups, a kuja, some water spouts and large number of children's toys. This account of a lost city buried at a depth of 10 feet below the surface prompted us to pay a visit to the village of Hakra. An old man of the village could vouch for the correctness of the account, and brought us to a spot two miles and one furlong from the Nara head and pointed out the place where the Sabhis Sahib had in bygone days come across a bazaar in the midst of the canals but now there is absolutely no trace of the hidden structures. There is, however, a likelihood that in its close vicinity there may still be found on excavation, the remains of an early, probably prehistoric, settlement." The present compiler of this Gazetteer has himself visited recently (1956) the site of Aror and found it to consist of vast uneven mounds containing myriads of broken pieces of pottery with occasionally an old copper coin found near the surface.

Debal and
Bambur.

No certainty exists as to the exact site of Debal or Debul and Bambur. Identification of these places has been the subject of much learned discussion. It cannot be said with any certainty that agreement has yet been reached. Debal or Debul means simply temple and indicates the existence of some Hindu place of worship and it is quite possible that the name applied to more than one locality. Abbott in his "Sind-A Re-interpretation" remarks, "of the survival of the name Debul up to recent times there is no doubt. The instructions of the East India Company's Committee to Fennell and again to Sir Henry Middleton in 1610 suggest the founding of a factory at Debul. Paynton calls Debul the port at which Sir Robert Shirley landed in 1613. Crowe the British Agent

at Thatta in 1799, writes of Thatta as Debul-Sindhi. In an earlier period the Arab writer Al-Idrisi described Debul as a populous place, "but its soil is not fertile, and it produces scarcely any trees except the date palm. The highlands are arid and the plains sterile. The houses are built of clay and wood. But the place is inhabited only because it is a station for vessels of Sind and other countries. Ships laden with the production of Oman and the vessels of China and India come to Debul. They bring stuff and other goods from China and the perfumes and aromatics of India. The inhabitants of Debul who are generally rich buy these goods in bulk and store them until the vessels are gone and they become scarce. Then they begin to sell and go trading into the country, putting their money out at interest or employing it as it may seem best". Al Istakhri, who wrote about A.D. 956-961, puts Debul west of the mouth of the Mihran and so does Ibn Haukal, and Al-Idrisi puts it 6 miles west of the mouth, and earlier than them all Masudi puts it two days' journey west. The old history says that when Rai Dahir heard of its fall in A.D. 711, he made light of it, saying it was a place inhabited by low people and traders. In the thirty-sixth year of Chach's reign one Mughira commanded an expedition from Arabia against Sind, but was killed before the walls of Debul. At the time of the Arab invasion under Muhammad bin Qasim the ruling Hindu King was Dahir and his capital city was Aror, or Alor. It seems plain from the historical account of the Arab invasion of Sind at the time when Debul fell, that Debul was an important trading port and that it boasted a large and wealthy temple where numbers of Brahmans were continually performing their devotions.

The Arab conquest of Sind took place at a time when Buddhism was on the decline and Brahminism was again becoming the predominant form of religion.

Gul Hayat Institute

In his "Explorations in Sind" Mr. N.G. Majumdar, in the Archaeological Survey Report of India for 1929/30 remarks "Our first camp was at Gharo near Dabeji Railway Station on the Kotri-Karachi Line of the North Western Railway. We moved to this place from Karachi with a view to examining the site at Bambor on the Gharo creek, about $3\frac{1}{2}$ miles from Gharo, being the scene of the legend of "Sassi and her lover Punnu" which is so familiar to the people of Sind. The mound is locally known as Sasui-jo--Takar or the Hill of Sasui. It is about 50 feet in height and was probably an outpost guarding the Gharo creek not earlier than the Arab invasion of 711 A.D. This dating was confirmed by the surface finds of glazed pottery, a kind of honey comb-shaped ware and small copper coins of the rulers of Sind. In the exploratory

trenches sunk at the site by the side of a stone wall about eighty of these copper pieces were found together with fragments of glazed pottery like those noticed on the surface of the mound."

Bambura, a ruined city near the town of Gharo, in the Mirpur Sakro taluka of the Thatta district, in latitude $24^{\circ} 40' N.$ and longitude $67^{\circ} 41' E.$ It was known as the Kafir or Infidel city, and it is presumed to have been in existence before the first Muslim conquest of Sind in A.D. 711-12. It is stated that there are reasons for supposing that this ancient place was known during the eighth century under the names of Debal, Dewal or Dawul, and that it was the first town that was stormed by the Muslim conqueror Muhammad Bin Qasim Sakifi. The catapults used by this general are said to have been brought by sea to this place which is thought to have been at that time the principal port in Sind on the western side of the Indus delta. This ancient city, it is said, exhibits marks of great antiquity, displaying the remains of ramparts, bastions, towers and houses and bearing evidence of former population and trade in the number of coins washed up during heavy rain. At the time of its destruction there was a temple renowned for its sanctity of the fort, whence the town is supposed to have been called by Muslim historians, Dewal or the temple, but it is believed that before the Muslim conquest it was known under the name of Mahara, or Mansawar.

Bhambor is the local name of a mound of ruins on a low rocky elevation situated on the north bank of the Gharo creek, three and a half miles westwards from the village of Gharo in the taluka of Mirpur Sakro, and about a quarter of a mile to the left of the road to Karachi. The remains of a fort with walls and bastions, are distinctly traceable, and from among the heaps of broken bricks old coins have frequently been picked up after a fall of rain. No collection of them has, however, been systematically made. From the mound an old dam runs to hilly ground in the north, holding up rain water and forming a lake. As the Gharo creek is the most westerly channel of the Indus it is probably the oldest and seems more likely than any other to have been the one down which Nearchus sailed. This also gives an air of probability to the hypothesis that Bhambor, and not Thatta nor any of the other places that have been suggested, was the great Hindu town known as Debal, which was the first object of attack when Muhammad Bin Qasim invaded Sind. But there is not

room on the site for a town of any size and no direction in which it could have extended. *

Bambur is said to have been destroyed by an earthquake at the same time as Brahmanabad, that is about the middle of the eighth century. According to the Tuhfat-ul-Kiram, or Sasui the heroine of the romance of Sasui and Punhun was the adopted daughter of a washerman of Bambur. As regards the Gharo creek Assistant Surgeon Heddle, reporting in 1836, stated that the branch which flowed north of Thatta to Gharo had been closed for sixty years. By this Thatta was thrown out of the Delta. Fifty years later the Bhagar branch, now converted into a canal silted up, and the apex of the delta was pushed nearer the sea. It seems, therefore, that Bambur or Debal, if they can in fact be identified as the same place, has for a considerable time now been cut off from direct communication with the sea. The present condition of the place on a silted up mouth of the River Indus can therefore convey no true picture of what it must have been like in the days when it served as the main entrance for trading vessels seeking to do business with the country of Sind.

Ibn Haukal, writing about 976 A.D., describes Mansura in the following terms. "Mansura is about a mile and a half broad and is surrounded by a branch of the Mihran. It is like an island and the inhabitants are Muslims. The climate is hot and the date tree grows here, but there is neither grape nor apple and the ripe date Tamar (no stone in it) and sugar-cane grow here. The land also produces a fruit of the size of the apple which is called limon and is exceedingly acid. The place also yields a fruit called ambaj (mango) resembling the peach in appearance and flavour. It is plentiful and cheap. Prices are low and there is an abundance of food. Multan is about half the size of Mansura. The language of Mansura

Brahman-
abad and
Mansura.

* The excavations at Bhambhore for seven seasons since 1958 revealed one of earliest known Muslim cities in the Sub-continent. The site dates back to the 2nd century B.C. and subsequently it witnessed better days under the Umayyid and the Abbasid rule till its desertion at the beginning of the 13th century A.C. An impressive system of fortification, city plan with streets and lanes, gateways and a rich collection of antiquities consisting pottery, coins, stone and metal objects, glass wares and other household articles have provided detailed information about the then prevalent Muslim culture. The discovery of the ground plan of a mosque in the centre of the city and Kufic inscriptions recording the date of its constructions are undoubtedly the most significant achievements of the excavation. The mosque which is built on the plan of early Arab mosques at Kufa and was proved to be the earliest known mosque in the sub-continent.

Deep diggings were carried out down to the water level encountered at a depth of 30 feet. Besides revealing the successive building level of the Islamic period, the pre-Islamic remains were also uncovered which provided additional confirmation of the date already obtained at other areas of the site.

The excavations yielded copper coins and objects of daily use, beautiful vases of glass, ivory objects and the polychrome pottery. (The Roots of Pakistan-details of Archaeological excavation P. 204, Dr. F.S. Khan, S. I. T.Pk.).

and Multan in most parts is Arabic and Sindhi. In Mekran they use Persian and Mekrani. All wear short tunics, except the merchants who wear shirts and cloaks of cotton like the men of Iraq and Persia". The geographer, Al-Idrisi, has this account of Mansura: "That of which we are speaking is great, populous, rich and commercial. Its environs are fertile. The buildings are constructed of bricks, tiles and plaster. It is a place of recreation and pleasure. Trade flourishes. The bazaars are filled with people and well stocked with goods. The lower classes wear the Persian costume but the princes wear tunics and allow thier hair to grow long like the princes of India. Fish is plentiful. Meat is cheap and foreign and native fruits abound." In the 1907 Edition of the Gazetteer Aitken says that when the Ummayid Khalifas gave place to the Abbasids in 750 A.D. a new set of governors and place holders rejected the old, which cannot have signified much to the country or its people. The Chief Governor, Mansur bin Jamhur fought for his place but had to fly to the desert where he died of thirst. But his name remained in the city of Mansura, founded by him according to the Arab geographer Masudi. About 951 A.D. the geographer Istakhri described Mansura as more fertile and also more populous than Multan. He gives a glimpse of the common life in the note that the people of Multan wear trousers and most of them speak Persian and Sindhi as in Mansura. Masudi's assertion of the founding of Mansura by Mansur bin Jamhur has been disputed. It has been held that excavations carried out by Henry Cousens leading to the discovery of the Jamia mosque, the numerous coins of the Arab governors, prove that the site near Dalor 8 miles south-east of Shahdadpur which has been known as Brahmanabad is actually the site of Mansura. The Arabic writer Baladhri states that Mansura was built two farsangs from Brahmanabad and that the city of Mansura was founded by Amar, the son of Muhammad Bin Qasim, the conqueror of Sind, during the reign of Governor Mansur bin Jamhur about 112-114 Hijra, that is nearly 14 or 15 years before the advent of Mansur. Baladhri clearly mentions that Mansura was founded by Amar.

There is a very full account of the excavation of Brahmanabad in 1854 contained in the first edition of "The Sind Gazetteer" by Hughes in 1874. This account, which is full of interesting antiquarian and archaeological facts, is too long for quotation here. But it is to be hoped that sooner or later the account of the excavation of Brahmanabad contained in the 1874 Gazetteers will be reprinted as an historical paper worthy of permanent record.

This name of Brahmanabad has for more than half a century been assigned to a vast mass of ruins lying in 25° 53' North latitude and 68° .49' East longitude about eight miles east of Shahdadpur in the Sinjhor taluka. They are locally known as Bahmanah, with variations. The question of the identity of these ruins has for long

been a matter of controversy and it is only possible here to give a summary of the opinions which have been formed on the subject.

When Muhammad Bin Qasim conquered Sind in the year 711 A.D., there was a great Hindu city with a name which has been almost universally rendered by historians as Brahmanabad. Major H. G. Raverty, author of "Mihran of Sind and its Tributaries" has produced a good deal of evidence to show that this pronunciation and spelling are erroneous and that the city in question was identical with one which was founded by Bahman, son of Isfandayar, and called by his own name, Bahmannih, or Bahmanabad, about the year 470 B.C., i.e., nearly half a century after the conquest of Sind by the Persians. Whether Brahmanabad or Bahmanabad, it was a Hindu town when Muhammad Bin Qasim attacked it, and lay a few miles east of a river which has been assumed to be the Indus, but which Major Raverty contends was the 'lost river', the Hakra, or a branch of it. Under Arab rule this town passed out of view, and in its stead came an Arab town called Mansurah, near to the same place, about the founding of which there are several stories. One historian Bu-Rihan al-Biruni, as quoted by Rashid-ud-din, says that when Muhammad, son of Qasim, came to Sind he subdued Bahman-no and gave it the name of Mansuriyah. Others refer to it as a distinct place. It became the principal city of the Arab Province of Sind and was more populous than Multan. After Mahmud of Ghazni expelled the Abbaside Governors, there was a long period during which the Hindus regained a good deal (it is difficult to say how much) of their former independence on the east of the Indus, and Mansurah disappeared from the ken of historians, as Brahmanabad had done before it. As regards the fate of Brahmanabad, tradition disposed off the question centuries ago. Once upon a time there was a Hindu King who was a very wicked man and he reigned at Brahmanabad and his name was Dalu Rai. He made a law that every young maiden who was married to any of his subjects must be sent to his palace on the night of the wedding. There was a noble who had a beautiful daughter and she was to be married, but he was a Mussulman and to obey the King's law would blacken his face for ever. In his difficulty he sought the advice of a very holy man, who told him not to be afraid for he would destroy the city of the wicked king. The holy man then caused it to be made known that the vengeance of heaven was to fall on Brahmanabad and that the faithful should flee and save their lives. The king scoffed at the warning: so, when a fearful earthquake shook the whole city to the ground with its walls and houses and idol temples, the king and all his courtiers were buried in its ruins. But those who heeded the warning of the holy man escaped and afterwards founded the city of Nasarpur. As this legend is fitted to almost every imposing heap of ruins in former Sind, and they are many, it does not help towards the identification of Brahmanabad. Finally in 1854, Mr. A.F. Bellasis to whose memory

a mural tablet stands in the Church at Hyderabad, made a searching exploration of the ruins to the east of Shahdadpur, and seemed to have finally settled the site of the famous city. Mr. Bellasis sent a number of coins which he found on the site for examination and these proved to be those of Mansur bin Jamhur, Abdur Rahman and other Arab rulers of Mansura. Major-General M.R. Haig put forward a suggestion in a paper published in the journal of the Royal Asiatic Society, Volume 16, Part 2, that the ruins described by Mr. Bellasis were really those of Mansura and that another mass of ruins, 6 miles to the north-east of them, was the remains of Brahmanabad. He disbelieved the story that the city had been destroyed by earthquake and attributed the desertion and subsequent decay of Brahmanabad to nothing else than a change in the course of the river leaving it without water. Mansura might have succumbed, he thought to a similar fate some centuries later. General Haig further suggested the probable identity of a smaller ruin at the village of Mutahlo about $2\frac{1}{4}$ miles to the north-west of Brahmanabad, as Mansura with a Buddhist monastery, Sawandi, which is known to have been near to Brahmanabad in the days of Chach and is mentioned in the Chachnama.

The next light was thrown on the subject in 1897, when Mr. H. Cousens, Superintendent of the Archaeological Survey, Bombay, made deep excavations into the ruins of Bahamanah and came to the surprising conclusion that both Mr. Bellasis and General Haig were right. He found convincing evidence that he was among the remains of two cities, one of which had been built on the debris of the other. The lower was Hindu, but the upper unmistakeably Mussulman. The foundations of several mosques were cleared and numerous coins were found with Arabic inscriptions, some of which Mr. Cousens states to be those of the eastern Khalifas, so that they must have been brought to Sind by the Arabs. Upon this theory it is possible to construct an account of Brahmanabad not wholly inconsistent with such information as history supplies. We know that Muhammad Bin Qasim did not destroy the Hindu town, but put a garrison in it and left the Hindus to manage it. Shortly afterwards Jaisiya the son of Dahar led a revolt and managed to get possession of Brahmanabad but had to submit again and become a Mussulman, after which he was confirmed in the governorship of the town. Later on he had a quarrel with an Arab governor "on the other side of the water" and was killed in a battle against him. The name of Brahmanabad Bahaman-nih, or Bahaman-no (for it has several variations,) remained, as General Haig says, linked to that of Mansurah long after both were in ruins and eventually the Arab half of it was dropped and Bahamanah-Mansurah became Mansurah. At the present day local tradition knows nothing of Mansurah. Mr. Cousens' theory of the destruction of Mansurah is that it was

sacked by the enemy and the inhabitants were put to the sword. This would account for the skeletons found by Mr. Bellasis and numerous human remains found by Mr. Cousens himself.

Another very interesting discovery of Mr. Cousens was the foundation of a Buddhist stupa at Depar Ghangro, the ruin which General Haig identified with the real Brahmanabad. This may be the site of the Sawandi monastery which General Haig placed at Mutahlo.

The ruins of Brahmanabad are about four miles in circumference. The whole space is covered with mounds of broken and crumbled bricks some of them fifteen feet high, with a few clear spaces which are conjectured to have been market squares. There is no stone but occasional lumps of charred wood seem to indicate the former presence of woodwork in the buildings. The earth of the ruins is considered to be a valuable manure and is excavated for the purpose by the cultivators of the neighbourhood. It seems that between them, Brahmanabad and Mansura, whether one city or two cities continued as a place of habitation for about six hundred years. What was the excavation of this great site is indicated by a few extracts from reports made at the time.

“On the occasion of our second visit, we selected for excavation a heap of ruins adjoining the site of the house first excavated, and standing on the verge of the same bazar. The house was built of burnt brick and the rooms of similar construction to those before described. Among the first things of interest found were some very curiously carved stone slabs raised about five inches from the ground on four feet. They were carved out of a solid block of stone but with one exception were all more or less broken into pieces by the weight of the walls that have fallen upon them. I was, however, successful in finding all the pieces of some of them, so that the whole could be put together. They varied in size from two to two and a half feet square.

The most beautiful was one of red sandstone similar to that now found at Porbandar in Kachh. The slab is square with a large circular space in the centre, the corner pieces being ornamented with peacocks and snakes. This circular space is slightly depressed for the retention of water and on one of the side of the slab is a bull's head, with the water escape passing through the bull's mouth. In this specimen the four corner feet were panelled and exquisitely carved with bas-relief figures two on each foot. Two feet were wanting, but on the two found, the figures were a lion on one panel, and on the other a warrior armed with sword and shield. On the other foot are two female figures one playing the sarindah, a kind of guitar still in use. The other female appears to be

admiring herself in a looking-glass, which she holds in one hand, while with the other she is dressing her hair. These feet are connected with each other by a cornice of open tracery of great beauty, running along the sides of the slab, and the whole forming a beautiful specimen of carving.

“The figures, and all the emblems and ornaments used, are Hindu, such as are seen on old Jain temples. One remarkable fact is that the figures carved on this slab are quite perfect and have not been mutilated by any iconoclast.

“In this same house we were further repaid by finding nearly a complete set of ivory chessmen, one set white, the other black. The kings and queens are about three inches high and the pawns about one: the other pieces of different intermediate heights. All have been made for use on a board with holes, for each piece has a peg in it, similar to chessmen used nowadays on board ship, to prevent the pieces being easily knocked down and the game disturbed. The ivory of these, too, is in a very decayed state, and very brittle, every particle of animal matter seemed completely exhausted and the ivory reduced to a substance not unlike lime or chalk.

“Among the curiosities found at Brahmanabad, showing an advanced state of art, are some beautiful engravings on cornelians and agate. Many of them are perfect gems of art, and like the intaglios of Rome, are polished on the inside of the device, an art, I believe, now lost. Some that were found had upon them a bull, and others a lion, some merely a name in Arabic, and some in characters resembling the Devanagiri or Sanskrit: most of these appeared cut in ovals and circles, and would be well suited for the purpose of a signet ring; others were ready cut into these shapes, but without any inscription or device, as if the engraver kept an assortment for the choice of his customers, who had only to express their wish-what device, what-name and the hand of the cunning artist was prepared to make any engraving ordered.”*

Mr. J.W. Smyth, I.C.S., the compiler of the Nawabshah District Gazetteer in 1919, has noted that the finding of chessmen is peculiarly interesting in view of the tradition that chess was invented by King Dahir at Brahmanabad or Alor.

* *Brahmanabad and Mansura* : “In order to supplement and ascertain the indication that Mansura was founded near the site of Brahmanabad also called Bahmanabad, excavations were started by Pakistan Archaeological Department at Mansura in January 1966 and the work still continues ”.

Rohri or Lohri, said to be the ancient Loharkot, is situated in latitude 27°-41' north and longitude 68°-55' east. It stands on the eastern bank of the river Indus on a rocky eminence of limestone interspersed with flint which is terminated abruptly on the western side by a precipice 40 feet high rising from the bank of the river, which during the inundation attains a height here of 16 feet above its lowest level. When seen from Sukkur on the right bank or from the island of Bukkur in the middle of the Indus facing Rohri, the town presents a most striking and pleasing appearance, the houses being lofty, frequently four or five stories high with flat roofs surrounded with balustrades and standing boldly up to the river bank. But when the interior of the town is reached, the pleasing impression is somewhat dissipated, while the streets are in several parts very narrow and also very steep, and the air is in consequence close. The interest of the town lies mainly in its antiquities. Rohri and its neighbourhood was one of the earliest Stone Age sites in this part of the world, and many artifacts of the Stone Age have been unearthed in the locality. It seems that for a very long time mankind has made an abode near Rohri and it is very likely that the site has been occupied continuously since Stone Age days. In 1911 the census of Rohri was 11,286; in 1951 the population was 13,716, of which almost one half, 6,646, consisted of Muhajirs. Rohri.

There is a wide gap between Neolithic man and the Arab conquest of Sind, at the time of which there was almost certainly no town on the present site, which was not then on the course of any river. But when the Indus changed its course and made a passage for itself through the hills between the present Rohri and Sukkur, the two towns probably grew simultaneously on its right and left banks respectively under the protection of the fortress which soon occupied Bukkur. From a very early period Rohri acquired a sacred character, which was enhanced when the Sayids who had settled in Bukkur were removed by Shahbeg Arghun and compensated with land and privileges at Rohri. Its history as a sacred place can be gathered from a description of its principal shrines and relics. Seventy-three years ago, according to Thornton, there were forty mosques in which prayers were still recited, besides eighty in a ruinous condition.

The next most important of the sacred buildings is the Jama Masjid erected about 1583 by one Fateh Khan, an officer of the Emperor Akbar. It is a heavy three-domed structure of red brick ornamented with good, glazed tiles. The conspicuous Idgah for public prayers at the Id festivals with its three domes and connecting, curtain was built in 1593 A.D. Of the other mosques, one is striking on account of its size and the fort-like enclosure in which it stands. This is the Masjid of Mir Yakub Ali Shah situated

about a quarter of a mile from the town. It is almost in ruins but still has a quantity of glazed tiles adhering to it. It was built in A.D. 1677.

On one of the little hills that rise out of the river bank on the south there is a level platform on which are many carved gravestones like those of the Makli Hills at Thatta, with chain ornament and panels of Arabic quotations from the Holy Quran. The whole space between the graves is paved and a flight of steps leads up to the platform from the south side. Enamelled tiled work is freely used on these tombs, most of which are dated from 1018 to 1301 A.H., that is between 1609 and 1883 A.D. The principal grave is that of Mir Qasim one of the Sabzwari Sayids dated 1018 A.H. This was probably the grave that sanctified the place, and a lamp post and lamp are placed in front of it still, and it gives the name of Than Qasim Shah to the hill. But a name by which it is more generally known is the hill of the Seven Virgins, from the building on the south side called Satbain, which consists of a row of shallow rooms, connected by a long passage cut partly out of the rock and ornamented externally with coloured tiles. These cells are said to have been occupied by seven virgins, who had taken a vow never to look upon the face of man. Sir Richard Burton, however, maintains that this derivation is wrong, ignorant people having perverted Satyun-jo-Than or seat of the Satis (*i.e.* celibate women) into something which means seven.

Opposite Rohri is a small island of about half an acre, of which about half an acre remains above water. This has been enclosed with a wall and contains a shrine to which Sindhis come together in thousands from all parts of Sind in March and April. The central building with the silver doors, be it tomb, or cenotaph, contains a niche which is the seat of the saint and above which a slab of stone clumsily built into the wall bears a Persian inscription which has been partly translated thus :

“When this Court was raised, be it known, that the waters of Khizr surrounded it; Khizr wrote this in pleasing verse.”

The date is found from the last words, “Dargah-i-Ali,” meaning “the Court of the High One” and they give the date 341 which corresponds to A.D. 952. The Superintendent of the Archaeological Society does not believe that the slab originally belonged to the present building, which looks quite modern. But whether it did or not, the inscription on it, a cast of which has been examined at the British Museum, is undoubtedly ante-dated. Its style and characters can hardly belong to a much earlier date than the seventeenth century. To the south-west of the shrine is a ruined brick masjid with an inscription which gives the date 1011 (A.D. 1602). The best part of the whole congeries is the imposing gate-way of the enclosure which is decorated with tile work, some of it old and good.

The reverence for Khwaja Khizr or Zinda Pir, represents an old form of animistic worship, namely, that connected with the worship of rivers and water. This is a phenomenon which is found amongst early communities in many parts of the world.

The island fortress of Bukkur in mid-stream between Sukkur and Rohri is a link in the chain of limestone hills which here crosses the line of the Indus and extends south-ward for nearly 50 miles. It appears that at sometime about the middle of the eighth century the Indus, forsaking its old bed and leaving the ancient Hindu capital of Aror to desolation, cut a passage for itself through the range at this point, but the solid flinty mass at Bukkur resisted erosion, and standing out of the rushing waters it became at once a strategic point of the utmost importance to the rulers of the surrounding country. How soon Bukkur became an island, or for how long it stood out as a peninsula from the Sukkur shore is not known. But as the similarity of the two names implies the physical connection Bukkur and Sukkur must always have been very close. Even now the channel between the two is only 100 yards wide, and as late as 1903 it dried up for a short time in the cold season. Bukkur must have been fortified and garrisoned at a very early date. The Sheikh Abu Turab, the Arab whose tomb near Gujo in the Mirpur Sakro Taluka of Thatta district is said to bear the date 171 A.H. (787 A.D.), is reported to have distinguished himself by taking it. Abbott says that Bukkur played no part either in the invasion or in the occupation of Sind by the Arabs. Neither the Chachnama nor the Arabic authorities refer to it. It is not alluded to in the time of the Ghaznavi Sultans. From the early thirteenth century Bukkur is a familiar name. In the reign of Akbar it was the capital of a province of the same name. The Tarikh-i-Masumi speaks of the villages and towns of Bukkur. "When Bukkur springs upon us", says Abbott, "it had a reputation throughout the Sub-continent for being impregnable and for never having been conquered. There is no record of a successful attack on the fort under the governors appointed by the Ghazni, Ghor or Tughlaq Kings of Delhi. Shahbeg Arghun obtained it by a treaty after the capture of Thatta and in his time it witnessed many a siege. The Dharejas tried vainly to take it from the Sayids. In 1540 Sultan Muhammad Khan held it successfully against Humayun". But the most colourful incident in the history of Bukkur was during the course of the civil war between Aurangzeb and Dara Shikoh for the throne of the Emperor Shah Jahan. In the course of the war the fortress of Bukkur was held on behalf of Dara Shikoh, and the artillery during the siege was commanded by the Venetian adventurer Manucci, who has left a most vivid account of the course of the siege. Those who are interested in this picturesque and amazing interlude of history may consult Manucci's "Story of the Mughals" or "Shah Abdul Latif of Bhit" by Dr. H.T. Sorley, When Shahbeg Arghun decided to make Bukkur his capital

Bukkur.

he fortified it strongly and turned out the miscellaneous population who had settled in it. Among these were a number of Sayids who proceeded to settle on both banks of the river. From that time both Sukkur and Rohri began to rise in importance. Although the Sind region west of the Indus came under Nadir Shah, Bukkur and Sukkur were included and, no doubt, shared in the prosperity that accrued to Shikarpur from the Afghan connection in the trade through the Bolan Pass. The circumstances in which Sukkur came into the hands of the Talpurs are not clearly known. This event must have happened between 1809 and 1824, in which year the Talpurs secured Shikarpur. In 1839 British troops were sent to Sukkur. Mir Rustam of Khairpur entered into a treaty to assist the British army on its way through Sind to Afghanistan, having allowed it to be used as a base. In 1842 the town, together with Karachi, Thatta and Rohri, were made over to the British Government in perpetuity. Sukkur, Bukkur and Rohri constitute really one locality and here may be treated together. The word "Sukkur, is presumably "Sakhar" meaning favourable, and Bukkur may be, though this is not certain, formed on the common Sindhi analogy of reduplication, a feature of the Sindhi language, connecting words together in a sort of jingle. Thus Sukkur-Bukkur might easily have been used as indicative of the locality covered by both just as in the same way as a Sindhi talks of tappar-bappar and level-level.

Sukkur. There are three antiquities of Sukkur deserving of mention : the tomb of Adam Shah, the tomb of Khairuddin and the tower of Mir Masum.

The conspicuous white tomb of Adam Shah crowning a small hill to the west has no architectural attractions, but is historically interesting. Adam Shah was the first of the Kalhora who rose to fame. He had contrived to get a Zamindari in the parganah of Chanduka (Larkana), but afterwards went to Multan where he gathered a great host of disciples and became a power. He was a turbulent character and getting into conflict with the ruler, was killed and so became a martyr. His disciples brought his body to Sukkur and buried it where the tomb is. The hill has been taken possession of by the military authorities and is not open to the public.

The blue dome in Old Sukkur already mentioned is the tomb of Shah Khair-ud-Din of whose life and doings there is a manuscript account in the possession of the Kazi of Sukkur. He was born in the year 1492 A. D. and spent his youth in the study of religion at Baghdad. Afterwards he travelled and spent some time at Bulri in lower Sind, but finally he settled in Sukkur where he remained until his death. He became the

founder of a spiritual dynasty, and one of his successors on the throne built him a mausoleum in the year A. D. 1760. The manuscript says that it was decorated with coloured tiles on the outside and white and green ones inside; but from a report of the Superintendent of the Archaeological Survey it appears that much of the outside work at least was renovated less than forty years ago with tiles of very poor quality.

The most conspicuous object in Sukkur is the Minaret of Mir Masum. It was built by Mir Muhammad Masum, a famous Sayid, soldier and the author of the History of Sind, whom the Emperor Akber appointed Nawab of Sukkur giving him large jagirs in the surrounding country. The monument is an unshapely, more or less conical, tower built of red bricks slightly off the perpendicular and surmounted by a dome to which an internal staircase worn very smooth gives access. It is 84 feet in circumference at the base and about 100 feet high, so that a magnificent view of the surrounding country can be had from the top. It has been disfigured by an iron cage. An oblong stone over the door bears this inscription in Persian characters : "The Minar of Nami (this was the nom-de-plume assumed by Mir Masum) gives a view of the world." This spells 1002, which is equivalent to A.D. 1593, but the structure is said to have been completed fourteen years later by Mir Masum's son. Near the minaret are the tombs of the holy man and his father, family and disciples, under canopies resting on fantastic stone pillars covered with Persian writing and a domed octagon decorated internally with coloured tiles which Sir Richard Burton calls a place for prayer meetings.

There are several other buildings associated with the name of Mir Masum. A mosque and rest house on the bank of the river below the new reservoir which have been fitted with doors and windows and turned into a residence, bear an inscription saying that he built them as a place of prayer and rest for Muslims. In old Sukkur there is a Jama Masjid said to have been built by Sayid Mir Safai, Mir Masum's father. Among the many ruins that lie scattered about, there are some that would be interesting if we knew more about them. On the plain lying south-west of the Collector's bungalow there is a group of which the principal is called the tomb of Mir Abdul Baki Purani. In two of these there are still large blocks of tile work which according to the Superintendent of the Archaeological Survey differs entirely both in design and combination of tints from that which is seen on the Makli hills or elsewhere in former Sind.

In Vijnot, 5 miles south of Reti Station in the Ubauro Taluka, there is a mass of ruins standing in the barren plain which is known by the name of Vijnot. Mr. Henry Cousens has left the following account of his visit to these ruins : "On approach-

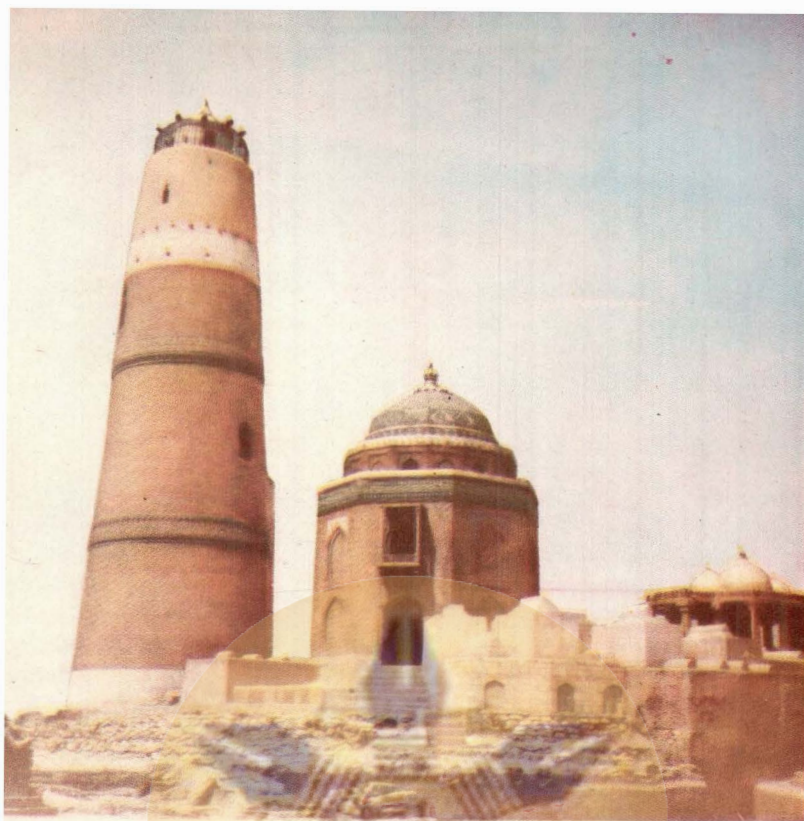
Vijnot.

ing the place one notices a great number of dark-coloured ridges and mounds rising to a height of from 16 to 20 feet above the flat ground at their base; and on reaching them, they are found to consist of heaps of broken bricks, both in small sharp-edged pieces, and in pulverised fragments, mixed with loose salt soil and a large amount of charred wood in extremely small pieces. It is the presence of this comminuted charcoal chiefly that gives the dark colour to the mounds of debris; but on examination a considerable portion of the brick fragments is seen to be composed of semi-vitrified brick of a dark colour. An entire brick, or a large piece of one, is not to be seen on the surface of any of the undisturbed mounds, the whole having been reduced to small sharp-edged irregular fragments, apparently by the action of the saltpetre present. Recent excavations were made to provide metal ballasting for the Indus Valley State Railway, but the old site has probably been a quarry for centuries for any one who wanted a few stones or burnt bricks in that part of the country. Bricks of the Vijnat pattern are to be seen on Muslim graves for many miles around and far into the desert to the south-east. The bricks in the foundations underground were in perfect preservation when first taken out, and measure usually 15 inches long, 10 inches wide, and $2\frac{1}{2}$ inches thick; but a few were found as large as 18"x12"x4". They are roughly moulded but well burnt generally and of a good deep red colour. The bricks seem to have been well laid and bonded in mud; and no lime was noticed unless in the form of whitewash on the walls and pillars when first unearthed.

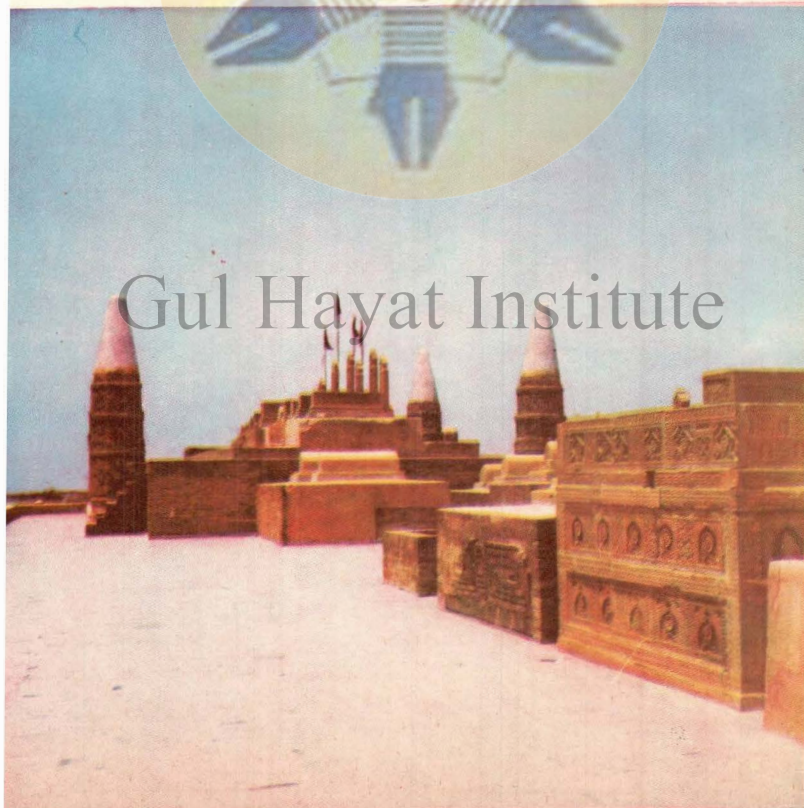
"The circuit of the mounds measures a mile and a half, the extreme length being over half a mile east and west, and the breadth from north to south nearly a quarter of a mile, beside a suburb of mounds at the south-west corner, now occupied by a Muslim grave-yard, and some outlying ruins at a short distance from the old city in various directions.

"Across the centre of the ruins runs a large open area of "square" from 200 to 300 yards long north and south, and about one-third as wide. The west side of the "square" is occupied by the principal mounds of debris, which were probably the houses of the chief persons of the place, and in their centre was the temple, the ruins of which have been excavated more completely than the rest; for not only was the temple more solidly built, but from the pieces of stone still lying about, it appears to have been faced with carved stones brought across the desert from Jesalmer.

"From the drawings of some of the stones accompanying the article, it is seen that the sculptures are of the same type, and no doubt of the same age, as the temple or temples whose material was used in the building of Ahmad Shah's mosque in the Bhadr at Ahmadabad (Samvat 1307, A.D. 1251). It was, therefore, of a comparatively late period compared with that of the older brick-work.



Tomb of Mir Masum at Sukkur.



Gul Hayat Institute

The tomb of Seven Sisters at Rohri.

“Amongst the objects picked up on the site were the following:—

Coins—principally copper, corroded beyond recognition measuring about half an inch in diameter and one-tenth of an inch in thickness (weights 30 to 40 grains) : these were the commonest, but there were others a little smaller weighing 17 to 22 grains. A few little rude silver coins were also found, about three-tenths of an inch in diameter and one-fourteenth of an inch thick weighing six to seven grains each. They are also very corroded, but have plainly had an impression on one or both sides: and what remains gives the idea of the human figure, or a couple rather than of a legend with symbols.

“Beads—round, flat and oval, mostly of carnelian, apparently one of the flat ones had a pattern marked on in white (enamel?). A very similar one was picked up at Sirwahi with the same pattern apparently, only rather more clearly marked and alike on both sides. Carnelian beads and ornaments of this description with almost identical markings in white have been taken out of the stone-circle graves in Central and Southern sub-continent. A few specimens of glass, green, blue, and white, were found, the latter iridescent and in a state of flaky decay; and some pieces of plain (glass?) bangle, like those worn to the present day.

“Many little fragments of copper or brass ornaments turned up, and amongst them a complete (though corroded) little anklet bell (ghangri), with a ram’s-head pattern on it.

“Besides the above many pieces of shells, and amongst them a few cowries, some marbles of stone sand of earthenware, and some burnt clay figures of animals, probably children’s toys.

“At a few feet or less below the surface, bones were found in the last stage of decay, and, here and there, well preserved pieces, with charred fragments in close proximity, a few of them undoubtedly human.

“The appearances generally were as if the town had been, destroyed by a tornado, or an earthquake ; and that the ruins composed principally of mud or sun-dried bricks mixed with masses of inflammable materials such as timber and thatch, had then caught fire. Or perhaps an unusually high flood may have overthrown the houses, and the fire may have occurred afterwards. The marks of a great conflagration are unmistakable over the entire site, whilst it is equally certain that some of the bones and thing found below the surface show no signs of having been burnt. The age and long occupation of Vijnot is attested by the height of the mounds of ruins and the extraordinary amount of saltpetre about them, whilst the surrounding country is comparatively free from it.

“Raverty says the correct name of the place is “Wanjhrut.” “It stood, in ancient times, before the Hakra or Wahindah ceased to flow, on the east side of that branch of the great river which passed Aror on the east. Its situation was in the do-abah or delta, between that branch and the main channel, about forty miles below the junction of the rivers. The changes in the river caused it to go to decay centuries since.”

Thatta.

Thatta, or Nagar Thatta, 24° 46° north latitude, 67° 59° east latitude, is 15 miles east of Karachi and 30 miles distant from Jungshahi Station on the Pakistan Western Railway, with which it is connected by a metalled road. The date of the foundation of Thatta is unknown, but it is certain that a town existed on the site for many centuries as long as the Makli hills stood at the apex of the Delta; and that condition ceased only a hundred and forty years ago by the silting up of the channel which is now the Kalri Canal. The situation was so obviously suited to a commercial town that it could never have been long unoccupied. Both the site and name of the town have probably changed many times and such changes can seldom be traced with exactness because the new one does not at once replace the old. Abbott's summing up of the available evidence seems fairly reliable. He says “To Thatta I would give a much earlier date than 1350, even than 1333, the date of Ibn-Batuta's visit to Sind. Badyuni says that the eldest son of the Emperor Ghiyasuddin, 1266-1286, conquered Thatta and Dumnala. Traditions that connect Thatta with Sultan Ala-Uddin are more numerous. The Tuhfat-ul-Kiram brings in this Sultan to wipe out the Sumras: the Tarikh-i-Masumi also brings him to Thatta; whilst today there remain as an object of worship at Thatta the reputed tombs of royal Sumra dames who committed suicide rather than fall into his hands. But what is greater than all these is the testimony of the Tarikh-i-Feroz Shahi of Shamsi Shiraj describing the defeat of the Jams at Thatta in 1362 by Sultan Feroz Shah. He writes thus: “Thatta had been a source of trouble to the sovereigns at Delhi ever since the days of Sultan Muizuddin. The splendid army of Sultan Ala-Uddin had marched towards Thatta, but the difficulty of the enterprise had rendered the attempt abortive. Sultan Muhammad Tughlak lost his life in the same country. “Here then,” says Abbott, “is the evidence that in the reign of Feroz Shah Thatta traditionally had a history that took it back to the time of Sultan Ala-Uddin (1296-1315), if not to the days of Debal, A.D. 1182, and this evidence with that of Badayuni is the earliest reference to Thatta.” Whatever the exact date of the founding of Thatta, it is certain that for more than four hundred years it was the most important and the wealthiest town in former Sind. It began to decline in the middle of the eighteenth century for two reasons: first, the approach to Thatta from the sea became progressively more difficult with the silting up of Indus

channels and the industrial revolution in Britain, which towards the end of the eighteenth century began flooding the Eastern markets with cotton goods from Lancashire. This seriously undermined the strength of a textile industry which had been a great source of profit in the sixteenth and seventeenth centuries. When manufactured cotton goods began to replace the handwoven textiles produced in Sind and marketed through great commercial organisations in Thatta, the prosperity of the city was doomed. The Sammo Kings, who came into power in the middle of the fourteenth century, called their capital Samui, but it was only 3 miles North of the present site of Thatta, to which the population may have transferred itself gradually until Jam Nizamuddin by some official recognition of the new settlement gained the credit of having founded the city of Thatta about the end of the fifteenth century. The city has moved a good deal in much more recent times, creeping after the retreating river by a process of growth on the east and decay on the west. It has also been Sacked or burned three times—first by Shah Beg Arghun in 1521, then by a Portuguese force in 1555, and lastly by its own ruler, Mirza Jani Beg, when he was resisting Akbar's forces in 1591. Nevertheless, it continued to be the capital of south Sind until the building of Hyderabad in 1768 and rose to great splendour. Father Manrique, who sailed down the Indus from Lahore to Thatta in 1641, has left a description of what he calls. "The Metropolitan City of the Kingdom of Sind". His description leaves no doubt in the mind of the reader that the place was then of great importance and a hive of commerce and business.

Captain Alexander Hamilton who saw it in 1699, thus writes of it, "Thatta is the emporium of the Province a very large and rich city. It is three miles long and one and half broad, and is about 40 miles from Larry bunder (Lahori and has a large citadel at its west and capable to lodge 50,000 men and horse, and has barracks and stables convenient for them and with a place built in it the for the Nabob. Thatta stands about two miles from the river Indus, in a spacious plain, and they have canals out from the river to bring water to the city, and some for the use of their gardens, the King's gardens were in a pretty condition in Anno Domini 1699 and were well stored with excellent fruits and flowers particularly the most delicious pomegranate that ever I tasted." Again he says: "The city of Thatta is famous for learning in theology, philosophy and politics, and they have 400 colleges for training up youths in those parts of learning". Thatta had at one time a lucrative trade with the Portuguese and from the following passage it seems that their missionaries must have got a footing there and lost it: "The Portuguese had formerly a Church at the east end of the city. The houses is still entire and in the vestry are some old pictures

of saints and some holy vestments, which they desired to sell, but I was no merchant for such bargains." There had been a drought for the previous three years which, "Caused a severe plague to affect the town and circumjacent country to such a degree that in the city only, 80,000 died of it, that manufactured cotton and silk and above one-half of the city was deserted and left empty." This was the time when Surat and all Gujarat suffered so severely from the plague.

After the rise of the Kalhora, the decay of Thatta was very rapid. Henry Pottinger, who passed through it in 1809, writes: "We rode a long way after we got among ruins before we came to the habitable part of the city". In 1831, Alexander Burnes described it thus, "It does not contain a population of 15,000 souls and of the houses scattered about its ruins, one-half are destitute of inhabitants. Of the weavers of 'loongees' for which this place was a famous 125 families only remain. There are not forty merchants in the city".

The decay of Thatta in the first half of the nineteenth century has been described by R.H. Kennedy in his narrative of "The Campaign of the Army of the Indus and Sind to Kabul in 1838-39". Of Thatta he writes "the manufactures of Thatta are languidly carried on by the few survivors of its population. Lungis or waistcloths of a mixture of silk and cotton probably 'Zonae' of the list of imports in the Periplus still continue to the admiration of the wealthy Asiatics. One relic of the ancient taste in mechanical skill of Thatta exists in the mosaic in-laid work of what are called the "Bombay boxes". The original workmen were driven by the reckless despotism of the Talpur family and their Baluch retainers to emigrate from Sind and found shelter and employment in Bombay. According to the 1911 Census the population of Thatta amounted to 11,116. In the 1951 Census the population of Thatta only 9,716. It has not attracted many Muhajirs after partition because of the greater attractiveness for town dwellers of Hyderabad and Karachi which most of the artisan refugees made their goal. It is quite possible that with the increase of irrigation when the Kotri Barrage reaches its full scope, Thatta may revive. But at present there are few signs that any rapid improvement will take place. The town consists today of narrow streets; houses of two or three storeys constructed of wattle and mud-plaster. Stone has never been used in domestic architecture in this town.

Thatta is distinguished among the towns of Sind for its unhealthiness. The lowlands all round are submerged during the inundation, after which malaria rages in the town.

There are still a good many Banias in Thatta engaged in trade and its ancient industry, the manufacture of silk lungis, is carried on still upon a small scale. The most influential section of the

community by far is the Sayids who have settled here for centuries. The historian of Sind, Ali Sher Kani, the author of the "Tuhfat-al-Kiram", was a citizen of Thatta and lived in the middle of the eighteenth century. The only monuments which survive of the former glory of Thatta are the tombs on the Makli hills and the Jama Masjid and Dabgar Masjid in the town. The latter will be conveniently described with the former as they belong to the same time and style.

The Makli hills are geologically a very interesting outcrop in a flat alluvial plain, of the great bed of tertiary rocks which have been distinguished as the Ranikot Group, consisting of nummulitic limestone. The range, which starts from Pir Patho, runs north for about 11 miles, ending due west of Thatta and scarcely a mile distant from it. Seen from the west it scarcely seems to deserve the name of a hill, but from Thatta its aspect is more abrupt. The actual height is from 80 to 150 feet above sea level. The top is a plateau studded with the formal and forbidding "cactus" so called (*Euphorbia nereifolia*) and strewn thick with pebbles and nodular lumps of hard, yellow limestone, which are sometimes quite speckled with little nummulites. These get detached and lie on the ground in such quantities that has become a trade to collect, drill and string them for sale to pilgrims on the way to Hinglaj in former Baluchistan. They are called thumbra. But far more interesting than its geological features is the great necropolis which occupies the northern half of the Makli hill. The population of this city of the dead has been estimated at one million. It is impossible to say when the Makli hill first began to be a cemetery. It was evidently invested from a very early time with vague sacredness, which accumulated as one Sayid after another found a resting place in it. The Samma Jams had their capital, Samui, just below the north end of the hill and, according to one popular tradition, Jam Tamachi and the fisherman's daughter whom he made his queen are laid in two old tombs at that end of it. With Jam Nindo, or Nizam-ud-din, we come to history. There is no doubt about the identity of this tomb, built in 1508 A.D. It is entirely of sculptured stone and designs are distinctly Hindu in their character. The Arghuns, who expelled Jam Nindo's son, lived at Sukkur and were interred at Mecca, but under the Tarkhans, who followed them, Thatta again became the capital of lower Sind and then an era of architectural magnificence set in. The mausoleum of Mirza Isa, the first Tarkhan ruler, is built entirely of stone, but in that of his son, Muhammad Baki and all the subsequent tombs of any distinction, the principal materials are glazed bricks or encaustic tiles. Of this work Mr. H. Cousens, Superintendent, Archaeological Survey, Bombay, says: "The built

Tombs on
the Makli
hills.

dings of the latter class are almost entirely built of bricks masonry, the brickwork being very superior, being made of the best pottery earth, perfectly formed, dense and having clean, sharp-cut edges. Some are unglazed, a plain dark red, while others have their outer surface enamelled in dark and light blue and white. The joints between them are exceedingly fine, but an imitation joint is formed on one side of each brick by a five-eighth inch strip along its edge being sunk and enamelled white. Most of the brick buildings have been built of these bricks with the various coloured faces so disposed as to form patterns, every brick being burnt for its own position. When used in the inner lining of domes they have been worked in zigzag patterns, in radiating divisions and flutings from apex to springing line, and look remarkably well, though quaint. But the finest features in these buildings is the beautiful glazed tilework in the shape of panels and dados. The lovely soft blending of the colours has run slightly in the firing, thus blurring the edges of the pattern, and the result of this accident is to give the work a softness and waxy, translucent look which is its chief charm. To my thinking the effect is superior to that of European tiles with their harder and sharper lines. A single pattern will often run over several square yards of surface, each tile consequently being different from its neighbour, instead of a single small pattern from tile to tile. The pigments chiefly used are three, viz., a rich, dark blue, a turquoise or light greenish blue, and white. The first two are very transparent colours and thus acquire great depth and richness. Now and again at Thatta is found a yellow, but very rarely in the old work. Its place is taken by a buff, unglazed tile or stone, being the same colour right through, and which, being a softer and subdued tint, harmonizes better with its surroundings."

In recent years steps have been taken to keep the tombs in repair, and all those detailed below, and also the Jama Masjid, Dabgar Masjid and Kalan Kot have been declared protected monuments under the Ancient Monuments Act, 1904. The principal tombs are:—

1. *Tomb of Mirza Jani Beg and Mirza Ghazi Beg*:—Jani Beg was the last independent Tarkhan ruler of Thatta. He resisted manfully, but unsuccessfully, the general whom the Emperor Akber sent to take possession of Sind. Making his submission afterwards, he was reinstated as governor of Thatta. He died in 1599. His son Ghazi Beg succeeded him in his office and was also appointed governor of the province of Qandhar. He was murdered in 1611-12 A.D. and the remains of both father and son were interred in this tomb in 1613. It stands in a courtyard, on a high plinth, and is itself octagonal, with a domed roof. The plinth is of stone, but the superstructure is of glazed blue bricks in lines alternating with unglazed brown ones. This striped pattern is quaint and occurs

nowhere else. The stonework exhibits some beautiful carving and inscriptions. There are three tombs inside—two of marble and one of stone. This is the first of the imposing edifices which crown the slope near to the district bungalow.

2. *Tomb of Nawab Mirza Isa Tarkhan.*—This nobleman, who must not be confounded with his namesake the first Tarkhan ruler of Thatta, was appointed governor of south Sind by the Emperor Jehangir in 1627 A.D. and began to build his tomb, it is said, in the same year. It was finished in 1644. He had been deputed in the meantime on military service to Karnal, whence he is said to have sent the stone for the tomb; but according to another account it came from Junagad. The mausoleum as a whole is the most imposing one on the hill. It stands in the middle of an ample courtyard and is itself 70 feet square. In the centre is the great apartment, containing eleven graves, which rises through the full height of the building to the dome. This is surrounded on all four sides by pillar edverandahs in two storeys. The whole is built of buff-coloured stone elaborately and exquisitely carved. The tombs within are literally covered with carving, which consists largely of texts from the Holy Quran in Arabic or Persian characters. Their ends are plain save for the names and dates inscribed on them. Outside, with an enclosure of their own, are the graves of the ladies of the family, distinguishable, as usual, by their flat tops, but as elaborately sculptured as those of the men. The dome is quite plain on the outside and white. This tomb stands north of the one last described.

To the east of this tomb and in front of it is an enclosure in the same style, with a magnificently carved mihrab, which is said to contain the remains of the zenana of Nawab Isa Khan; but one of the graves in bears the date 964 *i.e.* 1557 A.D., which would be about ninety years before the death of the Nawab. The history of this enclosure is uncertain.

3. *Tomb of Mirza Tughral Beg.*—This is between the last two. Not much is known of Tughral Beg, except that Kalan Kot at one time had the name of Tughralabad, from which we may conjecture that he was a commander of some reputation. His tomb is in rather a ruined condition, but is now preserved from further damage. It is almost entirely of stone. The dome, of canopy, is supported by twelve sculptured stone pillars.

4. *Tomb of Diwan Shruja Khan.*—This offers a contrast to the last two white-domed tombs, for its dome is faced on the outside with the finest red bricks, varied with lines of blue-green enamel. Probably the whole was originally enamelled. The whole of the structure is of the same work, except the foundation and plinth. It stands on a platform in a large courtyard. The Diwan, who

was an Arghun, held the post of minister to one of the governors of Thatta appointed from Dehli. His tomb is said to have been built in 1638 A.D., during his lifetime.

5. *Tomb of Nawab Amir Khalil Khan.*—This is said to have been built at some time between 1572 and 1585 A.D. The Amir, of whom little else is known, had such a tender conscience that he left directions that his body should not be buried inside the mausoleum, which was reserved for seven holy men. Their sanctity has unfortunately not preserved it from utter ruin, for it bears a striking and unique inscription in white Arabic letters upon a broad band of large, deep blue tiles. Time has dealt more gently with the humble tomb of sculpture stone in the courtyard in which the body of the Amir is laid.

6. *Tomb of Mirza Isa Tarkhan.* This Mirza was the first Tarkhan ruler of lower Sind and his tomb is said to have been built in 1573 A.D. It stands, with several smaller tombs, in a large square courtyard, within which there are two minor courtyards. All are of stone, sculptured, inscribed and in some places perforated.

7. *Tomb of Jam Nizam-uddin.*—This is the oldest of the tombs on the hill which have any clear historical interest, having been built in 1508 A.D. Jam Nizam-ud-din was the last but one of the Samma Jams and an autochthonous ruler, unlike the Mughals and Sayids who afterwards covered the hill with their memorials. His tomb is a square building, without roof, built entirely of stone. Two contiguous stones in the wall are sometimes of different breadths and contain dissimilar patterns. A staircase through the side wall leads to a narrow balcony and portico. An adjacent tomb, evidently of more recent date, is decorated internally with glazed tiles.

6. To the north of the last and on the other side of a valley is the large and conspicuous tomb of Sayid Ali Shirazi, built of brick, with a large and two small fluted domes, all plastered and white-washed. There are inscriptions on some of the tombs within the enclosure, but none on the Sayid's. This venerated man was chosen to carry the offerings of the people of Thatta to the Emperor Humayun at Umarkot. He died in A.D. 1572 and his tomb is said to have been built by disciples of the Jokhia tribe.

MASJIDS.

Jama Masjid.—This truly magnificent mosque, which is still in use, is in the town of Thatta. It was, according to the local histories, a gift from the Emperor Shah Jehan in recognition of the hospitality of the town, in which he sought refuge for some time when in rebellion against his father. It was begun in 1644 and

finished in 1647, but the floor was not laid till eleven years after. It is said to have cost 9 lakhs of rupees. It is built in the form of a caravanserai, a great court enclosed by a corridor of ninety domed compartments, exclusive of the masjid proper in the middle of one side and its counterpart opposite. It measures 315 by 190 feet and covers 6,316 square yards of ground. The exterior is quite plain and white-washed, but the whole interior, from the ground level to the centre of the highest dome, is covered with the most amazing variety of beautiful patterns worked out in coloured tiles. Many of the small domes along the sides are not so covered now, but probably were originally; for the whole edifice was in terrible disrepair when, under Sir Bartle Frere in 1855, it was saved by subscription, Government contributing Rs. 5,000. In 1894 again a sum of Rs. 20,500 was raised by the same means and spent in repairing the denuded faces of the walls with tiles made in Hala and Multan. These do not harmonize well with the old, but happily it was the dado chiefly that needed repair, where the patterns are comparatively simple. Higher up the designs are not printed on square or hexagonal tiles, as they are in the tombs on the Makli hill, but worked out in mosaic with minute tiles of different colours and shapes.*

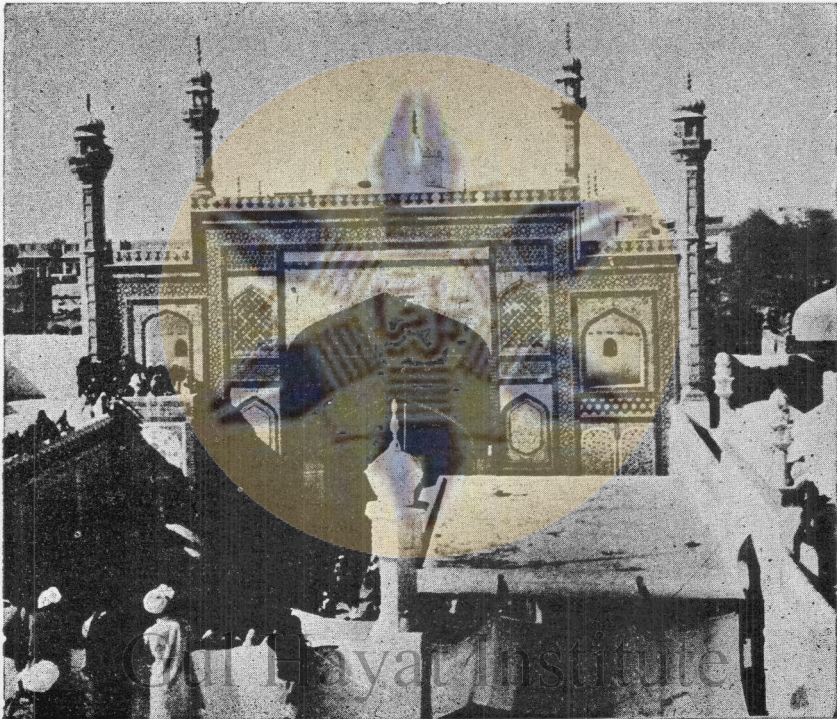
Dabgir Masjid.—This was probably in the heart of the town once, but lies quite outside of it now. It is a hopeless ruin, the dome having fallen in and much of the facing of enamelled tiles wholly disappeared, but what remains is so beautiful that measures have been taken to preserve it as far as possible from further destruction. The mihrab is so exquisitely sculptured that it is difficult for the visitor to realize that he is not looking at carved sandal wood but at stone. Yet the building is more than three hundred years old, having been built by Amir Khusro Khan, who got into trouble by his handling of public moneys when he was governor of Thatta under Mirza Isa Tarkhan.

Samui, the capital of the Sama Jama before they moved to Thatta, lies three miles north-west of the latter, on high ground. Of it the report of the Archaeological Survey says that "it is now represented by a small hamlet of a few houses clustered upon a mound, with the indispensable, Pir's tomb. There is very little of antiquity to be seen above ground save the indications of the foundation of a plain brick mosque upon a low knoll upon one side of the village."

Samui

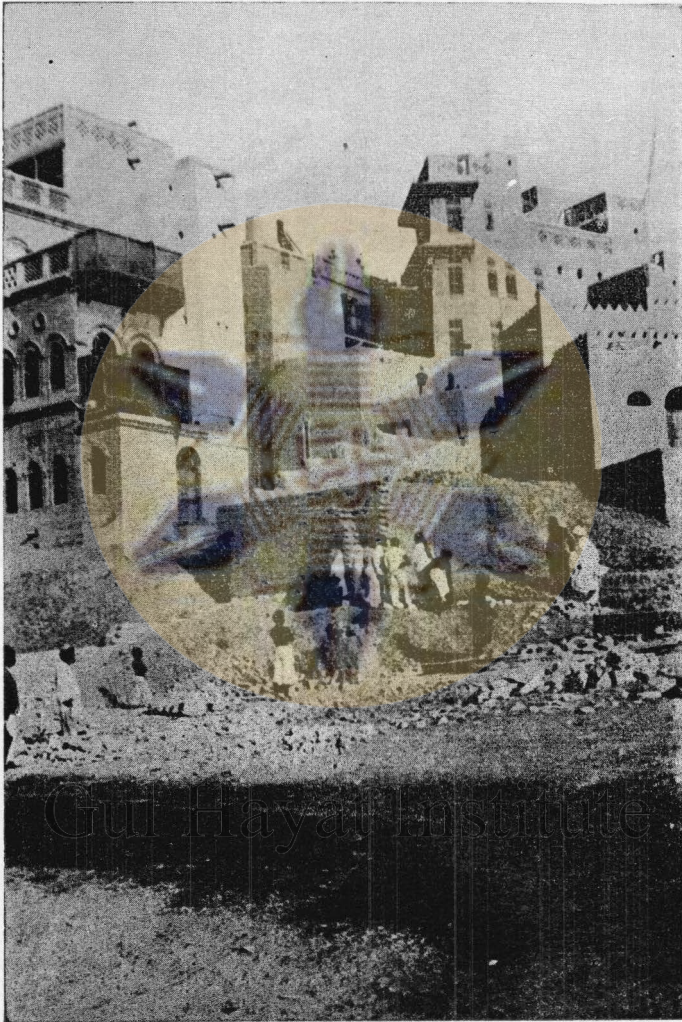
*Since the establishment of Pakistan, years careful labour have gone into restoration work being carried out by the Government in order of revive some of the original splendour of this mosque Editors.

PLACES OF INTEREST



Shrine of Lal Shahbaz Qalandar at Sehwan

PLACES OF INTEREST



Rohri-Shoring House architecture

CHAPTER XI
LAND REVENUE

Gul Hayat Institute



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CHAPTER XI

The valley of the Indus has always been an agricultural area. Land Revenue System. Geography has determined this, although in the exigencies of the present, day, states do not regard themselves as firmly based unless they possess a sound backing of industrial production. In the case of Sind and Khairpur region, it is difficult to see how the fundamental character of the economy of the Sind Valley can be greatly altered by encouragement of industrial undertaking in an area singularly devoid, apart from cotton, of the kind of materials which modern industry requires. The importance which agriculture and the land revenue derived from it, holds in the Sind economy can be seen from the statistics provided in the Census of 1951. The 1951 Census divides the population into the civilian labour force and those not in the civilian labour force. Statement 11-A- of the Census shows the proportion which the agricultural civilian labour force bore to the non-agricultural civilian labour force and also its relation to the population not in the civilian labour force and the number of dependents in the population. The table which is given here shows the main features of this distribution.

CENSUS TABLE-11—LABOUR FORCE.

The total population according to Economic Status.

					Number of persons
Region.	Total	Self-Supporting			Depen- dents.
		Civilian Labour Force		Not in Civilian Labour Force	
		Agricul- tural	Non- Agricul- tural		
	All	Persons			
Former Sind and Khair- pur Districts.	49,25,342 .. 46,05,934	11,86,247 11,06,047	4,57,912 4,35,926	31,926 29,792	32,49,227 30,34,169
Former Khairpur State.	3,19,408	80,200	22,016	2,134	2,15,058

The predominance of agricultural occupations in the economy of former Sind is further displayed in the statement below which breaks up into percentages the proportionate sections of the population engaged in the civilian labour force in agricultural and non-agricultural occupations and shows also the proportions of the other self-supporting persons in the civilian labour force and the total number of dependents.

CENSUS TABLE 11-A—LABOUR FORCE

Percentage of total population according to Economic Status.

Number of Persons

Region	Total Population (1000's)	Male	Percentage.			
			Labour Force.		Other Self-supporting	Dependents.
			Agricultural	Non-agricultural		
Former Sind and Khairpur Districts.	49,25	55.0	23.6	9.1	0.6	21.7
	46,06	54.9	23.4	9.3	0.6	21.6
Former Khairpur State.	3,19	55.5	25.0	6.9	0.6	23.0

The Census Report has also compiled statistics showing the agricultural labour force according to their status and cultivators by land tenure. The figures given exclude children under twelve years of age and this table omits the number of females.

CENSUS TABLE 14—AGRICULTURAL LABOUR FORCE AND CULTIVATORS LAND TENURE.

The Agricultural Labour Force according to their Status and Cultivators by land tenure.

Number of Persons

Region	Total Agricultural Labour Force.	Cultivators owning or renting Land.			Landless Agricultural Force	Herds-men etc.
		Total	Renting all Land tilled	Renting and also working for hire.		
Former Sind and Khairpur Districts.	11,86,247	11,16,765	8,33,569	13,540	30,940	33,268
	11,06,047	10,39,795	7,92,727	12,926	30,031	31,227
Former Khairpur State.	80,200	76,970	40,842	614	909	2,041

The importance of agriculture is plainly evident from these figures.

The chief single source of government revenue obtained by direct taxation of the population in Sind and Khairpur region is derived from land revenue. The following figures show the proportion which revenue from land cultivation occupies in the financial resources of the Sind and Khairpur region.

The total land revenue for the years 1950/51 to 1954/55 inclusive is shown in the table which follows:

Total Land Revenue (in lakhs of rupees).

	1950-51	1951-52	1952-53	1953-54	1954-55
Former Sind ..	150.94	267.82	274.82	254.25	203.29
Khairpur ..	58.36	74.41	72.00	61.59	63.98

The proportion of land revenue to other revenue heads during these years was for Sind region.

	1950-51	1951-52	1952-53	1953-54	1954-55
Former Sind ..	18.1	27.5	28.1	24.7	20.9
Khairpur ..	..	..	..	..	..

The revenue system from which this vast portion of government income is obtained, and under which so many members of the population derive their livelihood, is an inheritance from the past. The Kalhoru and Talpur system continued the Mughal system of land revenue. This was itself taken from the practice of the Hindu kings, under which the land of a country belonged to the ruler, who was entitled to the revenue thereof, and charged a certain proportion of the yield of the land for the right of cultivation by his subjects. Under this system the state was in effect the owner of the soil and the cultivators and land holders were tenants at the will of the state. During feudal times the state rewarded loyal followers with especial grants and concessions in respect of the holding of land.

Napier, on the annexation of Sind, favoured the cultivating tenants as against the large landholder, but he continued the holding of landed concessions called jagirs to those landholders who submitted to the new British rule. Napier divided the country for administrative purposes of land revenue into three districts. This was exclusive of Khairpur state, whose independent existence he recognised. In course of time, however, the need for more district charges grew as work increased and as cultivation spread with improvement in irrigation. The officials through whom the administration of the land revenue system is worked consist of the Collector who is in charge of a district, the Deputy Collector, who is in charge of a sub-division of the district, the Mukhtiarkar, who is in charge of the taluka, the Tapedar, who is in charge of a number of revenue units called dehs which are consolidated into a tapo. The Tapedar is subject to the supervision of an official called the Supervising Tapedar whose charge runs to several tapos. In most districts the number of Sub-Divisional Officers is from two to three, and the number of Mukhtiarkars six to seven.

The 1874 Gazetteer gives an account of the revenue administration, which is still accurate for today. The chief revenue and magisterial charge is vested in the Collector and in the sub-division in the Deputy Collector, or Assistant Collector, who as a Magistrate also has full powers in criminal matters. Under the Deputy Collector, or Sub-Divisional Officer, are the Mukhtiarkars who besides having each the revenue charge of a taluka, are also subordinate magistrates of either first or second class. The establishment of each of these Taluka Officers consists on an average of six Munshis and seven peons, the Head Munshi being usually vested with the powers of a subordinate magistrate, so as to enable him to take up criminal cases when the Mukhtiarkar is on tour in his district. Each taluka is divided into a number of tapos, each of which is placed under the charge of a Tapedar whose duties though confined mostly to getting in the revenue, are very onerous. Each Tapedar again is assisted in his duties by one or more kotars or peons. The Tapedar's duties are to keep a record of the land under irrigation, to measure up the area of all cultivated land, with certain exceptions, and to collect the land revenue of his tapo. His work is subject to test by both the Mukhtiarkar and the Sub-Divisional Officer. The Mukhtiarkar is responsible for the due collection for the Land and Sair revenues of his taluka and all matters in any way connected with revenue come under his cognisance. The system works well and provides an arrangement of check and counter-check, the Tapedar's work being seen by the Supervising Tapedar and the Mukhtiarkar checking the work of the Supervising Tapedar and Tapedar. The Mukhtiarkar's work itself is under the supervision of the Deputy Collector, who himself is supervised by the Collector. All these officers are touring officers and move from place to place during the course of the year. The work of the Collector is in its turn subject to the supervision of the Commissioner, who every year has a programme for the inspection of Collector's offices and a certain number of Sub-Divisional offices as well. The revenue collection called Wasuli is made at certain times of the year in instalments and the revenue accounts are closed once a year in the system known as Jamabandi. The Record of Rights maintains a list of cultivated and uncultivated land in the taluka and states the rights which exist in respect of it on behalf of the holders whose names appear in the record. The Commissioner has from time to time issued a number of special circulars dealing with land revenue administration. These circulars deal with the collection of revenue and prescribe the powers of officials and their duties and the relations with the landholding and the land cultivating classes in respect of the many types of interest which are linked up with the holding and the cultivation of land. The Land Revenue Code and its rules is the master piece of legislation concerning land revenue and its collection. But the introduction of the Barrage has led to a modification of the provisions of the Land Revenue Code and Rules with special reference to the conditions prevailing in Barrage irrigated lands. This point will be developed a little later in this chapter.

Under the Talpur rulers the land revenue was generally taken in kind by means of a division of the produce known as *batai* (*i.e.* division). The state demand varied with the nature of the irrigation employed. For crops grown on land irrigated artificially the prevailing rate was from one-fourth to one-third of the gross produce while for crops raised on land naturally flooded the customary demand amounted to two-fifths or one-half. But the rates varied much, local usage being everywhere respected. An additional cess, generally of one-fifteenth, was levied, also in kind, to defray the cost of the establishment employed by the state, and a number of petty fees was exacted to provide perquisites to the officials or subsistence to their menials. These additional charges constituted a heavy tax upon agriculture. Cash rents were taken on certain crops (called *mahsuli*, *i.e.* taxed crops) such as sugarcane, cotton, tobacco and vegetables, which, not being gathered in one operation, do not readily admit of partition. Upon these rents also additional charges, amounting on an average to 9 per cent., were levied for the same purposes as were the cesses and fees exacted from the payers of rent in kind. On corn land sometimes, especially in Chanduka, there was another system of payment in kind known as *kasagi*, the Government demand being fixed at 7 *kasas* per *kharar* on the computed produce of the field, which works out theoretically to about one-fourth. The rate was very high, but remission could be claimed if the crop was bad. By yet another system, known as *Rakab-ira*, the cultivator could commute his grain rent for a payment in cash calculated on the value of the estimated crop at the current price of grain in the nearest large towns.

But the revenue was frequently farmed under the *Mirs*. Upon payment of an advance the farmer was allowed to take full possession of the tract farmed and to oust the regular officers of the Government, whose places he filled with his own men. The system provided little check upon oppression beyond the farmer's self-interest, and even this restraint ceased to operate when the farm was taken for a short period. The exactions of the farmer sometimes compelled the landholders to come forward in self-defence and offer a larger sum for the right of collecting the revenue, and, no matter at what stage it might be made, a higher bid generally secured the displacement of the farmer by the new comer.

Upon the introduction of British rule the system was not immediately changed, though the state demand was limited to one-third of the produce, and this share seems only to have been taken on lands irrigated without the aid of machinery. The proportion of the crop taken on lands to which water was required to be lifted was one-fourth. Money rents were fixed at Rs. 1—8—0

Rs. 1—50) per bigah* equivalent to a rate of Rs. 2-10-0 per (now Rs. 1—62) acre in Lower Sind region and at Rs. 2-8-0 (now Rs. 2—50) per bigah in Upper Sind region. The old fees (and cesses were at the same time abolished and a uniform charge of 4 kasas in the kharar† equal to one-fifteenth of the produce or in the case of cash assessments of 6 per cent. on the rent, was substituted to defray the cost of the collecting establishment. A water-rater 3 kasas in the kharar, or one-twentieth of the produce, was also levied.

On its annexation by the British, Sind was attached administratively to the Presidency of Bombay. This attachment, however, meant little during the governorship of Napier, whose attention was directed more to military than to non-military affairs. When, however, Napier departed in 1847 the attachment to the Presidency of Bombay became real, and Mr. Pringle, who succeeded Napier, was an administrator trained and experienced in the revenue system of the Bombay Presidency. Naturally he considered that the system as it prevailed in former Sind at the time was lacking in efficiency and thoroughness. When in April 1848 Sir George Clerk, the Governor of Bombay, visited Sind region he took a poor view of the state of the revenue system, and remarked "Having seen then how imperfect and indeed how utterly worthless are all the checks which we possess under the present system, be it of minute division of grain or of money commutation, I regret that, on our acquisition of the country we did not avail ourselves of the existence of zamindars, muccadums heads of tribes and other village communities to relieve ourselves from details so complicated that we could not possibly enter on them with any hope of success". What followed was easily intelligible. For the next twenty years attempts were made to adapt and model the Sind region revenue system upon that prevailing in the Bombay Presidency, where conditions were utterly dissimilar. The 1907 edition of the Gazetteer has given a full account of the various attempts made to apply the Bombay land revenue system to the conditions prevailing in former Sind. It is unnecessary to describe these attempts now in detail; but it is sufficient to outline the process of assimilation which was followed up to the time when an irrigational settlement suitable to Sind conditions was finally adopted.

*The Napierian bigah contained 2,500 square yards, or 80 square yards more than half an acre.

†The kharar is a grain measure containing 60 kasas. Its contents are approximately equivalent to 3 quarters English measure and, on an average of the five staples, wheat, rice (unhusked), juari, bajri and jamba to a weight of 28 Indian maunds of 82 lbs. each.

The first step was what is called the First Settlement, admittedly introduced when administration was in a rather chaotic state. Baden-Powell in his Land Systems of British India remarks : "Upon the introduction of civil administration, in 1847, a seven year's settlement was made by measurement of crops and commutation of Government's share at assumed prices on raiyati lands and by leasing out the zamindari estates at lump-rents. Prices' subsequently fell, the assessments proved heavy, and the settlement expired in 1853-54 amidst general demands for reversion to the old native system of dividing the crop and taking revenue in kind. There were no village maps, nor even any taluka lists of villages, boundaries were undefined, and land-registers were unknown, all; existing information being exhibited under the name of the person by whom, not of the place for which, revenue was to be paid. It was therefore determined to institute a 'rough survey and settlement,' as a preliminary to a complete revenue-survey and settlement at some future time. Settlement Officers were to demarcate village-boundaries for the Topographical Survey then at work in former Sind, and were then to measure the fields, fill in the village-maps, classify the soils, and make the settlement.

"This 'rough survey and settlement' went on till 1862. By that time about one-third of the former province had been surveyed for settlement purposes, but no settlements had been made, the Settlement Officers having been fully occupied in demarcating boundaries for the Topographical Society, afterwards making their own interior survey of the villages. In the absence of precise rules, the system followed had more or less modelled itself upon the Deccan revenue survey, and the assimilation was now made complete by the deputation, in 1862, of a Bombay Settlement Officer to draw up a scheme of classification (of soils) and settlement. The rules then framed still form the basis of settlement operations in Sind region though in practice they have been subjected to great and material modification as regards details, so that the present form of settlement differs largely from that adopted about 1864-65, the failure of which became more and more evident eight or ten years later.

"The classification rules of 1862 divided the land into four orders, differing from each other in the proportion of sand, and these again are liable to be degraded by 'faults', for example, the presence of salt, a sandy substratum, or uneven surface. In making a settlement, water supply was classed under one of three heads, namely, flow (mok), lift (charkhi), or flood (sailabi), and then further classified according to the sufficiency and constancy of the flow, the expense incurred in bringing the water by the lift to the field, and the certainty and duration of the flooding.

"In the first, or 'original', settlement, the land was divided into rather large survey numbers ; it was estimated what portion of the number could be cultivated annually, and the whole number

was assessed on that basis only. This was what is known as the 'diffused rate' system. But the cultivators took an unintended advantage of it. They ploughed up the whole land in one year in a hasty and imperfect manner, and then, as the soil was exhausted 'relinquished' the entire number and took up new land. The Settlement was also marked by the difficulty already indicated about zamindars' waste. It was at first proposed to include all waste that fairly belonged to the zamindari in the survey ; but then the Zamindars as registered occupants would be liable to pay the whole assessment ; and this they were unable to do. It was on the failure of this system that a new system came into force. This allowed assessment to be paid on cultivated lands only, but a lien to be retained on fields that were by custom left fallow"

This constituted the Revision Settlement. It was based 'on a more minute survey making the numbers' of a much smaller size. Each is regularly assessed ; but the holder of land can register himself as occupant of as many numbers as are comprised in his holding, and can, under certain rules, allow some of the fields to lie fallow, retaining his lien on them (without payment) during the period allowed. If he chooses to cultivate, he pays full assessment.

But the abolition of the diffused assessments destroyed an automatic check against an individual holding more land than he was able to cultivate. To remedy this defect a rule was introduced requiring the payment of assessment on unoccupied land which had been allowed to lie fallow for more than a reasonable time. The scale adopted ranged from one fallow in four years for rice to three fallows in four years for lift lands.

The revision of the survey was necessarily a slow process and several years frequently elapsed after the expiry of the Diffused Settlement in a taluka before the new one could be introduced. In the interval a temporary and experimental settlement was adopted which was called the "Irrigation Settlement" because, the survey and classification of soil not having been completed, attention was paid only to the method of cultivation employed in cultivating a field in each particular season. This gave so much satisfaction that it was decided in 1887 to adopt the system permanently. In this settlement the villages of a taluka are divided into groups arranged in accordance with the facilities which they enjoy for obtaining water and for the disposal of produce at a market. Rates are then prescribed for the different methods of irrigation in each group of villages. The pitch of assessment is governed by the trend of prices, the value of the land, the state of the canals and the economic conditions of the cultivating classes. The introduction of this form of settlement began in 1882-83, when it was subsequently extended to the whole province of Sind with the

exception of the Kohistan and a few other places in the Karachi District and some parts of Tharparkar, where conditions differed largely from the areas where irrigation was readily available.

The leading features of the Irrigational Settlement are :—

1. Land pays assessment only when cultivated.
2. The rate of assessment depends on the class of water supply.
3. Remissions are allowed on a most liberal scale in cases of total or partial failure of crops.
4. Four clear years of fallow are allowed free of assessment without lapse of occupancy right.

Experience has shown the system to be admirably adopted to the condition of lands settled on inundation canals. The assessment is treated as a consolidated charge : nine-tenths represent the price of the water and are credited to Irrigation, while the balance is treated as Land Revenue and credited to that head. A reduced assessment is charged on lands watered from private canals, the clearance of which is not undertaken by Government, the deduction being made on a sliding scale varying with the length of the canal. A cess of one anna (six paise) per rupee of the land assessment is levied to defray the cost of the collecting establishment.

The desert Talukas of Tharparkar are shown as unsettled. In these the land revenue, such as it is, is raised on a system known as Tali, from tal, the local term for those patches of low ground between sandhills on which it is possible to raise a crop after suitable rain. The area which can be cultivated in each year varies with the rainfall, therefore the land revenue is imposed in the form of a fixed rent graduated according to the average productive area included the whole. In the Kohistan also, where a sparse and precarious cultivation is carried on after rain, it was found necessary to make special arrangements for levying an assessment which is little more than nominal and yet has frequently to be remitted.

Assessments fixed under the Irrigational Settlement are paid in cash by the holder of the land to the Government; but payments as between the landholder and the cultivating tenant, that so to say between the zamindar and the hari, are still regulated by the system of batai, or division of produce. The produce-shere appropriated by the Talpur government, apart from cesses, as a contribution due from the occupiers of land to the revenue of the state, varied from one half or two-fifths for land naturally irrigated to one-third or one-fourth for land-watered by labour. For what length of

time this rate had been sanctioned by usage it is impossible to say. But the Talpurs were conservative princes and as a rule respected local customs and hereditary rights. On the establishment of British rule the produce-share taken by the Government was reduced to that which the Mughal emperors had considered fair, namely one-third. But this was the maximum demand, made only upon land irrigated with the least expense. The lift rate, which applied to the greater portion of the country was one-fourth. This then is the basis of the present assessment. On the introduction of cash assessments in 1849 the one-fourth share was commuted into an empirical rate of Rs. 24—8—0 (Rs. 24—50) per wheel, which may be taken as approximately equivalent to Rs. 2—8—0 (Rs. 2—50) per acre. The settlement current in 1904 resulted in an average demand of Rs. 2—13—0 (Rs. 2—81) per acre on all kinds of irrigation throughout the former Province, and the average lift rate is of course a good deal less. The current settlement was thus nearly the same in money as the amount into which the produce-share of the state was commuted in 1849. But the relative difference between the rates of the two periods is far greater, for the records of sales of grain collected as revenue in the years 1845 to 1849 show that the average wholesale price of the five staple grains, bajri, juari, wheat, rice and jambo, was for that period scarcely one-third of what it was fifty years later.

As the cultivation in former Sind is largely a co-operation between the occupant of the land and the cultivating tenant, and as the financial arrangements prevailing between the occupant of land and the cultivating tenant are regulated by a system of batai, or division of produce, it is necessary to give a full account of how this system of batai actually works, not only because it describes the actual condition prevailing today regulating the distribution of the produce between the landholder and the cultivating tenant, but also because there is a great likelihood in the future that the batai system may disappear altogether in the financial arrangements between zamindar and hari. In these circumstances a description of the working of batai is highly desirable. The following account is taken from the 1876 edition of the Sind Gazetteer, and in applying it to the present day care must be taken to realise that the division of produce now applies, not to the payment of the Government assessment which is in cash, but to the shares of the profit of the cultivation of land divided between the zamindar and the hari.

Division of Crop-Batai System

“The batal of a Government “khara,” or threshing-floors is thus described by Lieutenant Jameson : “When everything is ready the officials above mentioned, accompanied by the kardar and his moharar, proceed to the khara or threshing-floor. When there the bataidar first looks about to see that the whole of the grain has been threshed and cleaned, and that none is concealed in pits and wholes, a very common custom. The cultivators are

then ordered to make the 'kori', or usual division and where there is the produce of several fields or patches belonging to different individuals in the khara, each cultivator portions his grain by measurement into koris or heaps, according to the rates at which he is assessed. In addition to these, in all cases, one odd detached heap, called 'tar', varying in size from one-fourth to one-third of that of the others according to the rate of abwab at which the cultivator is assessed, is always left after the koris have been made up. The bataidar then walks round, picking out and marking on account of Government those heaps which appear to him to be the best. Returning to the remaining heaps, the bataidar selects one and commences the batai. Thus if it appears to contain one kharwar of grain, he says at random that there are $1\frac{1}{4}$ kharwars in it. If the cultivator agrees to this, the business proceeds, otherwise the bataidar orders it to be measured by the darwai, who does so in such a way as to make it appear the exact quantity stated by the bataidar, and thus the cultivator's objections are effectually silenced. The three heaps, that is, supposing the usual rate of batai to be one out of three, will now be calculated to contain altogether $3\frac{3}{4}$ kharwars of grain, which will be so entered in the khasra. The division of the detached heap, or 'tar', then commences. If the rate of abwab be 4 kasas the kharwar, then $4 \times 3\frac{3}{4}$ gives 15 kasas, which is measured therefrom by the darwai on Government account. This is invariably measured in such a manner that the amount exceeds a good deal what is stated. This measuring is called hona dasti, and is added to the Government heap. At this point the zamindari, or zamindar's dues, where it is the custom to exact these from the hardasra, or whole produce, are collected according to the invariable custom of the 'deh', or place bataied, and put on one side. In some places Government claims one-fourth of this on its own account, and in others the whole goes to the zamindar. The zamindari is, however, as frequently taken from the cultivator's share of the produce, in which case it never appears in the batai accounts. After this the twentieth share of the whole produce, or hardasra, is calculated and measured out on account of 'lapo', or reaping expenses. This goes to the cultivator, who has previously defrayed the expenses, and as the first gets over measure, so does this get short measure. Then come the carpenter and potter on the part of the cultivator—two most important essential assistants to him in the commencement of the season the first to make his water-wheels (charkhas), and the second to provide him with water-pots to attach to them. Their shares are generally calculated at the rate of 1 rupee, or 5 kasas of grain per charkha that is to say, on the produce of the land cultivated by one water wheel, and (Rs. 0-50) on every hurlo, or half-charkha. After these shares have been separated and placed on one side, those of the Government inferior officials, viz., the kotar, bangi and batrra, each varying from $\frac{1}{2}$ to $1\frac{1}{2}$ kasas on every charkha, are also measured out in a similar manner. What remains is then divided into three

portions, one of which is added to the Government heap, the other two reverting to the cultivator ; that is, the quantity that is calculated by the darwai, and if, for instance, there be 15 kasas left, 1 kasa will be considered as Government 'abwab', or 'kharch,' and 5 kasas as the Government share, the whole six being measured and added to the Government heap, and the rest made over to the cultivators. After this the bataidar minutely examines the spot where the grain of this particular field was collected to see if any has been reserved for seed, or left uncleaned in the straw, etc., and should he find any, he guesses the amount and takes the supposed equivalent from the cultivator's share. This is entered separately in the accounts under the head of kundi, and is added to the Government heap. The above is successively gone through with the produce of all the different fields in the khara, and the Government shares as above described, collected into one grand heap ; the Government official's shares from each field are also collected into four distinct portions and placed beside the Government heap. The kardar, bataidar, and Government officials now gather round, and the process of measuring commences. After this measuring, or tak-rargang, is over, the amount of grain is entered in the khasras and should it exceed the quantity already calculated in the khasras which is nearly always the case, the difference is added thereto, and called izafaitakrargang, or surplus on measurement. At this stage of the business a certain portion, generally one-fourth of the whole, is taken from the shares of the four Government officials the kotar, bhishti, sweeper and batara by the bataidar on account of Government, and credited in the khasras under each individual's name. The final item now requires mention. Owing to bad reaping, a good many ears of grain fall on the ground, these are generally gathered afterwards by gleaners, from whom the karawas, or watchmen, always claim a nominal portion on account of Government. This, which is cleaned and kept apart from the bulk of the grain, is called the vadd karawa, but is more generally known as khosha cheeni. When this item is entered in the khasras the batai is finished, the accounts closed, and the total amount of grain calculated. The kardar's and bataidar's seals are now attached to it, and the patwari enters an acknowledgment at the bottom that he has received that amount of grain, and it is finally sent in to Government, whom after this, holds the patwari responsible. It is the business of the cultivator to convey the Government grain to the granary (or ambar khana), or to pay for the carriage of it, and this latter privilege was often availed of to exact additional revenue from the cultivators. They cannot touch their own grain until they have accounted to the patwari for the Government share, when they can do as they like with it."

The system of batai so minutely described above must be read *mutatis mutandis* as applicable to the conditions of the present day, when the Government assessment is no longer levied as a hare of the crop, but as a cash instalment payable at fixed time

in money. The batai system, however, still regulates the relation between the occupant and the cultivator, between the landlord and the tenant, in respect of the main cereal crops, namely, rice, bajri and juari in kharif and wheat in rabi. The batai system in its present form is no doubt complicated, but it works easily and well and is understood by the persons concerned. At the same time the modern tendency is definitely in the direction of substituting cash payments for payments in kind, though whether the present system of batai will be displaced soon is a matter of some doubt. The reason for this is that the Sind region system of cultivation is still largely in character and the act of cultivation is itself an act of co-operation between the zamindar or landholder and the tenant or cultivator, and it is an easy way of apportioning the share of the produce at the time of the harvest. The zamindar, or occupant of land, under this semi-feudal system, pays the Government assessment in cash and arranges for the clearance of the private watercourses which bring the irrigation water onto the field. The zamindar, or occupant, is also the financier of the cultivator, to whom he makes advances of money for the expenses of cultivation. These expenses he recovers from his share of the produce at the time of batai. The system is also linked up with the lingering relics of a true feudalism under which the inferior is required to render certain services to his superior, and the system, though weakening in force, is a living necessity in the conditions of Sind region agriculture today. It has been stated above that the batai system prevails in respect of the chief cereal crops in kharif and rabi. Mahsuli, or cash rents, are however peculiar to certain descriptions of crops, such as tobacco, sugarcane, cotton, every kind of vegetable safflower, bhang and various other crops, and they vary in amount according to the nature of the crop, the description of the land, the pleasure of the proprietor, but generally speaking they are not liable to change. These cash rents are subject to the law of supply and demand, and with the growing shortage of agricultural labour in former Sind it is likely that the cultivator will be in a stronger position to demand higher remuneration for his services tilting the balance in the bargaining more in his favour as against the landlord, or occupant of the land.

Tenures.

The following clear account of the different tenures prevailing in Sind region was written for the second edition of Mr. Hughes' Gazetteer of Sind (1876).*

*By Lieut-Colonel R. M. Haig.

“Land tenures are throughout the province of an extremely simple character. Classing the land under the two heads,

“Assessed to the State Revenue” and “Alienated”, we find it in the occupation of:—

- (1) Large proprietors, a comparatively small but important class.
- (2) Holders of estates of a few hundred acres, the middle class gentry.
- (3) A large body of peasant proprietors, all paying revenue direct to Government, or to the Alienee to whom the Government rights in the land have been transferred.

The other agricultural classes are:—

- (1) Tenants possessing a right of occupancy.
- (2) Tenants-at-will.

“The latter class, though many of them pass their lives on the same estates yet possess no kind of right of occupancy, and are subject to such conditions as the land holder may from time to time find himself able to impose on them. A prudent landholder however, knows it to be for his interest to keep on good terms with his tenants, and understands the benefit of maintaining in his service a body of cultivators who have grown up on his property: hence most of these tenants-at-will have almost as secure a footing on the land they cultivate as if they enjoyed a right of occupancy. Their position has become still better since the introduction of the settlement, which in putting an end to the monopoly of land previously enjoyed by the larger holders has rendered the tenant class much more independent than they formerly were”.

“Tenants possessing a right of occupancy are found exclusively in North Sind where such a tenant is termed a “Maurusi Hari,” literally ‘Hereditary Cultivator,’ his right of occupancy being heritable. It is also transferrable at the will of the tenant, and irrespective of that of the superior holder or Zamindar, whose right in the land is strictly limited to a quit-rent and this he cannot enhance. In fact the Zamindar is in these cases simply a person possessing a certain lien on the land, and although he is the superior holder he is not allowed to pay the Government demand, which it exclusively belongs to the “Maurusi Hari” to discharge. This tenure is very prevalent in the Rohri division and in the Sukkur taluka, less so in the rest of the Sukkur district and Shikarpur sub-division, whilst south of Larkana and the territory of Khairpur it is almost unknown. It appears to be of foreign origin and to have spread into Sind from Bahawalpur and the former Punjab where it is believed to be

common. The hereditary right of occupancy is said to have been acquired formerly by any person who reclaimed land from the jungle and brought it under cultivation. All land at all accessible to a petty cultivator being claimed as in the "Zamindari" of some large holder, the rights of the latter were recognised by the payment of a quit-rent fixed for ever, and the cultivator became the occupant of the land with, in fact, every right of ownership. Occasionally, according to native accounts which seem to have some ground of probability the tenure arose the reverse way to that above described, that is, instead of a cultivator acquiring an occupancy in a Zamindar's land, a Zamindar acquired Zamindari rights over lands belonging to peasant proprietors, being foisted into this position by the corruption of the local ruler or the favour of some successful invader. This would account for the fact that hereditary tenancy is found in full vigour in the lands adjoining a populous town like Sukkur, which must have been reclaimed so many centuries ago that to suppose the original tenure to have come down to the present time unaltered and to so many successors would be manifestly absurd."

"The question of what are called "Proprietary" or "Zamindari" rights as pertaining to the larger landholders in Sind has been much discussed and opinion is still divided on it. It is contended by some that Zamindar rights exist in this former province just as much as in other parts of British India. What these rights consist in has not been precisely defined by those who argue for them but they appear to be connected with waste land over which it is maintained the right of the Zamindar ought to remain in force, even after he has relinquished the land owing to inability to cultivate it. The Islamic law the only law to which a Sindhi landholder could refer the matter recognises no right in land which has been more than three years out of cultivation. Such land reverts to the State absolutely. If custom is to decide the question it would be difficult to say what the custom has been. Under the Native Government, the powerful landholders no doubt acted on their own views of their rights, while the rulers gave themselves little trouble about the rights of others so long as their own were properly respected. The Talpurs appear to have recognised no special rights as pertaining to large landholders and to have summarily ejected the latter from their lands when occasion arose for such a step and in places where they were strong enough to venture on it. On the accession of British rule, it was found that at all events as a fiscal arrangement village communities were commonly divided into principal Zamindar, minor Zamindars, petty occupants (also calling themselves Zamindars), and the "Haris" or cultivators of the larger holdings.

Where this organisation prevailed the principal Zamindar transacted all business with Government on behalf of the community and from him or under his supervision the Government share of the

produce of the village lands was collected. On account of this he levied "Zamindari" (for his trouble as principal "Zamindari") from all occupants of the village lands in addition to the "Malikano, or proprietor's (Malik) fee levied from the tenants of his own particular estate. There can be no doubt that under the circumstances of the Native Government this was by far the best if it was not the only possible arrangement for collecting the State dues. There was at least one high authority in favour of continuing the system under British rule*. But Napier was strongly opposed to it. He likened the larger Zamindars to the middlemen of Ireland, and urged the Revenue Officers to displace them, wherever it was possible from their position of village managers, and to deal directly with the occupants of land whoever they might be. Thenceforth the larger Zamindars ceased to enjoy much of the influence and importance they had hitherto possessed, and the smaller occupants came to appreciate the advantages of being independent of the large proprietors, and of having their own rights as holders of land fully recognised by the new Government. The policy of British administration has been to foster this desire for independence and to place all classes of landholders on precisely the same footing in regard to their obligations to the State".

Lapo.

With respect to Zamindari rights, about which Colonel Haig held views different from those of some authorities, the following remarks may be quoted from an official report on the land tenures of the Bombay Presidency†.

"Under the former native rule certain individuals were granted the privilege of collecting certain fees on the revenue accruing from the lands of a tract of country in consideration of their using their influence in bringing it under cultivation and collecting the revenue on the same. They attracted cultivators, probably advanced them money on account of the expenses of cultivation, afforded them the protection necessary in the then unsettled state of the country and aided in the collection of the revenue: and the "lapo" was the consideration they received in payment of their services; the "deh kharch" (or village expenses) was probably an extra cess which they levied from their cultivators to meet the cost of entertaining Government officials, guests and etc. and the "malikano" and "zamindari" were other names for the above or similar benevolences. They all, however have one common meaning viz., a charge on cultivation, payable sometimes in kind sometimes in cash, which the zamindar is by custom entitled to receive from the cultivators."

*Sir George Russell Clerk, Governor of Bombay, during British rule.

†Selections from the Records of the Bombay Government, No. CCLXXVIII. New Services.

This right has never been abrogated and in cases in which maurusi haris have refused to pay lapo the zamindar's claim has been upheld by the civil courts. But the claim has been disappearing gradually in the Hyderabad, Larkana and part of the Sukkur District, as waste lands, formerly included in the estates of Zamindars but lapsed by neglect, have been taken up by new occupants under no obligations to pay lapo. In the Rohri sub-division, however, where the most influential landholders, some of whom hold sanads from the Emperors of Delhi, derive the larger part of their incomes from lapo and are powerful enough to enforce the payment of it without the countenance of the law, it shows little tendency to disappear, and the question what attitude Government should adopt towards it has given rise to interminable correspondence. The final orders of Government on the subject are that Revenue Officers may give assistance under the Land Revenue Code to superior holders in recovering lapo claimed to be due from persons whose liability to pay it is entered in the settlement registers. Where no such liability was recorded at the time of the settlement, or where a new and free title has been acquired subsequently assistance may not be given under the Land Revenue Code, but of course the claim may still be the subject of a civil suit. With respect to recording liability at the time of settlement it may be said that the general policy of Government has been not to recognise the shadowy claims of Zamindars over lands which were waste until Government brought water to them, but to show every consideration to the hereditary landholders of the country in the subsequent disposal of such lands.

Tenants at will and "2nd class maurusi haris," who differ from tenants at will only in this, that the landlord cannot eject them as long as they pay him his dues are of course bound by the terms of their contract with the landholders, which appear very generally to include the payments of lapo. But as the expansion of cultivation increases the demand for field labour and the independence of the labourer, he may be expected to release himself from such claims.

Settlement and Assessment.

Prior to the year 1959 in the former Sind and Khairpur State area water rate was not charged separately. There was a composite rate, which included water rate. The composite charge was bifurcated into land revenue and water rate components with effect from Kharif 1959. The water rate was rationalised by the Irrigation Department throughout the Province from the

above harvest. The chief features of the Sind region system of land revenue assessment are:—

- (i) The assessment is fluctuating and not fixed;
- (ii) It is subject to a sliding scale of assessment, but not for all crops;
- (iii) the three crops subject to a sliding scale assessment are cotton, paddy and wheat.
- (iv) Before integration (i.e. 1955) there was no upper limit and the land Revenue for these crops could rise to any height. After integration an upper limit has been placed in respect of commutation prices with the result that the land revenue cannot go beyond these rates.

The upper limit placed in respect of commutation prices is at present as under:—

American Cotton	..	..	Rs. 81.00 per maund.
Rice	..	..	Rs. 7.50 per maund
Wheat	..	..	Rs. 10.00 per maund.

According to the present settlements the basis of calculation of rates of assessment is that about $33\frac{1}{3}$ per cent. of the net income of a zamindar is taken as land revenue though, according to the long established practice, Government would be entitled to 40 per cent. of the net proceeds. The net proceeds of a zamindar are calculated by deducting the expenses of cultivation incurred by the zamindars from the value of his share of the produce which he gets according to law. This share of the produce varies according to the mode of irrigation, e.g. when the cultivation is done by flow, the zamindar gets 50 per cent, if it is done by lift, he gets $\frac{1}{3}$ rd of the total produce.

It may be stated that in Sind region the lands are mostly surveyed. The surveyed lands are divided into survey numbers and blocks. The maximum area of a survey number does not exceed ten acres while that of a block does not exceed 16 acres. The blocks are divided into petty hissass of four acres each. In certain cases these petty hissass are again sub-divided into 1 acre units. The Record-of-Rights is maintained for all the surveyed lands.

A survey number or a petty hissa is considered as a unit of assessment. If a petty hissa is sub-divided into one acre units, then that one acre unit is considered as a unit for assessment. If a portion of such a unit of assessment is cultivated, then the assessment is ordinarily to be recovered for the whole unit and not for that portion which has been brought under cultivation. In respect of unsurveyed lands the assessment is already levied on the land actually cultivated. That land is measured by bigoti measurement which is a rough way of working out areas. It is not deemed necessary to have the Record-of-Rights revised when a settlement is revised.

Before the advent of the Lloyd Barrage, Government had issued orders that in revising assessments they should not be increased to more than 33 1/3 per cent. in the case of a Taluka (Tehsil) or a group of villages brought under the same maximum rate, 66 per cent. in the case of a single village and 100 per cent. in the case of an individual holding. These orders were, however, cancelled in 1927 in view of the advent of the Lloyd Barrage. Thus, there is at present no bar to enhancement of the assessments to any extent. The only concession given by law is that in the year in which the original or revised settlement rates are introduced, the difference between the old and the new assessments of all lands on which the latter may be in excess of the former shall be remitted and the revised assessment shall be levied only from the next following year.

Kinds of Assessment.

The rates of assessment prevailing in Sind region were of two kinds:—

- (a) Those worked out on a 'sliding scale' system.
- (b) Flat rates.

According to the 'Sliding Scale' system, the rate of assessment is worked out for cotton, rice and wheat crops on the value of the crop of the season for which assessments are to be fixed. This is a very fair and equitable method as the zamindar gives more assessment if he gets more income from the crop owing to the prices being higher and he gives less if the prices go down. This system, which was introduced in Sind in 1938 for the first time, has worked very well. In respect of the crops other than cotton, rice and wheat, flat rates have been fixed.

The rates for the current settlement were fixed for ten years from 1943-44 to 1952-53. They were to be revised from 1953-54 and Settlement Officers had been appointed, but owing to integration they could not be revised.

Non-Agricultural Assessment.

In Sind all the settlements hitherto undertaken have been mostly in respect of agricultural land. The Settlement Officers appointed for the purpose do not touch the question of revising the non-agricultural assessments. This is, however, done separately by other officers who are specially appointed for the purpose.

Agency of Assessment.

When it is proposed to revise a settlement in a district or districts, an experienced Revenue Officer of the provincial Civil Service is generally appointed as Settlement Officer. He is given some clerks, supervising Tapedars and Tapedars for assisting him. He has to work under the directions of the Director of Settlements, Survey and Land Records and has to send his report to Government through the Deputy Commissioner and the Director of Settlements. Settlement of a district normally takes about 18 months. The procedure which a Settlement Officer is to follow for fixing or revising assessment is given in the Commissioner's Special Circular No. 33.

Revision of Settlements.

No revision of settlements took place in the former Sind till 1938, when the settlement of 38 talukas commanded by the Sukkur Barrage was revised and the period of settlements was fixed for 5 years. The most important point in respect of this settlement was that the assessment on cotton was ordered to be levied on a sliding scale system, which co-relates the assessment with the price movement of the crop. The settlement of these 38 talukas was again revised in 1943-44. Simultaneously, the settlements of all the non-barrage areas of the former Province, except the areas of the present Thatta district, and all talukas of Kotri and Kohistan Mahal and non-barrage parts of 17 other talukas, were revised. The main feature of these barrage and non-barrage settlements was that the sliding scale system of assessment was extended to the rice and the wheat crop in addition to the cotton crop but while no upper ceiling was provided in respect of these three crops in the Barrage areas, a ceiling was provided in respect of the non-barrage areas. In 1944, the settlements of the old Karachi district were revised in 1947, revision took place in respect of the areas; viz., taluka Kotri, Kohistan Mahal, and the non-barrage parts of 17 other

talukas. The period of settlement in respect of the latter two revisions was made conterminous with the period of other areas in order to enable Government to take up the revision of all the areas of the former Province from 1953-54. In 1952, the former Sind Government appointed Settlement Officers for taking up this revision work. They made their reports, which came under the consideration of Government; but, as the then Chief Minister thought that the revision proposals were not complete for want of adequate data viz., the results of crop experiments, he ordered fresh crop experiments to be undertaken. The settlements could not be revised before the One-unit amalgamation of West Pakistan came into force. After this amalgamation, the question of the unification of the assessment system for the whole of West Pakistan has been receiving the attention of the present West Pakistan Government. The Board of Revenue has prepared a scheme of assessment which has been under the examination of Government for a long time. Recently this scheme came under discussion in the advisory council and it was decided to circulate it for eliciting public opinion.

The policy in respect of settlement overdue other than Barrage settlements is at present in process of formulation.

The above revisions do not apply to the Desert portion of the 4 talukas of Nagarparkar, Diplo, Chhachhro, and Mithi. The assessments prevailing in those areas have not yet been revised but their revision is under consideration. The rates of assessment in those areas at present are very low ranging from four annas (Re.0.25) per acre to one rupee per acre.

It is intended to carry out settlement operation in Thatta district of Hyderabad Division and Nawabshah district of Khairpur Division on the Punjab pattern. Necessary data in this respect is being collected for obtaining the orders of the Council of Ministers in the matter.

Colonisation of Land.

The following paragraphs show the policy as regards the disposal of State land under the three Barrages :

(i) The Lloyd Barrage, Sukkur.

The policy of disposal of State land in the area of this Barrage has remained unaltered. Land has been classified into different categories and the price of each category has been fixed. Any one desiring a plot of land may make application to obtain it on payment of the advanced price fixed. Before the integration of the provinces of West Pakistan in 1955 no restrictions existed in respect of appli-

cants ; but after integration it was decided that persons owning more than 240 acres should not be considered eligible for allotment of land. Recently efforts have been made to dispose of as much of the area as possible, and a considerable portion of it has already been disposed of.

(ii) Ghulam Muhammad Barrage, Kotri.

The disposal of land in this Barrage area is taking place in accordance with a phased programme. G. M. Barrage and Guddu Barrage primarily aim at colonizing and developing culturable lands in lower Sind area. The irrigation system of the G. M. Barrage consisting of a head works, three canals on the left bank and one on the right have been completed. The work of construction of channels and water courses is now proceeding at a rapid pace. The project will provide assured water supply to the culturable uncommanded area of 28 lakh acres in Hyderabad and Thatta districts. The area for which water becomes available is disposed of according to a scheme approved by the Land Utilization Committee, which was set up in June 1958. On this committee there are representatives of the Army and the Central Government.

The Public Works Department released an area of 2,16,000 acres during the year 1957-58 and 1,32,000 acres in 1958-59. The area released in 1957-58 has since been disposed of and possession handed over to the grantees. Out of the area released in 1958-59 an area of 1,06,800 acres has been disposed of so far and the remaining area will be disposed of soon. The disposal of land in this Barrage is made (1) on Harap and (2) Zamindari conditions. Up-to-date (1959) the following allocations of land have so far been made:—

	Acres.
(i) Landless Haris ..	165,000
(ii) Mohagdars (i.e. holders of adjoining land) ..	116,000
(iii) Tribesmen ..	10,000
(iv) Sales by public auction ..	24,000
(v) Army ..	40,000
(vi) Leases ..	10,000

The details of the allotment so far made in the Ghulam Muhammad Barrage as is follows :—

	Acres.
(1) Haris ..	1,55,454
(2) Co-operative Societies of Haris ..	4,583
(3) Khatedars (Mohagdars) ..	82,423
(4) Defence Forces ..	28,400
(5) Animal Husbandary Department ..	4,535

	Acres
(6) P.I.D.C.	.. 2,933
(7) Forest Department	.. 12,780
(8) Tribesmen	.. 240
(9) Mandi towns and villages	.. 9,332
(10) Sale by auction	.. 15,000
(11) Leases	.. 7,000
Total	.. 3,22,680

The terms and conditions on which such leases are being given are set out in the Revenue Department Order No. Col-7/113-57 dated 12th March 1958. Paragraph 7(i) of this order lays down that the grantee shall bring under cultivation 25 per cent of his grant within the first year, 50 per cent. of his grant during the second year, and the balance during the third year subject to the designed intensity. Thereafter he shall keep the said land under cultivation by rotation according to the intensity fixed for the canal on which the land is situated. The portions of the cultivated area and the order of rotation shall be determined by the Revenue Officer whose decision shall be final.

The sale of land took place only in 1958 when the Public Works Department made water supply arrangements in the end of 1957.

The landless self-cultivating refugees who have been or will be displaced on account of the permanent Settlement Scheme are eligible to get land in this Barrage, but non-claimant refugees who secured temporary allotment of evacuee land but were not self cultivators are not eligible to get land unless they fulfil the conditions of eligibility laid down in this behalf.

The latest policy under which lands in this Barrage are being disposed of is that except in the case of Haris, Mohagdars and other categories for whom special reservations have been made no other person is allowed to take up land on Zamindari conditions. All state land beyond a radius of 5 miles of mandi towns except that specially reserved is being put to auction and the highest bidder obtains it.

An area of one lakh acres has been reserved for the Defenc Forces in this Barrage. Other Ranks will get 85% of the total quota and the remaining 15% will go to officers. Other Ranks are being allotted land on harap conditions and officers on the terms and conditions applicable to Zamindari grants.

The special concession is given only to Tribals from whom a flat rate of Rs. 250 per acre will be charged. No interest will be charged from them even on occupancy price outstanding and on the taccavi loans. The price is recoverable in 20 years in 40 half-yearly instalments.

Alienations.

Lieutenant-Colonel Haig's contribution to the old Sind Gazetteer may again be quoted on this subject.

"Under the head of Alienation are comprised:—

1. Jagirs.
2. Pattadaris.
3. Khairats or Charitable grants.
4. Garden grants.

When the province came under British rule a vast extent of land was found to be held in jagir. In the Hyderabad district the collector estimated that 40 per cent. of the land was thus alienated. When the question of the terms under which succession to Alienations was to be regulated first came under consideration, it was decided to regrant all cultivated lands subject to a charge, of one fourth of their net proceeds and resume all waste land. while lands originally granted for service-civil or military—were to be resumed on the death of the present incumbent. But it was soon found to be necessary to make a distinction between the various Jagirs, and ultimately they were brought under the following classification and conditions of succession:—

Class I.—Jagirs granted prior to the accession of the Talpurs (1783).

Class II.—Jagirs granted by the Talpurs up to the year 1810 the year in which Mir Ghulam Ali, the second of the four brothers who were the first Hyderabad Mirs, died.

Class III.—Jagirs granted between 1810 and 1833, the year in which the four brothers died.

Class IV.—Jagirs granted between the last mentioned year and the conquest by the British.

The following were the conditions of re-grant:—

1st Class Jagirs.—To be continued undiminished and unassessed.

2nd Class Jagirs:—Two distinct sets of Jagirdars were recognised by the terms of succession under this class 1st. The four great Talpur families of Shahdadani, Shahwani, Mnkani and Khanani. A promise had been made by Napier, when Governor, to the representatives of these families to remit in consideration of their high position and reduced means the charge of one-fourth of proceeds on succession. This promise was observed, and instead of attempting to ascertain the exact extent of waste land prior to resuming it, it was decided to resume one-third of the Jagir waste lands in all cases. Under the circumstances this arrangement is very liberal to Jagirdars. The second set of Jagirdars, known as the "Sind Sardars," comprised a considerable number of persons of very various degrees of social position, and it was found that to apply the fixed rule (resumption of waste and charge of one-fourth of proceeds and cultivated land) in all cases would operate most injuriously to the interests of some of the well-descended among this class of Jagirdars, while it would be over indulgent to others of inferior status. Accordingly it was decided to settle succession in each case on its own merits, taking into consideration various circumstances of social position, rank, and influence, unfettered by any strict rule of proceeding, and the result of the Settlement was that about one-sixth of all Jagir land held by the Sardars was permanently alienated.

3rd Class Jagirs :—To be regranted undiminished, but subject to payment of one-fourth proceeds, for one succession after the death of the incumbent at date of the battle of Meeanee.

4th Class Jagirs :—To lapse on the death of the incumbent at the date of the battle of Meeanee.

In all Jagirs of all classes succession is strictly limited to lineal heirs male, and all are subject to a cess of 5 per cent. on account of local funds, also to the hakabo, or water rate, if they receive water from Government canals.

The Pattadari grants are confined to a very limited district, comprising portions of Shikarpur, Sukkur, and Naushahro Abro talukas situated in the tract of country formerly known as "Moghuli" and under the Afghan Governor at Shikarpur. These grants are in fact of Afghan origin; settlers of that nationality having obtained from their Government deeds (pattas) of reduced assessment on lands which they had purchased from Sindhi proprietors, or reclaimed from the waste, were the ancestors of the present Pattadar. The Talpurs, when they succeeded in ousting the Afghan Government from North Sind region, recognised these grants, and they were confirmed by the British Government on the ground of "long enjoyment." The Pattadari has now become a rent

charge, a fixed portion of the revenue of certain lands being paid over by Government to the Pattadar." "The charitable grants require little notice. They are assignments to Saiyads, Faqirs and others of land, shares of revenue, money or grain, which length of enjoyment before the advent of British rule was held to be a proper ground for confirming."

Garden grants comprise lands under garden cultivation held either free of assessment or on reduced rates under Sanads granted by former Governments or by our own. According to rules framed by Sir Bartle Frere, such grants are ranged under two classes :—

I. Held without assessment.

II. Held on the quarter ordinary assessment on garden land

These grants are subject to the condition that the gardens are properly maintained. They are continuable to lineal heirs male and, provided the grantee complies with certain conditions, they may be mortgaged, sold or otherwise transferred.

There are two other minor alienations, namely, huri, or Tree Grants, and seri, or Village Service Grants. Owing to the treeless character of the country Mr. Frere, when Commissioner in former Sind in 1858, sanctioned the grant of land rent-free for growing trees. The concession, which is only a remission of revenue on certain lands so long as they are used only for the purpose of growing trees, has been continued and is transferable. If crops are cultivated on such lands they at once become liable to full assessment. The land thus granted amounted in 1900-01 to 3,850 acres. Seri grants were grants of land rent-free as payment for certain public services in connection with the prevention and detection of crime, etc. The office of the holder was not hereditary, but might be continued to his son. The Sind Village Officers, Act, 1881 having provided for the appointment of regularly paid village officers, the old seri grants are lapsing and the assessment on land now assigned for their services is debited to the village cess fund. The land granted under this head in 1900-01 was 10,017 acres.

Besides these ordinary alienations there are large tracts of land in the Jacobabad District granted rent-free to Baluch chiefs and their followers, some in perpetuity and others for life, on condition only of loyalty and good behaviour. They are liable to pay hakabo and any other legal cess. The land alienated under this head in 1900-01 was 26,100 acres.

The following statement shows up to the present day, the class, the number of grants and the area of jagirs for the pre-British and British periods :

Class.	No. of Grants.	Area of Grant. Acres.
I—<u>Pre-British period.</u>		
(a) First Class Jagirdars ..	11	2,93,000
(b) Four Great Talpur Families ..	17	4,79,000
(c) Sardar grants ..	55	56,000
(d) Muafi Nashistgah ..	15	26,000
(e) Khairat grants ..	8	2,20,000
(f) Garden grants ..	266	2,500
Total ..	372	10,76,500
II—<u>British period.</u>		
(a) Hindu grant ..	1	5,800
(b) Sodha Rajput grants ..	11	17,200
(c) Baluch Tribal grants ..	23	31,500
Total ..	35	54,500
Grand Total ..	407	11,31,000

In addition to the above, the approximate area of land held by Pattadars and Hissadars respectively is : Pattadars 35,000 acres and Hissadars 25,000 acres.

Jagirs.

On February 8th 1955 the Revenue Minister of former Sind, Pir Ali Muhammad Rashdi, defined a jagirdar as one who has been the recipient from the former rulers of the privileges of realising and appropriating to himself that portion of the land tax which otherwise would have gone to the state. This privilege was conferred upon select individuals. He added that the area with respect to which this privilege has been disbursed covers 11 lakhs of acres. Out of every ten acres of former Sind's occupied land one acre is held by way of jagir. Of this area of 11 lakhs of acres the Revenue Minister stated that nearly 3 lakhs of acres were being left uncultivated by the jagirdars, with the result that incalculable damage was being caused from year to year to the overall economy of the province. With respect to the rest of the area (over 7 lakhs of acres), he stated "The jagirdar paid no land revenue and no income tax, although in almost every case the jagir exceeded 500 acres. His sole contribution was by way of 'hakabo' (water tax) levied at half the land revenue together with a jagir cess at the rate of 5 or 6½ per cent." "It was even doubtful" he stated "whether the hakabo paid by jagirdars covered the cost of the supply of water. Sind's land revenue is a consolidated water rate and land rate, and the water rates is reckoned at nine-tenths of the consolidated land revenue. In normal times therefore the hakabo paid by jagirdars did not cover" said the Revenue Minister, "the cost of supplying them with water. The difference had to be made up by the ordinary tax-payer."

Such is a present-day account of the state of jagirdari in Sind region up to 1957. For the latest developments some account is given in the chapter of this Gazetteer dealing with the Refugee Problem and Rehabilitation, Development and Social Welfare. (See Chapter XVIII below.) It appears that in 1847 conditions were not very much different in respect of this matter of land alienation. In his report, No. 3886, dated 31st December 1847, the Commissioner of Sind reported: "The land alienated in jagir is estimated at about one-tenth of the Government land, but only a small proportion of this is cultivated. The alienations were chiefly for civil or military service, and in form are resumable at pleasure. Practically however a considerable portion of them held by families or individuals entitled to consideration, was regranted wholly or partially to their heirs, and this practice has been continued at the discretion of the Government since we got the country."

On the British annexation of Sind this question of jagir land was very fully considered and the rather haphazard old method was modified into something more like a rational system of control. The locus classicus on Sind jagir alienations is the report of Lieutenant-Colonel Haig, which has been reproduced in the section on alienations above in this chapter

The four following paragraphs on the political problem connected with jagirdari were written before the decision of the Martial-law administration in 1959, an account of which will be found in the chapter dealing with the Refugee Problem and Rehabilitation, Development and Social Welfare. They have been retained because they explain the mental atmosphere in which the abolition of jagirdari was contemplated by the former Sind Government before the integration of West Pakistan.

The future of jagirdari proved to be a political question of considerable moment. The present-day tendencies towards egalitarianism seem likely to bring this question prominently before the public as a political issue in the near future. The liquidation of jagirdari was taken up first in 1949 by Mr. S. Ridley (now Sir Sidney Ridley), then the Revenue Commissioner in Sind. His view was: (1) the present jagirdars were no longer rendering the services in consideration and on account of which they had been given the jagirs, (2) as, instead of a foreign government, Sind had now a national government, every citizen whereof was expected to be loyal without receiving a price for that loyalty, (3) as the jagirs under the present holders had become sources of distress and impoverishment of people and (4) as continuance of this system caused losses to the public exchequer and damage to the overall national economy, the grant of the privileges of jagir should be forthwith withdrawn. Mr. Ridley stated: "The position really is that the British Government told the Sanad-holder that so long as he is loyal to the British Government, and gives assistance whenever the opportunity arises and so long as there is a lineal male heir and hakabo dues are paid the Government will allow him to enjoy the Government dues arising in respect of some particular area of land. In the case of a very large number of jagir grants this right was limited to one, two, three or four generations. But in the remaining cases which are regarded as permanent grants, the grant is usually liable to resumption on failure of a lineal male heir. It is obvious that the Sanads could not bind future Governments. The main object of the Sanad is to ensure loyalty to the British Government, and there could have been no possible thought or intention of the Sanad out-lasting the British Rule, and binding any future Government to sacrifice a part of the Revenue in order to secure the loyalty of the Sanad-holders. When the Talpurs conquered Sind, they must have cancelled large numbers of jagir grants as only a few such original grants survived when the British took over. The British then decided that large number of grants of jagirs given by the Talpurs themselves should be abolished, and that others should be continued, either in perpetuity or for a limited number of generations. It follows that the Pakistan Government have now the power either to continue or abolish these grants."

In September 1949 it was decided that jagirs should be abolished and to that end that a bill should be prepared. The bill was actually drawn up and placed before the government, but before any headway could be made there was a change in the Ministry which led to the dropping of the bill and ultimately the entire plan of reform was shelved. The disposal of this important public matter is now in stalemate, since the Government of Sind, which was anxious to proceed with it at one stage no longer exists as a separate government. The abolition of jagirdari would then seem to depend on what will be agreed to by the West Pakistan Legislature, which, legislating for areas other than Sind and areas in which alienation are import in any ways, may very well take the view that whatever the merits or demerits of the jagirdari stem in the present state of political development in West Pakistan may be, a decision is most likely something for the future, and not for the present. The Revenue Minister in his statement referred to above had mentioned that the dimensions of some of the jagir holdings in Sind were quite staggering, two individuals alone, for example, holding 216, 095, and 217, 269 acres respectively, while in the year, 1952 it was estimated that in the shape of loss of revenue alone, calculated at the low rates then prevailing, the province every year suffered to the extent of 18 lakhs of rupees.

The Revenue Minister had stated the conditions justifying alienation of land as the following, that certain specific services were to be rendered to Government, loyalty to the granting foreign or indigenous ruler, good behaviour, blessings and prayers for the well-being of the ruler and his progeny, settling on land and feeding inruly tribesmen, so that they give up a life of crime, and assisting the police in the arrest of offenders and raiders and the revenue officers in the discharge of their duties. The decision of the former Government of Sind in 1955 (February) is worth recording in this Gazetteer. "The Government of Sind has been, for a number of years now, considering the question of abolishing Jagirs. The scrutiny of the Sanads conferring the Jagir concessions in land for the first time, or confirming such concessions granted by previous rulers, as well as the careful examination of the legal aspects of the case establish beyond any possibility of doubt the competence of the Government of Sind to terminate the Jagiri rights in land, which amount to no more than a transfer to the Jagirdar of the right of Government to levy assessment payable on the land. It is observed that the British Government at the time of the conquest of Sind cancelled many Jagirs, created new ones and also confirmed some of the Jagirs bestowed during the previous regimes, but made the continuance of most of the Jagirs dependent upon the loyalty and good behaviour of the holders of these concessions and their successors. With the disappearance of the British rule, the Jagirs have become an historical anachronism. It is quite inconsistent

with the dignity and strength of an independent State, and a grave reflection on the patriotism and self-respect of the Jagirdars themselves to perpetuate in this age a system which to all intents and purposes amounts to no more than securing by the State the loyalty of a small section of these citizens by payment of material consideration.”

In accordance with this decision the former Government of Sind was pleased to direct the Revenue Commissioner for Sind to : (a) issue formal notices to all persons in the Province classified and entered in the records as Jagirdars ; (b) cancelling with effect from the 8th February, 1955, their Sanads under which the Jagirs were granted to them ; (c) with the issue of these notices the Government would levy full assessment on the lands in respect of which the Jagirdar so far had been receiving assessment in terms of his sanad. All these lands would be simultaneously, but temporarily until the completion of the enquiry, entered in the Record of Rights held on ordinary occupancy tenure under the Land Revenue Code and become liable to pay full assessment in accordance with the settlement rates in force.

The question of the position of jagirs came under discussion in the Land Reforms Commission set up by the Chief Martial Law Administrator in 1958/59 and the Commission recommended the abolition of jagirdari. Under paragraph 21 of Martial Law Regulation No. 64 all jagirs of whatever kind and by whatever name described subsisting immediately before the 7th February 1956 were abolished, and any rights, interest or estate granted, assigned released, created or affirmed by any such jagirs reverted to Government free of any encumbrance or charge and without compensation. For the final treatment of jagirs see Chapter XVIII of this Gazetteer.

It is reported in “The Pakistan News Digest” of the 15th October, 1959 that, owing to the abolition of jagirs, the district revenue of the following districts will be increased annually by the sums shown against them, namely : Sukkur, Rs. 1,61,300, Nawabshah, Rs. 52,700, Larkana, Rs. 82,200, Dadu, Rs. 38,300, Tharparkar, Rs. 45,100 and Sanghar, Rs. 37,100.



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CHAPTER XII
AGRICULTURE

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AGRICULTURE

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CHAPTER XII

AGRICULTURE

Nature of
Agriculture
and principal
crops.

Former Sind and Khairpur form an area in which agriculture is by far the most important industry or occupation. From agriculture is derived most of the wealth of the country and by far the greater portion of the population is dependent either directly, or indirectly, on the success of agricultural operations. It is the policy of the Pakistan state today to increase the agricultural area and the acreage production of crops in Sind and Khairpur region as it is realised that with the great rise in population in the future more food will have to be provided for human sustenance. The aim of the Barrage policy has been to increase the agricultural potential of Sind region mainly in two directions; first, to extend the acreage under food crops like wheat; and second, the area under cash crops, like cotton, which has a world market. The three Barrages together will, when functioning fully, greatly enlarge the area under wheat and cotton. The amount of cultivation in former Sind and Khairpur is, therefore, vital to the well-being, not only of Sind and Khairpur region themselves, but to the welfare of West Pakistan as a whole. The Report of the Agricultural Department for the specimen year 1939/40, after the Lloyd Barrage had been operating for about eight years, shows that of the total agricultural production of the country in that year 75 per cent. consisted of cereals and 14.4 per cent. consisted of fibre, which is almost entirely cotton, 5.3 per cent. consisted of oil seeds and 2.4 per cent. consisted of fodder crops, leaving 2.9 per cent. for all other kinds of cultivation. Of the cereal and pulses production by far the greatest proportion was derived from that of rice, wheat, barley, jowari and gram. Of the fibre production cotton alone is important and occupies almost the whole of the fibre production of former Sind and Khairpur. Of the production of oil seeds, which is 5.3 per cent. of the total, rape and mustard took more than 80 per cent. of the whole. If the figures for subsequent years show the same tendencies as evinced in 1939/40, and it is reasonable to suppose that the acreage under wheat and cotton will be larger than in that year, the pattern of former Sind's and Khairpur's agriculture is that it is largely an area producing rice, wheat, bajri and jowari among food grains, rape and mustard amongst oil seeds, cotton amongst fibres. The other agricultural products are in comparison quite unimportant. The following two tables show the acreage and production of the principal crops for Sind and Khairpur region for the years 1954/55 to 1960/61.

TOTAL AREA UNDER PRINCIPAL CROPS
Hyderabad and Khairpur Divisions and Karachi District.

(in 000's acres).

Crops	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60
Wheat	..	1,401	1,532	1,641	1,622	1,596
Rice	..	1,407	1,446	1,545	1,659	1,655
Juari	..	476	552	382	422	493
Bajri	..	817	666	593	751	861
Gram	..	527	619	526	520	502
Barley	..	17	28	15	19	20
Maize	..	13	14	17	15	18
Sugar Cane	..	29	28	38	59	55
Rape and Mustard	..	511	584	581	516	500
Cotton	..	901	992	1,069	1,216	1,037
Sasamon	..	20.5	18.5	26	19	34

TOTAL PRODUCTION OF PRINCIPAL CROPS
Hyderabad and Khairpur Divisions and Karachi District.

(in 000's tons).

Crops	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60
Wheat	..	..	..	..	..	..
Rice	..	..	..	..	..	..
Juar	..	..	..	..	..	..
Bajri	..	..	..	..	..	..
Gram	..	..	..	..	..	..
Barley	..	..	..	..	..	..
Maize	..	..	..	..	..	..
Sugar Cane	..	..	..	..	..	..
Rape and Mustard	..	..	..	..	..	..
Cotton (in thousand bales)	..	..	..	..	..	..
Sesamum	..	..	..	..	..	..

Predominance of Agriculture in economy.

The predominance of agriculture as a source of livelihood in Sind and Khairpur region is fully borne out by the census figures of 1951 which show the remarkable preponderance in the numbers of those engaged in agricultural operations as compared with those in non-agricultural occupations. The Census figures when analysed show that on an average only about one-third of the population can be classified as workers and two-thirds as dependants, old and young and persons not engaged in economic productive efforts. The Census figures show also that on an average throughout Sind and Khairpur region each person classified as a worker in the country has over two dependants. The table which follows brings out clearly predominance of agriculture in the economic set-up of the country. From this it will be seen that of the self-supporting civilian population force in the total population, 24.1 per cent. are engaged in agricultural operations in former Sind and Khairpur as against only 9.3 percent in non-Agricultural occupations. The figures for former Sind districts alone are 24.0 per cent. 90.5 per cent. respectively and for Khairpur 25.1 and 6.9 percent.

Persons according to economic status per cent. of the population.

Areas.	Total Population.	Self-supporting Civilian Labour Force.			Dependent.	
		Agricultural.	Non-Agricultural.	Not in Civilian Labour Force in-active.	Under 12 years.	12 years and Over
Former Sind	46,05,934	24.0	9.5	0.7	34.2	31.6
Khairpur ..	3,19,408	25.1	6.9	0.7	37.1	30.2
Former Sind & Khairpur	49,25,342	24.1	9.3	0.6	34.4	31.6

The conclusion to be drawn from the above table is that agriculture as an occupation and as a source of employment and livelihood is about two-and-a-half times as great as all other occupations put together. This is the position at the present day. Whether it will alter in the future depends upon the success with which industry is established in this great and predominantly agricultural area and whether anticipated increase in acreage under productive crops will out-distance, or keep in step with, the increase in industrial activity created by the establishment of new industries, or by the extension and development of those industries already existing.

Former Sind, is divided into three parts, the alluvial soil of the Indus valley, the gravel and hilly country of the west, called Kohistan and the arid and sandy expanses of Registan on the east. The total area is 50,397 square miles. with a total population of 64,08,514 giving an average of 91 persons per square mile

The area of Khairpur is 6,050 square miles and it has a population of 3,19,543 giving an average of 53 persons per square mile. Practically all cultivated land lies on the alluvium of the Indus valley. The area of this is about one half of the total area of the country. Ragistan and Kohistan together make up the other half. The total area of the country comprises something over 30 million acres, of which 15 million acres are uncultivable; 15 million acres are cultivable, but of these only about 10 million acres, inclusive of fallows are actually under crop. But, of the 10 million acres considered cultivated, land lying in fallow amounts to one half, namely 5 million acres. The reasons for this enormous area of fallow are complicated. But mainly the extent to which cultivated land does not carry a crop every year depends upon the amount of water which can be brought to it, the intrinsic quality of the soil and the character of the Sindhi cultivator. The cultivable land which has not yet been brought under cultivation amounts to about 5 million acres. When the three Barrages are functioning fully they can supply water for something over two-thirds of the total cultivable area, leaving about one-third of the total cultivable area to be irrigated by inundation canals, floods, wells and rainfall. The possibility, therefore, of increasing the Cultivated area of former Sind and Khairpur depends upon the working of the Barrages to their maximum intensities for all kinds of crops and to making some efforts to reduce by improved agricultural methods and by manures and fertilisers the enormous area which year by year is now left in fallow. The salient facts are that the Barrages can irrigate about 10 million acres out of a total of cultivable area of 15 million acres. The area actually cropped every year amounts to little more than 5 million acres, that is one third of the total cultivable area. An equal extent of 5 million acres remains fallow. Over and above the 5 million acres now annually cropped and the 5 million acres left in fallow, there remain a third 5 million acres where more cultivation is, or will be, possible. This is the extent to which improvement in production can be achieved by proper policy and by applying more modern methods of agriculture. In fact if full advantage is to be taken of the vacant areas of Sind region which can produce crops, long term schemes will be necessary to ensure the full utilisation of the Barrage waters and a concentrated attack made on the excessive area left in fallow.

Sir Roger Thomas, former Adviser to the Government on Agricultural and Postwar Reconstruction, has remarked in his "Notes on Agricultural Development in Sind": "The Sindhi cultivator has a reputation amongst the unknowing of being lazy. This is an unkind and an unfair aspersion. The social customs-amongst the rural population have a strong bearing on their standards of living, and are dictated by family traditions and religious observances, which all together make a heavy drain on their finan-

cial resources. Their idea of luxury is antiquated. Their agricultural practices are primitive. With rare exceptions, they have no security of tenure of the lands they cultivate, while social amenities are indeed meagre. Their ignorance is profound. Much can be done on their behalf by the state and much can be done by themselves to improve their lot, provided they have greater knowledge. Education in its broadest sense, namely, the acquisition of desirable knowledge should, therefore, be in the fore front of planning.

The climate of Sind region is suited to cultivation of a great variety of tropical and sub-tropical crops, but none of these except millets and a few pulse crops can be grown without irrigation. The rainfall ranges from about 5 inches in the west of the former province to about 12 inches in the south eastern tract. The rainy months are July, August and September. For the greater portion of the remainder of the year the skies are cloudless and crops are customarily harvested without rain-damage. Winter rains are beneficial to the wheat crop but summer rains often do more harm than good to the cotton crop. In the arid south-eastern zone of the Thar desert large areas of millets and pulses are grown each year when monsoon rains are favourable. This tract is subject to occasional severe famines. This is the home of hardy people and of the hardy Tharparkar breed of cattle, both of which thrive when the grasses grow. Air humidity decreases with distance from the sea. Shade temperatures of 115° F. are not uncommon in the drier tracts during May and June until the advent of cloudy, humid weather associated with the south-west monsoon. Temperatures drop appreciably during July and August but they have a tendency to rise again during September and early October with a consequent depressing effect on cotton yields. Winter temperatures rarely reach freezing point.

The area of former Sind and Khairpur is roughly identical with the areas of England (51,000 square miles), Czechoslovakia (49,000 square miles), Greece (50,000 square miles,) the Malay States (50,000 square miles) and Tunisia (49,000 square miles). Whereas the number of persons per square mile in England is 764, in Czechoslovakia 284, in Greece 155, the Sind figure is only 117 to the square mile. In this it exceeds the Malay states with 83 persons on the square mile and Tunisia with 56 persons to the square mile. In the case of the two latter countries there is much uncultivated, possibly uncultivable land, and in the case of Tunisia certainly there is much desert land. From the considerations which have been discussed above readers will be able to realise the hard physical difficulties which confront the practice of agriculture in former Sind and the many social obstacles which must be overcome, or at least lowered, before the production of crops per acre reaches anything like the standard of that attained in advanced western countries. The table which follows shows the figures of annual rainfall for all the districts of former Sind and Khairpur.

DISTRICT—WISE FIGURES OF ANNUAL RAINFALL.

Name of District	Total annual rainfall-Inches.										Average inches
	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	
Karachi ..	3.03	8.83	10.32	11.38	6.11	16.31	1.62	.23	18.65	5.10	8.15
Hyderabad ..	1.90	4.31	8.08	2.44	7.37	21.26	4.69	5.06	8.20	3.69	7.70
Sanghar ..	2.24	2.81	6.44	3.07	6.60	11.65	1.87	2.60	8.98	4.34	5.06
Thar Parkar ..	2.20	2.80	14.36	7.29	8.60	16.74	2.51	4.76	59.26	33.79	15.23
Thatta ..	..	..	..	..	..	..	..	..	..	19.41	..
Dadu ..	1.24	1.18	3.32	2.06	9.33	13.83	2.54	4.58	10.61	3.88	5.25
Khairpur..	1.36	0.79	5.00	0.05	2.00	18.13	2.45	1.00	4.60	4.00	3.93
Sukkar ..	0.93	1.11	8.90	1.36	5.79	12.41	2.79	0.31	3.99	4.98	4.21
Jacobabad ..	0.94	1.41	2.95	2.23	4.78	10.42	3.98	0.37	4.73	1.08	3.29
Larkana ..	1.68	0.76	4.84	1.68	3.59	9.04	2.00	1.99	4.53	3.88	3.40
Navab Shah ..	2.28	2.29	6.82	2.02	8.13	15.74	1.07	2.87	8.57	4.74	4.45

Soils and Soil Classification.

Excepting on, and, at the foot of the hills and in the desert of Tharparkar, all the soil of Sind region is alluvial, consisting of sand and clay in a very fine state of pulverisation. The proportions of sand and clay differ in the soil of different situations affecting its consistency and porosity, and the percentage of organic matter found present also varies. These differences are indicated by many Sindhi names loosely used and often local. The 1907 Gazetteer classifies the main soils of former Sind as wariasi, kacho, chiki or paki, rao, rae-wari and kalar. Of these soils Aitken remarks "Wariasi is a loose sand deemed fit only for melon cultivation. Kacho is soil resulting from recent inundation. It is called Rio Kacho if used for rabi cultivation the same year and Pako Kacho, if it has had a season or two to dry and harden. Latiari, Latwari and Lasiari are local names for varieties of this and Mithi (sweet soil) is a general term applicable to it. Gasiari appears to indicate a large proportion of sand. This soil is considered fit for almost all crops Chiki or Paki is hard baked soil, which has been submerged for a long time. It is also called Khahuri, Tak, Rappa, Rip and Dhuban. When rough and cloddy it is called Khariro and Khariari. It is very cohesive and heavy to work and therefore is not liked, but rice, wheat, jambo and other crops do well in it. A chemical analysis of these three main types of soil show that Wariasi contains 76.74 per cent. of insoluble silicates and sand, Kacho 67.64 per cent. and Chiki or Paki 66.68 per cent. Rao or Rae-wari, is soil enriched by the detritus of hill torrents. It is naturally very various, differing in consistency as the basis of it is sandy or loamy. A light and very dusty soil, found about Hyderabad, is called Dasar, and should apparently be classed with this; but the terms Dasar and Gasar are widely used for soft and light-coloured but productive soils. Soils of this class are of course suitable chiefly for barani cultivation. Analysis shows that this soil contains more limestone than Kacho, or Chiki or Paki. Kalar is land which has been more or less spoilt for agricultural purposes by excess of salts. It goes by a number of names. Shor and That Kalar are quite unfit for cultivation, while Mitho Kalar is capable of producing rice. A specimen of Shor from near the coast was found to contain 19.62 per cent. of sodium chloride, 2.32 of calcium chloride and 1.04 of magnesium chloride. A sample of Mitho Kalar from Jati contained 3.48 per cent. of sodium chloride, 0.84 of magnesium chloride and 1.42 of calcium chloride. A good clayey soil may have as much as 6 or 7 per cent. of sodium chloride and yet be fit for rice and after it leguminous crops and oil seeds. This is of course because the process of rice cultivation, during which water stands continuously in the fields and is frequently changed, washes out most of the salt. Such soil is known as Dangiasi Dangachhi. Kalrathi is another name for soil in which Kalar is mixed with good earth. In these soils the salts are generally near the surface and can be washed out, so that regular irrigation, with

drainage, may convert tracts which seemed to be hopelessly barren into fertile fields. In the desert parts of Thar Parkar all the soil is sand called Dago, and therefore yields small crops of bajri after rain. Cultivation in that area is generally confined to particular situations, such as flat valleys and shallow temporary tanks, where there must be a good deal of organic matter from decayed aquatic vegetation. On the margin of the Rann also there is hard soil, called Kathi zamin, which is submerged in summer and yields rabi crops of wheat after it dries. In Nagar Parkar the best soil is called Dasar. This rough and ready and rather unscientific classification of soils is now giving place to a more rational system. This system is being applied by a special officer, called the Soil Classification Officer, with a competent staff, which includes a Soil Chemist holding a Diploma of Agriculture. In his evidence before the Sind Agricultural Commission in 1953 the Soil Classification Officer described the method now used for testing soil. He said that there were four tests applied to soil : the first, to the surface condition ; clear loam soils are compact and therefore harden the surface, while loamy and sandy soils are soft ; the second test is colour ; certain colours are associated with different soils, as clay soils are brown or reddish and loams are generally khaki ; the third test is the most important, it is felt by hand, soil is taken up and felt with the hand and one can say whether it is soft or velvety touch of a loam, or it consists of small nodules and does not take a polish, which is indicative of clear loam, or it does not yield to any pressure from the hand which may indicate clay ; the fourth test applied is the water test ; in marginal cases where the feel test does not prove satisfactory water is used to find out how soil acts with water, whether it becomes sticky, which is an indication of clay soil, and how quickly it washes out off the hand which is an indication of sandy soil.

Acting on these principles the Soil Classification Department has divided the land in the Lloyd Barrage and the Lower Sind Barrage areas into four categories : A, B, C and D. Marks are awarded according to the merits of the soil under the four tests. First-class soil is categorised as 'A' if it obtains 400 to 326 marks. Second-class soil 'B' is that which obtains marks ranging from 325 to 151. Third-class soil 'C' is that which obtains marks ranging from 150 to 51, and the fourth-class soil 'D' is that which obtains marks ranging from 50 to nil. Soil classification is being carried on mainly for the purpose of the levy of land revenue. The problems associated with land are its fertility, which depends on finding out how the land and its water supply can be best utilised by cultivating the crops best suited for it ; deterioration of land, due to the formation of kalar and water-logging, and saving soil as far as possible from deterioration by taking measures in advance ; and the means of improving it when it has already deteriorated. The total area of land which had to be classified in the Lloyd Barrage area was 5,640,100 acres approximately, in the Lower Sind Barrage area

2,669,000 acres approximately and in the Gudu Barrage area 2,663,200 acres approximately. Of these the entire area under the Lloyd Barrage has been classified, and of the Lower Sind Barrage area almost all the land has been classified, except about 20,000 acres. The reason why this area of land has not been classified yet in the Lower Sind Barrage area is that the land is without proper boundary marks and there are some areas near the sea which have been omitted from classification as they are subject to tidal waters. The result of the classification of soils in the Lloyd Barrage area and the Lower Sind Barrage areas are shown in the following table.

	'A'	'B'	'C'	'D'
(a) Lloyd Barrage ..	18,23,749	26,74,160	8,33,600	3,08,630
Total ..			56,40,130	
(b) Lower Sind Barrage ..	4,36,700	10,14,300	7,64,500	6,400
Total			22,21,900	

Note.—In the Lower Sind Barrage Area, the figures are given only for the areas where totals have been taken. Of the rest of the area most of the land was rectangulated lately and therefore its classification has been finished very recently.

As regards the classification of soils in the desert area the Soil Classification Officer in his evidence before the Commission stated: "In the desert I actually, roughly, tested soils. There the cultivable areas can be divided into three categories. First are the low lying lands between two sand hills, forming a valley on a very small scale. Water during rains trickles down to this low level and crop is raised which is mostly bajhra although in some places 'Til' is also sown. The soil is very light and we may put it as sandy loam. The second is the 'Tarai' (low land). Here the soil is compact and it has the capacity to hold water. This soil the villagers use for hut building and naturally the area looks like a pit. Rain water is collected in these "tarais" mainly for drinking purposes. The "tarais" are rarely used for cultivation purposes. The third are sand dunes. On account of periodical rains grass grows on these and this yearly process of grass growing with rains has done some good in that roots of the grass bind the sand and hold the sand together and also retain moisture. The result is that not only

the grass provides fodder in abundance but keeps the sand from spreading down. There is also tree growth on the sand dunes like "Kandi" and "Kumbat" etc.

"In my opinion the desert land has never been affected by any soil forming process like collecting of alluvium or encrustation washing down from hills with natural processes like winds and rains. The nature of the soils or sand in the entire desert is similar and I do not think classification of these soils will serve any purpose.

"Similarly for hilly tracts the nature of soil is almost uniform and classification of soils there will also not be of much use."

As regards the delta tract of the river at Ketī Bunder and Ghorabari, the Soil Classification Officer remarked: "One could see that the soil here is mostly clay. The river in its long course deposits its heavier sediments in its upper reaches and at its tail end only the sediments of a very fine texture settle on account of the incoming force of tidal waters. Accordingly the soil is compact and sticky and suited for rice cultivation. The soil conditions are uniform and I think it will be of little use to get this tract classified. There is absolutely no tree growth in the tract mainly for the reason that the land is yet in the process of formation and water is affected very much by sea water."

In his "Notes on Agricultural Developments in Sind", Sir Roger Thomas has remarked of the Sind soils: "The soils in the alluvial belt are in general light loam in texture with a higher sand fraction than the average soils of the Punjab and considerably more sand than the soils of Egypt and Sudan. Sind soils respond readily to irrigation, except where they are impregnated with salt. The soil nutrient in greatest deficiency is nitrogen. Phosphates are rarely the limiting factor in crop yields. Potash in general is adequate for the needs of crops. The cultivated lands are rarely in good heart. The natural fertility of the soil", he says, "is a heritage which should be treasured and preserved. In Sind there is a grave danger of much of this heritage being lost to posterity. All alluvial soils under conditions of low rainfall carry deleterious salts of varying degrees. The concentration of these salts may be so high as to inhibit profitable cultivation. When sweet alluvial soils are irrigated they will in general preserve their natural fertility; but only as long as the subsoil water-table remains at a level beyond capillary reach from the soil surface. Once the water-table reaches this level the danger is imminent; within a few years the natural fertility will be lost and may never return. This has already occurred over extensive areas on the right bank of the Indus. The soil classification already carried out has revealed the presence of salt over wider areas than hitherto was suspected. What is of importance at this stage in the Lloyd Barrage area is the need to plan for the periodic reclassification of selected large blocks of land

with a view to watching the rate of deterioration, and at the same time to plan preventive remedial measures to counter the salt problem." The members of the Sind Agricultural Commission took this question of the rise of the subsoil water and the deterioration of soil occasioned by water-logging very seriously, and in paragraph 102 of their report they said : "From the experience of the working of the Lloyd Barrage canals on the right bank, during the past twenty years or more, it has been noticed that the subsoil water level is steadily rising. It has dangerously affected most parts of the district of Larkana, certain areas in Shikarpur sub-division of Sukkur district, and also certain parts of Dadu district. The original Lloyd Barrage Scheme had provided for drains at the cost of something like two or three crores of rupees, and these drains were mainly to be constructed alongside the perennial canals on the right bank because there is more of rice cultivation on the right bank of the River Indus, but drains were also provided for the left bank. Ultimately it so happened that the main scheme of the Barrage canals itself cost the Government of Bombay much more than what was originally estimated, namely 23 crores of rupees. The figure ultimately having gone higher to nearly 30 crores the Government of Bombay abandoned the idea of constructing the drains." The proposal which the Commission make for dealing with this question of seepage in the Barrage area is contained in paragraphs 103 and 104 of their report.

"There are two remedies which we think of. One that, as originally intended by the Government of Bombay when this scheme was prepared, the cemented drains be constructed alongside the perennial canals like Dadu Canal and Khirthar Canal on the right bank and Rohri and Eastern Nara canals on the left bank, to drain off all the water which rises from the soil.

The other scheme is that at least the two canals on the right bank, namely, Dadu and Khirthar as a whole, or at least the Warah branch which takes off 50 per cent. of the Khirthar Canal's supply and feeds western parts of Larkana district, be converted into non-perennial canals."

The Commission in paragraph 106 of their report states "Conditions are comparatively favourable, nevertheless, taking the long range view, and in order to safeguard any likelihood of the soil within the command of the left bank canals being exposed to water-logging and seepage, it is essential that steps similar to those suggested for the right bank be taken from now on even for the left bank." In accordance with this view, the Commission recommend the extension of suitable drainage channels for the Gudu Barrage area and the Kotri Barrage area."

The Soil Classification Officer in his evidence before the Commission had stated that seepage cannot be attributed to any one cause ; the physical texture of the soil, as well as the irrigation

system, bring about seepage. Light texture soil, like sandy loam or loam, has proved to be affected by seepage. The digging of canals deep in the soil crust and the low-grading of canals with the provision of water-falls tend to produce conditions conducive to seepage. The growing of rice is also one of the causes of seepage, as rice requires much water which keeps standing for a comparatively long time and the water-table in the area rises considerably. As regards the question of whether seepage is increasing or decreasing the Soil Classification Officer said that there were no statistics on the subject in his office ; but looking to the perennial flow of the canals in the Lloyd Barrage area one may expect seepage to increase.

In evidence given before the Sind Agricultural Commission the Executive Engineer, Research Division, stated : "Kalar lands are very common in Sind. They exist as small or big patches of land among cultivated fields and also as vast stretches of barren land extending over several thousands of acres covered with salt encrustations. The attention of predominantly kalar patches was drawn at the time the sub-soil level pipes were being fixed in the Barrage zone in the years 1930-32. After the pipes had been fixed, detailed investigation of these patches which number 34 was undertaken and completed in 1937. See APPENDIX No. VI.

The object of the investigation was to know the surface appearance of the soil with respect to different kinds of kalar and the nature of the substrata underlying it and to ascertain the causes of the formation of the various kinds of kalar in the surface and thus ultimately to consider remedial measures against the detrimental effect of kalar in order to make the soil fit for cultivation.

Another object of the investigation was to determine the co-relationship of the various flora growing on the soil with the surface appearance of the soil, the substrata and the water-table underlying it.

The main surface classification of the soil was as under:—

Serial No.	Classifications.	Symbol used.
1. Black kalar		B.K.
2. (a) Dark Brown kalar		B.I.
(b) Light Brown kalar		B.II.
3. (a) White kalar with traces of white efflorescence.		W.I.
(b) White kalar with thick white efflorescence.		W.II.

In addition, the nature of soil as to whether it is hard, cracked powdery or puffy was also noted.

The flora with special reference to intensity of growth was noted.

After the first classification of the kalar patches had been done between the years 1933 to 1937, in accordance with the recommendation, made by the sub-committee of the Central Board of Irrigation appointed to report on Water logging in former Sind in 1936, "that a complete soil survey should be made where salt lands are prevalent to see if there is any increase in the area which is unfit for cultivation, reclassification of the areas was started in 1937."

The kalar patches reclassified have been shown in Appendix VI. It was proposed to finish reclassification of the remaining kalar patches in about two years with the opening of the Drainage and Research Circle in 1946 but with the coming of the Partition there was depletion of staff and the Drainage and Research Circle was subsequently closed and very little further work was done.

No kalar reclamation work has yet been attempted by the Public Works Department, though with the opening of the Drainage and Research Circle which had a reclamation officer on deputation from the Agriculture Department, proposals and preliminary schemes were drawn up. It was considered that the immediate problem for former Sind was to take strict measures for controlling further deterioration of the soil rather than start on scattered schemes to reclaim kalar affected areas to bring more area under cultivation. As a first step in this connection collection of figures of rice cultivation in Barrage and Non-Barrage areas for 1932 and 1945 or 1946 for purposes of comparison with established and permissible rice areas and representation of this information on plans was decided on. The figures were not collected till about Partition in 1947 and therefore no further work was done beyond drawing the conclusion from a study of the water-table, with reference to the rice and dry crop cultivation, that rice is not the sole factor which contributes to rise of the ground water.

In November 1947, a detailed programme for reclamation work proposed to be carried out by the Reclamation Officer under the supervision of the Executive Engineer, Drainage Division was submitted by the Superintending Engineer, Drainage and Research Circle (now defunct). Two systems of reclamation were proposed, one, to open two experimental and reclamation farms:—

- (1) One in an area of high water-table, and
- (2) Another in an area of low water-table.

The sites selected were to contain soil textures of all the three types-Light, Medium and Heavy. The farms were to be of 60 acres each to start with. Experiments were to be carried out to test the comparative efficiency of the following reclamation methods under field conditions :

- (a) Sind methods, viz., leaching and cropping.
- (b) Punjab methods, viz., with or without leaching and cropping.
- (c) Modifications of the above methods necessitated by soil climate and irrigation conditions.

The second proposal was to have demonstration plots on zamindari lands showing how reclamation could be achieved. No further work was, however, done beyond drawing up the schemes owing to the closure of the Drainage Circle and the Drainage Division in 1947.

There are two main cultivating seasons, kharif and rabi. The former extends normally from June to October and coincides for the first three months with the height of the inundation. The month for sowing is usually June, though occasionally seed and especially rice seed is put in May, and if the rise of the river to a high and steady level happen to be late, sowing not infrequently takes place in July. Kharif crops are usually harvested in October. According to a popular formula Juari requires 3 chalihas (periods of 40 days) or 4 months to reach maturity and bajri 3 tihas (period of 30 days) or 3 months ; cotton on the other hand does not yield the final picking under 5 chalihas or nearly 7 months. The rabi season ordinarily comprises the period from October to March, though sowing may occur from September till early December and reaping may go on into April. A third season termed adhawa in Hyderabad and peshras in Upper Sind Region, lasting from April to June, is recognised, but owing to the want of water at that period of the year the area sown is exceedingly small and only subsidiary crops, such as juari for fodder, pulses and vegetables and in Upper Sind area tobacco, are grown.

The names of the months in the Sindhi and Muslim calenders (Muslim months calculated as for A.H. 1377), with their English equivalents, are :—

Sindhi Months.	English Months.	(Muslim) Hijri Months.
Chet ..	March-April ..	Ramzan.
Vesakh ..	April-May ..	Shawwal.
Jeth ..	May-June ..	Zill-Qadh.

Sindhi Months.	English Months.	(Muslim) Hijri Months.
Akhar	.. June-July	.. Zill-Hajjah.
Sawan	.. July-August	.. Muharram.
Bado	.. August-September	.. Safar.
Asu	.. September-October	.. Rabi-ul-Awwal.
Kati	.. October-November	.. Rabi-ul-Akhir.
Nahri	.. November-December	.. Jamad-ul-Awwal.
Poh	.. December-January	.. Jamad-ul-Akhir.
Mangh	.. January-February	.. Rajab.
Phagun	.. February-March	.. Shabaan.

The Sindhi names of the months given above are of Sanskrit origin and are those in full use throughout Sind and Khairpur Region.

In the desert and on the hills, though the seasons are the same, the farmer's operations, depending entirely on rain, vary with its variableness. Kharif sowing can rarely begin till well on in July and there is little or no rabi.

Methods of Cultivation—Kharif Crops.

Methods of cultivation Rice.

Rice is either sown in a prepared seed-bed and transplanted, or else the seed is sown broadcast in the field in which it is to grow. The latter method (called korar sariyun) is resorted to from indolence, or in low lying lands, such as beds of dhandhs and natural depressions, which retain moisture for a long time and are not suitable for transplantation. As soon as such land is dry enough it is ploughed several times and rolled ; then the seed is put in broadcast about April and the land ploughed again. Water is not usually admitted until the plants have grown a few inches. Sometimes the seed is put in with a drill, and sometimes the land is flooded and the seed is thrown on the water. From 1 to 1½ maunds of seed are required per acre for this kind of cultivation. Transplantation, though more troublesome, gives far better results and is usual both in Upper and Lower Sind areas wherever the nature of the land admits it. The seed-bed is either a moist corner of the field, which is ploughed several times, rolled and sown and only slightly watered as the plants grow, in which case the method is called bejo, or puraniyun bejariyun, because the seedlings are

grown on the old moisture; or else it is a small, prepared plot on which manure has been burned. The seed is sown among the ashes and well and frequently watered. This method is called khamosh or lurh'a. When rice is intended for transplantation the quantity required appears to be less on the average than one maund per acre of the field in which it is to be reaped, and the out-turn is much larger than when it is not transplanted. The average result of 19 experiments made in all parts of former Sind was 1,638 lbs. per acre, but it may be questioned whether this is of much practical value.

Transplantation (vehraj) is done entirely by hand, a month or more after sowing, when the seedlings are about a foot high. They are ready much sooner under the khamosh than the bejo treatment. The land, having been ploughed more than once during the winter, is again ploughed and flooded as soon as the canals fill, and the roots of the seedlings, in small bunches, are thrust into holes made in the mud with the hand or a stick. After that the field is kept flooded, the water being renewed occasionally, especially if any kalar land drains into the field. Rice is ready for the sickle in from two to three months after transplantation and all the male and female labourers gather to the reaping. They commonly receive payment in kind, from 1/10 to 1/15 of the quantity which each one reaps. The plants are cut a few inches above ground. To separate the grain from the straw, the whole is spread on a threshing floor (kharo) hardened and smoothed with kalar earth and trodden by cattle. The grain thus obtained is commercially known as "paddy" (Sindhi, sar yun). To make "rice" (chanvar) of it, it must be husked by being passed through a jandri, i.e., a hand-mill made of clay instead of stone, after which it is pounded with wooden pestles in earthenware mortars to remove the fine skin under the husk. Rice straw is good fodder for cattle, but horses do not like it.

A peculiar cultivation obtains in the bhal lands of the Ghorabari and Shahbandar Talukas, which are within the reach of tidal influence and liable to submergence by water more or less salt. These lands are never ploughed, except by the feet of the buffaloes which are turned in after the harvest to feed on the stubble and weeds. They knead the mud most effectively. When, with the rise of the Indus, fresh water predominates over the salt, it is admitted into the fields, which are enclosed with high bands, and allowed to stand in them until the seed is ready to put in. The seed undergoes a curious preparation. It is first packed in bags made of rushes and laid to soak for four days in pits filled with sweet water, then spread on a platform of hardened clay, covered with mat and earth and left for four days more. At the end of that time, having begun to germinate, it is washed, laid on mats and watered well for two days more. It is then ready for sowing, which is accomplished by throwing it in handfuls, into the air and allowing it

to alight, with the radicles lowermost, on the soft mud of the field, from which the water has previously been drained away. For the next three days, until the seeds are established and able to bear submergence, they are a sore temptation to birds and must be watched day and night. Heavy crops are obtained with little labour by this method of cultivation, but only red rice thrives on it. There are many varieties of rice, known by as many names. Sugdasi is one of the best known, a fine, white rice: sathria and sonahri are other white kinds. Motia, ganja, kambru and lari are red.

Bajri.

The Bajri plant is hardy and less exposed to the attacks of insect and fungoid pests than juari. As soon as water enters the canals, generally in the early part of June, the Persian wheels, which have been previously placed in position, are set at work to irrigate the land preparatory to ploughing. Sometimes two floodings are given before further operations are undertaken. When the surface moisture has been partially absorbed, seed is scattered and the land ploughed again; but sometimes, if the ground is hard, or plough cattle are not available, this ploughing is omitted. The seed rate ranges from 6 to 16 lbs per acre. The field is then divided into compartments (bara) by low earthen ridges (bana) for convenience of irrigation. If asked at this stage how his cultivation progresses the agriculturist will respond that his field holds bana. Another watering is given ten days or a fortnight later and after that the waterings succeed each other at intervals of a week or ten days: sandy soils require water more frequently. The spike in its sheath appears in about 40 days: this stage is known as dido chaunk. A fortnight later the grain begins to form in the spike and the necessity for its protection from the depredations of birds immediately arises. For this purpose a platform (peho) supported on poles is constructed, from which the watcher can view the tops of the waving corn. Standing there armed with a sling (khambhani) and provided with a pile of clay pellets (gulela), which he hurls with an accompaniment of imprecations at his feathered foes, the cultivator, or one of his sons, guards the crop from morn till eve. The cultivation is now said to have reached the stage of containing pehas. As the crop ripens the watcher remains at his post, though perhaps asleep, through the night to ward off other dangers. Bajri is ready for the sickle in three months. The spikes are cut off by the reapers, men and women hired for the occasion, and stacked at a previously prepared threshing floor (kharo), of which the surface is made of saline earth or otherwise hardened as much as possible. The reapers (lahyara) are commonly paid in kind, each receiving at the end of the day a quantity of spikes containing about 2 toyas or 16 lbs. of grain. The spikes are cut off quite short, the stalks being reaped afterwards. When all the spikes have been collected they are spread out to an even depth around a pole (muni) fixed in the ground and the grain trodden out by cattle.

The method of cultivation above described prevails in the Hyderabad District and, with little modification, throughout Sind region in irrigated lands. In the desert portion of Tharparkar, and wherever cultivation depends on rain, the farmer has to adapt himself to quite different conditions. He cannot begin till rain falls, which may be in June, or in July, or not till it is too late to be of any use. Dams are usually put up across valleys, or hollows, to confine the precious water. Immediately after the ground has been sufficiently moistened it is ploughed and then rolled with the Sanhar to prevent the moisture evaporating. A few days later it is again ploughed and the seed sparingly distributed with a drill, three sers suffice for an acre. After that progress of the crop depends on more rain. The time of reaping should be October, but varies with the time of sowing. The out-turn is small compared with that of irrigated lands.

Methods of cultivation.
Kharif
Crops. Bajri.

The cultivation of juari is similar in all respects to that of bajri save that the crop matures in four instead of three months and consequently require water for a longer time. Manure is not usually employed unless the land is cultivated without fallows. The seed, which is soaked overnight in water, is scattered by hand, the usual rate being 1 to 2½ toyas, from 8 to 20 lbs. Per acre. Subordinate crops such as saon, guar or field vetch, (Cyamopsis psoraliodies,) green gram and chaunra, are frequently sown with juari, either mixed with it or along the edges of the compartments. In some parts, e. g. the south of the Karachi District, juari and bajri are grown together. Seedlings are transplanted from patches of the field where they are thick to patches in which the seed has not germinated well, and it is the popular belief that transplanted, juari sends its roots deeper and yields more than that which has not been moved. Juari grows to a height of ten or twelve feet and the heads therefore have to cut off after the reaping: the grain is threshed in the same way as bajri. Juari straw, called karbi is excellent as fodder for cattle and horses and is sheaved and stacked in ricks (dan). The stalk (gano) is sweet and is eaten to a small extent by the cultivators, like sugarcane. The crop grown in the adhawa season, or hot weather months between the regular rabi and kharif crops which is called arhari juari, is simply cultivated as a fodder.

Juari.

Juari is not much cultivated on rain showers alone, but it is on land irrigated from hill torrents (nais). In this case the process is in some measure similar to the barani cultivation of bajri but if rain falls near harvest time juari sprouts again from the roots after being cut and a second crop is obtained in March or April. If rain falls again in May another kharif crop may be obtained from the same roots.

Maize is grown chiefly as a subordinate crop in the kharif and as a fodder crop in the adhwa season. The kharif sowing takes place in June or July. The seed is mixed with cotton, juari, or

Maize.

bajri. The crop ripens in September, but the crops are cut while the grain is still soft in them if intended for use as a vegetable.

Saon. Saon is a cheap millet which is grown in the same field with bajri and juari. It ripens quickly. The grain is eaten by Hindus on fast days and to small extent by poor cultivators. It is also grown as a fodder.

Chauara. Chaunra is a pulse which is grown as a subordinate crop along with bajri, juari or cotton either mixed with these or in one or two separate compartments of the same field. The pods are picked in September and October.

Sesame. The method of cultivation of sesame is the same as that employed for bajri and juari, with which in fact sesame is generally sown, either in separate compartments of the same field or along the ridge of the field channels. White and red varieties are grown: the former commands a better price. The seed rate is generally from 4 to 6 lbs per acre. The crop matures in three months and is reaped with a sickle, the stalk being cut near the roots. When dry the capsules open and the seed is shaken out by hand.

Cotton. Cotton is cultivated in several ways. The following is prevalent in the Hyderabad District. If the land is not well fallowed a dressing of 6 tons of manure per acre, may be given soil from old buildings is also used when available. In the neighbourhood of Brahmanabad the debris of that ruined city is freely employed. The seed, which is soaked in water and cleared of lint by rubbing it in the dust, is sown by hand, the usual allowance being 24 lbs per acre if seed obtained from hand-gins is used and twice that quantity if the seed is procured from a ginning factory. In some places the seed is drilled. Sowing takes place in June after the lands has been thoroughly ploughed and moistened. The land is ploughed once more after the seed has been put in. The crop requires no water for a fortnight, after which it is watered at intervals of 8 or 9 days. It requires to be weeded twice or thrice at intervals of a month. The first picking is ready in November, after which three or more pickings are taken until February. The pickers get from one-sixteenth to one-twentieth of the quantity they collect. If severe cold sets in before the cotton is picked there is serious risk of its being frostbitten on which account a very inferior variety but one which matures rapidly, has been the favourite in Sind Region.

But cotton is also raised by well irrigation and in that case the seed is sown in February. The land, which should be soft and silty, is first watered then ploughed once or twice and rolled with the sanhar between September and November. It is once again ploughed before sowing and then furrowed, and the seed is

put into the ridges by hand. Pickings commence in July. The first crop is called neri. A second (Mundhiyun) is obtained in the following year by leaving the plants and cutting them down, in February. They grow again from the old roots.

A third, very primitive method (called belai) is followed on soft or even sandy, soils near the river, which have been flooded and remain moist. The ground is merely ploughed once and rolled, and then the seeds are put in at intervals with the fingers. The plants grow very tall and strong but the cotton is coarse. The introduction of Egyptian cottons, mentioned elsewhere, will no doubt, if successful, bring in more careful processes than any of these described.

Sugarcane is best laid down in February, as it ripens then, if well manured, in November and thus escapes destructive frosts which not infrequently occur about the end of December and later. But it is occasionally laid down as late as May and in that case it is not ready before February. The first crop, grown from fresh sets, is known as neri: if the plants have been strong a ratoon crop, called banth, is grown from the old roots after the first crop has been cut. The ratoon crop matures in less time than the first. Land intended for the reception of sugarcane is given a dressing of from 10 to 30 tons of cattle dung per acre. It is thoroughly ploughed and divided into small compartments in which the sets, numbering from 20 to 30 thousand per acre are planted upright. The sets (bulli) consist of short lengths of cane, each containing a joint, from which two or three sprouts will grow. Before the planting they are kept in soft mud till the sprouts appear. A good flooding is then given to the land after which the crop is watered once a week. The irrigation is generally by lift, one wheel being capable of irrigating 5 or 6 acres. The crop is weeded once a month for the first four months. Sugarcane makes slow growth during the first three months and it is common to grow with it subordinate crops such as small-fruited dolichos, chaunra or bajri for fodder, which are removed before they interfere with the principal crop. The cane is cut with a sickle and crushed in presses worked by camels or oxen. The old wooden press (chichro) is being rapidly supplanted by iron machines. The extracted juice, to which a little chaniho, or crude carbonate of soda, is added to facilitate the removal of the scum, is boiled down in large iron pans to the state of a soft solid in which it is sold as gur, misnamed "molasses". It is simply unrefined sugar. A considerable quantity of cane is sold intact to be eaten fresh.

A light soil with a deposit of fresh silt is considered the best for this crop. As soon as the canals fill in June the field is irrigated and well ploughed and then divided into small compartments, in which the seed is scattered whilst the earth is still quite wet. From two to three kasas (76 to 114 lbs.) of seed are put in per acre.

The seed is soaked overnight in water. The field is given a slight watering every second day until the plant shows about two inches above the ground after which water is given every fourth day, after the crop is about 18 inches high water is given only once a week. The crop is weeded when it is about 3 inches high and again when it has reached a height of 18 inches. Indigo plants are ready for the sickle in about 3 months. A crop grown from seed is called neri. The roots are invariably allowed to remain in the ground for a second crop called mundhiyun in the following year, this ripens in $2\frac{1}{2}$ months and is the crop from which the seed is taken.

The dye is extracted from the stems and leaves of the plant, which are soaked in water in pits (hauz) constructed of bricks and mortar. The reaping is always done in the morning and the produce thrown into the pits at midday. After immersion for 12 hours the stems and leaves are removed and the water is churned for 2 or 3 hours. The contents are then allowed to settle for 6 hours during which the dye is precipitated at the bottom of the pit.

Hemp.

This is grown in small patches for the convenience of the cultivators. The landholder has no share in it. The seed is sown in July in a small compartment of a juari or bajri field, or along the ridges of the compartments. The crop is watered along with, and is reaped soon after, the principal crop. After it has been reaped the seed pods are cut off and the stalks are soaked in water for 4 or 5 days, when they are taken out and dried and the fibres (Tanduro or sut) stripped off by hand. From the fibres the cultivators make ropes, for which they find numerous uses in agriculture.

Tobacco.

Tobacco is always raised from transplanted seedlings. In the Hyderabad, Karachi and Tharparker Districts the seed is sown in June, on ridges, in a seed-bed which has been thoroughly ploughed, irrigated and manured. The seed rate is from 4 to 8 lbs. per acre. After a month's growth, the seedlings are removed and planted out singly on ridges in a field well manured with the droppings of sheep and goats. If possible the grower gets these animals penned in his field for some time but if he cannot arrange this he gives the land a dressing of about 5 tons of manure per acre.

The crop is watered every day for the first three days after which the waterings are gradually reduced to once a week. Reaping takes place about December and is done between dawn and sunrise. The whole plant is cut down at the root and on the following day the leaves are taken off and spread out in the sun. The drying takes a fortnight or more, during which the leaves are turned over every third or fourth day. When dry, the leaves are collected in a heap, which is covered over with palm-leaf matting and weighed. After remaining in this condition for about a fortnight the leaves are sewn

up in bags (toris) made of date fibre, each containing 160 lbs.

In the north of Sind region tobacco is a spring (adhawa) crop, the seed being sown between December and February and the leaves picked from April to June, but the method of cultivation does not differ materially.

Methods of Cultivation, Rabi Crops.

Land is prepared for wheat by being flooded at the end of the inundation, ploughed once or twice, pulverised and then rolled to restrain evaporation of moisture. Flooded lands, the beds of dhandhs etc. are prepared in the same way as soon as the water dries off them. No further watering is required except in lands dependent on artificial irrigation. Manure is not generally used. Seed is scattered occasionally, but usually it is drilled. The seed rate varies enormously, the ordinary range being from 50 to 180 lbs. per acre. Sowing takes place in November and December and reaping generally in April. The reapers are either paid in cash or given from one-fifteenth to one-twentieth of the quantity each reaps. **Wheat.**

Both crops are invariably grown either in kacha and other lands which have been submerged by the spill of the river or of a canal (sailabi), or on lands which have been given a flooding of wheel irrigation towards the end of the inundation (bosi). Sowing takes place late in September or in the early part of October. The seed is generally scattered, but sometimes drilled, the usual rate being about 2 toyas or 15 lbs. per acre. The crop is frequently grazed a little in order that the plants may grow thick. The leaves of rape are also used as a vegetable by all classes. Reaping is done in March and April. **Rape and Jambho.**

The grain is threshed out by bullocks.

The cultivation of gram is in all respects similar to that of rape and jambho except that it ripens a little later. In reaping the whole plant is plucked up. The seed rate is something less than a maund per acre. **Gram.**

The cultivation of chickling vetch is simple like that of gram or jambho. In kacha land the soil is frequently not even ploughed, the seed being scattered over the cracked surface; and no further irrigation is given, nor any manure. The seed rate is about 2 kasas or 75 lbs per acre. The crop is frequently grazed in order to strengthen it and the leaves are used as a vegetable by the cultivating classes. The crop ripens in March, when the plants are pulled up by the roots and the pods trodden out by cattle. **Chickling Vetch.**

VEGETABLES AND FRUIT

Vegetables.

Vegetables.

A list of the principal vegetables cultivated in Sind will be found in the article on Botany. The methods of cultivation cannot be given in detail. All the roots are grown in the winter. Of the greens, hibiscus (bhendi), brinjals, purslain and amaranth are sown in the commencement of the kharif season, whilst the rest are sown in November and December. The gourds are nearly all grown in the kharif; the only kinds which are sown in the rabi are melons, musk melons and water melons. In addition to these the pods of the guar (*Cyamopsis psoralioides*), a pulse occasionally sown with bajri and juari, and of the horse-radish tree (*Moringa concanensis*) and the young leaves of rape and gram are used by all classes as vegetables. In the winter tomatoes, lettuce, beetroot cauliflowers, peas and other European vegetables are grown in gardens near to large towns.

Spices.

Spices.

The principal spices cultivated in Sind Region are ved chillies (garha mirch), coriander (dhana), fennel (saunf) and mustard (ahur). Chillies are grown both in the kharif and rabi seasons, the rest only in the rabi.

Fruits.

Fruits.

A Sindhi, as a boy, exhibits the same craving for unripe berries and wild fruits as boys in other parts of the world, but when grown up he does not cultivate fruit for his own consumption. However, after integration, the Sind Region is progressing well in producing fine qualities of varieties fruits, particularly mango and bananas for consumption in other parts of the country. Describing Thatta in 1699 Captain Alexander Hamilton writes, "The Kings' gardens were in pretty condition and were well stored with excellent fruits and flowers, particularly the most delicious pomegranates that ever I tasted." It was Thatta then, now it is Hyderabad, where, if there is no king, there is a population able to appreciate and pay for good fruit. Near Karachi also, along the Lyari river and as far as Malir, there are gardens owned by Khojas or Memons which supply the market with all the standard fruit of which the following are the principal.

Mango.

It is raised from seed, which is sown between July and August in a nursery, from which it is transplanted after two or three years. For about five years other things are cultivated round about it so that the soil is frequently dug up and well manured with cattle manure, or goats dung. After that it is not manured, but the roots are exposed for a few days in the autumn,

after which the ground is well watered and turned up. A mango tree begins to bear fruit when 5 year old. The fruit begin to appear in March and ripens in June or July. Mangos of various varieties are being produced in abundance in Hyderabad and other Districts.

This is grown from cuttings, which are put down about March or August and begin to bear in two years. Figs are regularly manured with goat or cow dung and also pruned in February or March, when their roots are also exposed for a week or two. The fruit ripens in July or August before which it is customary to sprinkle or wash the foliage from the dust which would smother it. Fig.

Cuttings are put down in the spring or autumn. The trees have their roots exposed and are manured either in spring or about June. In the former case the fruit comes on in July or August in the latter about November. Pomegranate

These are raised by layers in the spring or autumn and are ready to bear in 3 years. They are manured at the same seasons, with goats' dung if procurable, otherwise with cattle manure. They are not pruned but their roots are exposed before manuring and the leaves are removed by hand in December or January. The fruit ripens in May and June. The Sind apple is a very small fruit of unpromising appearance but develops a flavour when cooked. It does not grow on the coast. Apple.

Peaches are raised from seed sown in the spring and afterwards transplanted. The treatment of the tree is similar to that of apples, except that the leaves are not artificially removed, as they fall of themselves in the winter. The fruit ripens in July, earlier than any obtainable from Quetta, and hence is in demand though not of high quality. They do not grow on the coast. Peach.

Guavas may be raised from seed or layers, the tree is ready to bear in 3 years. The soil is richly manured in spring with buffaloe or cow dung, but the trees are not pruned or otherwise treated. The fruit ripens principally at the end of the monsoon season. Guava.

Vines are raised from large cuttings put down in the spring and begin to bear fruit in the third season. In February or March they are severely pruned and the roots are exposed, after which the ground is richly manured with dung of goats and cows, or blood and offal and the entrails of fish. The fruit ripens in June and July and is done before the Quetta grapes are ready to compete. The Karachi season is a little earlier than that of Hyderabad. The grape most commonly and successfully grown is the Kismis or seedless sultana, but the large Qandhar grape also grows well several fine foreign varieties have been introduced. Grape.

Plantain.

This is the poor man's fruit and is an exception to the rule that orchards are found only near large towns. Dense groves of plantain trees may be seen near many remote villages. The fruit may be described as execrable. There is no reason why it should be so, for the best Bombay varieties flourish in the soil of former Sind. Plantains are propagated by separating the shoots which spring up around the parent stem after it has fruited. No further trouble is taken with them. They must have abundant water and are therefore usually planted near an irrigation channel or well, but the soil is rarely manured. The transplanted shoots produce fruit in the second year and at any season.

Papai

This yields a quicker return than any other orchard tree, the fruit being ready to pluck eight months after the seed is sown. But the trees are short lived. Seed is sown at any time except the cold season, and after a short time in the seed bed the young plants are transferred to well manured land. They require liberal watering.

Rotation, Fallows and Manure.

These three things are interdependent and may be taken together. Rotation of crops, is unknown in Sind. Fallows are too well known. As to manure, the way in which the Sindhi farmer gets on without it would astonish his fellow in any other part of Pakistan to say nothing of western countries. The truth is that, in the absence of competition, ambition and every other stimulus which urges the husbandman to get the most he can out of his field, the Sindhi has for generations cherished the gentler ideal of allowing his field to divorce him as little from his hookah as might be compatible with keeping the latter filled. The Indus has fertilised his field once a year, and if that proved insufficient, he could leave it for a while and till another, for land was lying around him in abundance, as it still is. But to describe the system on which he leaves land fallow is impossible, for he has no system. Land watered by flow, in which a kharif crop has been grown, is generally left fallow for a year ; but land watered by lift gets less silt, so he lets it lie for two years, or three, or some times four. Lands which are inundated all the summer will go on year after year yielding a winter crop ; but if after some years they get impoverished and begin to give a poor return, he will give them a rest. So also rice lands flooded by the inundation are rarely left fallow : if they are, then a crop of jambho, gram, or something else, is taken from them in the winter, which is a step, though an unintelligent one, towards rotation. Very good rice lands are made to yield a winter crop regularly without lying fallow in the summer, especially in the Larkana District. Deliberate rotation is only practised in the case of cotton and sugarcane. Cotton will not thrive for two successive years on the same land ; accordingly a cotton field is either left fallow in the second year, or manured and devoted to

some millet. In the case of sugarcane, which is an exhausting crop and must be heavily manured, rotation appears to be practised from motives of parsimony. Having put so much into the ground, the farmer is loth to leave it unproductive when he can, without further expense, get from it a crop of pulse or millet. Sometimes garden vegetables, which require much manure, are put into the ground from which it is intended to raise sugarcane in the following season.

As has been said, the Sindhi farmer seeks very little help from fertilising agents. The farmsteads, especially in the south, contain great accumulations of manure, the removal of which would benefit man and beast alike ; but the adjoining rice fields, though cropped year after year, are never manured. The mud-flats of the Indus, which are yearly cropped with wheat and oil-seeds, and lands newly brought under cultivation, or those bearing leguminous crops, are also made to yield their produce year after year without manure. And the land justifies the indolence of its occupant, giving him larger returns than the farmer of any other region can show. One reason for this is that the average holdings are so large that the most thriftless cultivator can satisfy his wants by tilling portions in rotation and refusing to be troubled with exhausted ground. But some crops must be manured even in former Sind, especially sugarcane, tobacco and vegetables ; and it may be noted that the two last are raised chiefly by Lohana, Memons, Borahs and other castes than the Sindhi peasant. The manure in most general use is the dung of cattle, sheep and goats, the last being considered by far the best for garden produce generally and tobacco. Another fertiliser which is in great request is the earth from the mounds that mark the sites of old towns and villages. Whether this is valued for the lime in it, or supplies those nitrates in which the soil of former Sind is so poor, has not been ascertained. Canal silt is also valued and kalar is employed occasionally for various crops, especially when the soil is thin and dry. Sewage and town refuse and even nightsoil are employed to a certain extent near all large towns for vegetables and special crops. Blood and offal are used for fruit trees, especially vines, and fish also ; but, with this exception, the use of fish manure appears to be unknown. Everywhere else in western country it is imported if not locally made. Green foliage also, which is deemed the only proper manure for cocoanut trees on the Kanaa coast, is thrown away as worthless in Sind. Bones are exported to fertilise the fields of Europe. The only use made of ashes is that cow-dung and chaff are burned on seedbeds in which rice is first sown.

The value of cattle manure and village refuse is known to most of the cultivators, but as these manures are inadequate to meet more than about 5 per cent. of the gross irrigated area they are customarily used for the fields nearest to villages. Composting is not a common practice. Much valuable manure is lost through

its use as fuel in domestic cooking. Chemical fertilisers were not in common use before the War. They are now being popularised by Government subsidies. The potential demand for chemical nitrogenous manures is great.

Under local conditions of agriculture it is sweet and naturally fertile land that responds best to chemical manures. Salt soils and hard clay soils rarely give adequate response. All irrigated lands respond more readily to chemical manures if they are first given organic manures in the form of cattle dung, compost, green manuring or oil-cakes. Green manuring, as practised by some of the more enterprising landowners offers considerable scope for preserving the fertility of the land and for increased crop production.

Crop Pests and Diseases

Since the last edition of this Gazetteer was published in 1907 very great advances have been made in the study of crop pests and diseases, though it may be doubted whether modern science is doing more than holding its own against the onslaught of the insect world. The pests which afflict the crops in former Sind and Khairpur may be classified roughly under fungoid growths, minute insects such as aphides, larvae of the higher orders of insect working in concealment, open-air raiders, such as locusts, birds and beasts. The cultivators denote the first three classes as "diseases" because the cause of the damage that is done is not obvious. Sindhi names for the pests are confusing and unscientific. The main pests, however, may be enumerated as Rati, Kani, Mahlo, Uli, Khas, Angari, Murih, Murahi, Bokhro and Rohro, Makoriun and Kiuliun.

Rati indicates a disease of wheat known in England as "Spring rust". It is a fungus which appears as minute spots on the leaves, first orange-coloured and afterwards blackish. It is favoured by cloudiness and damp.

Kani is a fungus that attacks juari principally, consuming the ripening seeds in the ear and filling them with its black spores. It is attributed to unfavourable weather, but steeping the seedcorn in water before sowing is supposed by some to have an influence in averting it.

Mahlo On the Jamrao canal this is said to be applied to smut in wheat but in general it indicates a black aphid (probably of several species) which attacks many kinds of cereals, oilseeds, cotton and fruit trees, weakening them seriously by sucking the sap. Favouring conditions are damp and cloudy weather and the only remedy used in this country is to hope for a change in weather.

Uli is another aphid which attacks oilseeds.

Khas may be translated as "blight" and is used when the heads of bajri or juari, are thin or empty owing to cold, a bad wind, or some occult cause. There are many bad winds with specific names such as bug, Vail.

Angari is a weed which grows in exhausted and ill-watered juari fields and blights or starves the juari. Weeding, copious watering and sprinkling with salt are remedies sometimes tried.

Murih, Murahi, Bakhro and Rohro are names for some of the countless caterpillars which feed, each on its own favourite crop, and do more or less mischief. One which attracts more attention than the rest is *Kinyo* which attacks the stalks of Juari from below and may be identical with *Suro*, a very serious sugarcane pest. It is the larva of a moth (*Chilo simplex*), which lays its eggs on the leaves of the plant. The larva burrows into the very heart of stalk and eventually kills the plant.

Murahi is the white-ant, a termite, or some insect confounded with it, which attacks various plants at their roots and is treated with earth over which a pir has repeated incantations.

Makoriun and Kiuliun, black and red ants, are also charged with injuries of which they are certainly not guilty though they may be in attendance on other injurious insects.

Cotton has three special pests besides the Cotton Aphis. One is the Red Cotton Bug, with a black diamond mark on its back, which pierces the boll with its long beak and sucks the seeds. It does damage both by destroying the seeds and staining the lint. To shake the bugs, into a pot of hot water, or kerosine oil, is an easy and effectual remedy. The second pest is the Bollworm, or rather worms for there are three species, the pink (*Gelechia gossypiella*) and the two spotted (*Earias fabia* and *Earias insula*). They are the caterpillars of moths which lay their eggs on the young bolls, and their food is the seed, but in getting at it they do in redible injury to the cotton. They have been a serious pest in Punjab but have not attracted much attention in Sind where they appear to have no special name other than kinyo or gadar. No effectual remedy appears to have been found, except hand-picking of affected bolls. The third special cotton pest is a "borer" or beetle (*Sphenoptera gossypii*), which bores into the stem of the plant and kills it. Burning all withering plants checks the spread of it.

Of open enemies the locust (Makar) is the most important. The Sind locust is *Acridium peregrinum*, the same which plagued the Egyptians in the days of Pharaoh. Its breeding grounds in this country are in the Desert, in the hills near Karachi and possibly in many other regions where the female lays her eggs in

soft sand or earth during the hot season or monsoon. The young locusts are said to emerge in a fortnight or so, but this probably depends on rain. They attain their wings in six or seven weeks, after which they take flight sometimes to very distant regions especially when, under favourable conditions they have multiplied abnormally. The campaign against locusts is waged with varying success, but enormous benefit results from the organised destruction of the "hoppers".

Makri and Tid are grasshoppers and crickets, which differ from locusts only in not being migratory. The damage they do is local, but may be serious.

Siato are landcrabs that do damage to rice.

Kukai, tortoises, are charged with the same offence. The species has not been determined, but several species of the herbivorous genera of Testudinidae are found in the Indus and spread over all the rice country during the inundation.

Kua, rats, are a more serious menace, for which no remedy is sought, though it should be easy, with a little energy, to dig up their burrows and exterminate them, or poison them. The Mole Rat (*Nesocia bengalensis*) is probably the species in every case, but it is spread throughout former Sind and stores large quantities of grain in its burrows, which may easily be recognised by the mound of earth that conceal the mouths of them. This rat is fond of water, swims like an otter and lives by preference in rice lands, and the banks of dhandhs.

Among feathered plunderers *Wahio* well-named the "Jowaree Bird," and known to science as *Pastor roseus*, is the worst. Starlings are often associated with it. *Bori* is a kind of bunting (*Emberiza melanocephala*, or *luteola*) which collects in vast and hungry flocks and is deaf (*bori*) to the maledictions of the frantic watchman. *Mithu*, the parrot, does some injury also. The remedy for all these is the boy (*ningar*) and the sling (*khambhani*). Among wild beasts *Gidar*, the jackal, is one of the worst. In spite of its carnivorous lineage, it has a sweet tooth and a penchant for sugarcane and melons. The porcupine (*Serh*) ravages gardens and is said to be especially destructive to potatoes. Wild hogs and deer are capable of doing much harm where they are common.

The remarks of Sir Roger Thomas on some of the pests afflicting agriculture in Sind region are worthy of inclusion in this Gazetteer.

Locusts. The headquarters of the Locust Intelligence Service in charge of the Central Government, is located at Karachi. It maintains close touch with locust movements in the Middle

East through the agency of the International Locust Service which gives warning of approaching swarms. Responsibility for control of locusts in the irrigated areas rests with the Provincial Government. Control in desert areas is shared between the Central and Provincial Governments, but responsibility for finding labour and supervisors for work in desert areas rest entirely with the Provincial Government. During the past few years, thanks to the resolute manner in which successive Collectors to Tharparkar district have tackled locust outbreaks in the desert areas, the swarms which would otherwise have multiplied by breeding have been decimated. But there is danger of locust outbreaks being much more intense and widespread than anything experienced during the past few years, and the plan should make provision for such a contingency. Owing to the short period during which locusts can be killed in the hopper stage, planning cannot be expected to be effective if it is delayed until the swarms arrive. All the ingredients of poison baits and other materials required for destroying this pest should be made available in the zone of attack at very short notice. The source of supply of labour and supervisors for trench digging should be made known well in advance to the administrative staff of the district concerned. The source of adequate transport for men and materials should be made known well in advance to the administrative staff of the district concerned. The source of adequate transport for men and materials should be previously decided. The help of the Military and Air Force may have to be elicited in the event of a serious outbreak in desert areas and this needs prior negotiation.

Crickets. The cricket pest is responsible for extensive devastation of crops in Upper Sind region each year. The life history, habits and methods of control of this pest have been investigated with the collaboration of the Central Cotton committee. The same poison baits can be used as for locusts.

Citrus Black Fly. The black fly (*Aleurodes* sp.) pest of citrus trees in the south zone of the Barrage takes a heavy toll of citrus fruits and especially grape fruits each year. This pest is controllable though so far the Department has failed to do what is required. The efficiency of the new insecticides viz., DDT and Freon Aerosol should be tested under control conditions.

Wheat Rust. The rust diseases of wheat are responsible for a very considerable depression in crop yields. Most of the wheat crop in former Sind is grown from varieties which have proved to be relatively resistant to rust in the ex-Punjab, but owing to more humid conditions and a shorter winter in former Sind even Punjab region varieties are heavily attacked by rust. It is my experience that early maturing varieties are less affected than the long duration varieties. The search for early maturing rust resistant varieties suited to the local climatic conditions should be intensified.

Aphis. The low yielding capacity of various rabi pulses and oil-seeds in Lower Sind area results in large part from the heavy attacks of aphis resulting in the cultivation of these crops being unremunerative. This in turn affects rabi intensity of cropping. A search should be made for rabi pulses and oil-seeds which are inherently resistant to aphis. At the same time experiments should be conducted to correlate the incidence of aphis attack with differential irrigation.

Terek Disease of Cotton. Terek is the name given to the physiological symptoms revealed in the cotton plants when the bolls refuse to open properly. Cotton so diseased may be so inferior as not to be worth picking. Investigations made by the Central Cotton Committee in Punjab and confirmed in Sind revealed that terek and also the red-leaf blight of cotton may result from a combination of a number of adverse environmental factors such as high salt content of the sub-soil, deficiency of soil nitrogen, high temperatures and strong dry winds when the crop is nearing maturing, and shortage of water at the same period. There is no single remedy for this physiological disease, but preventive measures include keeping the land in good heart with organic manures, the application of sulphate of ammonia to lands free from salt, frequent light irrigations during the maturation period and the breeding of cotton varieties which are inherently resistant to the disease. This last matter is engaging the attention of the breeder in charge of the long Staple Cotton Scheme.

Cotton Boll Worm. There is no direct method by which the cotton boll worm can be profitably destroyed but the incidence of attack can be considerably reduced by removing the old cotton stalks sufficiently early each year to break the life cycle of the insect by depriving it of its food during the interval immediate preceding the growth of the new crop. A scheme financed by the Central Cotton Committee has been in operation on an extensive area during the past few years in Tharparkar district to test the efficiency of these measures. The scheme has proved its usefulness and it now rests with Government to make it compulsory for all growers to remove the old cotton stalks before a prescribed date. The depredations of this pest are considerably reduced by growing early maturing varieties of cotton.

(For list of insect pests see Appendix No. VII.)

Field Tools.

The implements used in agriculture are of the most primitive description.

Wooden Implements. The wooden implements, for which the cultivator supplies the material, are fashioned for him without extra charge by the carpenter, the latter receiving his payment in kind at the harvest. Of iron

instruments the ploughshare, sickle and rambo are supplied by the blacksmith in return for a small share of the produce, and the only tools which require to be paid for in cash are hoe and exe.

The plough (har), which is drawn by one pair of bullocks, or, as commonly in the Desert, by a camel, consists of three main parts made of babul wood. The body (har) is a stout board from 3 to 4 feet long and about 9 inches broad, which inclines, when the machine is at work, in a slanting direction backwards. The guiding lever (muthio) is inserted in the upper end and in the lower the shoe (chuni), a pointed shaft about 2 feet long with works almost horizontally; the share (phar) is the iron point of the shoe and is about 9 inches long. Sometimes an iron ghobo takes the place of both chuni and phar. The draught-pole, haria, which is about 7 feet long, is inserted into the body of the plough a little above the shoe and at the other end carries the yoke (panjari). The latter is generally made of nim or geduri wood. The plough penetrates from 6 to 9 inches and is never weighted. It makes no furrow of course.

The other wooden implements required by the cultivator are the roller (letan), clod crusher (sanhar), leveller (kin), mallet (wato-har), rake (dandar, dandari and pahori), pitchfork (biano) and the seed-drill (nari). The lafen is a heavy wooden roller about 6 feet long and is drawn by two pairs of oxen. The sanhar, or far, is a rectangular log of wood about 4 or 5 feet long and only requires one pair of oxen. The leveller consists of two planks, each about 3 feet long and 1 foot broad, which are secured together at an obtuse angle by iron bands; it is dragged by a pair of oxen and is used for collecting earth for embankments as well as levelling. The mallet is a small hand-instrument for breaking clods. Three species of rake are met with. The large rake, dandar, has six or more broad teeth, each about 6 inches long, and is worked by two men, one of whom holds the handle while the other drags the implement by rope; it is employed in making the small ridges which separate the several compartments of a field. The dandari is a smaller instrument used for collecting manure and ears of corn. The pahori is a plain board with a handle, which is used for scraping up cattle dung. The seed-drill is a funnel made of wood or bamboo, which is tied to the body of the plough; it has the same length as the body, so that the bowl is close to the ploughman's hand while the tube reaches down to the furrow. The inner diameter of the tube is about $1\frac{1}{4}$ inch; the drill never has more than a single tube.

The iron implements of husbandry consists of the hoe (kodar), axe (kuharo), sickle (dato) and a kind of trowel (rambo). The hoe is the kind of used everywhere in Pakistan, with an iron blade about 13 inches square, into which the handle (gan) is fitted at nearly a right angle.

Iron Imple-
ments

Three kinds of axes are employed. The heavy axe (kuharo) has a blade nearly 6 inches long and is fitted with a handle $2\frac{1}{2}$ feet long. A lighter instrument (kuhari), used for lopping branches and cutting down bushes, has a blade from 3 to 4 inches long. Another kind of Kuhari, used for cutting chaff (kutir) for cattle in hard work, has a heavy blade 10 inches long and is fitted with a handle about 9 inches long. The cutting edge is always of steel.

The sickle has a curved steel blade about a foot long, with a serrated edge.

The rambo is kind of trowel used for weeding and has a steel blade about 7 inches long and 3 inches wide at the point, with a short curved handle.

If there is a resident blacksmith in the village, he supplies sickles and rambos to the cultivators without charge, in return for a share of the procedure.

These are the ordinary implements of the farmer in central Sind but there are of course many more. The chanjur, or pickaxe is not unknown, though little required. The waholo is an adze used for hacking out roots and stumps.

Water Wheels.

Of contrivances for raising water the nar, so common on the banks of the canals, is simply a Persian wheel with a shall, strong, cogged wheel immoveably fastened to a prolongation of its axle and interlocking with the cogs of a horizontal wheel. A long pole from the latter connects it with the blind-folded bullock, or camel, which walks wearily round it and turns the whole arrangement. An approximately circular form is obtained for the wheels by making their circumferences of short lengths of wood connected by wooden rivets. The cogs are also of wood, rough hewn and securing the maximum of friction possible. The waste of animal power must be enormous. The leather bag (kos, or boko) for raising water from very deep wells is identical with the mot of the Deccan. It differs from the Persian wheel in this that half of the water raised does not tumble back into the well. The huge bag, which has the form of a teapot, is let down by a strong rope working over a high pulley which projects far over the well. Another rope attached to the end of the teapot spout runs over a lower pulley at the margin. It follows that, as soon as the bag is raised above this level, the spout is pulled out horizontally and the water gushes into a place prepared for it.

Carts.

The cart (gadi) of the country is too well known to need much description. General Jacob wrote of it, "They are rude and noisy; at first sight they seem ridiculous; but they can be constructed in any village at a cost of four or five rupees, while the loads they carry are as heavy as could well be drawn by a pair of bullocks."

So he let them along and they have remained, except in Karachi and Hyderabad. Their wheels are solid discs, or nearly so, without tipes. There is indeed no iron in their construction. They are made of rough-hewn pieces of wood mortised into each other, which, if they come out, can be hammered in again with a stone. In Sukkur and Shikarpur these carts are to be seen in their original innocence, and heard also. The unintermitted squealing of their wheels and its necessary connection with their progress encourage the idea that it was part of the inventor's design. The cessation of it at once makes the nodding driver aware that his bullocks have stopped.

Development of Agricultural Department.

The Director of Agriculture in his evidence before the Sind Agricultural Commission in 1953 gave information showing the immense development that has taken place in the Department of Agriculture since the time when the Gazetteer of 1907 was written. The department now has a Headquarters Staff, a Propaganda Staff, a Research and Education Section and an Agricultural Engineering Section. Asked to specify the outstanding contributions of his department in the improvement of cotton crop, wheat crop, sugarcane, oilseeds, pulses, fodder crops and green manure crops, the Director of Agriculture mentioned the following:—

“(1) *Cotton*.—289 F, I was evolved in 1935. M 4 in 1944-45 M-100 now being tested on zamindari lands and 27-N.W. among short staples.

(2) *Wheat*.—A.T.-38 for non-Barrage area, C-591 and C-518, Punjab wheats acclimatized in Sind to replace ‘Phandni’ and other types, H-68 now being tried on zamindari lands.

(3) *Sugar-cane*.—C.O. 42, C.O. 213, to replace C.O. 312. There is no facility for multiplying these varieties.

(4) *Oilseeds and Pulses*.—No work is being done on oilseeds and pulses as there is no staff sanctioned for these crops.

(5) *Fodder Crop and Green Manure Crops*.—No staff has been sanctioned for this purpose. From general practice the methods of using “guar” and Sann-hemp in Kharif and berseem in rabi as green manure crops have been worked out.

As regards increased yields of improved varieties of cotton and food crops it is admitted that these varieties give 15 to 20 per cent. more yield than the varieties that existed before. Yield is not the only criterion for judging the new variety. The factory like resistance to diseases, earliness and market value should also be considered as important factors. The new varieties are better in respect of the above characters.”

The official brochure published in 1955 by the former Government of Sind says of the Sakrand Research Institute that the research work there is divided into a Chemical Section, an Agricultural Section, a Mycological Section, a Botanical Section, an Entomological Section and a Horticultural Section. The various sections are placed under a separate sectional head assisted by a number of qualified research assistants who are graduates in Agriculture. The main research institutions are:

- (1) the Government Fruit Farm at Mirpurkhas where experimental work is being carried out to determine the best methods for the establishment and maintenance of fruit orchards, investigating alternative seasons for horticultural operations, studying irrigational requirements of fruit and vegetable crops and solving problems connected with their cultivation, manuring and care of fruit trees under Sind conditions.
- (2) The Rice Research Station at Dokri where the principal items of research are beneficial work and agronomical work.
- (3) the Cotton Research Station at Mirpurkhas.

Cotton has been cultivated in Sind since prehistoric times dating back to the Moen-jo-Daro civilisation.

The indigenous Cotton of Sind is known as desi belonging to the species *Harberaum* var *neglectum* but it has been replaced considerably by the American variety *C. Hirsutum*. Both the desi and American cottons are sown under irrigation.

The improved types distributed by the Department are 27 W.N. in desi and M. 4 in American. M. 4 covers almost the entire area under American cotton. The following five schemes for the improvement of cotton of the region as a whole have been prepared and approved by the Pakistan Central Cotton Committee:—

- (1) Production of long staple American Cotton in Sind.
- (2) Breeding of Egyptian Cotton in the Lower Sind Barrage Area.
- (3) Establishment of American cotton on the Right Bank of the Indus.
- (4) Maintenance of Herbarium of living plants of the various races of cotton.
- (5) Increased yield of cotton per unit by manuring.

A high yield and superior quality variety of American Cotton numbered M. 100 has been evolved by hybridization at the Cotton Research Station, Mirpurkhas. It has done well on Zamindari lands as well. Mir Ahmed Khan, a very enlightened Zamindar of District Tharparkar who had grown M.100 and M.4 (known to the trade as N.T. Sind) side by side, reported that M.100 gave an out-turn of 17 maunds of seed cotton per acre as compared to 13 maunds of M.4. The variety also possesses a staple of 11/16" and a spinning value of 40/60" as against 15/16" and 34" respectively of M. 4. This cotton is evaluated at Rs. 20 to Rs. 35 on 289 F. This variety is being tested in different zones now

The remarks of Sir Roger Thomas on plant husbandry and plant breeding throw light upon the present-day operations of the Agricultural Department.

Cotton
Breeding.

"At present, independent cotton breeding work is being done at the Sakrand and Dokri research stations and also at the Long Staple Cotton Breeding Station, Mirpurkhas. With the prospects of the present Sind American cotton having staple length less than 1" being replaced in the near future by new varieties having staple length exceeding 1" combined with other desirable characters, there is need for closer co-ordination between the breeders engaged on cotton improvement. The main cotton breeding work on American types should continue at Mirpurkhas. The work on these types at Sakrand and Dokri should be limited to field tests of the promising varieties evolved at Mirpurkhas. This will enable the breeders at Sakrand and Dokri to devote more of their time to plant breeding with crops other than cotton.

"The aim should be early-maturing rust-resistant varieties. Quality of the grain is a secondary consideration. The most promising varieties bred at Sakrand should be tested at all district and taluka farms against the present commercial types 8-A, C-591, C-518, P-125 and P-228. The tests for all the varieties in the experiment should cover three sowing dates, namely very early, mid-season, and very late, at each farm. The size of the plots should be the minimum consistent with the requirements for statistical analysis and convenience of handling. Particular attention should be given to discovering the optimum period of sowing each variety with a view to increasing rabi intensity. Three years should suffice to solve this important problem in so far as the existing varieties are concerned. Additional new varieties bred in the Punjab and by the Imperial Botanist at new Dehli should be included in the trials at the district farms. This work should be delegated to the Class I Botanist at the Agricultural College with a Class II Plant Breeder at each district farm with perennial irrigation.

Wheat
Breeding

"Good progress has been made in breeding improved varieties of rice suited to conditions in Upper Sind. This work has been neglected in Lower Sind and on the rice canals in Tharparkar

Rice
Breeding.

Rice Breed- district. Facilities should shortly be available at the recently
ing. opened Shorki Rice farm in the Karachi district for rice breeding work. Separate arrangements will be necessary for breeding work on deep-water varieties and salt resistant varieties of rice which are features peculiar to extensive areas in these parts. This work should be delegated to a Class I Botanist located at Dokri with a Class II Plant Breeder at each district rice farm.

Mirpurkhas "This farm has recently been extended from 60 acres to 124
Fruit Farm. acres. It is the main source of nursery plants. It should not extend its fruit cultivation for the supply of fresh fruits beyond its present tree population. These may however be needed for planting additional trees of some varieties to obtain the requisite grafts and buds. In distributing seeds, seedlings and grafts, priority should be given to the requirements of Government farms and P.W.D. bungalows. But when propagating fruit trees, the number of varieties should be curtailed and the work intensified on those few selected varieties which have proved their superiority."

Livestock Sind region is still pastoral, though not at all to the same extent
and Animal as it once was. A livestock census was taken in 1945 and the results
Husbandry. are set out in the table below.

1945 Census.

Cattle	..	19,58,764	} 26,61,143
Buffaloes	..	7,02,397	
Horses	..	1,05,789	
Poultry	..	8,03,740	
Sheep	..	6,38,101	
Goats	..	14,14,167	
Camels	..	1,05,469	
Donkeys	..	1,25,698	

Official figures supplied in the year 1957 give the number of milch cattle for every thousand of the human population as 60 in milk, 56 dry and 14 not calved. These figures show a very great discrepancy from those in the 1907 Gazetteer, from which it may be inferred either that the 1907 figures were exaggerated, or that there has been a great change in the state of the milk industry in the last fifty years, or alternatively the habits of the human population as regards the consumption of milk have altered considerably

It is impossible to say which, if any, is the correct explanation. Official figures given in 1957 for plough cattle show that the number was 587,044, which compares favourably with the number 538,933 given in the 1907 Gazetteer. To what extent plough cattle are being displaced by mechanical methods of traction is not known. The number of tractors being used in Sind is certainly growing and this will, at least as far as the larger zamindars are concerned, help to reduce the number of plough cattle which they maintain.

The means of transport most natural in former Sind is, and Camels always has been, the camel, and there is evidence that twelve centuries ago camel-keeping and breeding was the occupation of a large section of the people, as it is at this day chiefly in the Hyderabad and Tharparkar districts and also in the districts of Larkana and Thatta. Some attention is paid to selection and distinct breeds are recognised. As riding camels, (mahri uth) none are considered superior to the dhathi, or tharri, i.e. those of the Desert, which resemble the Bikaner camels, the finest in India. They are very large, light-coloured and smooth-skinned, hold their heads high and carry themselves nobly. Their stride is great and they get over the ground swiftly, with little vertical motion. They do not thrive, however, out of the sandy tract of which they are natives. The Makran riding camel, which some esteem even better than the dhathi, is a small, dark, shaggy animal, carrying its head low, but trotting fast and smoothly, though its pace is not equal to that of the dhathi. It is hardy and enduring and better than any other on hilly ground, but its temper is shocking. The strongest baggage camels (ladu uth) come from the Hyderabad and the north of the Tharparkar Districts; those of the Sanghar Taluka are proverbial. Camels are popularly supposed to have a natural aversion from water and not to thrive in damp regions, but in the Delta there are hundreds which feed habitually on the foliage of the mangrove, wading in the mud and even swimming the creeks. These coast camels are regarded as a distinct breed. The price of camels varies of course with their quality and age. Like everything else, the prices of camels have risen very much since the first decade of the present century. Prices today vary from Rs. 250 to Rs. 1,000 on an average and Rs. 400 may be considered an average overall price. The average cost of baggage camels is probably from three to four times that shown as current at the time of the 1907 Gazetteer.

Camels are worked from the third year of their age and are in their prime till 12, but they will work for many years after that and may live to 40. The female has her first foal at the age of 4 (the period of gestation being about a year) and every second year or so after that until she has had 9 or 10. The rutting season is from December to March, at which time the male is apt to become mast, when he is savage and quite unmanageable. The female suckles her foal for a year and it is said that a good one will yield

12 seers of milk a day besides. The milk is universally used by Jats, but is at first laxative to those who are not Jats. It is considered a good medicine for diseases of the spleen.

Most contradictory things have been written about the camel's powers of endurance, abstinence from food and water etc. There has been wild exaggeration on the one hand and undue depreciation on the other. As far as a general statement is safe it may be said that a baggage camel can carry between 300 and 400 lbs. according to size, marching 20 miles a day. The rate will be something over two miles an hour for the whole distance. A good riding camel can trot at more than 6 miles an hour and will go 40 or even 50 miles a day at a slower rate; at a pinch 100 miles have been covered in a single day. But all special efforts demand special feeding on gur and flour, besides ample grazing. A camel accustomed to it will also go for several days without water. But if really over-taxed it collapses altogether and then it probably dies. Its greatest advantage as a transport animal is that the foliage of almost every tree or bush (with some important exceptions) is food to it and it can browse as it goes.

Horses.

While there is no doubt the camel still maintains predominance in Sind Region transport, the same cannot be said of horses, the numbers of which are plainly decreasing with the rise in the number of motor vehicles and with the great improvement in metalled roads. The indigenous Sindhi animal rarely exceeds 14 hands in height, with light bone, weak hocks and loins, flat ribs and generally a bad colour. These defects are the results of generations of inbreeding, also of using animals for pack and riding purposes when not matured, generally as yearlings. Notwithstanding these drawbacks they are hardy race and can travel long distances on very little food. Despite efforts made over many years to induce the more intelligent zamindars to take advantage of their opportunities of obtaining higher class animals through selected breeding from the stallions maintained by the Civil Veterinary Department, little success was achieved. From the zamindar's point of view the Sindhi horse could not be improved, or at least was quite good enough. They had a notion also that the produce of an Arab or English thorough-bred could never be taught the rawal, that forced amble which carries the rider swiftly on his way without shaking the water in his stomach. There is only one Horse Show held in former Sind, at Jacobabad in the month of February. The official report for the year 1952/53 gives the number of horse-stock, not including branded mares, present at the Jacobabad Horse Show; 160 animals are shown as belonging to breeders and 40 as belonging to dealers. In actual fact the Jacobabad Horse Show today, though a colourful spectacle, retains but a relic of the glory with which it was invested in the days when the supremacy of the horse was in no doubt.

Cattle.

The cattle of Sind region are among the best in Pakistan. The finest milch cows are to be found within a radius of 30 or 40 miles from Karachi, chiefly in the hilly tracts, wherever there is grazing and water. The cows actually in milk are kept as near to Karachi as practicable and the milk is sent in twice a day by camels. The owners are particular in the selection of breeding bulls and keep records of pedigree. Bull calves from inferior milkers are castrated and sold for the plough. Sind cattle are not bred true to any type of form or colour, but are more or less recognisable. A rich red brown is the commonest colour, with white markings occasionally and a darker shade surrounding the eyes. They are of medium size, with long, deep, massive frame and short, well-set legs. The tail is long and the best cows show little droop in the hind quarters. The head is heavy, the neck short and thick and the dewlap much developed. Both bulls and cows are remarkably placid and tractable even with strangers.

A Livestock Section established in the year 1938 under the control of the Director of Agriculture of former Sind was amalgamated with the Veterinary Department and placed under the control of the Director of Animal Husbandry, from the 1st November, 1950. The main activities of this section are to carry out research work for the improvement of the three breeds of cattle and buffaloes in the region, namely, Red Sindhi, Thari and Bhagnari, and Kundi buffaloes, and to render advice to zamindars and maldars in growing fodder crops, in poultry farming, and dairymen for improving the dairy industry. The Animal Husbandry Report for the year 1952/53 states: "The most desirable type of Red Sindhi Breed should have medium size, rich colour, broad udder, early maturity, high performance of milk, good fertility and hardness to withstand disease. A very careful selection of pedigree bulls is made to intensify these characteristics in the herd. The work of breeding was continued during the year under report under the personal supervision of the Deputy Director of Animal Husbandry (Breeding and Research), Mirpurkhas, in spite of the fact of no improvement in the existing conditions of the farms to provide better results. The results obtained were, as for milk output, satisfactory. The total quantity of milk yield obtained from 35 cows in milk was 1,76,163 lbs., against 37 cows and 1,48,622 lbs., respectively last year. The daily average milk was 13.4 lbs. as against 12 lbs. last year after feeding the calf. During the year under report 41 cows completed their full lactation and the maximum lactation yield in 300 days recorded was 7,600 lbs. from 2 cows and the minimum yield was 1,742 lbs. in 143 days. 9 heifers calved between the age of $2\frac{1}{2}$ years to $3\frac{1}{4}$ years, maximum milk yield from these heifers was 24 lbs. per day excluding the milk suckled by the calf".

Thari Breeding. The herd of Thari cattle is maintained at the Agricultural Research Station, Sakrand. The Thari Breed is a dual purpose animal, males being good draught animals, and females

capable of giving economical milk yields. After amalgamation of Livestock with Veterinary, the report of this breeding station at Agricultural Research Station at Sakrand, is not received and incorporated in the report of the Animal Husbandry Department, hence details cannot be given. Nevertheless, it may be mentioned that the herd is making a slow but good progress. Eleven Thari bulls of very good qualities and with pedigree were issued from this herd at Sakrand for up-grading purposes and old bulls were rejected from the old stock and brought back to Sakrand and were utilised for draught.

Bhagnari Breed.—This is an Upper Sind Breed, its home being Bhag and Nari along the river Nari north of Jacobabad, which extends up to Jacobabad proper. The Government Auxiliary Farm, Dadu, where this breed of cattle is now stationed was converted into the Bhagnari Cattle Research Station, Dadu, with a Class II Officer in Charge. The herd continued to be studied for some of its undesirable traits. Every effort was made to preserve the outstanding characteristics of the breed. Attempts were made to eliminate such type of animals with the above defects to ward off further unexpected results”.

The following are the latest figures available showing the average milk yield of various breeds, namely, the Red Sindhi cow, the Thari cow, the Bhagnari cow, the buffaloes and goats (Kamori).

Name of breed.	Minimum lbs. per lactation	Maximum lbs. per lactation.	Average lbs. per lactation	Maximum per day in lbs.
Red Sindhi Cow.	2000 lbs.	8000 lbs.	4000 lbs.	40 lbs.
Thari Cow.	1500 lbs.	7000 lbs.	3500 lbs.	30 lbs.
Bhagnari Cow.	500 lbs.	4000 lbs.	2000 lbs.	20 lbs.
Buffaloes.	2000 lbs.	8000 lbs.	4500 lbs.	40 lbs.
Goats (Kamori)	100 lbs.	800 lbs.	300 lbs.	8 lbs.

The maximum and minimum prices of milch cattle are: for a cow a minimum of Rs. 150 to a maximum of Rs. 1,000. with an average of Rs. 500; for a Buffalo cow a minimum of Rs. 300 and a maximum of Rs. 1,500, with an average of Rs. 800.

The official report for the year 1952/53 shows the organisation of Cattle Shows throughout the country.

District	No of Shows.	Bulls	Bullocks	Cows.	Buffaloes	Goats	Young stock.	Total	Prize awarded
U.S.F.	2	3	48	55	36	47	84	323	800
Sukkur.	1	—	17	22	20	—	51	110	100
Larkana	1	—	23	19	36	—	53	131	100
Tharparkar	1	8	82	170	—	—	40	382	200
Nawabshah	1	6	37	49	—	—	30	159	100
Hyderabad	1	57	64	59	29	..	115	388	300
..	7	74	271	374	211	47	373	1,493	1,600

Buffaloes (menh) are found in large numbers in the Delta and on the banks of the Indus. The breed is like that of Delhi, characterised by short, curled lateral horns, comparatively long legs and a short barrel, a good deal of hair and almost black colour. The smooth, long-bodied buffalo of Bombay, with its long scimitar-shaped horns, is unknown in former Sind. But the Sind buffaloes are good milkers.

Buffaloes.

Sheep (ridh) are found all over Sind region, usually mingled with goats, particularly on the western hills and eastern desert, where nomadic shepherds subsist almost entirely on their produce. They are regularly milked with the goats and their wool is either sold or spun and woven by the shepherd and his family into blankets, saddle-bags- &c. In Tharparkar the poor people mostly wear the woollen fabrics thus locally made. The Sind sheep of the plains specially Tharparkar, are commonly of a light brown colour, leggy and hornless in both sexes. Their wool is long and abundant and in quality the best is that exported under the head of "Sind Wool". It is known as Nara Wool and it goes mostly to France. The dumba, or fat-tailed sheep, which belongs to the western hilly tracts, is robust and short-legged, white in colour with black on the face and feet. The rams have large curled horns. The chief claim to distinction of this breed lies in the quality of its mutton.

Sheep.

The thorny shrubbery of Sind region is particularly suited to goats (bakri) which vastly outnumber the sheep in every district. They are for the most part large, high-standing animals, with plenty of hair, small heads, a peculiarly curved and short profile and pendent ears of ridiculous length. It is a curious fact that their horns, when developed at all, are distinctly of the markhor type unlike the horns of the European goat, which are similar to those of the ibex.

Goats.

The only poultry much bred in Sind region are common fowls. A few turkeys and even geese may be seen in the chief towns and a small flock of ducks occasionally. The fowls are scarcely equalled else-where in Pakistan. Poultry thrives in former Sind when they are allowed free range as is customary under village conditions. But when they are bred under confined conditions they are highly susceptible to many diseases and the casualties are heavy. The indigenous-Sindhi game breed is hardy and is a good table fowl but an indifferent layer. The value of poultry under local condition lies more in their egg producing qualities than, in their table qualities. The White Leghorn and the Rhode Island Red are almost as hardy as the Sindhi Game bird under range conditions and as egg-producing machines they excel. The agricultural plans provide for foundation flocks of poultry at each of the Government farms, veterinary hospitals and dispensaries. At each centre eggs, young chickens and matured birds will be produced for general distribution to the public at attractive prices.

Poultry.

Work of Animal Husbandry Department.

The most devastating diseases of farm animals common in Sind are Rinderpest and Liver Fluke both of which are subject to Control. Foot and mouth disease is more widespread, but it is not subject to control, though fortunately it generally occurs in non-virulent form, and deaths from this disease are relatively few. The other major diseases include tuberculosis, mastitis and contagious abortion. Some details from the report of 1952/53 as regards animals diseases are interesting. As regards foot and mouth disease in cattle which was prevalent in all districts, except Jacobabad there were 5,257 attacks and 77 deaths. Amongst buffaloes there were 402 attacks of Rinderpest in the Thatta, Hyderabad, Nawabshah and Mirpurkhas area and there were 285 deaths. Haemorrhagic Septicaemia accounted for 679 attacks and 158 deaths from all districts, except Jacobabad. Other contagious, infectious and parasitic diseases totalled 5,979 with a mortality of 853 from parasitic and Liver Fluke diseases. In the case of sheep other contagious and parasitic diseases accounted for 13,475 attacks with 535 deaths from Liver Fluke and parasitic diseases. In the case of goats though there was a certain amount of mortality from Anthrax, Goat Pox, Pleuro-Pneumonia and Foot-and-Mouth disease, it was the other contagious and infectious diseases which, accounted for the greatest mortality; 7,704 goats were attacked, of which 421 died of Liver Fluke and parasitic diseases. Camels seem to be fairly immune from diseases, as in 1952/53 the only diseases classified are Surra, with 90 cases and 15 deaths, and Mange with 41 cases and 2 deaths. The poultry in Sind region is affected mostly by Raniket disease, Spirochaetosis and Fowl Pox, and these cases were reported from Hyderabad, Nawabshah Tharparkar, Dadu and Mirpurkhas: 708 of the 863 birds affected died.

In the government brochure "Sind People and Progress" dated 1955 the subject of Animal Husbandry receives considerable attention. Herein it is remarked: "It has taken a long time for the maldars to shed apathy and prejudice, but they have started to realise the importance of veterinary services, and now bring their sick animals to veterinary hospitals and dispensaries, and report outbreaks of contagious diseases promptly. At present the chief obstruction is poverty combined with the illiteracy of the average maldar which results in the neglect of his animals. There is, however, a great awakening among animals owners and it will not be long before they take full advantage of the Department. The campaign of castrating scrub bulls more extensively will, the government hopes, be undertaken as soon as the necessary staff for the work is available."

The work being done by the Animal Husbandry Department in the year 1952/53 is exhibited in the following table;—

Veterinary Hospital and Dispensaries 1952-53.

No. of animals treated as In-patients	1,003
No. of animals treated as Out-patients	52,147
No. of cases supplied with medicines which could not be brought to the dispensaries.	25,521
No. of castrations performed at dispensaries ..	9,198
No. of castrations performed on tour ..	3,113
No. of animals treated for non-contagious diseases on tour	41,721
No. of animals treated for contagious diseases on tour. ..	7,828
No. of cows covered at veterinary dispensaries. ..	1,203
No. of mares covered at veterinary dispensaries ..	118
No. of animals vaccinated or inoculated against:—	
Rinderpest	11,688
Haemorrhagic Septicemia	11,261
Anthrax	1,508
Ranikhet	4,954

In order to protect animals from contagious Pleuro Pneumonia, Rinderpest and other contagious diseases, Government have maintained a well fitted mobile dispensary and veterinary aid is reaching out of way places more promptly and more frequently than before.

No. of Government grants-in-aid dispensaries.	27
No. of mobile and static government dispensaries	13

The development of bone and size as well as milk output of Red Sindhi breed was satisfactory. The total output of milk from the average of 37 cows in milk per day was 433 lbs. The daily milk yield was 12 lbs. after feeding the calf which works out to 5 lbs. or roughly about 1,200 lbs. per lactation. About 169 stud bulls and bucks have been issued to the districts in the region for up-grading purpose. Total number of services performed by these bulls and bucks as recorded was 7,945. To this if, 4,000

services or 50% of the above given services are added, the total number of services work out at 11,900. New development schemes for the Animal Husbandry Department have been sanctioned by the Government, particularly schemes for the incidence and control, of Liver Fluke and other parasites of domestic animal in Sind region also a scheme for running mobile dispensaries have been sanctioned for providing medical aid to form one-fourth of the normal activities of this Department for diagnosis and eradication of diseases and doing propaganda in disease control. The placing of stud bulls and stallion in the Veterinary Dispensaries in Sind region as it stood on 31st March, 1954 was 31, and the total number of cows covered during 1952/53 was 1,203. The ultimate target is to keep at least 67 cows and buffaloes at Jacobabad, and horse stallions stationed at each district headquarters. There is also an important sheep-breeding scheme under examination. The object of this scheme is to up-grade the local stocks of sheep for cross-breeding with the fine quality wool breeds of the world, such as Merino, a type of sheep which can withstand the climatic conditions of this region and breed freely, can live on roughage and produce a progeny superior to the indigenous breeds.

Work of Civil Veterinary Department.

The following table shows the working of the Civil Veterinary Department during the year 1950-51. The development of the Civil Veterinary Department since 1907 has indeed been remarkable

Region	Number of Veterinary Institutions	Number of Veterinary Assistant Surgeons employed	Number of in-patients treated during the year.			
			Bovines	Equines	Others	Total
Sind region..	40	44	367	420	216	1003
Total ..	40	44	367	420	216	1003
*Total 1951-52.	40	44	230	380	181	791
Total 1950-51..	40	44	287	420	222	929

*Total for previous two years.

A re-organisation scheme was brought into force in 1912/13; at Thatta the total number of veterinary hospitals and dispensaries working in former Sind was only 8; in 1922 the Baluchistan veterinary charge was separated from that of Sind region, and by then the number of veterinary hospitals and dispensaries had increased to 16. With provincial autonomy which made Sind a full-fledged governor's province, Sind region was separated from the Bombay Presidency on the 1st April 1936, and the Superintendent of Civil Veterinary Department, of Sind, was made head of the department, with his designation

changed to Director of Veterinary Services, Sind. The number of veterinary hospitals and dispensaries in Sind then was 19; by 1941 the number of veterinary hospitals and dispensaries had reached 32, and on the 1st November, 1950 a Livestock Section was amalgamated with a Veterinary Section under the Animal Husbandry Department, and the Director of Veterinary Services was changed to the Director of Animal Husbandry. With the temporary separation of Karachi from Sind on the 23rd July 1948, the Willingdon Cattle Farm, Malir, was handed over by the Government of Sind to the Government of Pakistan, with half its herd removed to Mirpurkhas, and the then Seed Farm with the Agricultural Department was converted into the Red Sindhi Cattle Farm, Mirpurkhas, from November 1949. The Bhagnari cattle herd, which was stationed at the Agricultural Research Station in Dokri, was transferred to the Dadu Auxiliary Farm in 1949. This Auxiliary Farm at Dadu was converted into a full-fledged Bhagnari Cattle Research Station in 1950. The Thari cattle breeding was continued at the King George VI Institute of Agriculture and Agricultural Research Station at Sakrand from 1939. With the amalgamation of the Livestock with the Veterinary Department under the Animal Husbandry Department, of Sind, cattle breeding and research have been placed under the Deputy Director of Animal Husbandry, Breeding and Research, formerly known as the Livestock Officer for Sind.

Khairpur has not lagged behind former Sind in the advance of veterinary facilities and the expansion of animal husbandry. There was originally only one central veterinary hospital in Khairpur. A little before the year 1937 another veterinary dispensary was opened at Gambat, but this was run mainly by a compounder, and twenty years ago the number of animals treated was about 20,000 and preventive inoculations were nil. In 1955, 300,018 animals were treated and 14,256 inoculations were given. Chick hatching activities have been entrusted to the Veterinary Department, which now has six hatching machines, with a total capacity of seven hundred eggs at a time. At present there are 3 chick rearing houses, electrified brooders, 4 state horses, 2 stallions, 1 buffalo bull, 1 bull and a Poultry Department and Dairy Farm have been attached to the Veterinary Department. The Sind Agricultural Commission took a serious view of the needs of animal husbandry and made several recommendations connected with the work done. One recommendation was that cattle breeding farms should be established on a much wider scale than before and that the census of animals should be made according to breed. While commenting on the fact that no dairy industry run on modern lines exists, the Commission stated that it was imperative that some up-to-date and modern dairy farms with proper laboratories should be opened by the Government where the processing and preservation of dairy products could be carried out, and the results obtained there be made available to private enterprise. The Commission stated that

undoubtedly some parts of the region were ideal for animal raising, such as the Talti district in Kohistan, but owing to the failure of the rainfall no fodder was produced in some years, resulting in the scarcity of fodder and the starvation of animals. Some arrangements should be made to husband the fodder crop when there is plenty of it, so that it may last during the years of scarcity and failure of rainfall. In this connection it is interesting to note that one of the schemes put forward by the Animal Husbandry Department for future development is for the preservation of hay in the Thar Desert. The Committee consider that a major part of the cattle wealth was wasted by epidemic and other diseases. They stated that, while preventive inoculation is being carried out by the Animal Husbandry Department on quite a large scale, it is still inadequate. For mass vaccination purposes the Department ought to be expanded. The Agricultural Commission would also like to see a veterinary dispensary in every Taluka and the opening of a full-fledged Animal Husbandry and Veterinary Science College. Doubtless the recommendations of the Agricultural Commission will be implemented in due course.

Famine.

Famine is unknown in the Indus valley, in which cultivation is independent of rain, but the desert portion of Thar Parkar has had a cruel experience of it. There was a serious famine in the year 1868/69 and another in 1898/1899. In the former famine people who, after spending money and almost all they possessed, managed to save the cattle which were almost their sole means of livelihood, drove them westward to the Nara valley; but the animals were too emaciated to bear the journey and the change, and most of them perished. In the 1898/99 famine the Deputy Commissioner reported that 95 per cent. of the cattle had died, and the remainder were saved only by driving them to the Nara valley or to Baroda and other areas. The desert was left almost uninhabited, and in the Nara Valley Division, to which the inhabitants resorted, they were mixed up with an unnumbered host of Marwaris in the same case as themselves. In their poor condition they fell an easy prey to fever, dysentery, pneumonia, and to cholera when it came in May 1900. The labouring classes had not much difficulty in getting work, but among respectable landholders and graziers, who could not be expected to work as coolies, much distress and humiliation was averted by small advances free of interest.

As Sir Roger Thomas has remarked, in the arid south-eastern zone of the Thar Desert large areas of millets and pulses are grown each year when monsoon rains are favourable. This tract is subject to occasional severe famines ; but it is the home of hardy people and of a hardy Thar Parkar breed of cattle, both of which thrive when the grasses grow. Famine conditions are, in fact, likely to prevail wherever the rainfall fails for two successive seasons, as it has done in the past occasionally. But famine of the kind which

took place in 1869 and 1899 is not likely to occur again on anything like the same scale, because of the result of the organisation of experience during the war years and the years succeeding the establishment of Pakistan. Governmental measures were then taken, at a time when the crops were scarce, to ensure the procuring of food grains and an organised system of distribution was established in areas where shortage was felt. The experience thus gained administratively is not likely to be lost and, even if in the future the rains should fail for two successive seasons in the Thar, the population is not likely to have to suffer the distresses which their ancestors had to undergo sixty and ninety years ago. The rationing of food grains which took place during the war years and later has taught the Government the way to abolish the catastrophe of famine, even if the miseries of scarcity can never be completely eliminated in unfavourable seasons. Furthermore, if schemes for the preservation of grass and its storage in good years are carried out in the future, there should be little fear of very tragic mortality amongst the livestock on which the herdsmen and the people of the Thar must largely rely for their livelihood.



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CHAPTER XIII
IRRIGATION

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IRRIGATION

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CHAPTER XIII

General
Nature.

Sind might well be called "Daryadito" or "Daryadino". "the gift of the River", to give it nomenclature in accordance with the facts, for without the Indus, Sind would be like Egypt deprived of the Nile. Its rainfall is meagre and ill-distributed, and in itself insufficient to yield regular worthwhile crops on which a large population can exist. Since, however, the Lower Indus Valley has been inhabited continuously for at least five thousand years, it must be inferred that the intelligence of man has been at work improving the capricious and uncertain bounty of the great river. How vital a part the Indus plays in the livelihood and welfare of the people of Sind can readily be understood when it is realized firstly, that the average yearly rainfall in the north of Sind is only 3" and in the south about 9" and secondly, that most of this rain falls in the months of July and August. The shade temperature in northern Sind reaches 127° and the hot weather is an exceptionally long drawn out one, shade temperatures of 110° frequently being recorded in August and September. October is only slightly cooler and shade temperatures of over 100° are recorded in November. If night temperatures are considered, matters are even worse as between April and June, the thermometer in some years never reads lower than 90° even in the early morning.

The area of Sind including Khairpur is 56,447 square mile and of this roughly half is mountains and sand hills, the other half being land suitable for the production of crops. The population of Sind including Khairpur in the 1951 Census was 49,28,057 and almost the whole of the population is engaged directly or indirectly in agriculture. To what extent then the people of Sind depend on the water of the Indus for their very livelihood can readily be understood.

The river Indus has three remarkable characteristics : (a) It has a regular inundation which brings with it immense quantities of silt that in the course of centuries have produced the alluvial area of the Sind Valley and are still adding to the land area at its mouth ; (b) the river is gradually raising its bed level above that of the surrounding alluvial deposits ; it is thus ideal for the development of irrigation, both natural, since the river is always bursting its banks and flooding low-lying areas near them, and artificial, which there is no doubt has been in existence in Sind for several millennia ; (c) it pursues a westering course and throughout the centuries has shown this tendency to eat into and erode the land on the right bank and leaving the land on the left bank dry, except for occasional break-throughs. There is no doubt whatever that long ago, and indeed up to comparatively recent times, the Indus followed a much more easterly course, and this can be traced today in the empty bed of the Ghaggar, the Hakro and the Mihran of Sind a huge river that at one time made its way into the Arabian Sea much to the east of its existing course. Alor was once on the bank

of the Hakro and the old course of the Mihran is traceable today through large parts of what are now the eastern portions of the Nawabshah, Thar Parkar and Hyderabad districts. The westerly drift of the Indus still continues, and strong protective embankments have been found necessary to prevent its bursting through on to the low-lying fertile lands on its right bank in the Upper Sind frontier, Sukkur and Larkana districts. These are still danger points. Between Sehwan and Jerruck the river cannot work its way much further west because of the great range of the Khirthar hills which effectually shut it in for one hundred miles of its course. The Indus follows a more or less midway stage through the alluvial belt, shut in by the limestone of the Khirthar on the west and the sand hills of the Registan on the West. The area over which its waters can spread or be distributed amount to about 16 million acres for the most part a uniform flat surface with only scattered portions rising more than a few feet above the general level. The gradient of the land from the southern border of the Punjab at Sarhad to the Indian Ocean is no more than two hundred and fifty feet in 600 miles which is less than 6 inches per mile. The conditions are, therefore, all in favour of scientific irrigation, of which Sind is today one of the outstanding examples in the whole world. With the completion of the Gudu Barrage, about sixty miles north of Sukkur, and the development of the Ghulam Mohammad Barrage, a few miles above Kotri in Lower Sind, and the now almost fully functioning Sukkur Barrage, almost the whole of the alluvial area capable of irrigation by flow water will be commanded and all-the-year-round cultivation of an area as large as 10½ million acres will be assured.

The Indus Valley Civilisation, which was flourishing in the middle of the third millennium B.C., consisted of an agricultural economy supporting the two large cities of Harappa and Moenjo-Daro, which appear to have been the centre of extensive trade. Though no evidences have come down to us of the nature of irrigation at that distant time, it cannot be doubted that a canal system of considerable efficiency must have been fully operative, though it is probable that during that epoch the Indus valley and southern Baluchistan were blessed with a better rainfall than they enjoy at present. No extensive cultivation on rainfall alone is likely to have been so large as to cut out all need for artificial irrigation. From Ibn Haukal's account of Mansurah, which was flourishing about 800 A.D., it is clear that irrigation at that time was extensive and efficient. Ibn Haukal says that Mansurah is about a mile and a half broad and is surrounded by a branch of the Mihran—"date trees grow here, but there is neither grape, nor apple, nor walnut in it. Sugarcane grows here. The land also produces a fruit of the size of an apple, which is called 'limon' and is exceeding acid. The place also yields ambaj resembling the peach in appearance and flavour. It is plentiful and cheap. Prices are low and

there is an abundance of food.” Ain-i-Akbari, the great Domesday Book, or Gazetteer of the Moghul Empire, compiled under the orders of Akbar, mentions the sarkar of Thatta. It says : “The assessment of the country is made on the system of division of crops, Ghalibuksh, the third being taken from the husbandman. Shali rice is abundant and of good quality. The staple food consists of rice and fish.”

Sind has been irrigated by means of artificial canals from time immemorial. As far back as the eighth century the conquerors of Sind, in assessing their land tax, had to differentiate between land watered from the public canals and land watered privately by artificial means. To come to much more recent times, Captain (afterwards Sir Alexander) Burnes while touring up the Western Nara (one of the old courses of the river Indus but used as a canal) in 1830 wrote thus; “Its waters are courted and distributed by canals, which add to the blessings bestowed by nature on this flat and fertile land. The eastern bank, though less favoured than the opposite one, is highly cultivated, and most of the towns and villages stand on the verge of canals, which bountifully distribute the water of the periodical swell and attest the industry and assiduity of the inhabitants.” The Mirs, the rulers of Sind at that time, levied an additional tax on lands watered from the State canals, but discharged very imperfectly their duty of repairing and clearing these canals, so much so that in 1841 Lieutenant Postans wrote: “In repeated instances, large tracts of fertile lands have become perfect wastes entirely owing to the neglected state of the canals”. After the British conquest of Sind in 1843, the condition of the canals grew worse, due partly to the officers responsible for them being ignorant of the technicalities of the work on which they were employed. Napier organised a Canal Department under Lieut.-Colonel Walter Scott, of the Bombay Royal Engineers, but his Assistants were not engineers, and it was abolished in 1849 without any useful work having been accomplished.

There is no evidence that the Moghul administration did anything to maintain or improve the irrigation of Sind. But it must be remembered that under the Moghul system the local authorities were recognized to the extent to which they could exercise local control, provided they kept faith with and observed their feudal obligations. The conclusion seems, therefore, to be that in Moghul days the care of canals, water-courses, embankments and wells was left largely to the local chiefs, who could not have afforded to neglect them since the revenue depended upon some control of the waters of the Indus. There is not the slightest doubt that skilful irrigation has existed in Sind since the earliest days and that the present system of canals is the work of generations of cultivators who by rule of thumb methods succeeded, within the bounds imposed by the limited public resources of those days,

in bringing water on to the land and controlling to some extent the vagaries of a very capricious river. Raverty's monumental work on 'The Mihran of Sind' endeavours to trace the wanderings of the Indus over Sind during historic times and is characterized by a wealth of contemporary evidence from all native sources, backed up by an extensive study of the geography of the Lower Indus plain. Modern Sind presents everywhere over its alluvial area traces of the wanderings of the Indus, ever breaking out into new channels and deserting old ones. It is still possible in many parts of the country to follow these old river courses and find on their banks the relics of villages which have long since disappeared. Precision of irrigation such as exists today was unknown. Instead of precision there was uncertainty or capriciousness as channels altered and fresh areas of soil came from time to time under flood.

The old Sindhi system was to use the natural river channels thus formed, dig small water-courses from them, excavate 'khuados' at which Persian wheels worked, and make the utmost possible use, by means of wheels and wells, of low-lying places where the flood waters collected. In these low lying hollows, which go by vast variety of names in the Sindhi language, much cultivation was possible, and even where the circumstances made irrigation impossible, there were great expanses called 'chhans' where grass and jungle scrub grew luxuriantly, nourishing the vast numbers of camels, buffaloes and bullocks which supported a large population and were the foundation of the milk, curds and ghee business and of the leather and hide industry described by travellers. In olden days the area under flow irrigation was incomparably smaller than it is today when canals have been dug on scientific principles and the levels of a canal, from its head to its tail, have been worked out to fractions of an inch. Thus rice, which is a 'flow' crop, was confined to areas where flood water could be conducted without much difficulty of control so as to give the depth of stagnant water that this crop requires. These areas were chiefly in the Larkana district of Upper Sind, called Chandookah in the old records, and in the low-lying land nearer the delta in Lower Sind on what is now the lower alluvial tract of the Hyderabad and Thatta districts.

Pottinger mentions a large canal passing close to Khairpur by which small boats approached the place during the floods. At other times the canal was quite dry and was used as a road. Rohri was surrounded with gardens. "In sailing the Indus", says Pottinger, "many large towns and villages are met with on the banks, but at certain points the nature of the country renders it so evident that extensive inundations must take place during the freshes, that the towns are for safety all built some miles away from the banks and this has led some travellers to believe that in many places the country", on the banks of the Indus is deserted, which is usually far from

fact. He states also that 'to the north and north-west of Shikarpur there is a large tract of country which at one season is entirely under water owing to certain mountain streams, which come from the hills to the north and also from a great body of water which, during the freshes, forces itself through a deserted channel of a branch of the Indus which formerly flowed south-west from the main river 100 miles north of Bakhar. The water from these two sources, having no channel of escape, inundates nearly the whole face of the country and even in the dry season leaves it so cut up that it is passed with difficulty by horses.'" Similar conditions prevailed in Lower Sind which was another great rice-growing area.

Del Hoste mentions the following branches of the Indus, namely Puran, Nara, Arul, Fuleli, Guni, Pinyari, Gangro, Lakhi, Sitta and Bhagar, and adds that there were also several important water-courses and extensive marshes: of the former, the Nara, Dadaji and Nurwah, of the latter, the Marui, Manchur, Mirpur and Kinjar lakes. Hamilton in 1699 has described the fertility of the Indus silt and writes of Thatta that it stands on a spacious plain and 'they have canals cut from the river that bring water to the city and some for the use of their gardens'. Conditions such as these were very different from those described as prevailing in Upper India in Moghul times, when Bernier was impressed by the absence of, and the neglect in improving irrigation works. The truth is that Sind has always been a pioneer of irrigation in India and has had a system of canals and water-courses since the beginning of historical time, tended by people who knew very well how to use the bounty of nature. Oral tradition in Sind today ascribes many of the older canals now existing to the energy of the Kalhora there is no doubt whatever that the Kalhora as Sindhis themselves realized the importance of maintaining the system. There is furthermore, some ground for believing that the irrigation existing in those days was superior to that prevailing during the regime of the Talpurs, whose irrigational works were not numerous and who tended to be parsimonious in their grants for the essential annual clearance of the inundation canals and water-courses. Dr. Kennedy in 1840 says of the Arul canal that 'it is an artificial canal dug in some long forgotten age by some patriot sovereign or by some wise generation which preferred spending their money on what was useful rather than the usual waste of both in which kings and subjects are alike disposed to indulge'. James states that the Shah canal, which suffered a decline under the Talpurs, was dug by Nur Muhammad Kalhoro, whence its name and also the name of the village of Shahpur. 'The traces of extensive cultivation are visible throughout its course and the records of the Amirs prove its former value to the Government'. The Sarfaraz Wah in the Hyderabad district is ascribed to Sarfaraz Khan Kalhoro. It is, therefore, quite fair to assume that the canal system taken over

from the Talpurs in 1843 represented a series of public works which had been even more efficient in Kalhoru days.

Lt.-Col.
Scott's
report on
Canals 1853

We have very full evidence in the Bombay Record Office of the condition of that system in Lieut.-Colonel Scott's report in 1853 on the management of Canals and Forests in Sind'. Colonel Scott examined with the critical eye of the scientific engineer the irrigational system inherited by the Talpurs. He found much to criticize. 'It may fairly be said', he remarks, 'that the whole system of canals in Sind is one of makeshifts and expedients to save some present expense. There are many works which are now called canals but which were probably mere improved branches. It does not appear that the Amirs took any trouble respecting these branches. In fact I scarcely think that much can be done to them by manual labour. It appears to me that the Indus in former days threw out many more branches than it does at present and that there has not been any very natural change in the course of the main stream.' The defects of the system which impressed themselves on Colonel Scott's mind were : (1) that districts removed from the river were very scantily supplied with water even for the ordinary purposes of life ; (2) that the water in wells was often very offensive from the practice of lining temporary walls with rough branches sometimes ingeniously supported by a sort of coiled plait of tamarisk ; (3) that the brick sluices in the canals were defective, as they were not furnished with gates but cross beams were built into the side walls and support branches of trees and rubbish were thrown in to stop the water ; (4) that the system of embankments, a peculiar feature of Sind irrigation, was very unsatisfactory.

These embankments need further description, as they were very common. 'The remains of old works show that great attention was paid to them in former times. Unless where the land is adapted to wheat cultivation unrestricted inundation appears to be dreaded. These embankments which are constructed of alternate layers of earth and brushwood and built as steep as possible, are in fact extremely insecure. The face exposed to the river is annually faced with brushwood, but even this seems to afford little protection. During high floods they require to be watched day and night and are always under repair of some sort. The water of the canals is passed through the embankments by means of brick sluices similar to those before described.' In places where water lay in ponds and lakes cultivation was always by the Persian wheel, of which Sind possesses two types, the 'nar', a big wheel driven by camels, and the 'hurlo' or small wheel driven by a pair of bullocks, or even a single bullock. Such cultivation is called 'lift' because the water has to be lifted on to the land on an endless chain of earthenware pots and the crops cultivated by this method were 'dry' crops like bajri, jowari, cotton, sugar cane and vegetables. Wheat and barley were generally grown on flood water, 'sailab', or on land

that had a watering before the floods subsided, called 'bosi'. These methods are still in use today and can be seen all over Sind, where each droning water wheel, with its small 'landhi' and little orchard of cucumbers and castor oil plants and standing trees, is a petty social centre.

With a river that carries so much silt as the Indus and with the old winding water courses and canals regular clearance of silt was imperative. Maintaining the flow of water was the most expensive part of the irrigational system. Elaborate rules and regulations dealt with this subject. There were four main systems; (1) the clearance of the large canals (called 'wah') was done by the Government alone in some cases ; (2) in other cases the clearance was done by the Government but the cost was partially recouped from the cultivators, called 'sherakati' (or sharing system); (3) in the case of other canals, the smaller ones, the Government made an allowance of a certain number of 'khasas' in the 'kharar' of produce as the Government share of clearance-mukhadimi; (4) in all other cases the cultivators cleared each water course and smaller channels, called 'kario' or 'kasi', entirely at their own expense. A whole district was liable to be called out to do canal clearance and usually received a certain quantity of food in payment. Colonel Scott was unable to find any trace of regular annual clearance. There was a distinct liking for excavating new heads to canals rather than cleaning out old ones, usually a very laborious process, as the banks had from previous clearance become very high and steep so that it was difficult finding any where to throw the silt. At present the canals contract and expand without any reason whatever and there is scarcely a canal in Sind the banks of which are straight for a single mile. The native management of the canals was in fact entirely guess-work and there was no attempt to combine the canals into one system. Canals could often be seen running parallel with each other for long distances and the frequent jagirs made it very difficult for the Government to do much in the way of unifying control. When clearance was to be done and paid for by the Government, the kardar prepared an estimate of the total sum required, without giving details. The Amir had rude maps and lists of the canals in his territory and was familiar personally with the nature of the land. Calculations were made in the rupee of the district and the measure was the 'guz' which had different standard lengths in almost every pargana. A cotton rope was used to measure the work and the rise and fall of the land were measured by the eye only. The Amirs sanctioned as much as they thought fit and the amount depended more on their idea of the kardar's honesty than on the necessities of the work. Thus both authorities took means to protect themselves, for it was likely in such circumstances that the kardar would estimate far more work than he actually intended to perform and it is certain that there was much corruption in carrying out clearance. In

Hyderabad and Karachi districts there were no fewer than fifty-six sets of rules governing the payment of clearance charges. Usually half of the amount paid for was paid in kind and not in money. There was generally a distinction between earth carried out by the basket and earth thrown out by the hoe. The former, which was called 'dhuli', was more laborious, and must have been necessary in all the older canals with high banks. The latter was called 'uchal' (throwing). The difference in remuneration between the two methods was calculated as worth six guz (yards) per rupee. The kardar superintended the work of the kamrios (labourers) and was assisted by amins and mohiris. The amin measured the depth of the excavations and the mohiri the length and breadth of them. To help them in their calculations, small portions of the canal beds, called takis (bench marks of earth) were left in their original state for measurement purposes exactly as is done in canal clearance in Sind today.

The Talpurs were miserly, and distrusting the integrity of their kardars, they were always ready to cut down the demands for canal clearance and for the making of fresh irrigational works. Some works were, however, carried out by them, notably the bund or embankment at Ali Bunder across the Fuleli, which is mentioned by Pottinger as the work of Fateh Ali Talpur in 1799. Talpurs did nothing deliberately to ruin the productiveness of their country, though they may have been short-sighted and suspicious of improvement. It may, therefore, be quite possible that much of the decay attributed to their carelessness and parsimony by English observers was due partly at least to changes in the set of the river which resulted in some of the old river channels being left high and dry. Possessing no public works department they could hardly have been expected to indulge in costly experiments to bring water back into watercourses that the river had deserted and made unprofitable.

The Commissioner in Sind in 1848 held the view that the revenue system had 'too frequently been arbitrary and subject to no restraint. Burnes, who is a judicious and fair-minded observer, says of the last native rulers of Sind : 'Ignorant and oppressive as her rulers are, her annals do not show that she has ever been better governed than in recent times and they have at least the merit of having maintained her in a state of tranquil and almost uninterrupted repose for the last thirty years'. We may perhaps therefore conclude that irrigational conditions in the sixteenth and seventeenth centuries differed in essence very little from what the British found them to be in 1843 and that, if there had been deterioration, it was more likely to have been due to changes in the river Indus than to the stupidity of man. Of the canals known to be old, the following may be mentioned. The Naulakhi canal in the Nawabshah district is believed to be older than the time of the Kalhora. The Nasrat canal in the same district dates from the time of Nur Muhammad Kalhoro, who died in 1754, and the

Sarfaraz Wah in the Hyderabad district is said to date from the time of Sarfaraz Khan Kalhor. The Begari canal in the Upper Sind Frontier district is also an old inundation canal, but it is not known when it was first constructed. As its name indicates, it was the result of the employment of forced labour. The left bank inundation canals in the extreme north of Sind in the Mirpur Mathelo and Ubauro Talukas are all old canals. Their names are Lundi wah, the Dengro wah, the Korai wah, the last is the work of the Korai tribe. Mulchand wah in the Hyderabad and Thatta districts dates from the time of Mir Nasir Khan Talpur, and the Talpurs were also responsible for the creation of the Ali Bund which blocked the flow waters of the Puran, heading them up on the Sind border and preventing them reaching the lands of Cutch.

With the British annexation of Sind the improvement of the inundation canals began to receive attention. Napier's effort to establish a Canal Department was unsuccessful because he relied upon military officers unfamiliar with engineering. The Superintendent of the combined Canal and Forest Department in his time was Lieutenant-Colonel Walter Scott. The combined Canal and Forest Department was abolished in 1849, but was reformed two or three years later under Lieutenant, afterwards General Fife, R.E. In the history of Sind given in the present edition of the Gazetteer the great progress in the improvement of the inundation canals undertaken by the British has been described in general terms. The scientific development of irrigation from the early fifties of last century up to the present day is, after stable government, probably the most valuable legacy which British rule has conferred upon Sind. The pioneers in this great work were Lieutenant-Colonel Walter Scott above referred to, who traced the main defects of the old system of irrigation and suggested the best method of improving it, General John Jacob, Mr. Bartle Frere and Lieutenant Fife, R.E. It was due to General John Jacob's initiative that the Desert Canal was dug and the fertility of the Upper Sind Frontier developed. This development led to the creation of the town of Jacobabad, which in the course of two generations became the centre of one of the most heavily productive areas in the whole country. Mr. Bartle Frere probably was the greatest administrator which the country of Sind has ever known. He used all his ability and skill to get irrigation put upon a scientific and profitable basis. But Lieutenant Fife is the real architect of what has since become a most impressive system of public works; not only was he responsible for many of the earliest improvements on a small scale undertaken in Sind, but he was the first Irrigation Engineer to foresee the need for what became the Sukkur Barrage. In 1855 Lieutenant J. G. Fife, R.E., as he was then, submitted a very able report on the remodelling of the irrigation system of the whole province. This report was entitled "A Sketch of Irrigation in Sind with proposals for its improvement". In this report he stated that in one year

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the province had lost 31 lakhs through the defects of its irrigation works, and he mentioned certain principles which he considered ought to guide all future operations. In accordance with these principles he proposed four lines of canals, one leaving the river at Rohri and running parallel to its left bank at a distance of about fifteen miles from it until it entered the Fuleli canal near Hyderabad, another leaving the river at Sukkur and running parallel to the right bank and about four miles away from the latter till it entered the Western Nara canal a few miles north-east of Larkana, and the third and fourth leaving the left and right banks of the river respectively at Jerruck. The last of these was ultimately to reach Karachi. He suggested a fifth canal as likely to be very beneficial to the country, running from Mithrao to Wanki Bazar on the Eastern Nara. The first of these projects, the Rohri canal, was at the time considered to be of alarming magnitude and was not adopted. The second project, the Sukkur canal, was accepted in a very reduced and modified form and sanctioned in 1861. The fifth canal was sanctioned at once, but owing to the financial embarrassments of the period it was not completed till 1879.

If one examines the history of the period between 1855, the date of Lieutenant Fife's epoch-making report, and 1932, when the Lloyd Barrage was opened in Sukkur, the general impression gained is one of a battle between two rival schools of thought, those who relied upon inundation canals as the answer to Sind's irrigation problem and those who took the wider view that the only satisfactory long term solution was perennial water brought on to as much of the land as could be irrigated. The battle between those who believed in make and mend and the few far-sighted men who considered this inadequate was waged with continuing success by the makers and menders, who had throughout the stout assistance of the Treasury, namely, the Finance Departments of the Government of Bombay and the Government of India, who always showed themselves unwilling to risk large sums of money in big schemes for future improvement. But the logic of facts in the opening years of the present century began to support the view of the far-sighted men. It is interesting in this connection to recall one more service rendered by Lieutenant Fife, who became in the nineties of the last century Lieutenant-General Fife. In 1890 Lord Reay, the Governor of Bombay, one of the far-sighted men who looked into the future, wrote on the subject of irrigation: "But there is a question which I desire to record; I regard it as an important one, and it is not a new one by any means. It is: Are we right in improving and extending and thereby perpetuating the existing system of inundation canals? The satisfactory increases in the cultivation and revenue in the last five years would at first sight appear to afford an answer to this question. But it was before remarked that a large proportion of that increase was on the new canals constructed by Government. If these works are excluded

I fear it must be said that little has yet been done effectually to improve the canal system in Sind. A large proportion of the cultivation is still carried on at enormous cost in labour for lifting the water on to the fields, and there are not more than perhaps three of the large canals with heads which are in any sense permanent and not liable to damage from changes in the river channel. The excellent paper written many years ago by General Fife entitled "A Sketch of Irrigation in Sind with Proposals for Its Improvement" exposes the evils of the present system, many of which still prevail, and the loss it entails, and suggests effectual remedies. The subject is one I would commend for a further consideration and enquiry in the light of General Fife's remarks," and on the 9th May 1890 Lieutenant-General Fife, who had never wavered in his belief in his project since he took it up in 1855, addressed a letter to the Secretary to Government at Bombay, in which he referred to Lord Reay's minute and gave reasons why this canal ought to be made. Thus was the prophet, even after thirty five years, still without honour in his own country. Another forty-two years were to pass before General Fife's dreams were to come true, and by that time he had long been dead. The victory of perennial irrigation is now complete, and it will not be long before the last of the inundation canals are matters of history, as the two great areas left out from the command of the Sukkur Barrage project are now being covered by : (1) the Kotri Barrage, called the Ghulam Mohammad Barrage opened in 1955, which will give a perpetual supply to those areas of the Hyderabad and Thatta districts which were outside the Rohri canal command, and (2) the Gudu Barrage in Upper Sind which will make good the supply of water to those areas of the Sukkur and Upper Sind Frontier districts which received no water from the Sukkur Barrage. The Gudu Barrage, about which some information is given later in this chapter, is still in course of construction, and until it and the Kotri Barrage are functioning to their full extent, an amount of cultivation must still remain on the inundation canals of the old type. Between 1884 and 1894 the largest canal work carried out was the construction of the Unhar wah in the north of Sind at a cost of 6 lakhs of rupees. The two smaller canals, the Pritchard and the Dhamrao, were constructed in 1894, each costing about 3 lakhs of rupees. The Jamrao canal was also started in 1894. This canal was designed as a perennial canal, and up to the time when the Lloyd Barrage canals started flowing, it was the only one so designed. But owing to the failure of the Eastern Nara as a feeder channel in about 1908, the supply in the Rabi season was uncertain and deficient. Lieutenant Fife in 1860 had brought the Jamrao canal project before Government more in order to prevent it being lost sight of than to press for the immediate execution of the work. In fact the Jamrao scheme was subordinated to the much more ambitious project of the Rohri Hyderabad canal, and remained in abeyance till 1872, when it was taken up afresh.