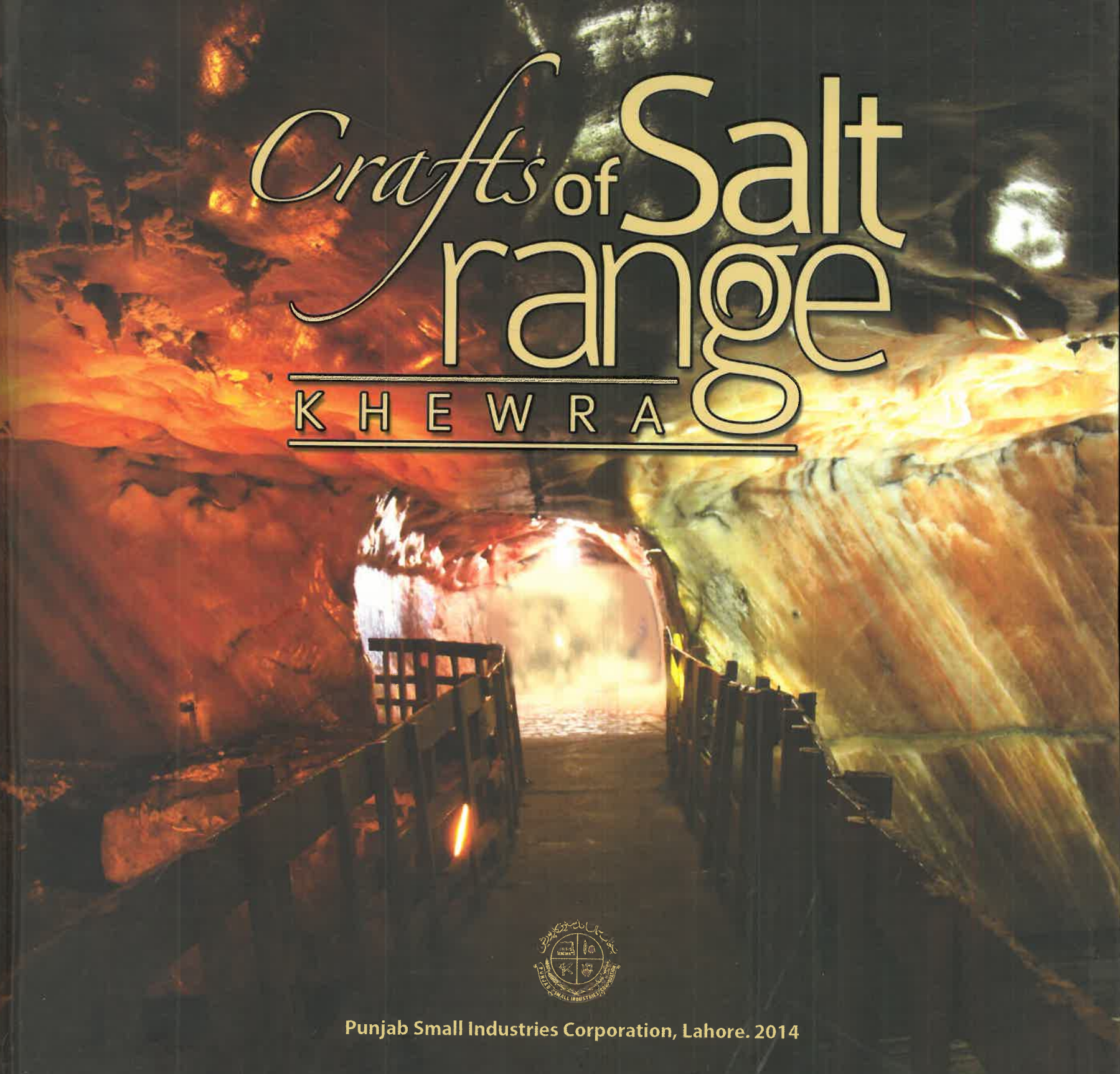


Punjab Small Industries Corporation, Lahore. 2014

Crafts of Salt Range Khewra

PUNJAB SMALL INDUSTRIES CORPORATION
LAHORE

Crafts and Craftsmen of Punjab
VOL-IX

Crafts of Salt Range Khewra

DIRECTORATE OF HANDICRAFTS AND DESIGN,

PUNJAB SMALL INDUSTRIES CORPORATION LAHORE, 2014.

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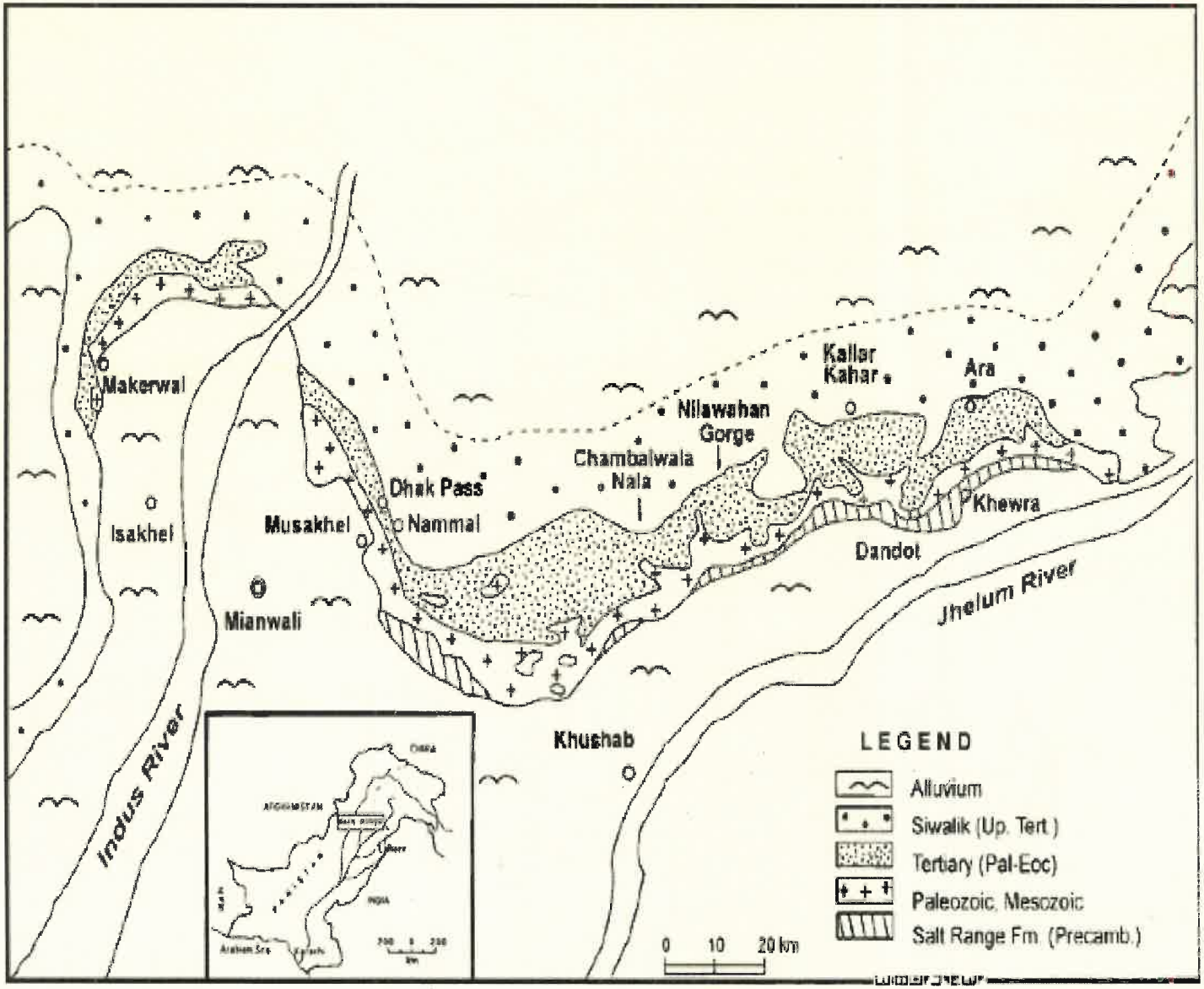
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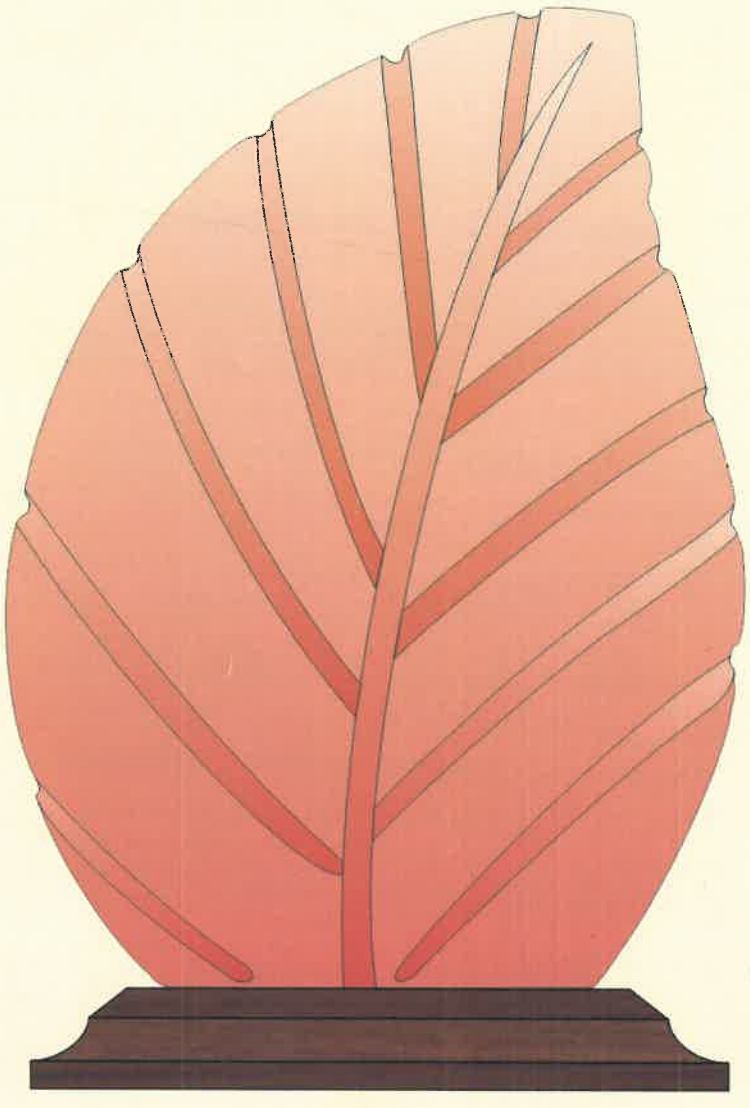


THE PEOPLE WHO STRIVE TO MAKE THIS WORLD BETTER
FOR LIVING ARE

THE SALT OF THE EARTH (Anonymous)



Map of the Salt Range, Pakistan (after E.H. PASCOE, 1919).



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Message

The Salt Range, is a series of hills and low mountains between the valleys of the Indus and Jhelum rivers located in the northern part of the Punjab region of Pakistan. The Salt range derives its name from extensive deposits of rock salt that form one of the richest salt fields in the world. The range extends from the Jhelum river to the Indus, across the northern portion of the Punjab province. The Salt Range contains the great mines of Mayo, Khewra, Warcha and Kalabagh, which yield vast supplies of salt. Coal of medium quality, gypsum, red clay and iron ores are also found.

The Salt range is a landmark near Rawalpindi-Lahore motorway. The Khewra mine alone attract up to 40,000 visitors per year and is the second largest salt mine in the world. Every part of the salt range has a romance of its own. Lakes, orchards, landscapes, springs, mountains, shikargah (hunting places) and the fauna of the salt range just add to the exquisite beauty of the place.

Salt range is a beautiful mix of history, geography, intellect, romance, skill, prosperity, people, traditions, culture and crafts. Salt range is a hodgepodge of so many spectcular manifestations of antiquity from craft to cuisine.

The mastery of the artisans made salt range world famous for Salt crafts, Khussa (A foor-wear), extensive trade of cotton and wool, Salara/Lungi, Khes (Majnun Khes), Truck Body, Daree, Khairi Tillayali (Traditional shoe), table lamps, candle stands, salt bricks, salad plates, soaps, decoration pieces and cusines like, Dhoda (a sweet), Pateesa (a sweet), Makhaddi Halwa (a sweet), Honey, Gulqand (Rose petal Jam), Arq-e-Gulab(Rose water) and Rewári (a sweet).

Punjab Small Industries Corporation (PSIC) is comitted for the promotion of arts and crafts and the publication on the subject is an endeavour on this account. PSIC has

successfully introduced works on arts and crafts through through series of publications on the crafts that has been appriciated by public at large. Mr. Abdul Kabir Tahir deserves appreciation for the hardwork and commitment he had shown to produce this book. He is an art lover and has demonstrated his passion by making his vocation an avocation. There is an old saying that one finds a profession one loves, then one does not have to work for the rest of life. Mr. Abdul Kabir Tahir is lucky to have been in a profession since decades, he loves most. Once he is working on his desk or speaking on the arts and crafts, a natural glow of hope and glittering smile is on his face reflecting his deep inner satisfaction. The project team in his supervision especially the co-author Mr. Talal Jamil Qazi and Prof. Agha Rehan Ahmad also deserves appreciation for his cooperation and magnificient achievements. Here i would like to acknowledge the services of Mr. Ahmad Farooq, Director (H&D) for his valuable contribution in supervising the publication and Mst. Tehmina Khalid, who carried the flag after the retirement of Mr. Kabir Tahir. I am sure that this publication will be a valueable addition in the literature on the subject and will difinitely the pace of craft industry in the area.

It is our earnest effort to promote the hereditary skills of our artisans by linking them with the economic growth and development of the area. I am optimistic that our efforts will achieve success inshaALLAH.

Bilal Ahmad Butt
Managing Director
Punjab Small Industries Corporation

Preface

People generally know about the salt range of Pakistan as the world largest salt mines, tourists visit the mines especially Khewra and gaze in wonder and awe at the fascinating spectacle of light filtering through the solid walls of salt. In contrast comparatively little people know that it is home to the treasures of an ancient culture and history.

The salt range is centre of valuable discoveries in archaeology and ancient architecture. Its importance spans thousands of years, judging from skeletal remains of prehistoric animals found at many locations. Besides the sculptures unearthed by the Department of Archaeology dating back to 6th and 7th centuries, the salt range is scattered with divine structures, of which the most notable is Kataas Raj, located 25 Kilometres from Chakwal.

The Punjab Small Industries Corporation (PSIC) is engaged in documenting the regions of Punjab with respect to their history, art, culture, life of the people, crafts etc. and publishing a series of coffee table books that has been acknowledged by the researchers, scholars, and eminent personalities as a precious work. The present book in your hand is 9th volume of the Crafts of Punjab series published by PSIC.

The book ''Crafts of Khewra'' is an endeavour of PSIC to bring the crafts of the historic salt range to limelight not only to arouse interest of the readers to visit this heaven on earth but to promote the arts and crafts of this area for economic reasons as well. I believe the PSIC project team of "Salt Crafts Khewra" has been successfully able to cater for the needs of the region and to promote this

land as a worth seeing place. The medicinal benefits of the salt lamps had been quite discussed at length in this book that may create demand of this product.

Here i would like to acknowledge the support of P&D department, Government of Punjab , Dr. Shujaat Ali, Former, Secretary , IC&ID, Mr. Irfan Ali, Former Secretary, IC&ID, Mr. Farhan Aziz Khawaja, Former, Managing Director, PSIC, Mr. Muhammad Akhtar ,Former, Managing Director, PSIC,Mr. Ashiq Hussain Aulakh, Former, Dy. Managing Director, PSIC , Mr. Nazir Ahmad (TI), Former, Director (H&D), PSIC. Mr. Bilal Ahmad Butt, Managing Director, PSIC added laurels to the effort made by Mr. Kabir Tahir, Project Director, of the scheme "Salt crafts Khewra" by adding his valuable inputs into the book. Last but not the least the contributions of the staff of the Directorate of Handicrafts & Design namely Mst. Tehmina Khalid Khan, Project Director, Mr. Qamar Mehmood, Mr. Salahuddin Zaffar and Mr. Sabih Zaka are commendable as with their whole hearted support the work on this marvellous coffee table book have been accomplished. I am confident that this book will be a significant contribution among the series of PSIC books on crafts.

AHMAD FAROOQ
DIRECTOR (HANDICRAFTS &DESIGN)
Punjab Small Industries Corporation

Foreword

This book "Crafts of salt Range Khewra" embarks on revealing and depicting the so far un-revealed, unraveled story of the salt range. The salt range constitutes of the beautiful landscape of Pothohar. It could have been a very difficult and excruciating exercise of narrating minute and relentless details about the landscape, its proportions, the magnitude and prospects that do not attract a layman. Any piece of craft or literature has to appeal the very common interests although its objective specification always addresses a few. Best effort has been made to cover up all the aspects related to the past, present and future of the salt range.

The litrature review about salt range revealed a shortcoming in respect of adequate research needed to ascertain and glorify the "hidden truth about the prospects of salt range". This book is an effort to satisfy this immaculate need to research and may prove useful and appropriate description of the salt range.

Moreover, the book covers up all the representative details including people, personalities, history of the area, social background, tourism crafts and skills and economic prospects of the salt range. Hopefully, this research oriented endeavors may soon emerge as a reference book about the salt range.

This book is published under the auspices of Punjab Small Industries Corporation (PSIC), through ADP Scheme "Salt Crafts Khewra" sponsored by the Govt. of the Punjab. PSIC has been a key player in the revival, promotion & development of regional crafts & craftsmen of Punjab by providing infrastructural support to the craft sector. This book is an endeavor to add a ring more in the chain of its previous publications.

But here I do admit that this ring has been casted, carved and polished to this extent by the wholehearted, sincere and complimentary support of the research team especially Mr. Ehtesham Aziz Chaudhry, Usman Ashraf and Talal Jamil Qazi headed by Prof. Agha Rehan Ahmad.

I have to admire the patronizing role of Former Managing Director, PSIC, Mr. Farhan Aziz Khawaja, Mr. Muhammad Akhtar , former Managing Director PSIC, Ch. Nazir Ahmad Former Director, H & D and Mr. Sheraz-ud-Din President, Punjab Trade & Handicraft Group, who remained at my back from day one to the last as their personal efferts added the colours to this book both through paintings and guide lines. The whole team of Directorate of H & D, especially Mst. Tehmina Khalid , Munir Ahmad, Muhammad Riaz, Qamar Mehmood, Afzaal-ur-Rehman, Muhammad Hanif, Riaz Khan and Muhammad Nazim deserves thanks as they all under the creative and splendid leadership of Mr. Ahmad Farooq, Director H & D played their role promptly.

Malik Waheed Awan , Present Nawab of Kala Bagh, , Ms. Sumaira Malik, Malik Fida Hussain (New City Chakwal), Malik Abid-ur-Rehman (Wanhaar News) and Inaam Qadri are the people who really paved the way that led towards the accomplishment of this project.

Team of Makhdooms printers i.e. Mr. Asher Hafeez, CEO, Mr. Syed Mobien Hussaini, Director, Mr. Mumtaz Niazi (BDM), Mr. Amjad Farooq, Designer are the persons, who played the pivotal role while conceiving, designing, composing and over all accomplishment of this assignment in their respective fields.

At last but not the least, here I have to salute to Mr. Bilal Ahmad Butt, Managing Director, PSIC who not only finalized the things amicably but added many valuables by going far ahead to his normal official role as without the same this publication may remain to the extent of a dream.

Abdul Kabir Tahir
Project Director
Salt Crafts Khewra

Poetry on Salt

(By Ghalib)

زخم پر چھڑکیں کہاں طفلانِ بے پروا نمک
کیا مزا ہوتا، اگر پتھر میں بھی ہوتا نمک

گردِ راہِ یار ہے سامانِ ناز زخمِ دل
ورنہ ہوتا ہے جہاں میں کس قدر پیدا نمک

مجھ کو ارزانی رہے، تجھ کو مبارک ہو جیو
نالۂ بُلبُل کا درد اور خندۂ گُل کا نمک

شورِ جولاں تھا کنارِ بحر پر کس کا کہ آج
گِردِ ساحل ہے بہ زخمِ موجۂ دریا نمک

داد دیتا ہے مرے زخمِ جگر کی، واہ واہ!
یاد کرتا ہے مجھے، دیکھے ہے وہ جس جا نمک

چھوڑ کر جانا تنِ مجروحِ عاشق حیف ہے
دل طلب کرتا ہے زخم اور مانگے ہیں اعضا نمک

غیر کی منت نہ کھینچوں گا پے توفیرِ درد
زخم، مثلِ خندۂ قاتل ہے سر تا پا نمک

یاد ہیں غالب! تجھے وہ دن کہ وجدِ ذوق میں
زخم سے گرتا، تو میں پلکوں سے چُنتا تھا نمک

مرزا اسداللّٰہ خان غالب

Love Like Salt

(BY LISEL MUELLER)

It lies in our hands in crystals
Too intricate to decipher
It goes into the skillet
Without being given a second thought
It spills on the floor so fine
We step all over it
We carry a pinch behind each eyeball
It breaks out on our foreheads
We store it inside our bodies
In secret wineskins
At supper, we pass it around the table
Talking of holidays and the sea.

Ode to Salt

This salt
in the salt cellar
I once saw in the salt mines.
I know
you won't
believe me
but
it sings
salt sings, the skin
of the salt mines
sings
with a mouth smothered
by the earth.
I shivered in those
solitudes
when I heard
the voice
of
the salt
in the desert.
Near Antofagasta
the nitrous
pampa
resounds:
a
broken
voice,
a mournful
song.
In its caves
the salt moans, mountain
of buried light,
translucent cathedral,
crystal of the sea, oblivion
of the waves.
And then on every table
in the world,
salt,
we see your piquant
powder
sprinkling
vital light
upon
our food.
Preserver
of the ancient
holds of ships,
discoverer
on
the high seas,
earliest
sailor
of the unknown, shifting
byways of the foam.
Dust of the sea, in you
the tongue receives a kiss
from ocean night:
taste imparts to every seasoned
dish your ocean essence;
the smallest,
miniature
wave from the saltcellar
reveals to us
more than domestic whiteness;
in it, we taste finitude.
(Pablo Neruda)

Salt

He is salt
to her,
a strange sweet
a peculiar money
precious and valuable
only to her tribe,
and she is salt
to him,
something that rubs raw
that leaves a tearful taste
but what he will
strain the ocean for and
what he needs.
(Lucille Clifton)



Natural Composition of Salt in the Potohar Range

Natural Composition of Salt in the Potohar Range

In chemistry, salts are ionic compounds that result from the neutralization reaction of an acid and a base. They are composed of an equal number of cations (positively charged ions) and anions (negative ions) so that the product is electrically neutral (without a net charge). These component ions can be inorganic such as chloride (Cl^-), as well as organic such as acetate ($C_2H_3O_2^-$) andmonatomic ions such as fluoride (F^-), as well as polyatomic ions such as sulfate (SO_2^-).

Salt, also known as table salt or rock salt (halite), is a crystalline mineral that is composed primarily of sodium chloride (NaCl), a chemical compound belonging to the larger class of ionic salts. It is absolutely essential for animal life, but can be harmful to animals and plants in excess. Salt is one of the oldest, most ubiquitous food seasonings and salting is an important method of food preservation. The taste of salt (saltiness) is one of the basic human tastes.

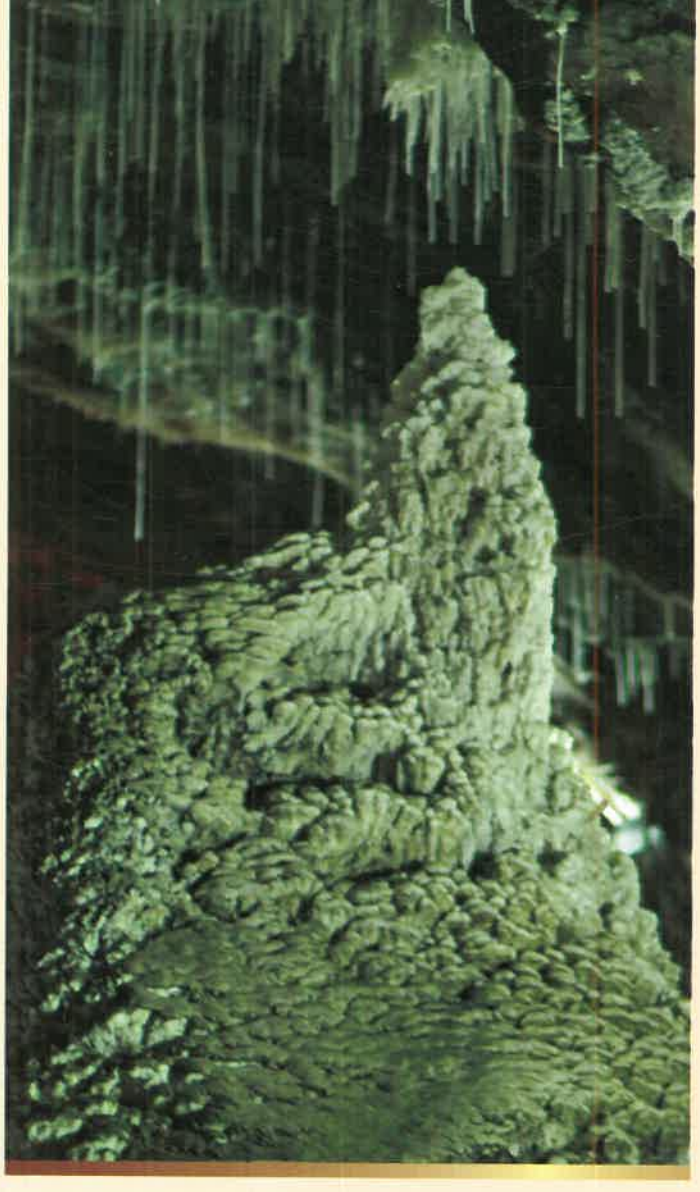
Salt for human consumption is produced in different forms: unrefined salt (such as sea salt), refined salt (table salt), and iodized salt. It is a crystalline solid, white, pale pink or light gray in color, normally obtained from sea water or rock deposits. Edible rock salts may be slightly grayish in color because of mineral content.

Chloride and sodium ions, the two major components of salt, are needed by all known living creatures in small quantities. Salt is involved in regulating the water content (fluid balance) of the body. The sodium ion itself is used for electrical signaling in the nervous system. Because of its importance to survival, salt has often been considered a valuable commodity during human history. However, as salt consumption has increased during modern times, scientists have become aware of the health risks associated with high salt intake, including high blood pressure in sensitive individuals. Therefore, some health authorities have recommended limitations of dietary sodium, although others state the risk is minimal for typical western diets. The United States Department of Health and Human Services recommends that individuals consume no more than 1500–2300 mg of sodium (3750–5750 mg of salt) per day depending on age.

History

While people have used canning and artificial refrigeration to preserve food for the last hundred years or so, salt has been the best-known food preservative, especially for meat, for many thousands of years. A very ancient saltworks operation has been discovered at the Poiana Slatinei archaeological site next to a salt spring in Lunca, Neamţ County, Romania. Evidence indicates that Neolithic people of the Precucuteni Culture were boiling the salt-laden spring water through the process of briquetage to extract the salt as far back as 6050 BC. The salt extracted from this operation may have had a direct correlation to the rapid growth of this society's population soon after its initial production began. The harvest of salt from the surface of Xiechi Lake near Yuncheng in Shanxi, China dates back to at least 6000 BC, making it one of the oldest verifiable saltworks.

Salt was included among funeral offerings found in ancient Egyptian tombs from the third millennium BC, as were salted birds and salt fish. From about 2800 BC, the Egyptians began exporting salt fish to the Phoenicians in return for Lebanon cedar, glass, and the dye Tyrian purple; the Phoenicians traded Egyptian salt fish and salt from North Africa throughout their Mediterranean trade empire.



Along the Sahara, the Tuareg maintain routes especially for the transport of salt by Azalai (salt caravans). In 1960, the caravans still transported some 15,000 tons of salt, but this trade has now declined to roughly a third of this figure.

Salzburg, Hallstatt, and Hallein lie on the river Salzach

in central Austria, within a radius of no more than 17 kilometers. Salzach literally means "salt water" and Salzburg "salt city", both taking their names from the German word for salt, Salz.

Hallstatt gave its name to the Celtic archaeological culture that began mining for salt in the area in around 800 BC. Around 400 BC, the Hallstatt Celts, who had heretofore mined for salt, began open pan salt making. During the first millennium BC, Celtic communities grew rich trading salt and salted meat to Ancient Greece and Ancient Rome in exchange for wine and other luxuries.

The word salary originates from Latin: salarium which referred to the money paid to the Roman Army's soldiers for the purchase of salt. The word salad literally means "salted", and comes from the ancient Roman practice of salting leaf vegetables.

The History of the Controversy

Scientific investigation of the Salt Range Formation began in the nineteenth century, when Pakistan was part of British India. The Cambrian age of the overlying Purple Sandstone, which contains trilobites, was generally undisputed. But there were various opinions about the age and origin of the Salt Range Formation, usually found beneath the Purple Sandstone. Questions also arose about the relative ages of the Salt Range Formation and the Kohat salt deposits, located to the north of the Salt Range Mountains.

A. B. Wynne (1878, p. 83) surveyed the Salt Range Mountains in 1869-71 and concluded that the Salt Range Formation was a normal sedimentary deposit of Paleozoic age. This view was shared by H. Warth, who had extensive knowledge of the region gathered over twenty years (Wynne 1878, p. 73). Wynne and Warth thought the Kohat salt formations were younger, perhaps Tertiary (Wynne 1875, pp.32-37). These views were shared by W. T. Blanford (Medlicott and Blanford 1879 v. 2, p. 488).

Later, C. S. Middlemiss of the Geological Survey of India (1891, p. 42) proposed that the Salt Marl was not a sedimentary formation. It was instead a secretion from an underlying layer of magma that had intruded beneath the Cambrian Purple Sandstone. R. D. Oldham (1893, p. 112), superintendent of the Geological Survey of India, came to a similar conclusion. This opened up the possiblity that the Salt Range Formation was younger than the overlying Cambrian Purple Sandstone.

The German geologist F. Noetling originally thought the Salt Range Formation was Precambrian (Zuber 1914, p. 334). But in a paper published in 1903 (Koken and Noetling, p. 35), Noetling assigned said the Cambrian Purple Sandstone was the oldest formation in the Salt Range Mountains and assigned the underlying Salt Range Formation a much more recent age, without explicit explanation. Holland (1903, p. 26) reported that Noetling believed that the Cambrian Purple Sandstone and other overlying formations had been pushed over the Salt Range Formation by a massive overthrust. According to this idea, the Salt Range Formation was a normal deposit, the same age as the Eocene salt deposits of the Kohat region, just north of the Salt Range Mountains.



This overthrust version was accepted by Zuber (1914). W. Christie (1914), chemist for the Geological Survey of India, held that the Salt Range Formation was not of igneous origin, as proposed by Middlemiss. He

found it to be a normal sedimentary deposit, produced by evaporation of seawater, but he did not say when this occurred.

Murray Stuart (1919) agreed with Christie that the Salt Range Formation was a normal sedimentary deposit. According to Stuart, both the salt deposits in the Salt Range and Kohat regions were both of early Cambrian or Precambrian age. In the Kohat region, the salt lies directly below the "nummulitic" limestones, from the Eocene. Stuart explained this by proposing that an overthrust had removed the Paleozoic and Mesozoic layers, which are found overlying the Salt Range Formation 20 miles away.

In 1920, E. H. Pascoe, in considering all the previous reports, came up with his own conclusion. The Salt Range Formation was a normal sedimentary deposit, of Tertiary (Eocene) age, as was the Kohat salt deposit. Pascoe also believed the Purple Sandstone overlying the Salt Range Formation to be Eocene. The position of the Salt Range Formation and the Purple Sandstone below other formations of Cambrian antiquity was attributed to a massive overthrust.

Robert Van Vleck Anderson (1927) gave the first report of botanical fossil remains from the Salt Range Formation.

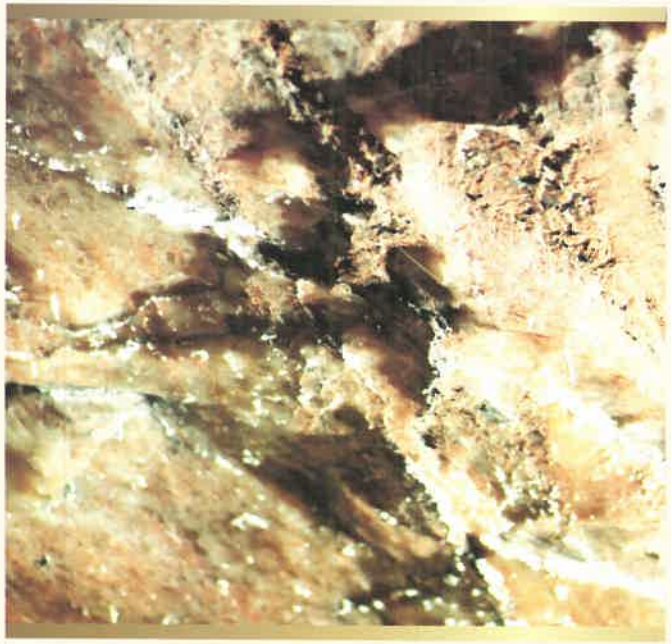


He noted the presence of "poorly preserved impressions of leaves of a Tertiary or, at earliest, Mesozoic type." The impressions came from shale deposits at Khewra Gorge in the Salt Range. He gave samples to Dr. Ralph W. Chaney of the Carnegie Institution, who said:

"This specimen clearly contains fragments of several specimens of dicotyledonous leaves. This places their age as not older than the Lower Cretaceous when the first dicots appeared. One of the leaves is very probably oak (Quercus) and its size and margin strongly suggest the Oligocene species Quercus clarnensis from western America. It is of interest to note that I found a closely related species in the Oligocene deposits of Manchuria. Your specimen is almost certainly of Tertiary age." (Anderson 1927, p. 672) From this evidence, Anderson

argued for a Tertiary age for the Salt Range Formation as well as the Kohat Salt. The presence of Cambrian layers above the Salt Range Formation was attributed by him to an overthrust.

In 1928, Cyril S. Fox published a study concluding that both the Salt Range and Kohat salt deposits were early Cambrian or Precambrian. He saw no signs of an overthrust. He did not mention Anderson's discoveries.



In his presidential address to the geology section of the Eighteenth Indian Science Congress, G. Cotter (1931, p. 296) disputed Anderson's report of leaf impressions found in the Salt Range Formation. He noted the E. R. Gee had searched the same locality in January 1929 and found no new specimens. Cotter joined Gee for another search in March 1929 and also found no new specimens. Cotter noted that they found "carbonaceous markings, some of which simulated broad leaf impressions." But they were in his opinion "not plant fossils."

Anderson then sent to the Geological Survey of India office his best Quercus specimen. Cotter considered it "doubtful." But Pascoe (1930, p. 25) said that the specimen had perhaps been damaged by friction during transit, making it "undeterminable." Pascoe expressed a hope that the specimen had been photographed before it was shipped, but there is no record of such a photograph in Anderson's reports. Some of Anderson's specimens were sent to Professor B. Sahni at Oxford, who, according to Cotter, thought that "the specimens, if they were plants at all, were quite indeterminate."

Cotter (1931, p. 299) also made this interesting observation: "About the year 1924 a large trunk of wood of a modern type and scarcely at all decomposed was found in the salt in the upper tunnel of the Khewra

mine. Dr. Dunn, who examined this wood states that the trunk was about 2 ft. in diameter, and that there were several branches associated with it of about 3 to 4 inches in diameter. Prof. Sahni regarded this wood as modern and resembling an Acacia now found growing in the Salt Range."

Cotter, after considering all arguments, pros and cons, said, he favored a pre-Cambrian age for the Salt Range Formation (1931, p. 300). But before his paper expressing this view went to press, Cotter examined occurences of nummulites, fossil formanifera typical of the Tertiary, discovered by E. R. Gee in the salt marl at Khewra. Cotter, who had originally thought they had been washed into the Salt Range Formation from younger deposits, decided they were native to the Salt Range Formation. In a footnote added to his paper before publication, Cotter (1931, p. 300) reversed the position stated in the paper and declared the Salt Range Formation to be Tertiary. But he regarded it as intrusive, which would explain its position beneath the Cambrian Purple Sandstone. According to Cotter (1933, p. 151), the plastic salt, of Eocene age, was somehow squeezed by geological pressure and other forces into an abnormal positon.

Cotter (1933, p. 150) said that the Khewra nummulites discovered by Gee "occurred in association with plant fragments." He further noted (Cotter 1933, pp. 150-151) that "plant fragments were also found by Mr. Gee in the Salt Marl at the Nila Wahan." Pascoe (1959, p. 569) cites a 1933 report that at Kalra Wahan, a sample of salt marl "yielded not only carbonised stem fragments but also several small leaves of apparently dicotyledenous type." Pascoe (1930, p. 132) also noted that Gee found a small piece of fossil wood in the reddish marls of the Salt Range Formation.

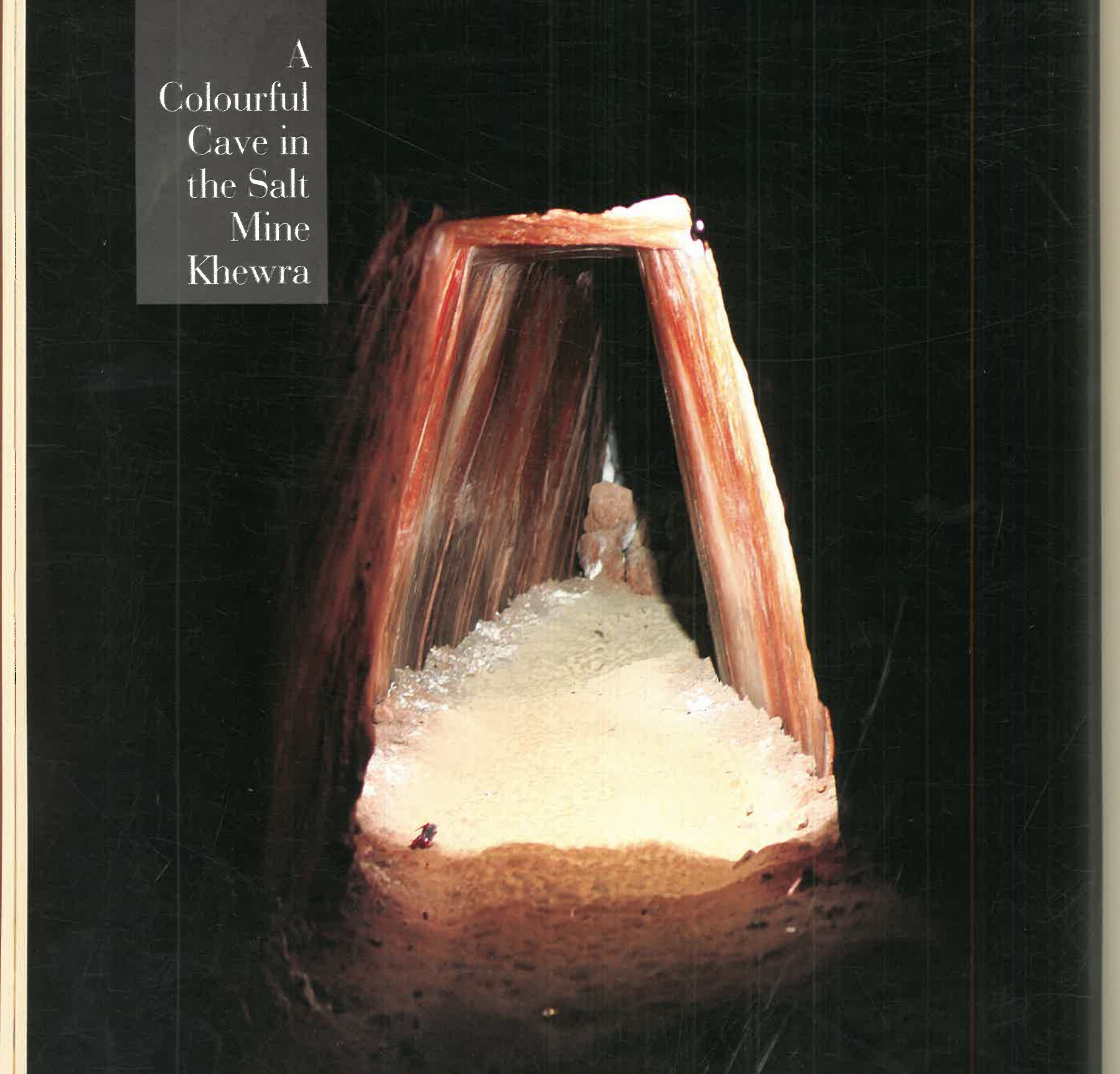
Gee (1934) gave his own opinion about the age of the Salt Range Formation, which he called "the Saline series." He concluded that both it and the Kohat salt deposits were of the same Eocene age. The Kohat salt was in its normal positiion, but Gee (1934, p. 461) noted that "a very regular thrust of immense dimensions must be postulated in order to explain the present position of the Saline series beneath the early Paleozoics (or pre-Cambrian)." Concerning foraminifera found by him in Salt Range Formation deposits, he admitted that they might be derived from more recent formations (Gee 1934, p. 463; Fermor 1935, p. 64). But Gee (1934, p. 463) noted, "Plant fragments, however, have been found not only in beds of doubtful age but also in beds which are regarded as being definitely in situ in the Saline series." He regarded this as evidence the Salt Range Formation was not Cambrian.

Some years later, B. Sahni, then a paleobotanist at the University of Lucknow, reported the existence of numerous plant microfossils in samples taken from the Salt Range Formation at the Khewra and Warcha salt mines. Previously, doubt had been cast on plant fossils from the Salt Range Formation. Critics, said Sahni (1944, p. 462), had pointed out that "in such a highly soluble and plastic substance as the Salt Marl, extraneous material might have penetrated through solution holes or have been enveloped during relatively modern earth movements."



But deep within the mines, Sahni found deposits where such objections could not apply. The salt in these places ran in layers separated by thin layers of saline earth, locally called "kallar." Sahni (1944, p. 462) noted that "the kallar lies closely interlaminated with the salt, in beds which run continuously for long distances and which, although visibly tilted, show no other visible signs of disturbance."

According to Sahni, the salt layers accumulated from evaporation of sea water in coastal lagoons, whereas the kallar represented dust and dirt blown on to the drying salt by the wind. Sahni guessed that the kallar might contain pollen and other plant microfossils. When he examined specimens, he found this to be so (Sahni 1944, p. 462): ". . . every single piece has yielded microfossils. . . . The great majority is undeterminable as to genus and species, being mainly shreds of angiosperm wood, but there are also gymnosperm tracheids with large round bordered pits, and at least one good, winged, six-legged insect with compound eyes." To Sahni, this meant that the Salt Range Formation must be Eocene rather than Cambrian. Sahni later found plant fragments not only in the kallar, but in associated solid rock layers composed of dolomite and shale.



A Colourful Cave in the Salt Mine Khewra

Around this same time, the Geological Survey of India and an oil company sent a team of geologists to carefully study the Salt Range Formation, and on the basis of their field observations they concluded that it was in normal position below the Cambrian Purple Sandstone and was thus Cambrian in age. This conclusion was announced in a letter to Nature (Coates et al. 1945). Among the geologists signing the letter was Gee, until recently an advocate of an Eocene age for the Salt Range Formation. The geologists admitted, however, that "our conclusions were arrived at despite certain difficulties, such as the occurrence of minute plant fragments of post-Cambrian age in the dolomites and oil shales, for which we have at present no clear explanation to offer." In other words, it might be possible to explain the presence of plant fragments in the soluble salt layers, but how did they get into solid rock such as dolomite and shale? This line of reasoning is based on the assumption that land plants did not come into being until the Silurian, with advanced plants such as angiosperms not arising until the Cretaceous.

In his presidential address to India's National Academy of Sciences in 1944, Sahni (1945) introduced numerous examples of pollen, wood fragments, and insect parts found in samples of kallar, dolomite, and shale from the Salt Range Formation. In his report, Sahni (1945, p. x) said that "stringent precautions" were taken to prevent contamination of the samples with modern organic remains. He also emphasized that samples were taken from locations where the geological evidence ruled out intrusion from younger strata.

The laboratory techniques employed by Sahni and his assistant, B. S. Trivedi, were rigorous. In a demonstration at a symposium, said Sahni (1945, p. xiv) "a piece of carbonised wood was revealed in a tiny block of dolomite . . . which had been cut and polished on all sides to show it had no pits or cracks visible even with a strong pocket lens. The block was, as usual, passed through a flame and then plunged into a jar of filtered dilute HCl."

In his own address to the National Academy of Sciences, Gee (1945, p. 293) concluded that the Salt Range Formation was a normal sedimentary deposit and in its original position below the Purple Sandstone. This meant it was Cambrian or Precambrian (Gee 1945, p. 305), while Kohat salt was Eocene. This was a change from his earlier opinion that the Salt Range Formation was Eocene (Gee 1934). He saw no compelling evidence for a massive overthrust in the region (Gee 1945, p. 305). Pascoe, formerly a supporter of the idea that the Salt Range Formation was an Eocene deposit covered by an overthrust, placed the Salt Range Formation in the

Cambrian section of a new edition of his Manual of the Geology of India (Sahni 1947b, p. xxxi).

Gee said that foraminifera of Eocene type found by him in the Salt Range Formation were not in situ, as he earlier believed, but were derived from younger formations. Concerning plant fragments, Gee (1945, p. 296) noted: "Further work on the clay containing plant fragments at Katha led to the discovery of one or two small leaf impressions which were identified by Prof. B. Sahni as belonging to Acacia, a genus still existing in the Salt Range area, whilst in the case of the Khewra mine occurrences, the existence of an important thrust-fault nearby, running roughly parallel to the seams of rocksalt, indicated an alternative explanation for the occurrence of these plant fragments." Gee thought they might have been introduced into the salt in relatively recent times.

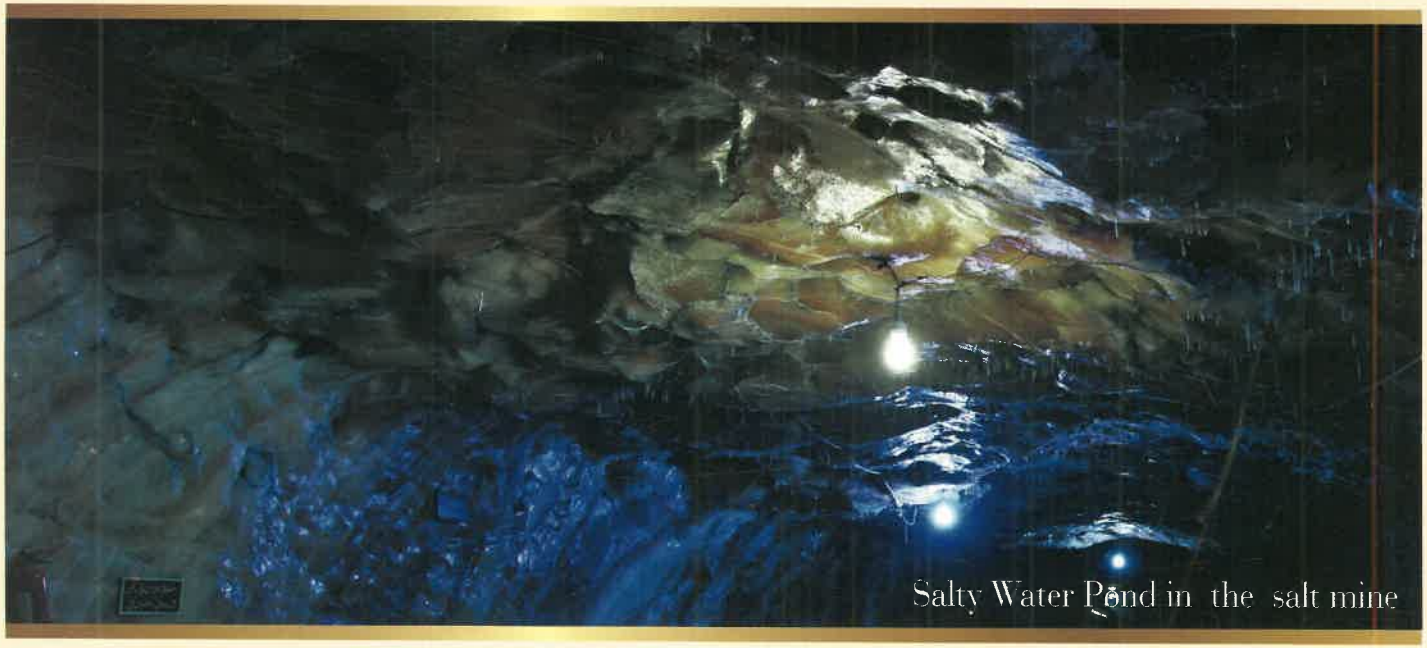
Concerning the Katha finds, Gee relies on the assumption that Acacia is quite recent, and could not possibly have existed in the Cambrian. Concerning the Khewra finds, Gee uses the existence of a fault to explain the presence of advanced plants in a formation he regarded as Cambrian. But he does not explain how close the thrust fault was to the exact places where he recovered plant fragments nor whether the stratification showed any obvious signs of local disturbance. The fact that the salt was still arranged in seams, apparently unbroken, leaves open the possibility that the plant fragments were found in situ.

Gee (1945, p. 297) found Anderson's leaf impressions unconvincing, calling them "unidentifiable brownish markings, possibly organic." Gee (1945, p. 299) saw signs of organic deposits in the shales and dolomites of the Salt Range Formation, but characterized them as "too primitive to include resistant skeletons or woody tissues such as might be preserved."

Gee was, however, seriously troubled by the discoveries of Sahni, which were based on careful observation and laboratory work. Apparently, Sahni had demonstrated the existence of advanced plant remains, including woody tissues, not only in the salt and dolomites of the Salt Range Formation but in other kinds of rock as well, such as shale. About the salt and dolomites Gee proposed that plant fragments could have been introduced into them by "percolating water." But this explanation would not, said Gee (1945, p. 307) apply to the extremely resistant oil shales, in which Sahni had also found microfossils. Gee (1945, p. 306) noted that if Sahni, on the basis of his plant fossils, was correct in assigning an Eocene age to the Salt Range Formation, "then it will be necessary to modify our views regarding the essential characteristics of normal sedimentary and tectonic contacts." According

to standard geological reasoning these indicated a Cambian age.

At the Indian National Academy of Sciences annual meeting for 1945, the Salt Range Formation was once more a topic of extended debate. Sahni (1947a, 1947b) gave reports of additional discoveries of angiosperm and gymnosperm microfossils from the salt marl, the oil shales, and dolomites at all levels of the Salt Range Formation. Microfossils of advanced plants were also recovered from core samples from deep borings in the Khewra salt mine. Sahni (1947b, pp. xxxi-xxxvi) gave convincing evidence that the microfossils were not intrusive contaminations. Furthermore, at scientific gatherings in Great Britain, Sahni (1947b, p. xxxix) demonstrated to geologists his laboratory techniques and obtained "fragments of woody tissue" from samples of the Salt Range Formations's dolomites and oil shales.



Salty Water Pond in the salt mine

Sahni (1947a, p. 243) added that "in a fragment of Mr.

Anderson's original material several microfragments of wood have been found." This would tend to support Anderson's identification of leaf imprints in his material from Khewra Gorge. Sahni had accompanied Gee and others to Anderson's site, and had found no similar specimens. Sahni (1947b, p. xx) noted that these circumstances "do not by any means cast a doubt upon the identification of Mr. Anderson's specimen as an oak leaf." Sahni (1947b, p. xx) also noted: "As it turned out, we had been searching at the wrong place." Anderson's oak leaf imprint had come from a spot lower than that searched, and some distance away.

Concerning the advanced nature of the plant and insect microfossils found in the Salt Range Formation, Sahni (1947b, pp. xlv-xlvi) noted: "Quite recently, an alternative explanation has been offered by Mr. Gee. The suggestion is that the angiosperms, gymnosperms and insects of the Saline Series may represent a highly evolved Cambrian or Precambrian flora and fauna! In other words, it is suggested that these plants and animals made their appearance in the Salt Range area several hundred million years earlier than they did anywhere else in the world. One would scarcely have believed that such an idea would be seriously put forward by any geologist today."

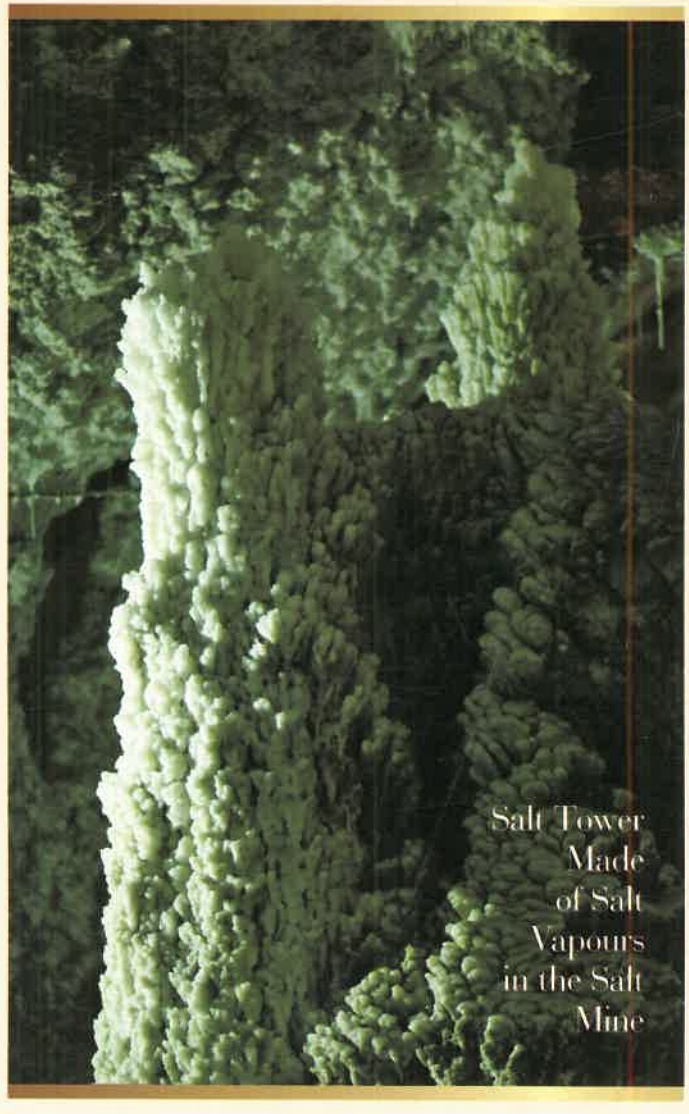
Gee, by questioning basic evolutionary assumptions about the progression of life forms on earth, introduces another possible solution to the Salt Range Formation controversy. Up to this point, the relatively late appearance of the angiosperms, gymnosperms, and certain insects had been taken for granted. Evidence of their presence in the Salt Range Formation had to be resolved by (1) suggesting they were intrusive into the formation, which was of Cambrian age or (2) suggesting that they were native to the formation proving it was Eocene and invoking a massive overthrust to account for the formation's presence below formations generally accepted as Cambrian. Supporters of the former proposal, including Gee, were troubled, however, by the strength of Sahni's evidence for the in situ status of his microfossils. So Gee suggested that perhaps the Salt Range Formation is, after all, Cambrian, as the geological evidence strongly suggested, and the microfossils of angiosperms, gymnosperms,and insects were in situ. This could only mean that the angiosperms, gymnosperms, and insects evolved far earlier than allowed by any current evolutionary account. It was a bold proposal, but fell on deaf ears at the time.

Subsequently, evidence for angiosperms and gymnosperms was also found in other beds of Cambrian age overlying the Salt Range Formation. These included

microfossils of angiosperms and gymnosperms from the Salt Pseudomorph Beds (Ghosh and Bose, 1947), gymnosperms from the Purple Sandstone (Ghosh, et al., 1948), wood fragments from the Neobolus Shales (Ghosh, et al., 1948), and wood fragments from the Magnesian Sandstone (Ghosh, et al., 1948).

Ghosh and Bose (1950, p. 76) proposed two possible explanations for this evidence of advanced vascular plants in the above-mentioned formations: "1. The geologically known Cambrian beds are of post-Cambrian age. 2. The vascular plants existed in Cambrian or pre-Cambrian times." Ghosh and Bose rejected the first proposal because geologists unanimously agreed that the beds in question were in fact Cambrian. Ghosh and Bose found the second proposal more likely, even though it was "inconsistent with the prevailing concepts of plant phylogeny." They pointed out that there had been discoveries of advanced plant remains in beds of similar age in Sweden (Darrah 1937) and in the USSR (Sahni 1947b, in note following plates).

Ghosh and Bose (1947) reconfirmed the original discoveries by Sahni and his coworkers of advanced plant remains in the Salt Range Formation itself. They also found fragments of advanced plants from a sample of shale from the Cambrian or pre-Cambrian beds of the



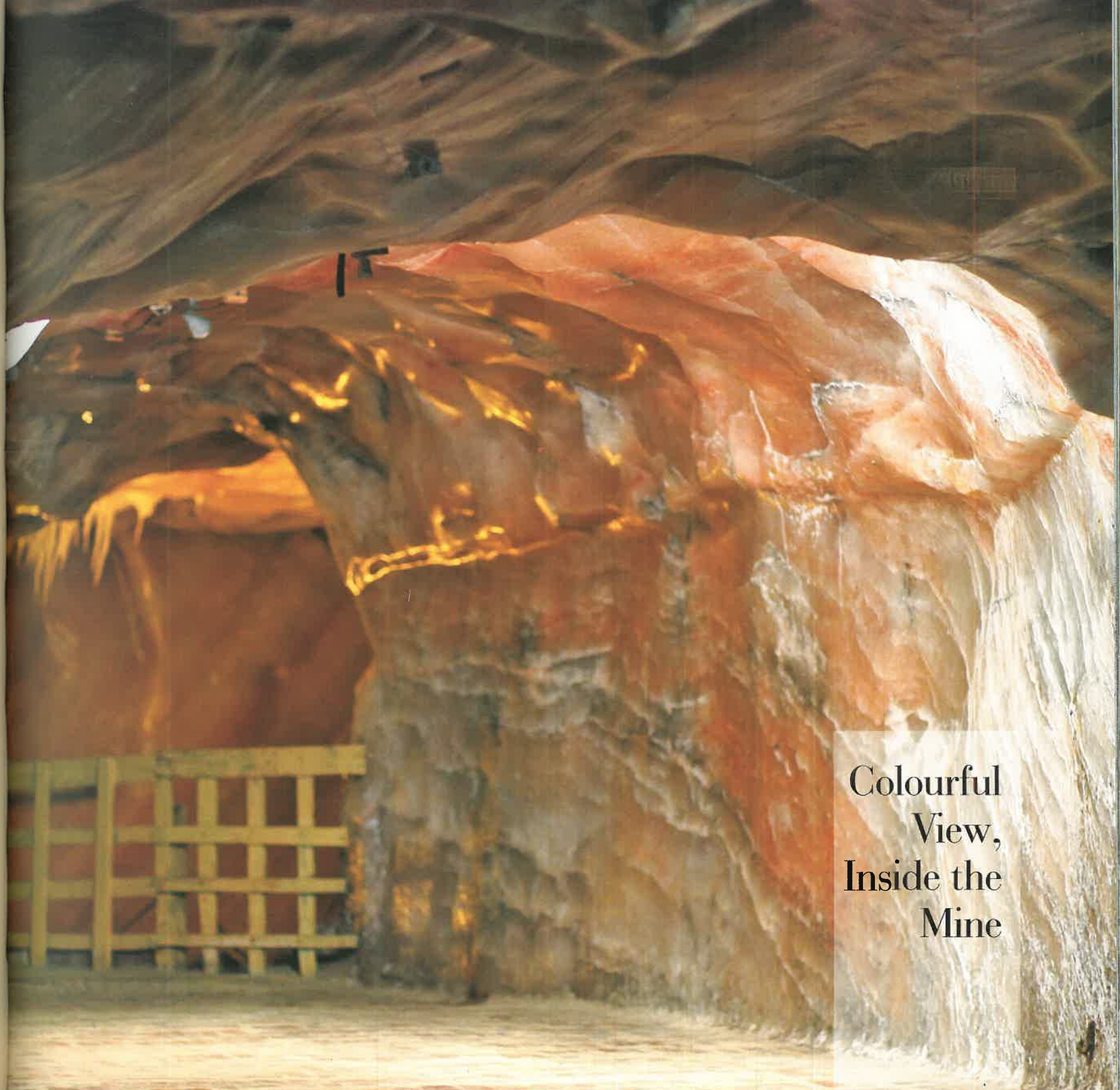
Salt Tower Made of Salt Vapours in the Salt Mine

Vindhyans of northern India (Ghosh and Bose 1950b) and from a sample of Cambrian rock from Kashmir (Ghosh and Bose 1951). In some cases, Ghosh and Bose (1951b, pp. 130-131; 1952,) found fragments of advanced plants (coniferous) in Cambrian rock samples that also contained trilobites. The samples were from the Salt Pseudomorph beds of the Salt Range and the shales of the Rainwar locality in Kashmir.

Other researchers confirmed the work of Ghosh and his associates (Jacob et al. 1953), finding evidence for advanced vascular plants, including gymnosperms, in Cambrian rock samples from the Salt Range and other sites in India. Jacob and his coworkers also called attention to similar Cambrian paleobotanical discoveries in Sweden, Estonia, and Russia, as reported by S. N. Naumova, A. V. Kopeliovitch, A. Reissinger, and W. C. Darrah (Jacob et al. 1953, p. 35).

German researchers (Schindewolf and Seilacher, 1955) took samples of rock from the Salt Range to Germany, where specialists found no evidence of plant remains. But in his discussion, Schindewolf mentioned that he personally witnessed an Indian scientist obtain plant microfossils from a Cambrian Salt Range rock sample in India. After this, active discussion of the controversy diminished. It is quite possible that this was the result of the partition of India and Pakistan. After partition, members of the Geological Survey of India may not have had such easy access to the Salt Range in the newly independent Islamic state of Pakistan.

In recent years, petroleum geologists have conducted extensive studies of the Salt Range region, with no reference or only slight reference to the debates that took place earlier in the century. Although modern geological reports acknowledge overthrusts in the Salt Range, they unanimously declare the Salt Range Formation to be Eocambrian (Yeats et al. 1984, Butler et al. 1987, Jauné and Lillie 1988, Baker et al. 1988, Pennock et al. 1989, McDougall and Khan 1990). One paper (Butler et al. 1987, p. 410) mentions discoveries of wood fragments in the salt deep in the mines at Khewra. The authors propose these are intrusive, but neglect to discuss the extensive reporting by Sahni and others ruling out such an explanation for the microfossils discovered in various kinds of rock from the Salt Range Formation.



Colourful View, Inside the Mine



Geographical and Geological Aspects of Salt Range

Geographical and Geological Aspects of Salt Range

Pakistan is located between 24 – 37° North Latitude and 61° – 75.5 East Longitude. It covers an area of 796095 sq. km. Out of this area 46, 8000 sq. km is in north and west in the form of mountains lands and plateau, while the remaining 3, 28000 km comprises the plains. Environmental variations in Pakistan range from high snow fall areas of Himalaya in the north to hot humid climate of shores of Arabia Sea in the South (Ahmad et al., 2007). The country is mostly arid with 75% of its parts receiving an annual precipitation of less than 250 mm and 20% of its less than 125mm. Only 10% of the area in the northern mountains ranges receives in between 500 mm and 1500 mm rainfall (Ahmad and Waseem, 2004).

The Salt Range Mountains run between India and Pakistan, in a province of Pakistan known as the Punjab. These mountains are named for their large natural deposits of rock salt; in addition to being important commercially, they are also interesting archaeologically, as they contain a number of sites which are worthy of study.

Geographically the Salt Range is located between 32°23 – 33°00 N and 71°30 –73°30. This area is of prime importance as it is located between the Thar Desert in the west and the Potohar plateau in the north east (Mc Kerrow et al., (1992), Yeats et al., (1984). Salt Range covers an area of 150 miles from east to west. It takes its name from important salt deposits, which are present at Khewra, Khatha, Warcha and Kala Bagh (Ahmad 1964, Ahmad et al., 2007). The range of hills extends in irregular arc from east of Jhelum River in the Tilla Jogian and Bakrala ridges. It runs southwards to the north of Jhelum River for some distance before turning North West to cross the River Indus near Kala Bagh. On the west of river Indus Salt Range continuous southwards to the districts of Bannu and D.I.Khan (Ahmad and Waseem, 2004).

Land

The landform is that range of low mountains from which the top strata have been removed by erosion. Forming the southern terrace of the Potwar Plateau

(1,700 feet), southwest of Rawalpindi, it consists of two unsymmetrical, parallel ridges divided by a longitudinal valley. The southern slopes of both ridges are steep; the northern slopes are slanting. The northern ridge (a cuesta—i.e., a sloping plain, culminating at the upper

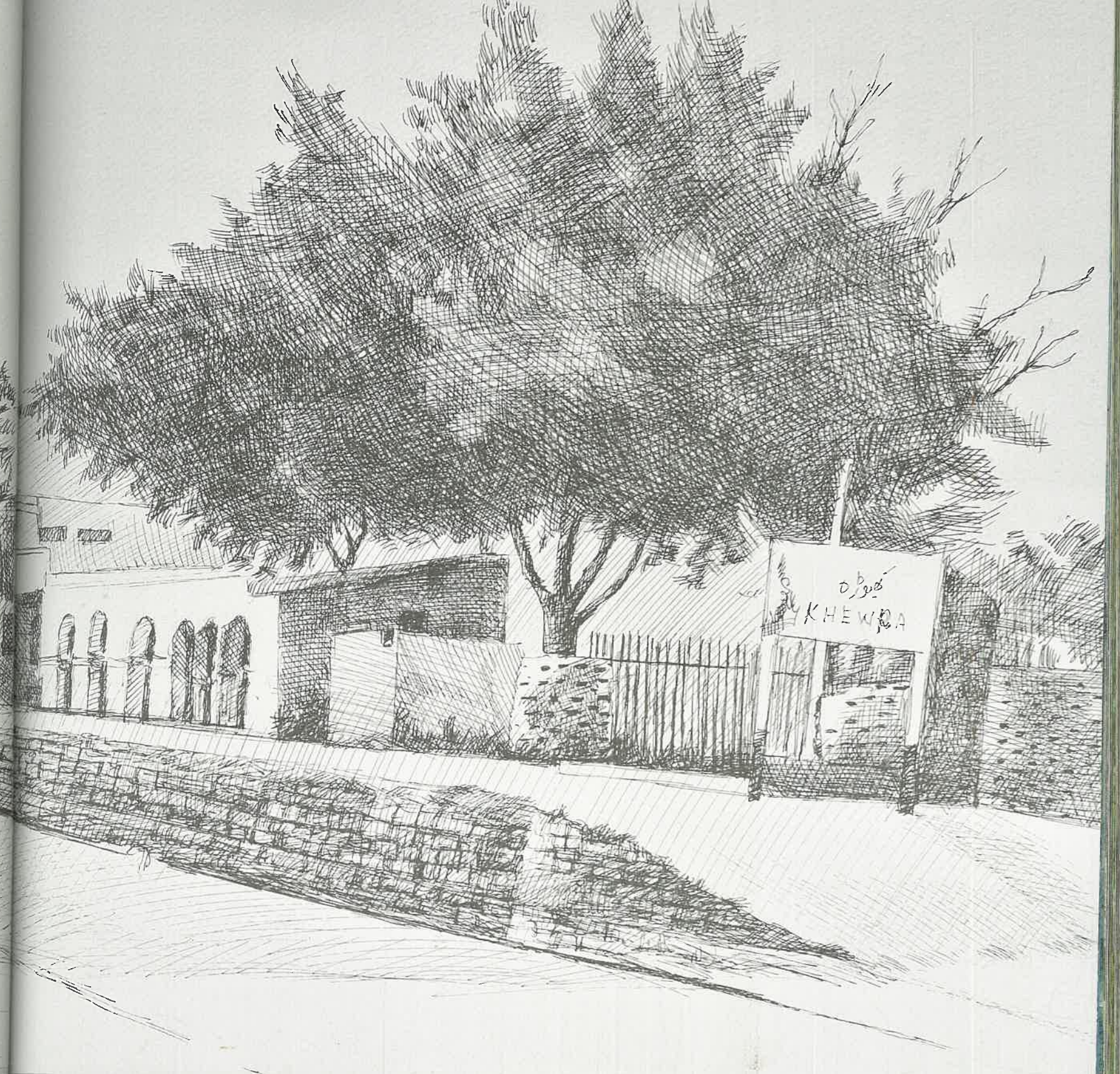


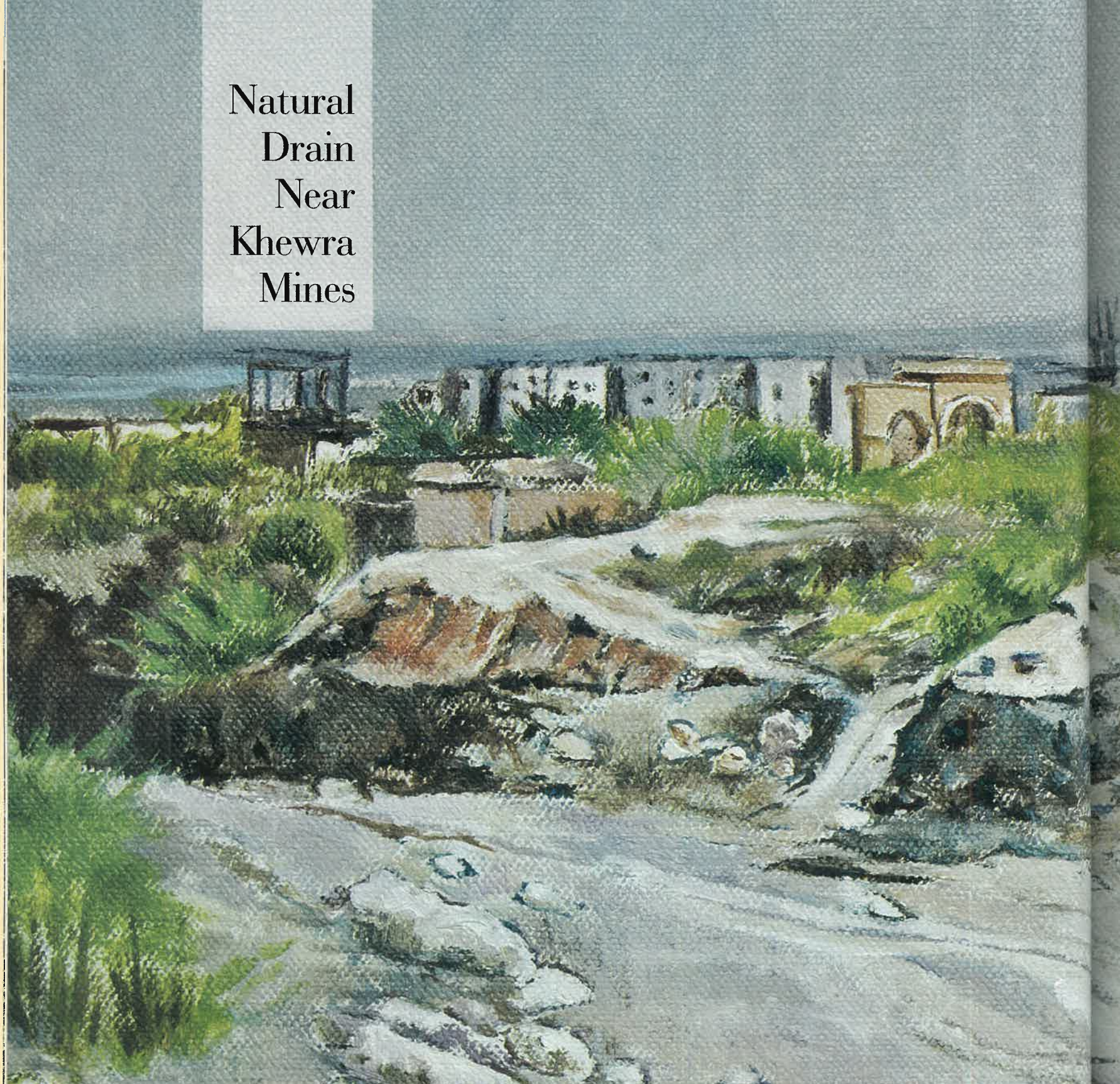
Barley Field

end at the crest of a cliff), with an average height of from 2,300 to 2,600 feet and with very steep southern slopes, is the lower. In the west and east, the range divides into separate mountain masses, or massifs. West of Sakesar the course of the range swings to the northwest, with low, longitudinal ranges. The Indus River breaks through the ranges at Kālābāgh, flowing between vertical cliffs inaccessible to communication. The summits of the Salt Range are slanting, hilly, and plateau like. The highest peaks are Sakesar, in the west, and the massif Chel (Chail), 3,700 feet, in the east. On the northern slope, a system of deep ravines (badlands) has developed

Railway Station Khewra

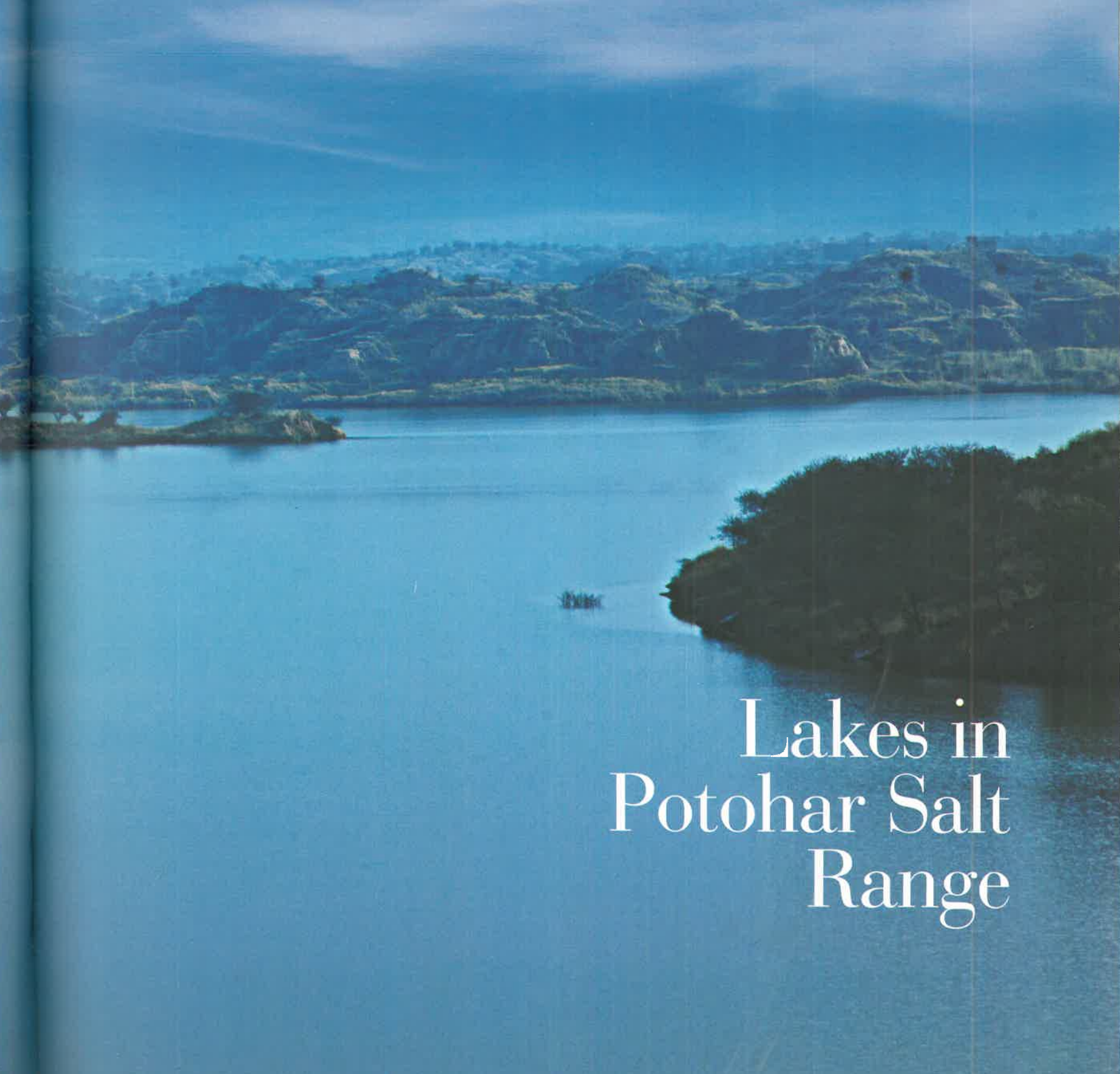



KHEWRA



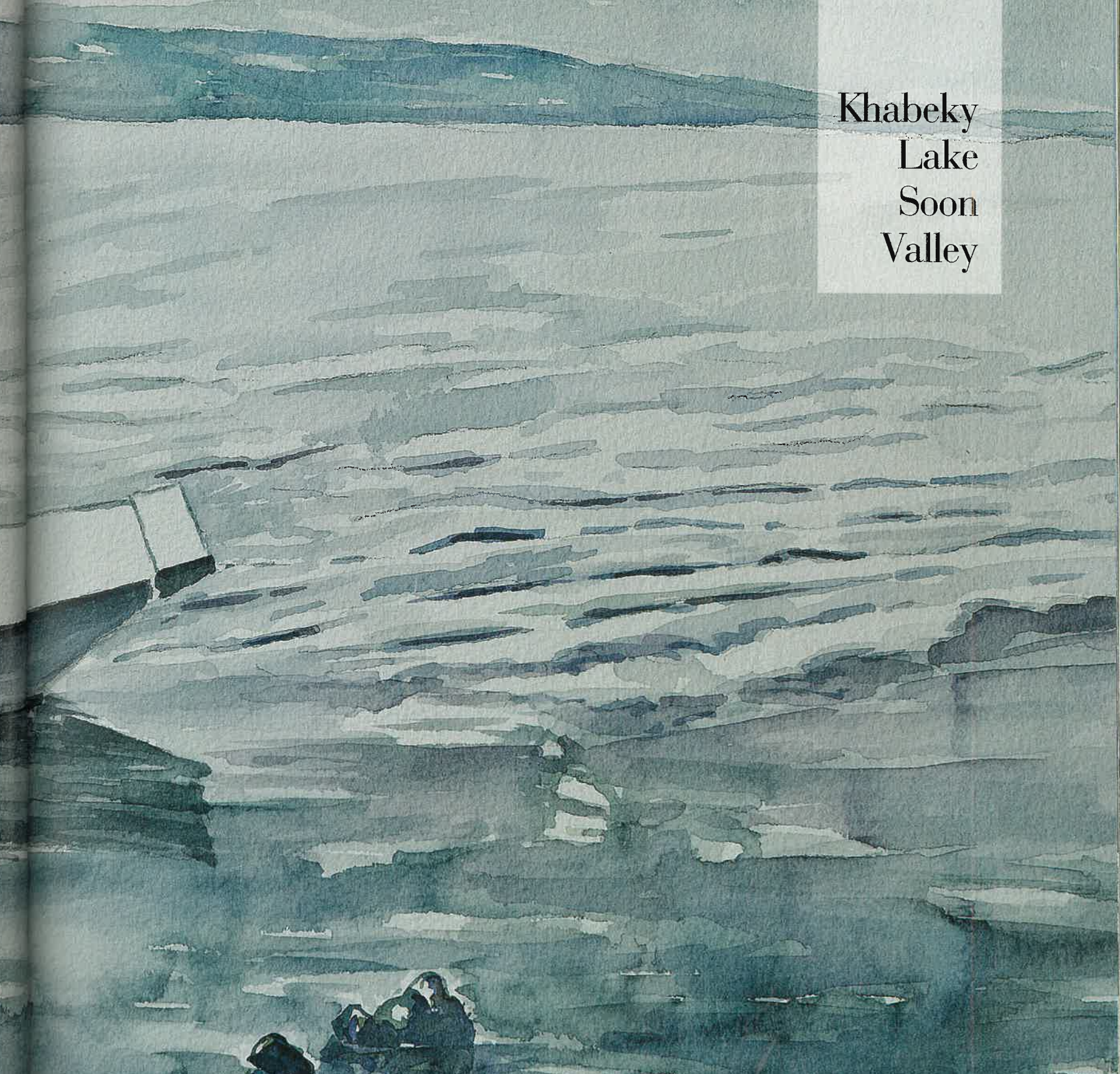
Natural Drain Near Khewra Mines

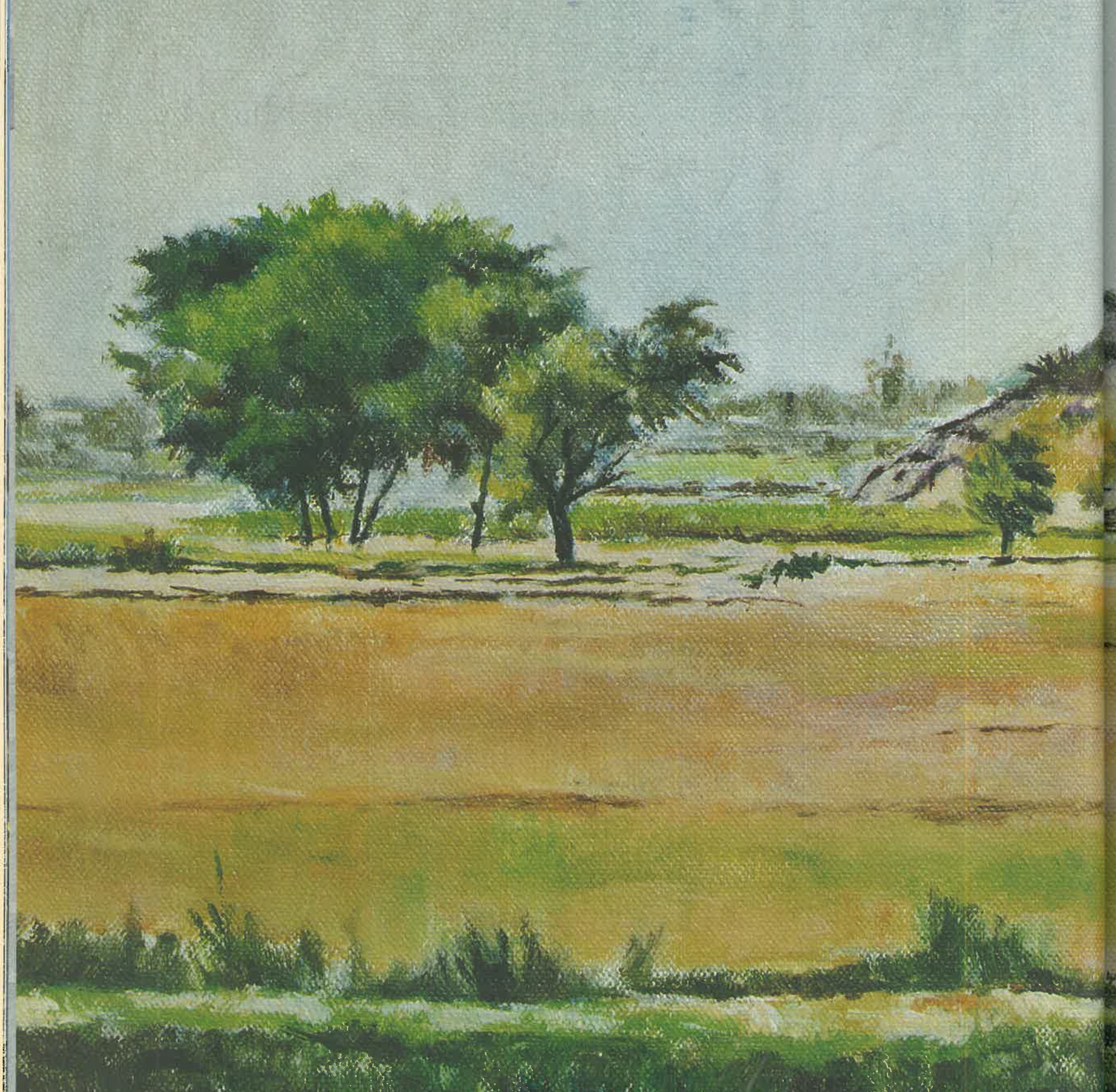


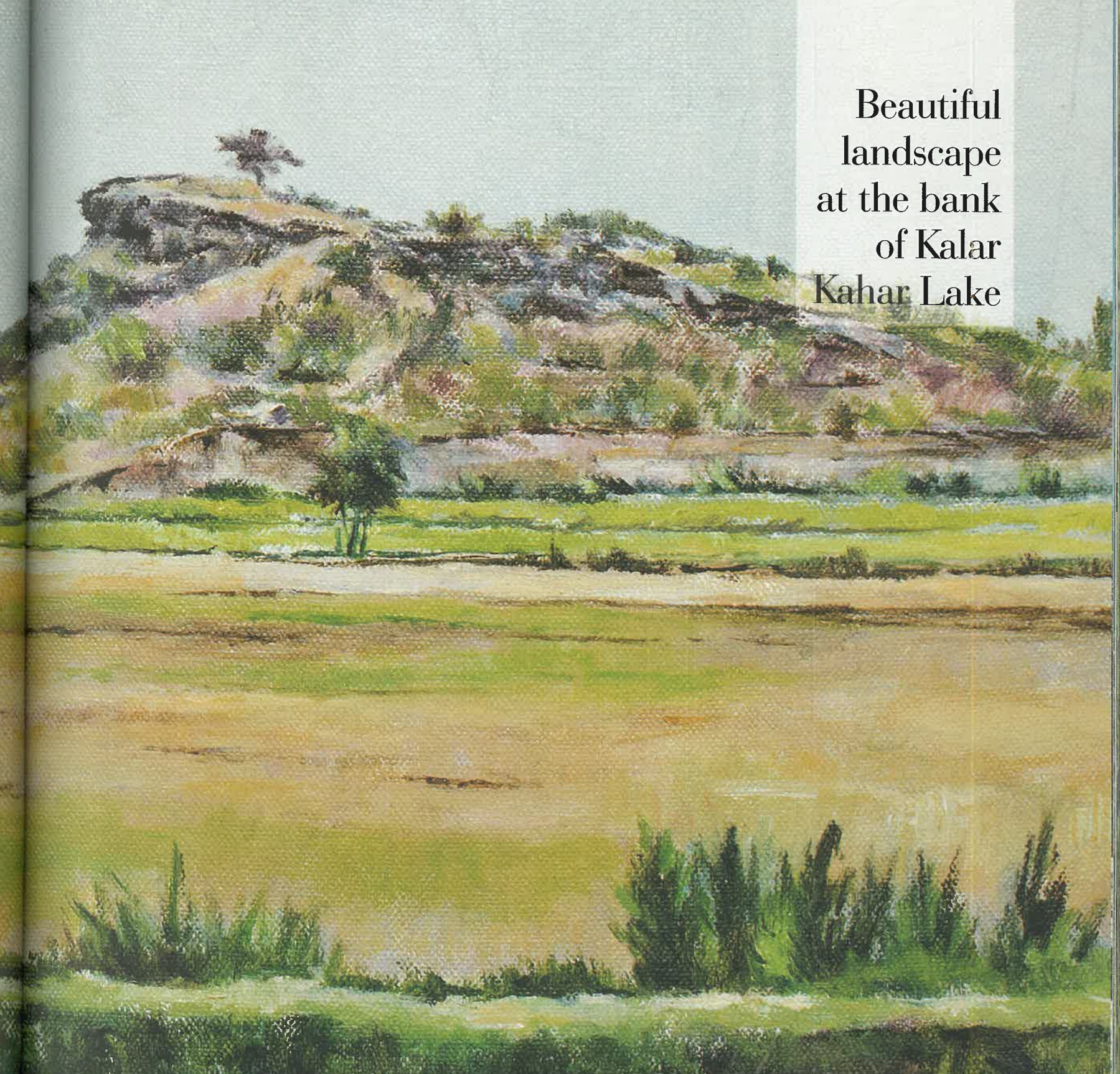


Lakes in Potohar Salt Range




Khabeky
Lake
Soon
Valley





Beautiful landscape at the bank of Kalar Kahar Lake

Kathwai

Two interesting sites are close to Kathwai, Kutte Mar and Tulaja fort. At Kuttee Mar to the Northeast of Kathwai are Muslim graves made of Kangar and the purported grave of a dog that is said to have died defending the wedding procession of its owner from an attack by bandits. Kutte Mar may have been the place where the Khura inscription of Toramana was found (Buhler 1891-92, 238-41; Sircar 1965: 422-4). If this assessment is correct, a Buddhist monastery was established here around 500. A.D. This inscription and another fragmentary inscription found at Sakaser (Pakistan Archaeology 5, 1968: 284-70) confirm that this area was a flourishing, centre for Buddhism, which is borne out by the extensive archaeological remains.

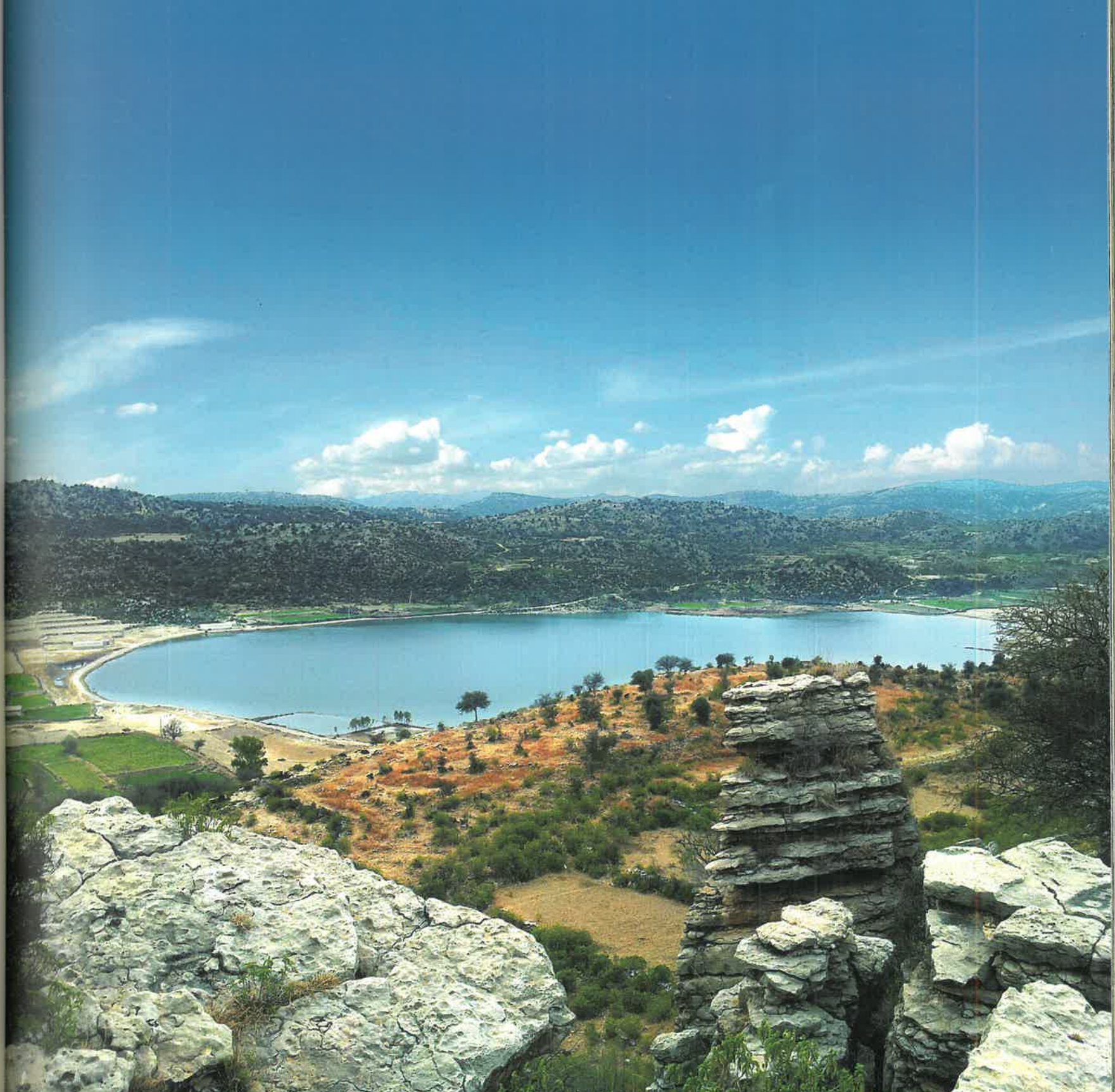
The Tulaja fort is located on a huge rock outcropping with sheer cliffs overlooking the shrine of Kacchianwalla and the Punjab plains. The entire area is covered with the ruins of defensive walls, houses, and other structures made of large stone blocks. Although one building has been identified as a mosque, it is very difficult to distinguish other religious, military or civil structures. One of the most interesting features is a large square tank made of the flat rectangular bricks, which may have supplied water so that the fort could withstand a siege. Comparing this tank with those in other forts may help in assigning a relative date to its construction. In addition to architectural styles, evidence from any coins, which are found here, may help to indicate if this city belonged to the period of the Turk Sultans, Lodhis or Mughals. Extensive remains of a cemetery and other settlements are on the slopes below the fort. There are also supposed to be some remains on Tulaji across the valley from Talaja.

Altitude

Area of Salt Range is located in subtropical region, its height ranges from 250 to 1520 m (Chaudhary, 1969). The highest point of range is Sakesar (5010 ft). Throughout its length the Salt Range has steep cliffs to the south (Ahmad, 1964).

Lakes

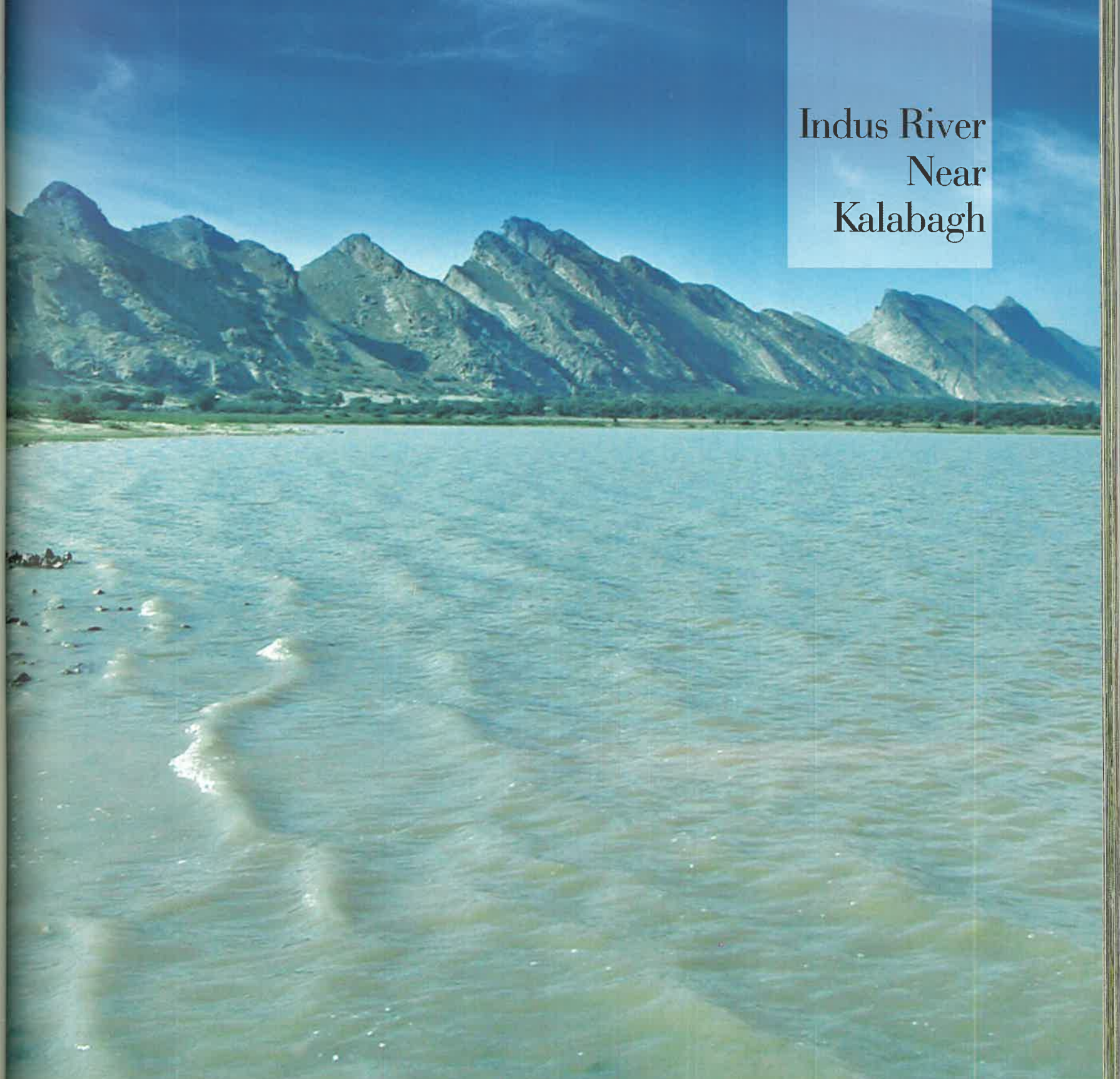
Salt Range runs in two parallel lines of hills separated by a distance of about 5 miles. These hills consist of a number of parallel ridges. These ridges include several high level valleys. The water from these hills finds no outlet and is collected in the valleys forming salt lakes. Five beautiful lakes are present in the salt range. The Khabeki Lake and Jahlar Lake are present in the central salt range. A large



lake known as Ucchali is also located in the central salt range. The Namal Lake is present in western salt range. The Kalar Kahar Lake is present in eastern salt range. Whereas another lake known as Durrabi Jheel that is not only the largest among all wetlands of the salt range but also the one that has the cleanest water as compare to the other lakes in the area.

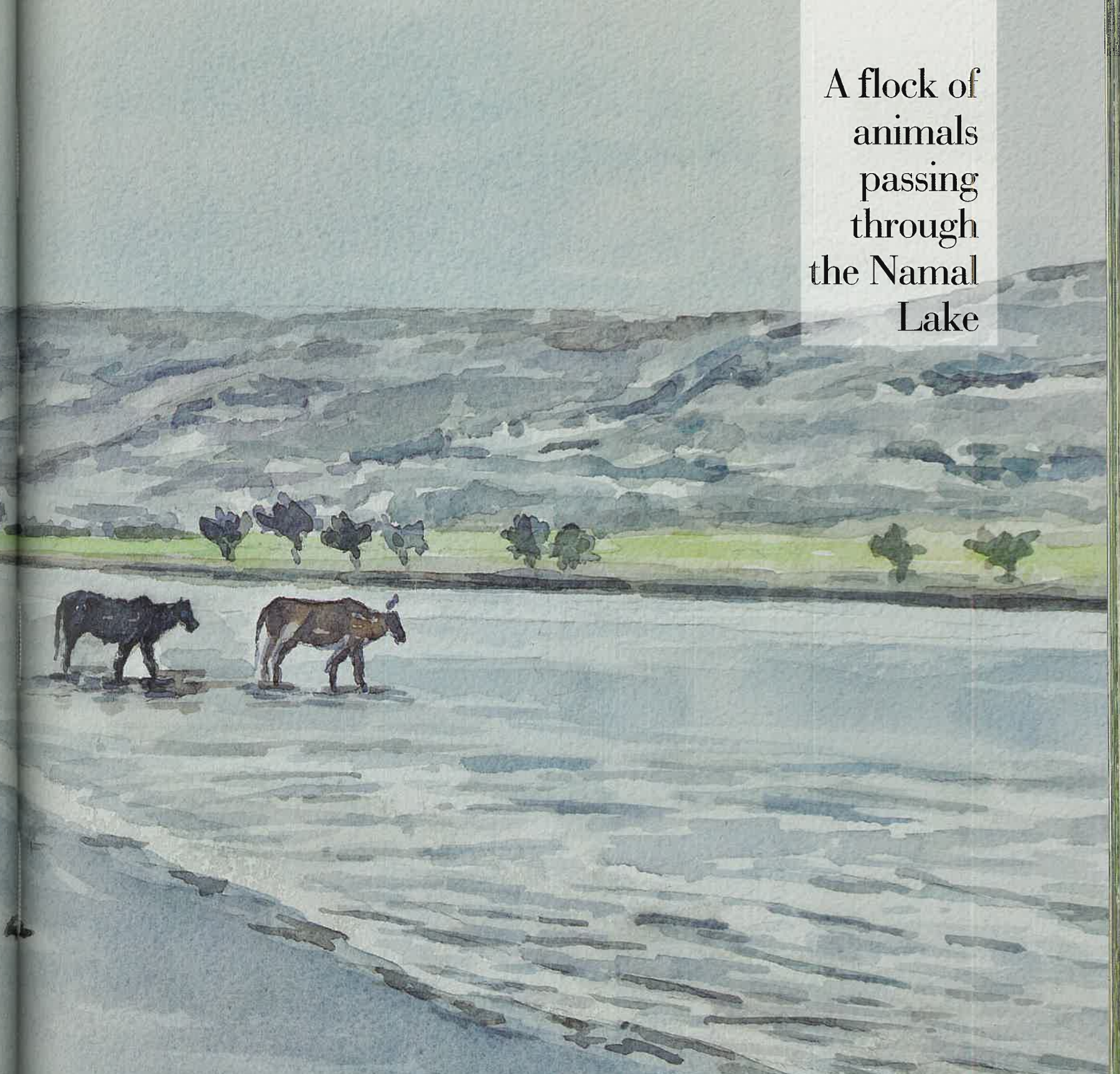
The wells situated with a short distance of these salt lakes have sweet drinking water, showing that the saline water of lakes does not affect the underground water (Ahmad, 1964). There are streams in the area, which flow between the mountains, near Sodhi and Kanhati. The nearby areas are irrigated by this water.


Kallar Kahar Lake



Indus River
Near
Kalabagh





A flock of animals passing through the Namal Lake

Climatic conditions

The climate of the Salt Range is continental and arid, changing from tropic to subtropic. Tropical air prevails during all seasons of the year except the cold winter months, when the relatively cool polar air penetrates at the tail end of high-pressure systems (cyclones). This is a cold, damp season. During summer, precipitations are connected with the equatorial, moist, southwestern (Indian) monsoon, which reaches the limits of its occurrence in West Punjab but brings the largest amounts of precipitation (more than 50 percent annually). Salt Range has relatively low annual precipitation of about 50 cm annually. Mostly there is rain fall in months of July, August and September (Ahmad, 1964). There are great



Kanhatti Garden
in the Soon Valley

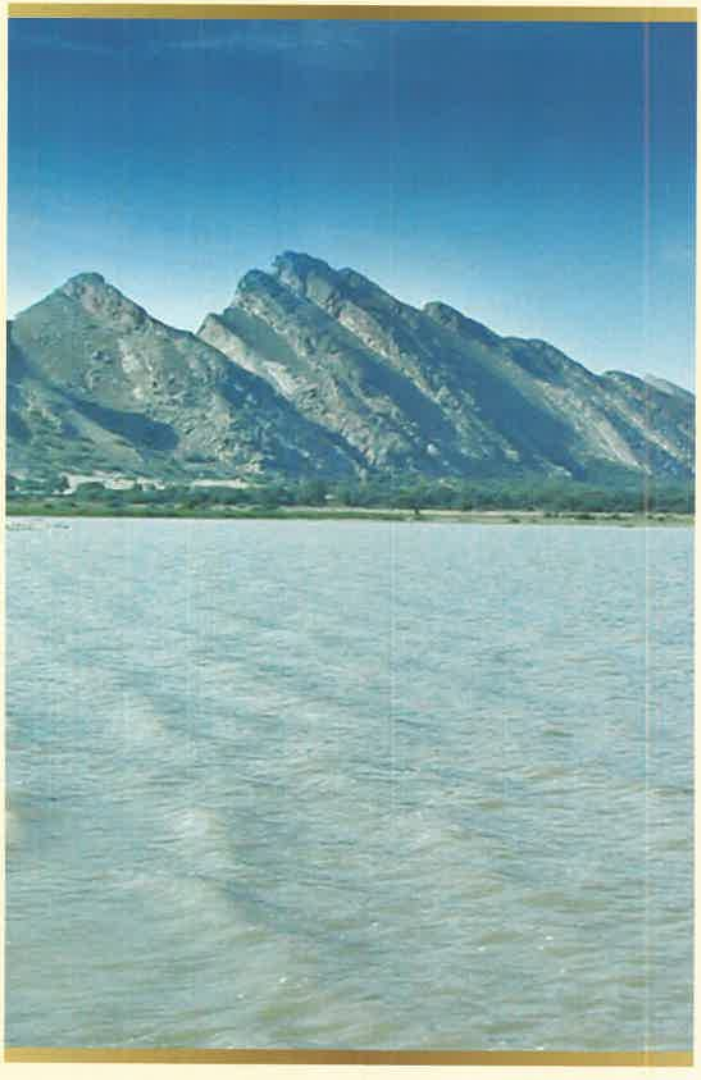
extremes in temperature between summer and winter. Drought persists for a long time in the area and hot dry winds are frequent. The length of winter season is longer and is accompanied by frost. Summer and winter both are cooler than those of adjoining plains (Ahmad et al., 2007).

Temperature

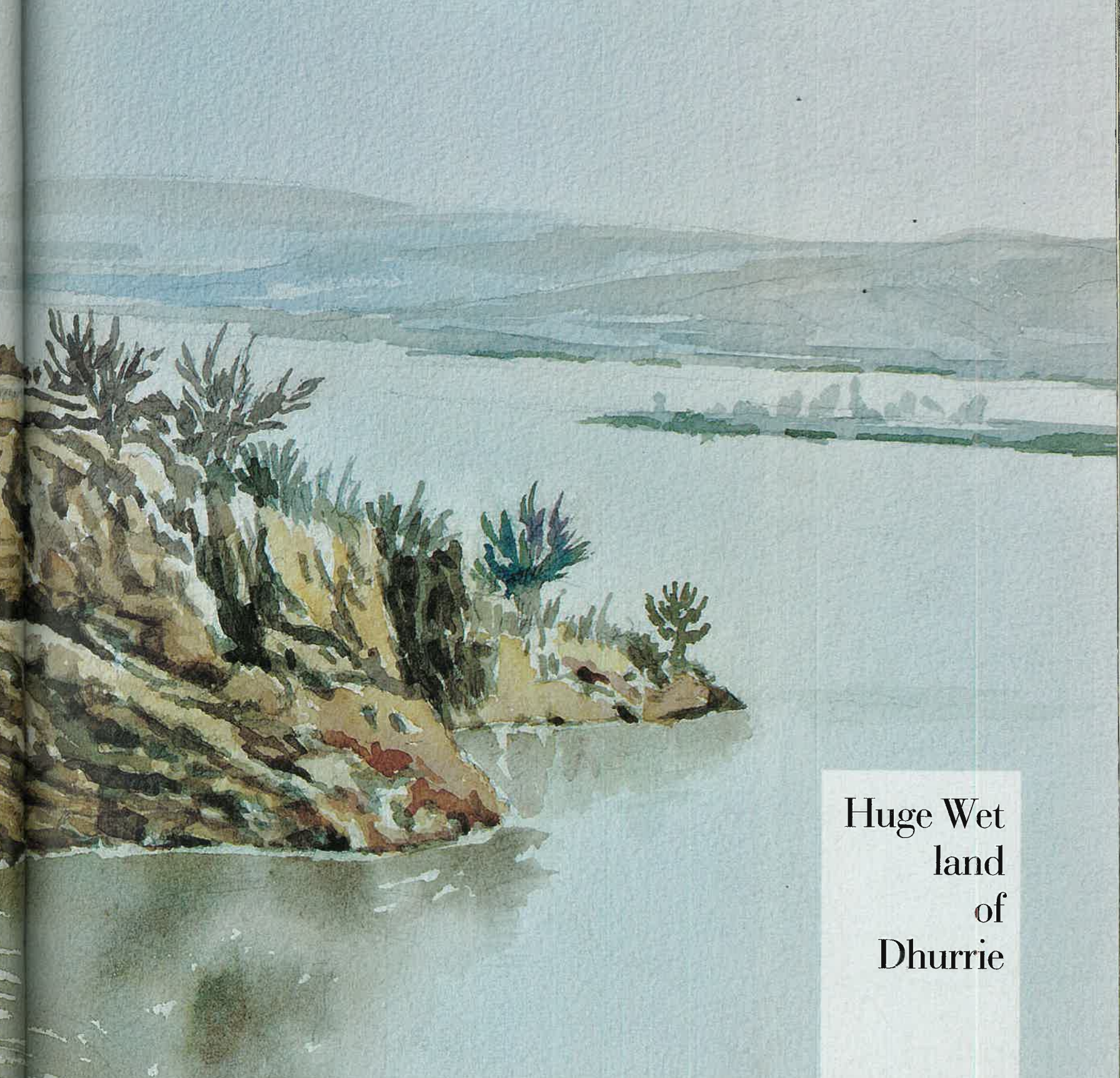
Average minimum temperature is 1°C (January) and average maximum temp is 36°C (June). Temperature falls below freezing during winter, and summer is comparatively pleasant as compared to adjoining areas (Hussain, 2002).

Rainfall

Most of the rain is confined to the months of July, August and September. A much lesser amount is received in January and February. The summer rains are due to Monsoon, while winter rains are associated with the western disturbances. Sakesar hill and the adjoining areas of soon valley receive maximum rain fall because of their height. (Ahmad, 1964). Winter rain is generally well distributed as compared to summer rain (Ahmad et al, 2007).







Huge Wet
land
of
Dhurrie





Salt Range Mountains

These mountains stretch from the Indus River to the Jhelum River, making a clear natural boundary between Northern India and Southern Pakistan. The highest peaks of the Salt Range are Tilla Jogian and Sakaser. The average height of mountains in the Salt Range is around 2,200 feet (671 meters); in some areas, the Salt Range Mountains become more hilly than mountainous.

Geology

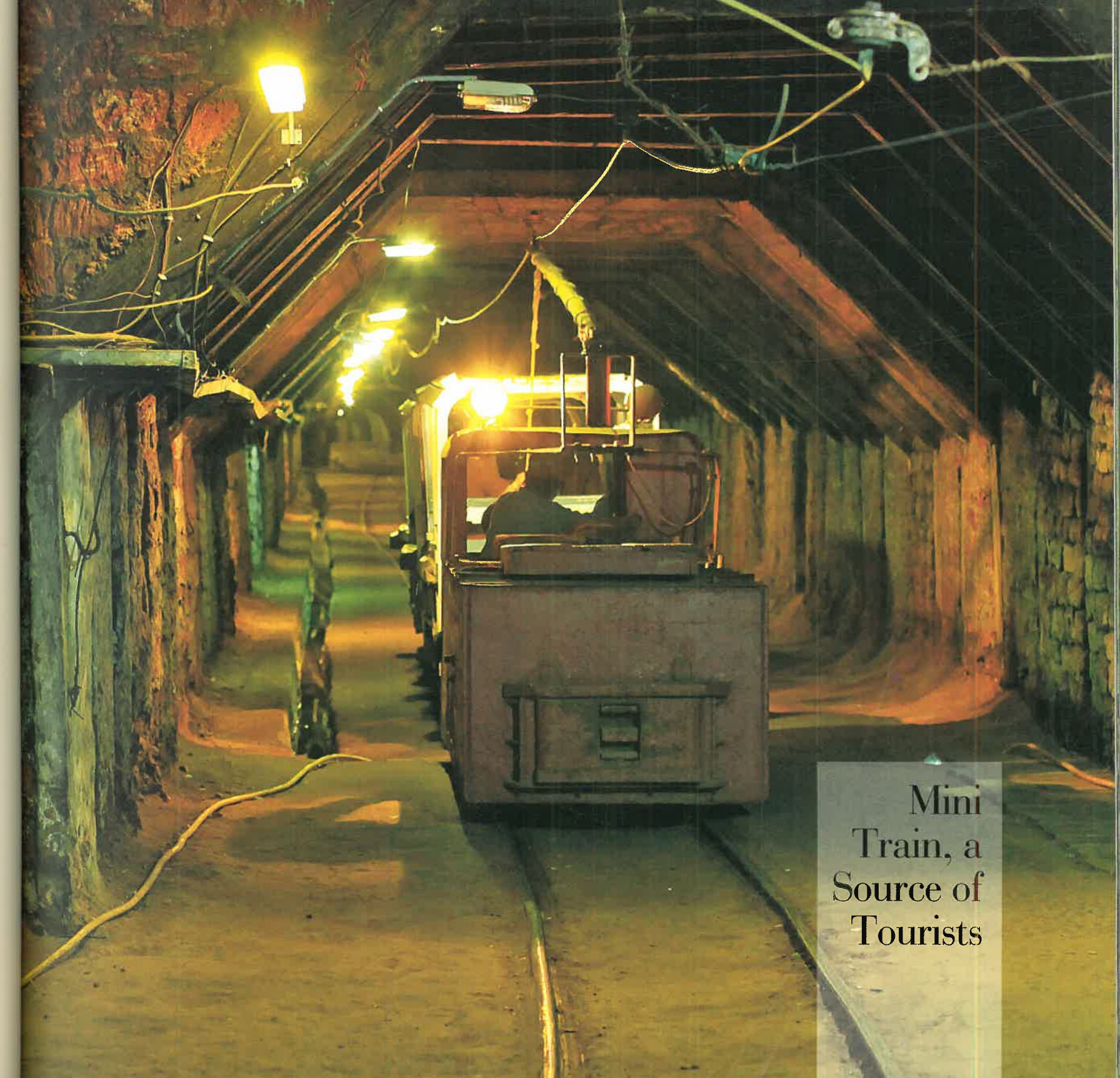
The Salt Range contains the most important geologic and paleontologic localities in Pakistan, and is one of the outstanding field areas in the entire world. Despite its easy accessibility, it has awealth of geological and paleontological features. In fact, it represents an open book of geology where various richly fossiliferous stratified rocks are very well exposed due to lack of vegetation. These include the Permian carbonate succession with its outstanding brachiopod fauna, Lower Triassic ammonoid beds (the Mianwali Formation, formerly known as "Ceratite Beds"), and Lower Tertiary marine strata with age diagnostic foraminifera. These rocks also provide an excellent opportunity for appreciation of tectonics in the field. In addition to the easily available roadside geology, some prominent gorges provide fantastic locations to study the sedimentary succession. Older strata are exposed in the eastern Salt Range between the Khewra-Choa Saidan Shah and Fort Kussak including the famous Khewra Gorge. In the west, beyond Kallar Kahar, are younger strata such as in the Nilawahan Gorge at Nurpur, the Namal Gorge near Mianwali, the Chichali Gorge near Kalabagh, and further west the Lumshiwal Nala at Makerwal. This succession has been rightly called a Field Museum of Geology and Paleontology and can be classified as one of the great paleontological areas of the world, fully worthy of conservation and protection efforts.

Khewra Gorge

Khewra Gorge, located in Salt Range near Khewra mines is known as "Museum of Geology" where rocks from pre-Cambrian age to recent period are exposed. It is unique in a sense that one can find geological and paleontological features representing almost all the geological ages/eras.

Significance

The Salt Range contains a number of unique fossil occurrences and many occurrences that are useful in research and education. It should be considered



Mini Train, a Source of Tourists

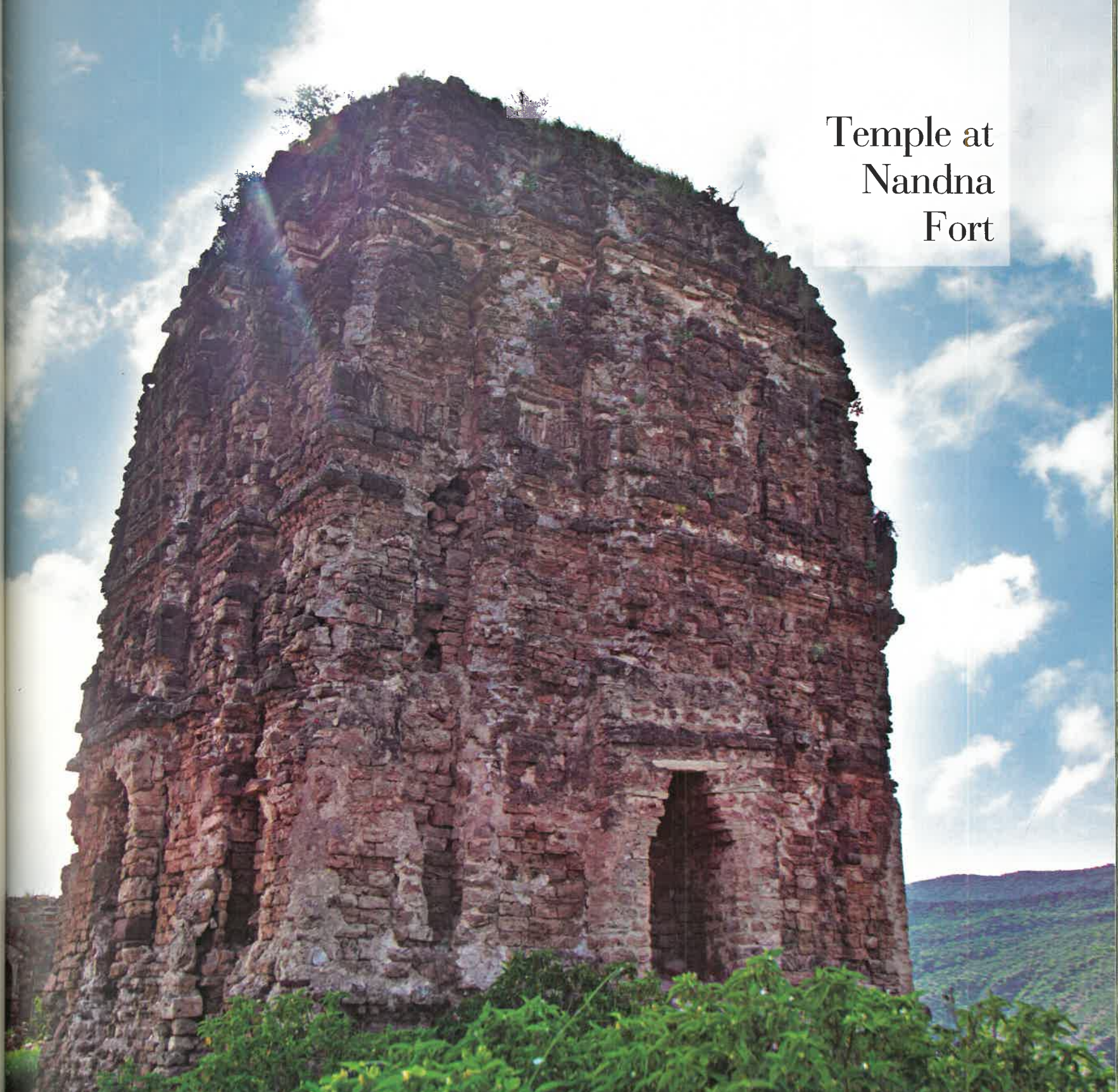
carefully by local paleontologists for the preservation and conservation of these resources. Also, these sites can become a tourist and research attraction for people across the world if effectively preserved and marketed. Those sites (of any geographic extent) that are deemed worthy of preservation should be designated a potential PaleoPark and local efforts to preserve them should be ensure. Although this will require significant efforts owing to numerous sites, and the size and paleontological fame of the Salt Range, however, this can very much introduce this geological wonder to the world.

Historical Background of Salt Range

The Salt Range derives its name from extensive deposits of rock salt. The Range stands as remnant of forts with bastions and temples. Exceptionally, this region maintains an almost continuous record of history that can define the evolution of society. Forts and temples surviving along the range are a reminder of how untouched many



Rohtas Fort A Distant View



Temple at
Nandna
Fort

of the ancient remnants are. Alexander from Macedon came to this Range twice; one from Taxila and later when his forces refused to go any further from the banks of the River Beas. From here he marched towards the Arabian Sea on his way to Babylon. And, now an NGO is constructing a monument of Alexander near Jalalpur town in the foot of the Salt Range in district Jhelum.

Salt Range is the home to the oldest and largest rock-salt mines in the world. Every Sunday, groups of students visit the ranges and gaze in wonder at the fascinating spectacle of light filtering though solid walls of salt, with the gentle sound of River Jhelum in the background. However, the Salt Range has recently come to the fore as; they are also home to treasures of ancient culture and history.

Abu al-Rayhan Muhammad ibn Ahmad al-Beruni a famous Muslim scholar and polymath from the Khwarezm region devised his own method of determining the radius of the earth by means of the observation of the height of a mountain and carried it out at Nandana in 11th century in Pind Dadan Khan, Pakistan (India at that time).

The site of the imposing Rohtas Fort built by Sher Shah Suri in the 16th century, the Salt Ranges are now at the



centre of new discoveries in archaeology and ancient architecture. Their importance spans thousands of years, judging from skeletal remains of prehistoric animals found in many of its out-of-the-way locations. Apart from sculptures unearthed by the Department of Archaeology dating back to the 6th and 7th centuries, the Salt Range is dotted with Hindu temples, of which the most notable is the Katas Raj. Located 25 kilometers from Chakwal, Katas Raj is notable in many ways.

The temple was not abandoned by local Hindus when they migrated to East Punjab in 1947. Many legends sacred to the Hindus are associated with it, some of them involving Shiva himself. It has always been the site of holy pilgrimage. Even nowadays, through an agreement between India and Pakistan, Hindu worshippers perform a pilgrimage to the temple every year and bathe in the sacred pool around which Katas Raj is built.

While Katas Raj has not received the publicity that it deserves, the two semi-ruined temples of the Hindushahiya period (650-950 AD) have been frequently photographed by newspapers and history journals. The remains are very beautifully carved and conform to the best in temple architecture.

Katas Raj is also held sacred by Hindus for another reason. Legend says that the five Pandava brothers, heroes of the Sanskrit epic Mahabharata, stayed here for four out of the 14 years that they spent in exile. While it takes a little effort to get there by road - one has to go off the Grand Trunk Road - Katas Raj is partially visible on the train route from Lahore to Rawalpindi. It is a picturesque sight.

The Salt Range has also been yielding prehistoric finds. While some local experts place the fossils discovered in the period between 6000 and 7000 BC, the fact remains that they have not yet been examined by trained paleontologists from the West. A large number of bones of the limbs and vertebrae of giant animals resembling the extinct mammoth and dinosaur have been found at some sites. "An entire range of low mountains in the area appears to be fossilised, revealing to the naked eye layer upon layer of a variety of plants and soils," says one writer.

Prehistoric tools and weapons such as axes and knives made of granite, and artifacts like terracotta bangles and pottery have also been unearthed. The latter have been found to be similar to those excavated in Harappa, but have not been dated for want of expert opinion from abroad. The fascinating Salt Ranges have a vast archaeological treasure still hidden underground. Exploratory work that could expose evidence of an ancient civilization here needs to be undertaken. (Daily Times, 9 August, 2004).



Krair's Blossom

Flora and Fauna of Potohar Salt Range

تیرا پنڈا پوری تُوت دی، تیری لغراں ورگی باں
تیرے بُل نے پھل کریر دے، تیرا جوبن ون دی چھاں

Flora and Fauna of Potohar Salt Range

General Biodiversity

The Salt Range of Pakistan has retained rich floral diversity of the low lying sub tropical forests, and different plant species have evolved drought and salinity tolerance (Akram et al., 2008). It is exposed to severe habitat losses resulting in accelerated depletion of physical and biological resources (Ahmad and Waseem, 2004). Bio diversity is a key feature of properly functioning grazed ecosystem. The vegetation of Salt Range comprises of both legumes and non legumes. Little is known about geological history of the Salt Range vegetation. Fossil record indicates that angiosperms date back to tertiary period, while pre tertiary fossils have no angiosperm affinities (Ahmad et al., 2007). The vegetation of Salt Range is under the division, sub tropical dry evergreen forests. Olea ferruginea Royle and Acacia modesta are recorded to be two characteristic trees of the area (Champion, 1936). Due to macro and micro environmental variations, large plant and animal diversity of the area is expected to be endemic to it. Scanty reports are available about vegetation of this area. Vegetation of plants of Salt Range consists of an open low forest in which thorny, usually hard woody species pre dominate, the trees usually have short trunks and low branching crowns. Soil is generally saline, but trees grow well, as ground water in most places is not salty. Climbers are relatively numerous and usually exhibit xerophytic adaptations.

Flora of the Salt Range

The Salt Range, Pakistan is bestowed with a great diversity of habitats and due to this fact the Range is significantly rich in species diversity. The habitats include high mountain peak like Sakesar, cooler climatic zone in Soone Valley, Thar desert in the west, Potohar plateau in the north east, hyper-saline lakes at Uchali complex.

Mangla reservoir of river Jhelum at eastern end and dry mountains of Kalabagh near river Indus at the western end, exposed salt rocks at many places, brine and fresh

water springs, and highly salt-affected foothill region at south eastern side (Chaudhry et al., 2001; Hameed et al., 2008; Ahmad et al., 2010). The vegetation is categorized as subtropical dry evergreen scrub forest (Nawaz et al., 2010). The ridges of Bakrala and Jogi Tilla in the east of Jhelum are on one end of the Salt Range, which is along the River Jhelum in the southwest direction. The other end of this range is at Kalabagh across the River Indus in the northwest direction (Ahmad & Waseem, 2004). Soone is the largest and most prominent valley, spreading over an area of 20 km in length and 5 km in width. Khabbaki, Kahun, Vanhur and Jhanger are the other important valleys of the Salt Range (Ahmad et al., 2009). The Salt Range is rich in paleontological remains, which is well known for floral (tracheophytes) and faunal (vertebrates and mollusks) fossils (Ahmad & Waseem,



Wild Bush "Krair"

2004). Floral diversity of the region is quite rich, which falls in sub-mountainous sub-tropical open scrub forest (Chaudhry et al., 2001; Ahmad et al., 2002, Nawaz et al., 2010). However, the region is exposed to severe habitat loss due to anthropogenic activities like population pressure, over-exploitation of resources and land clearing for construction and agricultural purposes (Ahmad et al., 2009). The Salt Range is rich in paleontological remains, which is well known for floral (tracheophytes) and faunal (vertebrates and mollusks) fossils (Ahmad & Waseem, 2004). Floral diversity of the region is quite rich, which falls in sub-mountainous sub-tropical open scrub forest (Chaudhry et al., 2001; Ahmad et al., 2002, Nawaz et al., 2010). However, the region is exposed to severe habitat loss due to anthropogenic activities like population pressure, over-exploitation of resources and land clearing for construction and agricultural purposes (Ahmad et al., 2009). Salt was originally deposited to lower layer during the formation of the Salt Range, but these layers are now exposed at many places, which is due to deformations during the post-Pleistocene era (Lillie et al., 1987). As a result, southern side of the Salt Range near River Jhelum is heavily salt-affected. Brine springs are the additional source of increasing salinity at many places in the Salt Range, which deposit salts along their route in the foothill region (Qadir et al., 2005).


Peeli Jhari

Another important feature of the Salt Range is the Uchhali complex, which comprises internationally important wetlands (Khabeki, Uchhali and Jahlar lakes). These wetlands are well known for breeding habitats of some threatened and vulnerable waterfowl species, e.g., white-headed duck (Nawazish et al., 2006), which breeds only in the Salt Range. These lakes are either brackish or hyper-saline, supporting very specific plant species (Ahmad et al., 2002). Dominant

trees are Acacia modesta, Olea ferruginaea, Tecomella undulata and Butea frondosa, whereas dominant shrubs are Dodonaea viscosa, Justicia adhatoda, Maytenus royleanus, Ziziphus nummularia and Buxus papillosa. Over 60 palatable grass species have been recorded from the area, the dominant among them are Cgrysopogon serrulatus, Heteropogon contortus, Dichanthium foveolatum, Cynodon dactylon, and Aristida mutabilis (Chaudhry et al., 2001; Ahmad et al., 2008). These are the details of different vegetation of the five ecologically distinct regions within the Salt Range, namely Kalabagh Game Reserve, the Soone Valley, Chumbi Surla Wildlife Sanctuary, Domeli Game Reserve and Lehri Jindi Forest.


Peeli Jhari

There is a variety of medicinal plants in the Pind Dadan Khan, District Jehlun, which is as follows.

Acacia nilotica (Linn.) Delice (Mimosaceae)

Vernacular name: Kikkar.
Common name: Babul.
Occurrence: Very common.
Flowering and fruiting: June to January.
Parts used: All parts.
Bark is astringent and used in diarrhea. Gum and immature pods are useful in sexual impotency and leucorrhoea. Bark decoction are recommended in toothache and swollen gums. Powder of ash is used as tooth powder.

Achyrathus aspera Linn. (Amarantaceae)

Vernacular name: Puthkandda.
Common name: Charchita.
Occurrence: Common.
Flowering and fruiting: September and April.
Parts used: Whole plant.
The paste of leaves is applied on skin diseases and also on insects (snake, scorpion) and mad dog bites for relief. Plant is burnt in a container on fire, and ash with honey is very effective in asthma and productive cough. Paste of root is applied on face freckles. Paste of seeds is given to patient for ejection of kidney and bladder stones. It is also applied on scars of small pox.

Adhatoda vasica Nees (Acanthaceae)

Vernacular names: Bansa.
Common name: Arusa, vasaca.
Occurrence: Common.
Flowering: Throughout the year.
Parts used: Whole plant.
It is antiseptic, febrifuge and expectorant. Decoction of leaves and root is highly recommended in cough, bronchitis, asthma and rheumatism. A salt is obtained from the ash of plant. Its root is ground along with black pepper and given in malaria.

Abutilon indicum (Linn.) Sweet (Malvaceae)

Vernacular name: Kanghi buti.
Common name: Peeli buti.
Occurrence: Common.







Flowering: Throughout the year.
Parts used: All parts.
Leaves extract is given in piles. Leaves are demulcent and used against gonorrhoea, urethrites and bladder



inflammation. Root is diuretic and used in stranguary. Decoction is given in diarrhea and also useful in toothache. Seeds are stimulant.

Adiantum capillus-veneris Linn. (Polypodiaceae)

Vernacular names: Persiaoshan.
Common name: Sumbul, hansraj.
Occurrence: Common.
Parts used: Fronds.
The plant is used as demulcent, expectorant, diuretic, tonic and febrifuge. Its decoction is used mostly instead of using powder alone. The steam of its decoction is used to reduce fever. It is ground and burn along with oil and applies to hairs to make hairs strong, black, shiny and long.

Calotropis procera (Wild.) R. Br. (Asclepiadaceae)

The characteristics and uses of this plant are very much similar to that mentioned for Calotropis gigantea.

Cannabis sativa Linn. (Cannabinaceae)

Vernacular names: Bhang.
Common name: Bhang, charas, ganja.
Occurrence: Common.
Flowering: August to October.
Parts used: Whole plant.
Plant is used as tonic, intoxicant, stomachic, narcotic and sedative.

Capparis decidua (Forssk.) Edgew. (Capparidaceae)

Vernacular name: Daila.
Common name: Karir.
Occurrence: Very common.
Flowering: January to April.
Parts used: All parts.
The coal of the old plant mixed with honey is expectorant and internally used for asthma, cough, and chronic pain in joints. The tender leaves and young twigs are ground and applied on boils, painful sites and inflammation; they also contain rubefacient and vesicant principle, which raise blisters. Flower buds and unripe fruit are boiled and cooked as vegetable for rheumatism. The unripe fruits are made into pickles and used as natural appetizer, expectorant, vermifuge and also recorded as hepatic stimulants and protectors, improving liver and stomach function and also used in cardiac troubles. The young branches are chewed to relieve toothache. Infusion and decoction from caper root bark have been traditionally used for dropsy, anemia and gout.


Wild Daisy

Ageratum houstonianum Mill. (Astraceae)

Occurrence: Less common.
Flowering: May to July.
Parts used: Leaves and root.
Juice of root is antilithic. Leaves are styptic, applied in cuts and externally in ague.

Alhagi maurorum Medic. (Papilionaceae)

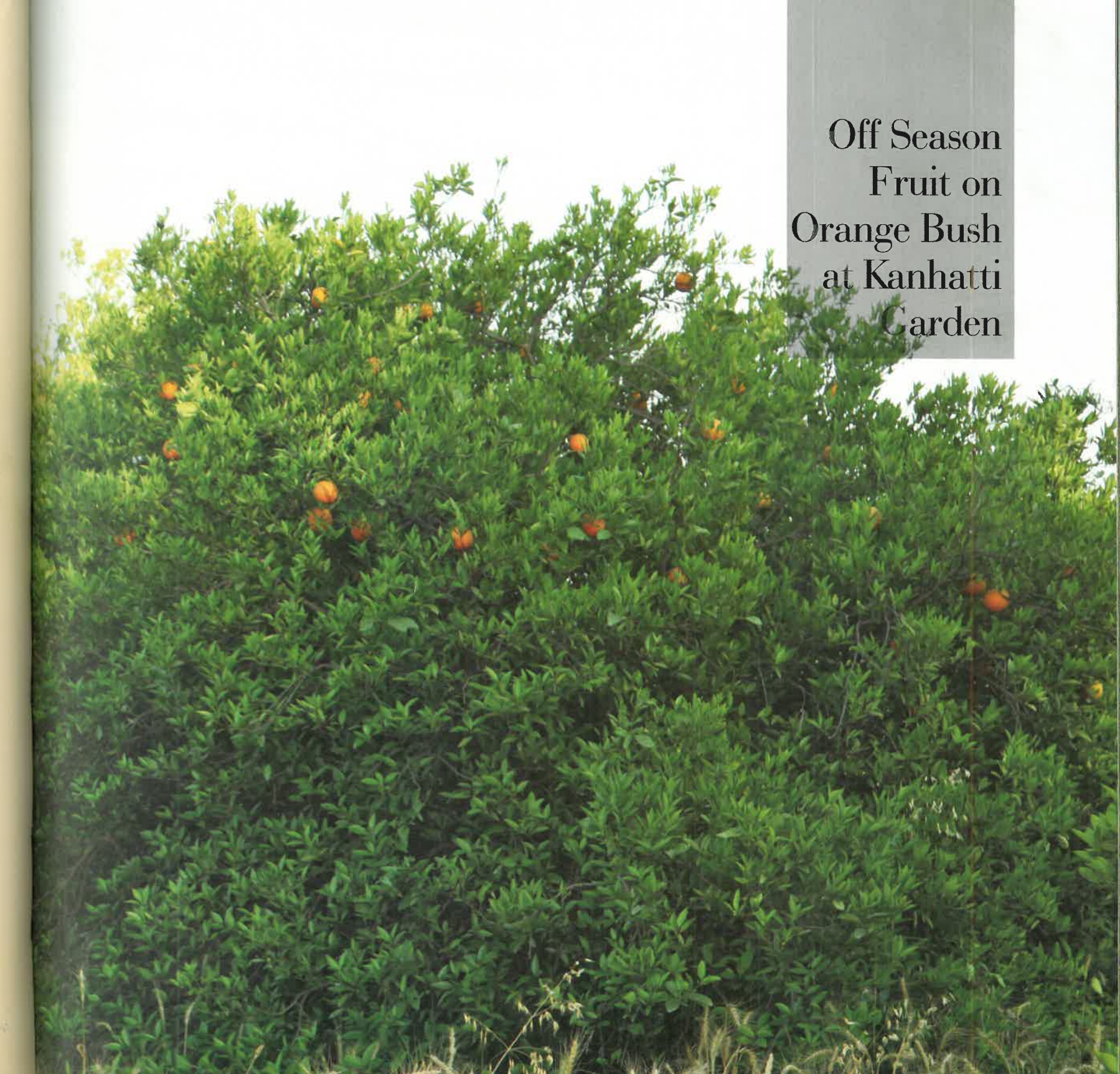
Vernacular name: Jawansa.
Common name: Khar shutar.
Occurrence: Very common.
Flowering: March to May.
Parts used: Whole plant.
It is diuretic and purifies the blood. Its decoction is suggested for bleeding piles. Its juice is anti–toxic against mercury toxicity. Exudation of leaves and branches known as "Taranjabin" used as aperient, calagogue. Oil from leaves is used in rheumatism. Bath taken from the decoction of this plant is effective against skin eruptions. Whole plant is fodder for camel and leaves for goat.



OPIM Flower

Boerhavia diffusa L. (Nyctaginaceae)

Vernacular name: Itsit.
Common name: Baskhapra.
Occurrence: Less common.
Flowering: August to December.
Parts used: Whole plant.
Plant is expectorant, diuretic, laxative, stomachic, diaphoretic, emetic, anthelmatic, febrifuge, purgative, used in anemia and jaundice.



Off Season Fruit on Orange Bush at Kanhatti Garden

Calotropis gigantea R. Br. (Asclepiadaceae)

Vernacular name: Ak desi.

Common name: Ak.

Occurrence: Very common.

Flowering: All the year round.

Parts used: All parts.

The fresh yellow leaves are slightly warm on fire and their extracted juice is poured in ear for relief in otorrhoea. Its root is ground along with black pepper and ginger, which is said to be eaten in cholera. Salts obtained from this plant are effective in rheumatism, cough and asthma, and along with honey it is appetizing and carminative. Latex is externally applied on ringworm and on insect (snake and scorpion) bites. Leaves are burnt in oil of aniseed and this oil is used in backache and rheumatism. The smoke of plant keeps mosquitoes away from house. Young twigs are ground and their poultice is applied externally to relieve pain in inflammation. The silky floss of the seeds is cotton.







Wheat Field in Potohar Salt Range



Centella asiatica (Linn.) Urban (Apiaceae)

Vernacular name: Brahmi buti.
Common name: Brami.



Occurrence: Less common.
Flowering: March to June.
Parts used: Whole plant.

Plant is blood purifier. It is dried under shade and powdered and then applied on leprosy and other skin diseases. Fresh or dried herb is ground along with black pepper and almonds and then sieved. This tonic is used to improve memory.

Chrozophora tinctoria (Linn.) (Euphorbiaceae)

Vernacular name: Bakkar.
Common name: Subali.
Occurrence: Less common.
Flowering and fruiting: May to July.
Parts used: Whole plant.
Plant is emetic, poisonous and cathartic.

Citrullus colocynthis Linn. Schrad. (Cucurbitaceae)

Vernacular name: Tumma.
Common name: Indrayan, Hunzal.
Occurrence: Less common.
Flowering: November to January.

Parts used: Root and fruit without seeds.
Fruit is resolvent, expectorant, abortifacient and purgative. It is used in small dose for gas trouble, constipation and intestinal disorder. It is used along with other herbs in epilepsy and paralysis. Juice is burnt in coconut oil and used for headache. Root is used as Miswak (toothbrush).

Convolvulus arvensis Linn. (Convolvulaceae)

Vernacular name: Leli.
Common name: Hiran khari.
Occurrence: Very common.
Flowering: December to January.
Parts used: Whole plant.
Plant is laxative. The powder of the plant is given in chronic constipation and in diabetes. Plant paste is applied on rat bite and inflammation. Its decoction is expectorant and used in cough, flu, and in jaundice. It is very good blood purifier, so plant is ground along with black pepper and eaten in leprosy and in other skin diseases and also in piles and diarrhea. The smoke of the plant purifies the air. It is favorite fodder of cattle and it is specially given to buffaloes as this plant improves the milk production.


"Bhaeekar"

Corchorus depressus (Linn.) Stocks (Tiliaceae)

Vernacular name: Bahu phalli.
Common name: Bhonphali.
Occurrence: Very rare.
Flowering: July to November.
Parts used: Seeds and leaves.
Plant is used as cooling agent. It is very useful in sexual impotency and leucorrhoea. Plant is ground in water and applied on wounds.

Croton tiglium Linn. (Euphorbiaceae)

Vernacular names: Jamal ghota.
Common name: Jamal ghota.
Occurrence: Very common .
Parts used: Whole plant.
It is extremely purgative and vesicant. The seeds are the source of croton oil used as a purgative.

Cuscuta reflexa Roxb. (Cuscutaceae)

Vernacular name: Amarbail.
Common name: Akash-bel.
Occurrence: Rare.
Flowering: January to February.
Parts used: Whole plant.
Plant is resolvent, demulcent, expectorant, vermifuge and blood purifier and used in gonorrhea. Steam of its decoction gives relief from pain. Juice is used in jaundice. Plant is crushed and cooked in oil and applied on abscess.





Loket
Bunch at
Kalar
Kahar



Datura stramonium Linn. (Solanaceae)

Vernacular name: Dhatoora.
Common name: Dhatoora, Joz-e-masal.
Occurrence: Common.
Flowering: March to June.
Parts used: Seeds and leaves.
It is used externally as demulcent. Plant is burnt in oil, which is used in headache. Leaves are dipped in oil and slightly warmed over fire and bound on abscess and pimples. Smoke of leaves is used in asthma. Leaves and seeds are narcotic and antiseptic. Juice of fruit is applied to cure dandruff.

Digera muricata (Linn.) Mart (Amaranthaceae)

Vernacular names: Tartara.
Common name: Tartara.
Occurrence: Common.
Flowering: August to December.
Parts used: Whole plant.
The plant is laxative in large doses; flowers and seeds are recommended in urinary disorder.

Echinops echinatus Roxb. (Astraceae)

Vernacular name: Uont-katara.
Common name: Astrakhar.
Occurrence: Common.
Flowering: October to January.
Part used: All parts.
Plant is appetizing, carminative, diuretic and used in liver diseases and sexual impotency. Powder of root bark


Kahoo

is used along with honey for asthma and cough. Juice of flowers is poured in eyes.

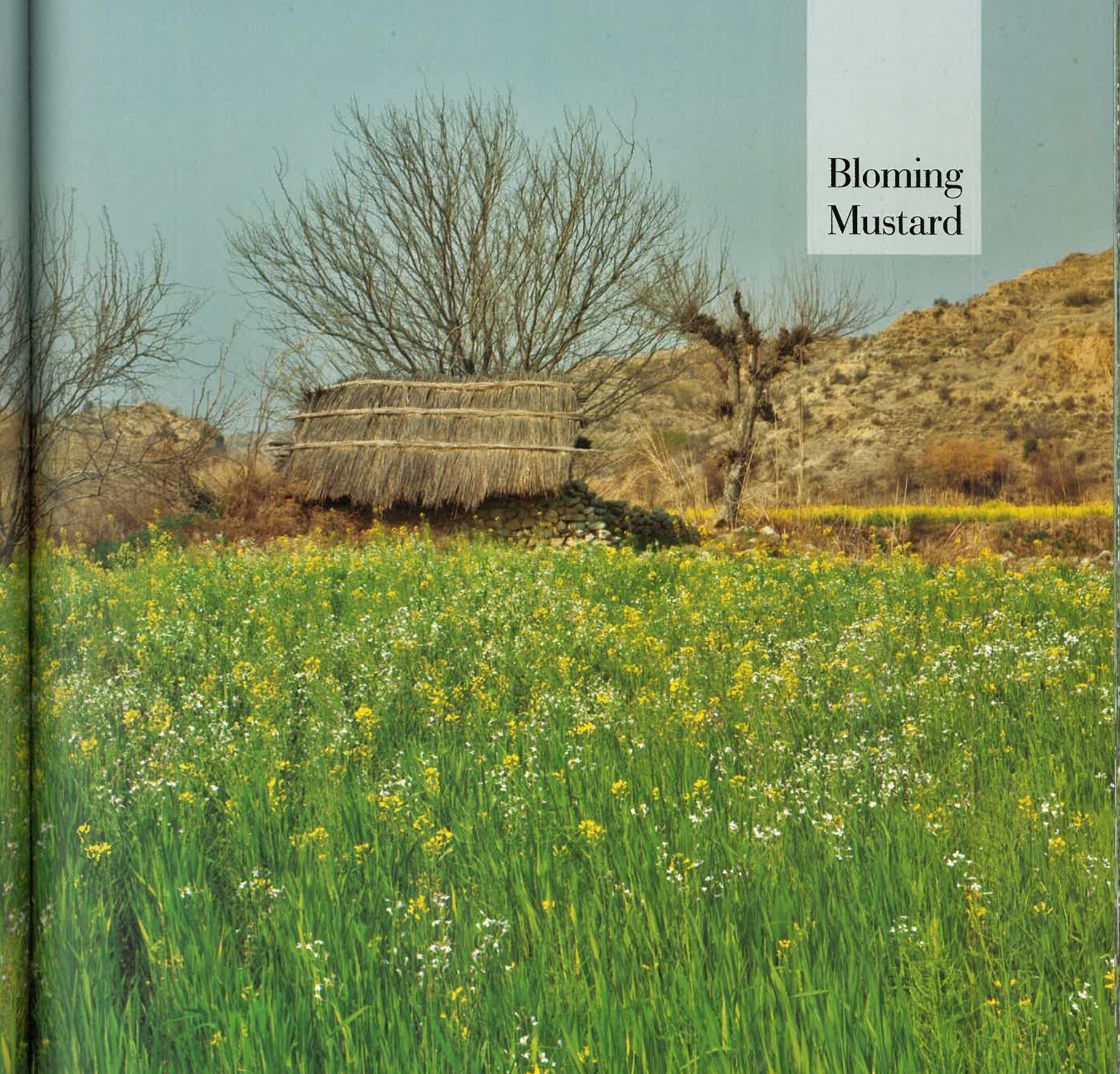
Eclipta prostata Linn. (Astraceae)

Vernacular name: Bhangra.
Common name: Bhaingra.
Occurrence: Very common.
Flowering: May to October.
Part used: Whole plant.
Juice of plant is used in oral disease, toothache, jaundice, spleen enlargement and also used in flu. Leaves are chewed for betterment of voice. Leaves are rubbed on anus as a vermifuge. Juice of leaves is applied on athlete's foot disease and other skin diseases. Juice of leaves is added into eyes to improve eyesight. Juice is burnt in oil of aniseed and this oil gives black color to hair.

Embelia robusta Roxb. (Myrsinaceae)

Vernacular names: Baobreng.
Occurrence: Common.
Flowering: July to September.

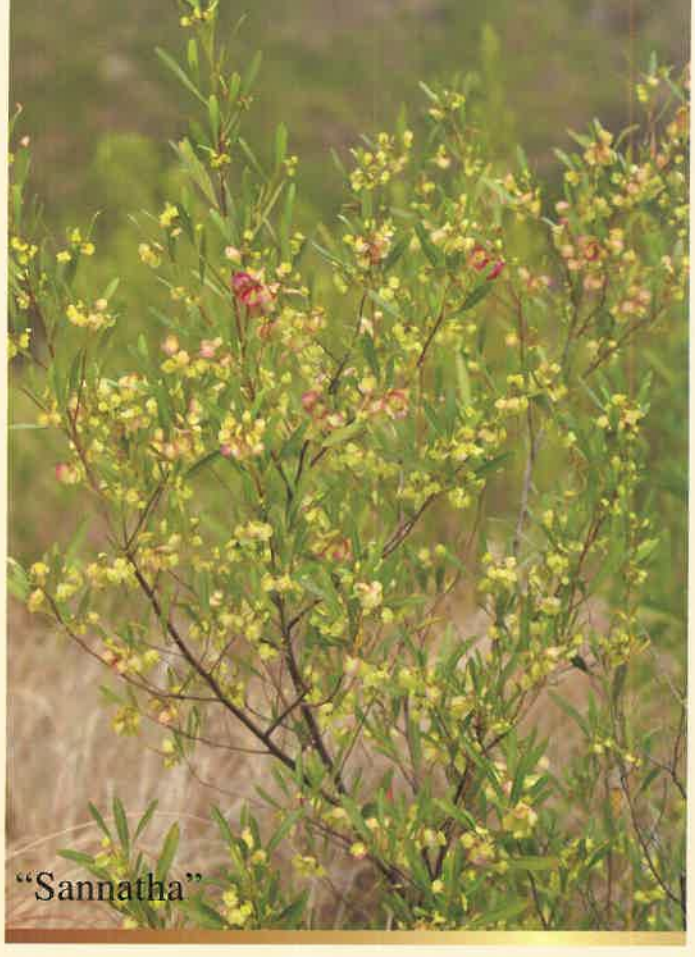



Bloming
Mustard

Parts used: Fruit and root bark.
It is expectorant and vermifuge. Dried bark is used against toothache. Its powder along with curd is used to kill the tapeworms.

Euphorbia helioscopia Linn. (Euphorbiaceae)

Vernacular name: Chatriwal.
Common name: Dodhi Kalan.
Occurrence: Less common.
Flowering: February to March.
Part used: Whole plant especially latex.
Latex is applied on ringworm, eczema, abscesses and other skin diseases. Plant is used in respiratory diseases.
Euphorbia prostrata Ait. (Euphorbiaceae)
Vernacular name: Hazardani.
Common name: Dodhi Khurd.
Occurrence: Very common.
Flowering: April to August.
Part used: Whole plant.
Plant serves as fodder of cattle. Fresh plant is ground along with black pepper and used for bleeding piles. Plant is dried under shade and powdered and is used in leucorrhoea and gonorrhea. Herb is ground along with water and recommended in dysentery.


"Sannatha"

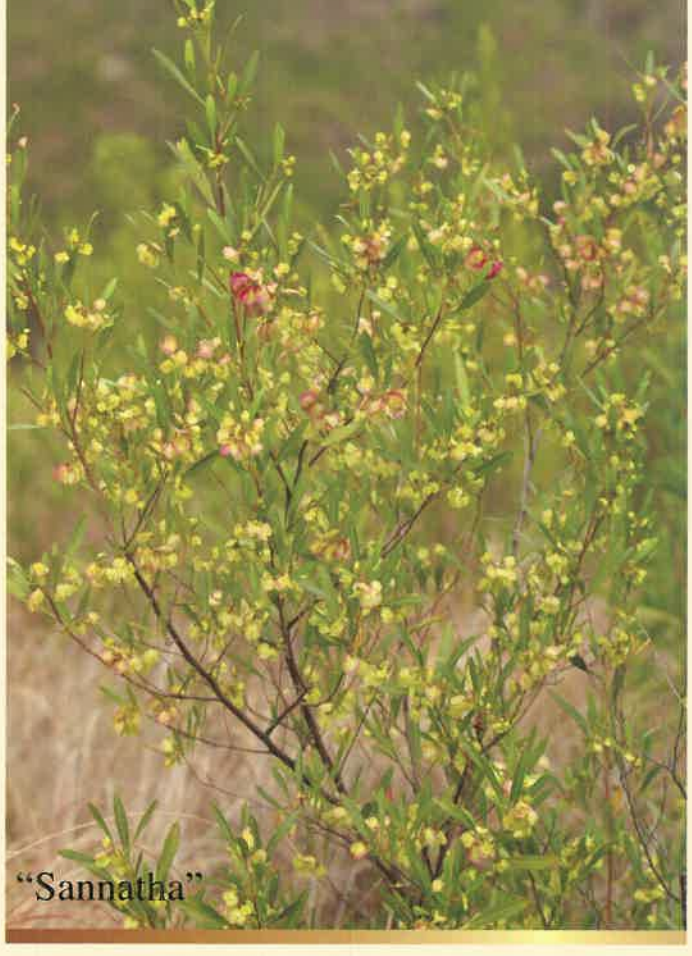
Fagonia cretica Linn. (Zygophyllaceae)

Vernacular name: Dhamasa.
Common name: Damaso.
Occurrence: Common.
Flowering: October to January.
Part used: Leaves, stem and juice.
Plant is dried under shade ground into powder form, which is used in gynae problems. The plant is demulcent, febrifuge, alterative and blood purifier. The paste of the plant is externally applied on tumors.

Parts used: Fruit and root bark.
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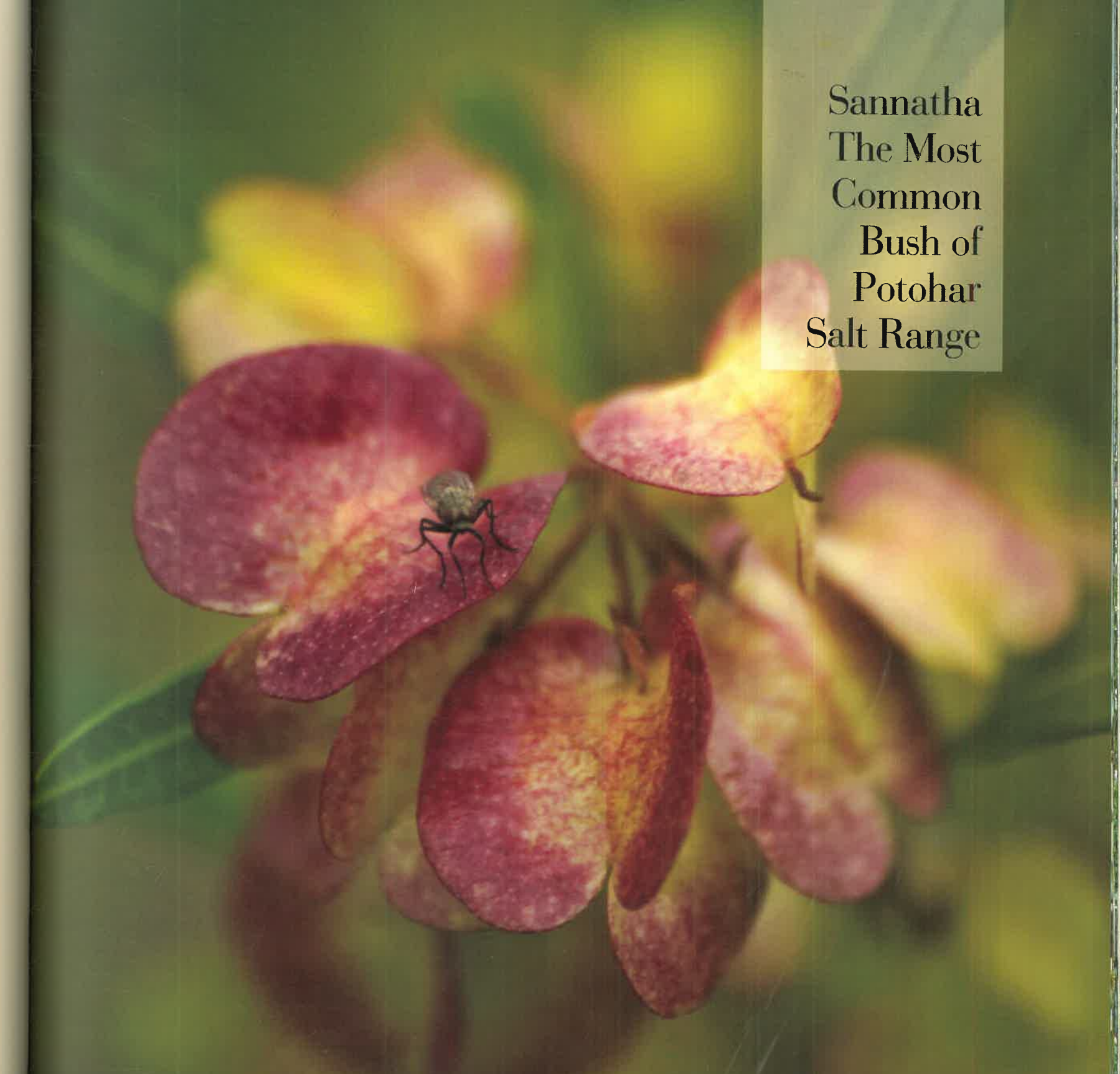
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Sannatha
The Most
Common
Bush of
Potohar
Salt Range




Harmal





Cactus bearing fruit

Foeniculum vulgare (Linn.) Mill. (Umbellifeae)

Vernacular name: Saunf.
Common name: Saunf.
Occurrence: Cultivated.
Flowering: March to April.
Part used: Fruit.
Fruit is alterative, lactagogue, emmenagogue, diuretic, aromatic and carminative. Dried fruit or its powder is very effective in gas trouble. Its decoction in winter and juice in summer is recommended for dysentery. Two or three drops of its juice is said to pour in eyes for improvement of eye sight.

Haloxylon recurvum Bunge ex Boiss. (Chenopodiaceae)

Vernacular name: Lana.
Common name: Ushnan.
Occurrence: Less common.
Flowering: November to December.
Part used: Whole plant.
The plant is abortifacient, diuretic, emmenagogue and resolvent. Local people burn the plant in a pit to get carbonates of soda that is used as an alternate of soap for cloth washing.

Heliotropium europaeum Linn. (Boraginaceae)

Vernacular name: Hathi sundi.
Common name: Feel khurtomi.
Occurrence: Very common.
Flowering: November to January.
Part used: Whole plant.
Plant is used as antiperiodic and powder of leaves is used in malaria. Leaves are rubbed on swollen gums. Paste of leaves is applied on poisonous wounds and insect and mad dog bite. Salts are obtained from ash of plant, which are used for cough.

Heliotropium strigosum Willd. (Boraginaceae)

Vernacular name: Gorakh pan.
Common name: Pana choni, Tindu.



Occurrence: Rare.
Flowering: April to July.
Part used: Whole plant.
Plant is blood purifier. It is ground along with water and said to be eaten empty stomach at morning for liver and stomach complaints, pimples and other skin diseases.

Indigofera gerardiana Wall. (Papilionaceae)

Vernacular names: Neel.
Common name: Neel.
Occurrence: Common.
Parts used: Whole plant, usually leaves.
It is astringent and prevents pregnancy. The plant is used locally for family planning in cases where the mother's health does not support the pregnancy otherwise the locals like to produce more children.

Lactuca serriola Linn. (Asteraceae)

Vernacular name: Berham dandi.
Common name: Berm dandi.



Occurrence: Less common.
Flowering: July to September.
Part used: Whole plant.
Plant is febrifuge and best blood purifier. Fresh plant is ground in water along with black pepper that is used to improve memory and for all types of skin diseases. Plant is dried under shade and ground into powdered form, which is used in malaria and fever.

Launaea procumbens (Roxb.) Ram. and Raj. (Asteraceae)
Vernacular name: Dudhbhattal.
Common name: Dudglak.
Occurrence: Common.
Flowering: October to December.
Part used: Whole plant.


Sumbal



The plant is crushed in water and given in painful urination and gonorrhoea. It is a good fodder for cattle.

Lawsonia inermis Linn. (Lythraceae)

Vernacular name: Medi.
Common name: Mehndi, Henna.
Occurrence: Cultivated.
Flowering: June.
Part used: All parts.
Plant is diuretic, blood purifier, demulcent and resolvent. Its decoction is effective in jaundice and skin diseases. Paste of its leaves applied over hands and feet in irritation. It gives colour therefore, also used as hair dye.

Linum usitatissimum Linn. (Linaceae)

Vernacular names: Alsi.
Occurrence: Less common.
Flowering: February to April.
Parts used: Seed, bark, leaves, flower and Oil.
It is resolvent, demulcent and expectorant. Powder of the bark is applied over wounds to stop bleeding. Its



decoction is used in cough, asthma, gonorrhea and ulcers of bladder and uterus. Its poultice is applied over abscess and pimples.

Malva parviflora Linn. (Malvaceae)

Vernacular name: Khubazi.
Common name: Panirak.
Occurrence: Less common.
Flowering and fruiting: January to March.
Part used: Whole plant.
Its decoction along with sugar is used in dry cough. Seed is demulcent; used in cough and ulcers in bladder.

Melia azedarach Linn. (Meliaceae)

Vernacular name: Dhrek.
Common name: Bakain.
Occurrence: Common.
Flowering: Flowers at various seasons.
Part used: Seeds and leaves.
Plant is resolvent, febrifuge, demulcent and blood




Phullah

purifier. Bark is vermifuge. Leaves are boiled in water and used to wash hair. Leaves are ground in water along with black pepper and used in all types of skin diseases. Small dose of powder of seeds is recommended for all types of piles.

Otostegia limbata (Benth.) Boiss. (Labiatae)

Vernacular names: Bui.
Common name: Bui.
Occurrence: Very common.
Flowering: May to June.
Parts used: Leaves.
Juice of leaves is applied to children's gum and to ophthalmia in man and beast.

Oxalis corniculata Linn. (Oxalidaceae)

Vernacular name: Khtkal.
Common name: Khatti buti, Tapti.
Occurrence: Common.
Flowering: March to December.
Part used: Whole plant.
Leaves are antiscorbic, refrigerant, cooling and stomachic. Plant is used as vegetable and cooked along with other herbs, which is used in liver and stomach complaints. Plant is diuretic and juice is very effective in jaundice.

Papaver hybridum Linn. (Papaveraceae)

Vernacular names: Post.
Occurrence: Less common.
Flowering: February to April.
Parts used: Petals.
The petals are diaphoretic. Fruit and its decoction are sedative and demulcent. The decoction of stem is used in relief of pain in eyes and ear. Decoction along with salt is used in flu and cough. The powder of fruit causes constipation, therefore, used in diarrhea.

Peganum harmala Linn. (Zygophyllaceae)

Vernacular names: Harmal.
Common name: Aspand.
Occurrence: Very common.


Bhaeekar

Flowering: October to December.
Parts used: Leaves, seed and root.
It is demulcent, diuretic and used in sexual impotency. The seeds are antiperiodic and are used in rheumatism. It is blood purifier, ammanagogue, emetic and alterative. Its seeds along with seeds of Linum usitatisimum are ground and given in asthma along with honey. It is mostly used for sexual impotency. Seeds are boiled in olive oil and used for deafness. It keeps warm brain and other body parts.

Phyla nodiflora (Linn.) Green (Verbenaceae)

Vernacular names: Bukkan.
Common name: Bukkum.
Occurrence: Very common.
Flowering: September to November.
Parts used: Whole plant (usually leaves).
It is expectorant and diuretic. Its decoction is used in fever. Its paste is also very effective for the eczema of head of children. It is also good for wounds and swellings, high blood pressure and spleen diseases. This is best herb for bleeding piles. Herb is ground along with black pepper, and then filtered. Filtrate is taken along with sugar in piles, gonorrhea and inflammation of bladder.





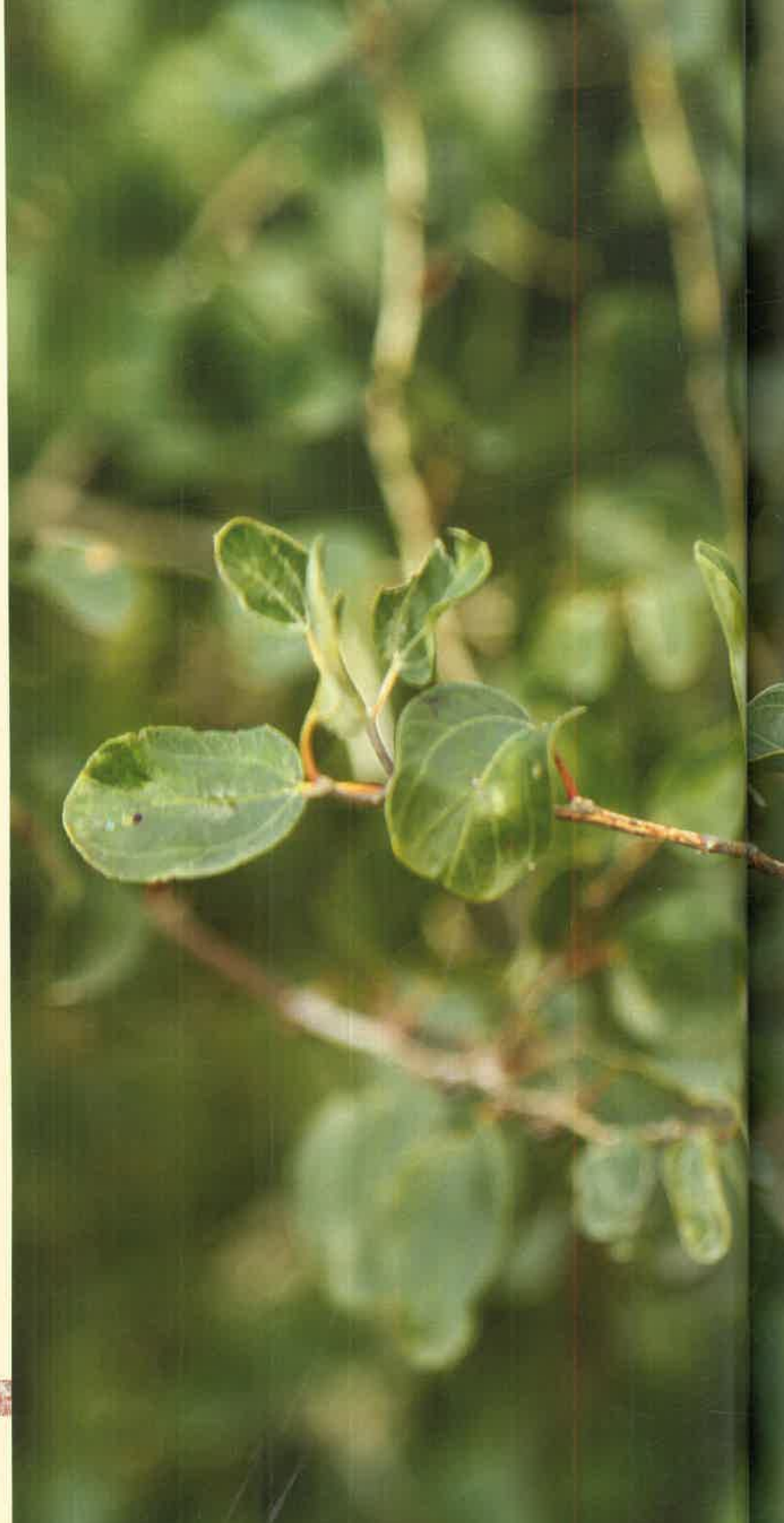
Ficus
locally
called
Peepal

Polygonum plebejum R. Br. (Polygonaceae)

Vernacular names: Ghumka.
Common name: Raniphal.
Occurrence: Common.
Flowering: February to April.
Parts used: Whole plant.
Dried and powdered plant is taken internally in pneumonia. Root is used in bowel complaints. It is astringent and blood purifier. This herb heals the wounds.

Portulaca oleracea Linn. (Portulacaeae)

Vernacular names: Lunak.
Common name: Khurfa, Kulfe-ka-sag.
Occurrence: Very common.
Flowering: July to October.
Parts used: Whole plant.
The plant is alterative and refrigerant; used as vegetable in diseases of liver, kidney and lungs. Paste of the leaves is externally applied to burns, scald and other skin diseases. Seed is demulcent, astringent, diuretic and vermifuge. Juice of stem is applied against prickly heat.




Wild Bairy

Prosopis cineraria (Linn.) Druce (Mimosaceae)

Vernacular names: Jhand.
Occurrence: Common.
Flowering: May to August.
Parts used: Bark, flower and fruit.
Flowers pounded and mixed with sugar are eaten by women in pregnancy to avoid miscarriage. Pods are astringents. Bark is used in rheumatism and scorpionsting. Ashes are rubbed over the skin to remove hairs. It is food for livestock and fuel for locals. Its wood is used in making huts. Unripe pods are used as vegetable.

Ranunculus muricatus Linn. (Ranunculaceae)

Vernacular name: Jal dhania.
Common name: Latokari, Kor gandal.
Occurrence: Less common.
Flowering: February to April.
Part used: Whole plant.
This herb is very effective in plague. Plant is vesicant and rubefacient. When crushed plant is applied on skin it raises blisters. Fresh plant is ground and applied on abscess and tumors of plague.




Jamni Butti

Ricinus communis Linn. (Euphorbiaceae)

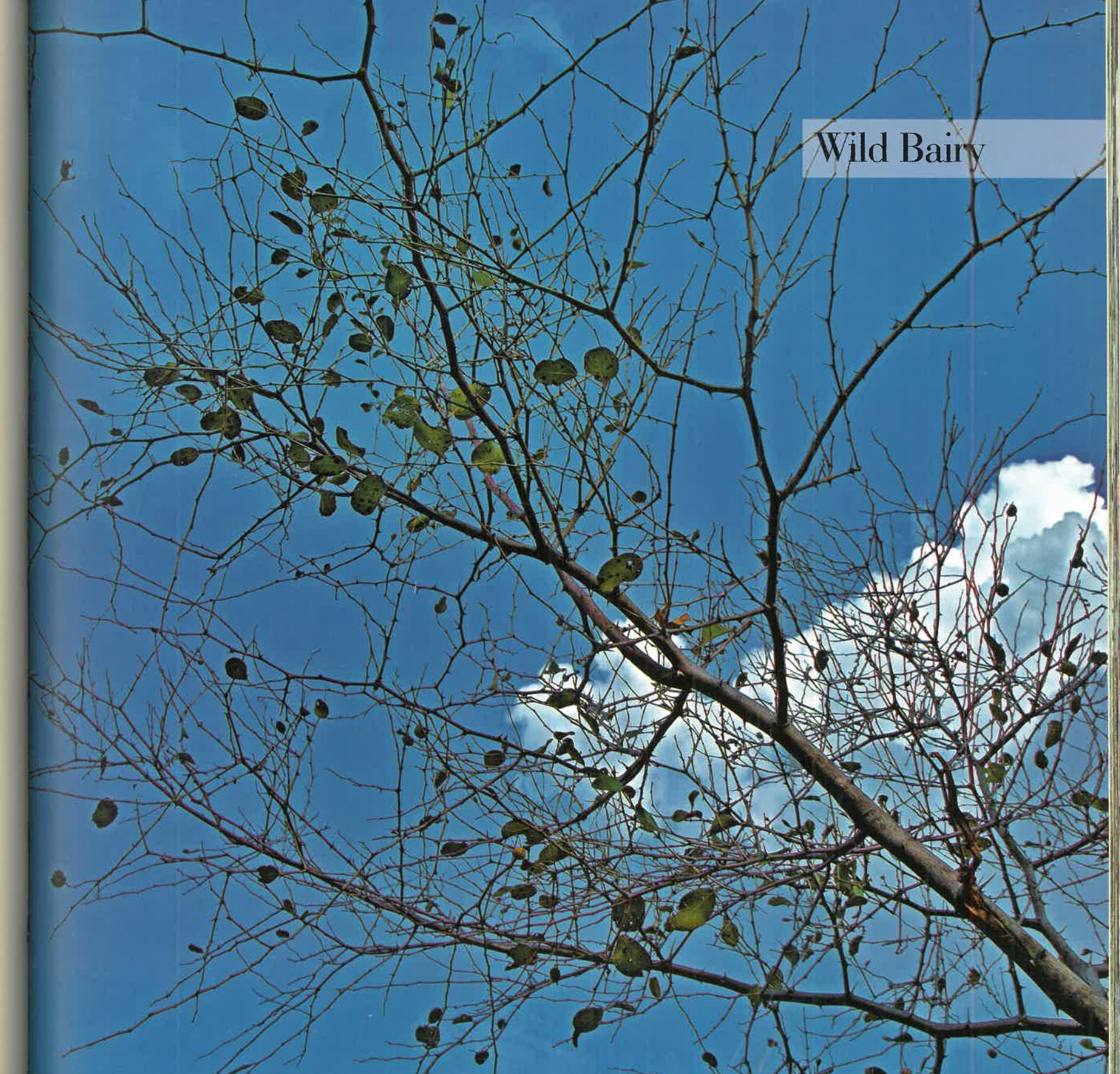
Vernacular name: Arind.
Common name: Arund.
Occurrence: Common.
Flowering: Flowers at various seasons.
Part used: Seeds, seed oil and leaves.
Leaves are dipped in oil of aniseed and bound on swelling and joints for relief from pain. Castor oil is purgative, expectorant and used in constipation. Seeds are counter irritant; used in scorpion sting and fish poison. Endosperm of seed prevents the pregnancy.

Rosa damascena Mill. (Rosaceae)

Vernacular names: Gulab.
Common name: Gulab.
Occurrence: Cultivated.
Flowering: April to June.
Parts used: Petals and buds.
Buds are considered astringent, tonic, cephalic, cardiac, aperients and reputed for removing bile and cold humors. Petals are applied externally as astringent. In the form of past with equal amount of sugar, it is taken as tonic and fattening. This paste is locally called as "Gulqand" and is delicious. Extract of petals, "Arq-e-Gulab" (rose water) is purgative and used for stomach ailments of newborn babies. Its smell is best for brain but in weak persons it initiates flue. It is also sprinkled on the funeral on the way to graveyard.

Salvadora oleoides Dence. (Salvadoraceae)

Vernacular name: Peeloo.
Common name: Pilu, Wan, Jal.
Occurrence: Less common.
Flowering: December to February.
Part used: Seeds, seed oil bark, fruit and root.
Its wood is use as fuel, tree trunk is used as pillar in huts, and branches and leaves serve as camel fodder. Ripen fruit is eaten by locals and seeds yield oil which is used in toothpaste. Twigs and roots are used as toothbrush. Fruit is resolvent, expectorant, diuretic and opens the pores of body. Decoction of bark is febrifuge.


Wild Bairy

Sisymbrium irio Linn. (Cruciferae)

Vernacular name: Khaksi.
Common name: Khub Kalan.
Occurrence: Rare.
Flowering: February to April.
Part used: Seeds.
Plant is febrifuge and used in chronic cough, decoction is used in fever. Seeds are sprinkled over bed of a patient suffered from small pox or measles.

Solanum miniatum Beruh. ex Willd. (Solanaceae)

Vernacular names: Peelak.
Common name: Mako.
Occurrence: Very common.
Flowering: All the year round.
Parts used: Whole plant.
It is resolvent, diuretic, demulcent, tonic, hydragogue and sedative. Juice of its leaves is given in small pox and other skin diseases. Its leaves are chewed for boils in mouth. Decoction is used to wash wounds, boils and also used to wash eyes to improve eyesight. Infusion of both fresh and dry plants is effective for wounds of stomach, spleen, intestine, liver and uterus. Decoction is mixed with sugar and used as sedative.

Solanum surratensis Burm. F. (Solanaceae)

Vernacular names: Choti kandiari, Mahokri.
Common name: Katai khurd.
Occurrence: Very common.
Flowering: June to November.
Parts used: Whole plant.
Plant is digestive, alterative, diuretic, expectorant and vermifuge. It is used in cough, asthma, fever, and chest pain. Flowers are dried in shade and ground; the powder along with honey is given in all types of coughs. Plant is used in gonorrhea and decoction is effective in toothache. Juice of berry is useful in sore throat and leaves are applied locally in relief pain. Pulp of fruit is rubbed on joints for relief of pain.

Sonchus asper. (Linn.) Hill. (Astraceae)

Vernacular names: Dodhak bastani.
Occurrence: Very common.
Flowering: December to April.
Parts used: Whole plant.
Pounded herb is applied to wound or boils.

Sueda fruticosa Forsk. (Chenopodiaceae)

Vernacular names: Lani.
Common name: Khar.
Occurrence: Common.
Flowering: April to October.
Parts used: Leaves.
The infusion of leaves is used as an emetic. Poultice made from leaves is applied in ophthalmia for relief. The plant is used as fodder for camel. Salts obtained from this are used in medicine for ejection of stones in bladder and kidney.

Swertia chirata Buch. Ham. (Gentianaceae)

Vernacular names: Chiretta.
Occurrence: Common.
Flowering: September to November.
Parts used: Whole plant.
Plant is resolvent, alterative and febrifuge. It is blood purifier therefore used in eczema, leprosy and other skin diseases. It is used in diarrhoea.

Tamarix aphylla (Linn.) Karst. (Tamaricaceae)

Vernacular name: Ukan.
Common name: Farash.
Occurrence: Rare.
Flowering: August to March.
Part used: Gall and Bark.
The bark is used for tanning purposes. Its leaves are good fodder for camels while local people use its wood for fuel as well as for agricultural implements. Poultice of leaves is applied over wounds of cattle. Gargles from decoction of leaves are recommended in toothache. Powder of dried

leaves is sprinkled over wounds. Powder of bark along with mustard oil is applied over burning.

Tephrosea purprea (Linn.) Pers. (Papilionaceae)

Vernacular names: Sarphonka.
Occurrence: Less common.
Flowering: August to October.
Parts used: Whole plant.
It is diuretic, blood purifier, laxative and used in leprosy. Leaves are used to avoid miscarriage. Its petals are ground along with petals of Cannabis sativa and said to be eaten in bleeding piles. Root is bitter; used in chronic diarrhea and as fish poison.

Terminalia belerica Roxb. (Combritaceae)

Vernacular names: Bahera.
Occurrence: Less common.
Flowering: April to June.
Parts used: Fruit and kernel.
Plant is alterative, appetizing, used in diarrhea and piles. It is also used in asthma and cough. Kernel is narcotic. Fruit is tonic and bitter. It improves eyesight and is very good for brain. When fruit is half ripe it is purgative and when fully ripe it is astringent.

Tinospora cordifolia Miers ex Hook. f (Menispermaceae)

Vernacular names: Gilo.
Occurrence: Common.
Flowering: June to September.
Parts used: Root, stem and juice of plant.
It is alterative, febrifuge, astringent and diuretic. It is always used in fresh form and its pieces soaked overnight and said to be eaten in old fever. Extract of fresh plant is very useful. Starch from root and stem is nutrient and is used in chronic dysentery and diarrhea.
Trianthema govindia Ham. (Aizoaceae)
Vernacular names: Mechachi buti.
Common name: Buskhapra.
Occurrence: Common.
Flowering: October to December.
Parts used: Whole plant and mostly root.

It is febrifuge, diuretic resolvent, expectorant and emmanogogue. Fresh juice is used in jaundice and in exploration and as diuretic. Root is used in cough, asthma, and flue and in fever of children. Seeds are used in sexual impotency. Plant is abortifacient and as a remedy for pain in bladder and for snakebite.

Tribulus longipetalus Viv. (Zygophyllaceae)

Vernacular names: Bhakra.
Common name: Gokhru kalan.
Occurrence: Common.



Flowering: October to December.
Parts used: Fruit.
Fruit is used in urinary disorder, impotence, cough and heart diseases.

Tribulus terrestris Linn. (Zygophyllaceae)

Vernacular names: Chota Gokhru.
Occurrence: Common.
Flowering: August to November.
Parts used: Whole plant.
The plant is cooling, diuretic, demulcent, tonic and aphrodisiac. Fruit is used in urinary disorder, impotence, cough and heart diseases. Seeds are recommended in diseases of bladder, kidney stone and gout.

Trichosanthes cucumerinus Linn. (Cucurbitaceae)

Vernacular names: Chichinda.
Occurrence: Less common.
Flowering: February to April.
Parts used: Seeds and fruits.
Seeds are cooling. Fruit is considered anthelminitic, purgative and emetic.

Trachyspermum ammi (Linn.) Sprague (Umbelliferae)

Vernacular names: Ajwaind.
Common name: Ajwain.
Occurrence: Cultivated.
Flowering: March to April.
Parts used: Fruit and root.
Root is carminative and diuretic. Fruit is stimulant, carminative, tonic, antiseptic, stomachic; used in colic, indigestion, diarrhea, and cholera. It is used along with lemon juice in sexual impotency and given in old fever.

Withania somnifera Dunal (Solanaceae)

Vernacular name: Asgand.
Common name: Aksan.
Occurrence: Very common.

Flowering: All year round.
Part used: Root and leaves.
Leaves are burnt in mustard oil and crushed to make a poultice that is applied on eczema. A poultice made up of leaves is also locally applied over breast to keep it shape. The powder of root is given with milk or butter in leucorrhoea, spermatorrhoea, rheumatism and also used for pregnancy.

Zizyphus mauritiana Lamk. (Rhamnaceae)

Vernacular names: Beri.
Occurrence: Very common.
Flowering: March to June.
Parts used: Leaves, fruit, root and bark.
Its wood is used as timber and fruits are edible. It is also food for cattle. Wood is considered best for small implements. Decoction is used to wash hair.

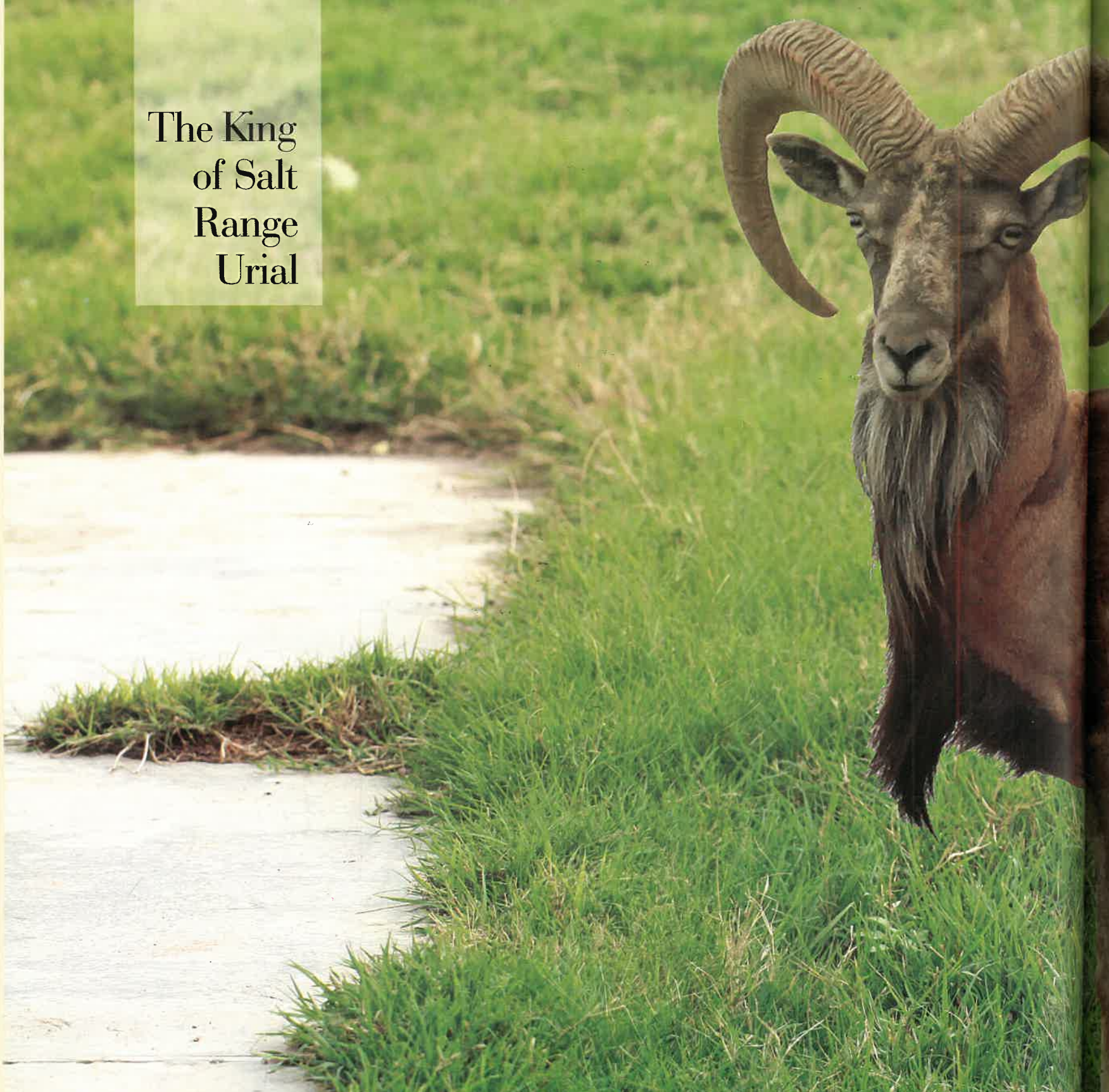
Zizyphus nummularia (Burm. f) Whight and Arn. (Rhamnaceae)

Vernacular names: Kokan-ber.
Occurrence: Common.
Flowering: March to June.
Parts used: Leaves and fruit.
The dried fruit is soaked in water with Ficus carica and this infusion is given for relief in jaundice. Leaves used as fodder for cattle.

Zygophyllum simplex Linn (Zygophyllaceae)

Vernacular names: Alethi.
Common name: Alethi.
Occurrence: Very common.
Flowering: November to January.
Parts used: Leaves and seeds.
Seeds are anthelminetic. Seeds and leaves are applied to eyes in the form of infusion in eye diseases like leucoma and ophthalmic. It is reported as fodder for camel.
There is a diversified range of plants and grasses within the salt range however minutest details of plants would lead to inrellivence of the book title that is why discussion on the flora is closed.

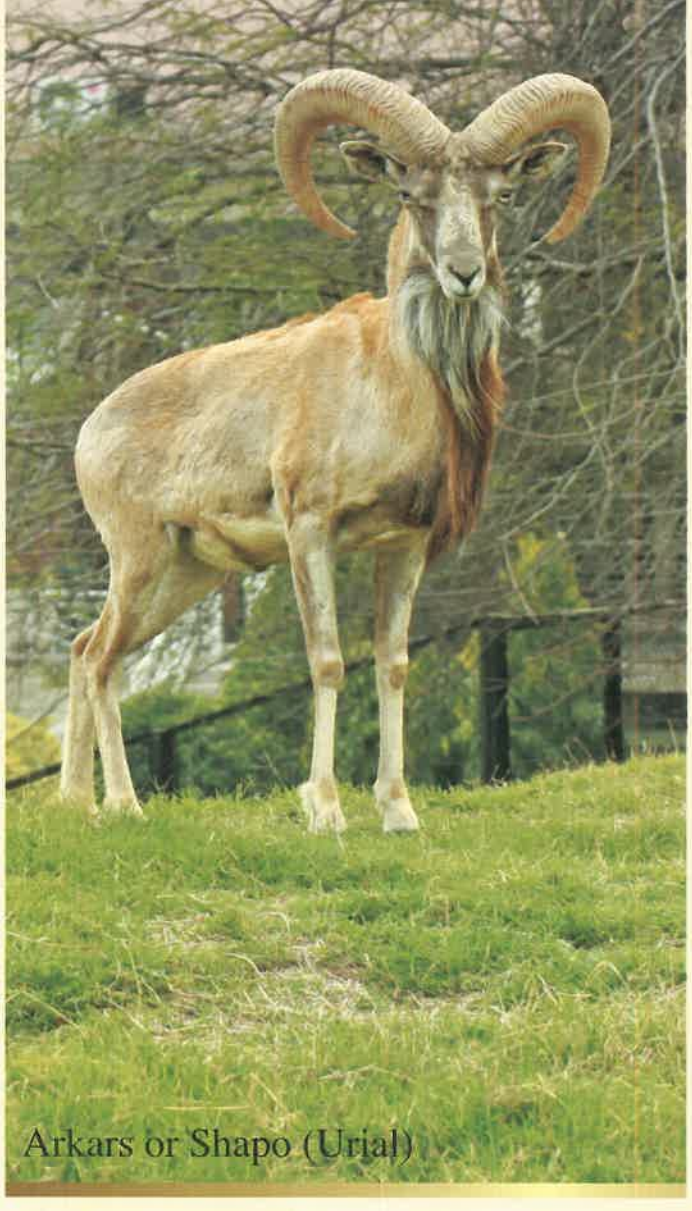
The King of Salt Range Urial





Fauna

Urial (ovis orientalis), wild boar (Sus scrofa), Golden jackel (Canis aureus) Indian grey Mongoose (Herpertis edwardsi) and wild hare (Lepus nigricollis) are common mammal species of Salt Range. Urial and wild hare are the important game animals of the area and indiscriminate hunting is affecting their present status. The populations of Urial (Arkars or Shapo) are vulnerable to many threats in Salt Range and other areas of Pakistan (Awan et al., 2004). However, with the planned collaborative efforts of the WWF, Pakistan, local communities and especially the marvelous contribution of Nawwabs of Kalabagh, the threats have been reduced to minimum to the endangered species of Urial. The common bird species are Black Kite (Milvus migrans), Black Partridge (Francolinus francolinus), Grey Partridge (Francolinus pondicerianus), Indian ring dove (Streptopelia decaocto), Red turtle dove (Streptopelia tranquebarica), Peacock (Pavo cristatus), House swift (Apus affinis), Golden oriole (Oriolus orivolus) and Pigeon (Chaudhary et al., 2001). Game birds like Chukar Partridge (Chakor), common quail and black breasted rain quail are needed to be conserved in the area. All these species are common except the rain quail, which occurs frequently (Roberts, 1991). Other common fauna of the salt range includes

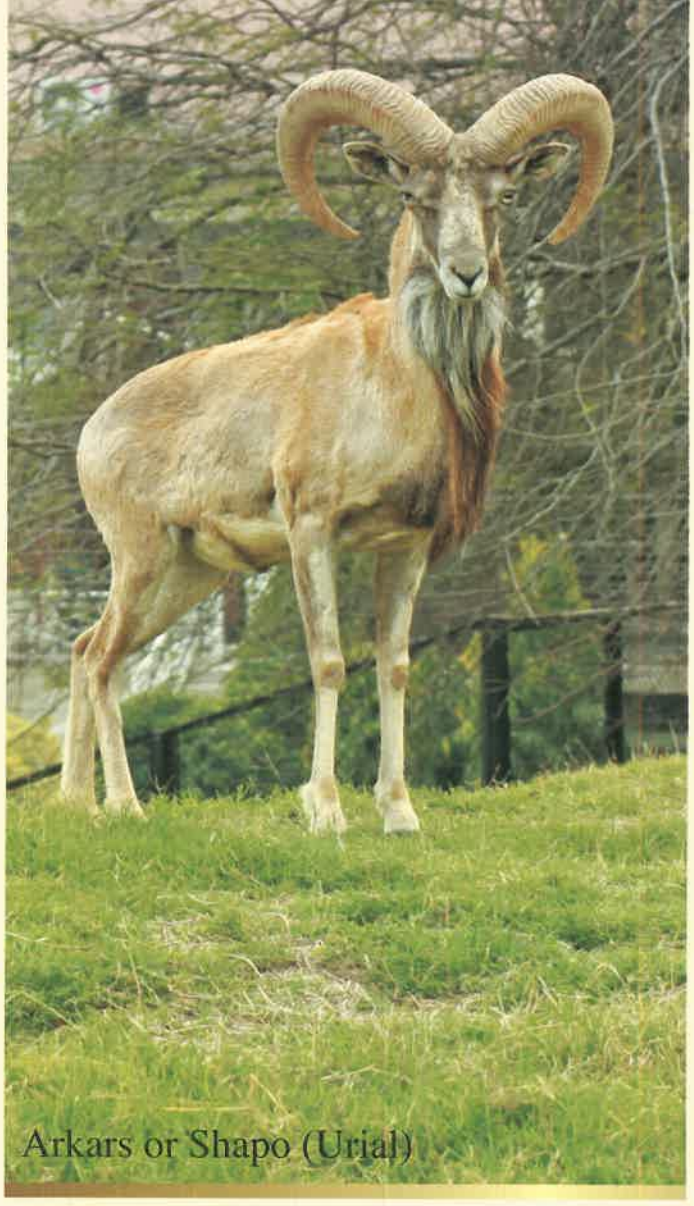


Arkars or Shapo (Urial)

Wolf, Wild Rabbit, Jackal, Chinkara (Indian Gazelle), Squirrels and Wild Cats. Snakes and lizards of various kinds are also found in the common reptiles of the salt range. Many of the natural water ponds and wetlands have some varieties of crabs and fish.

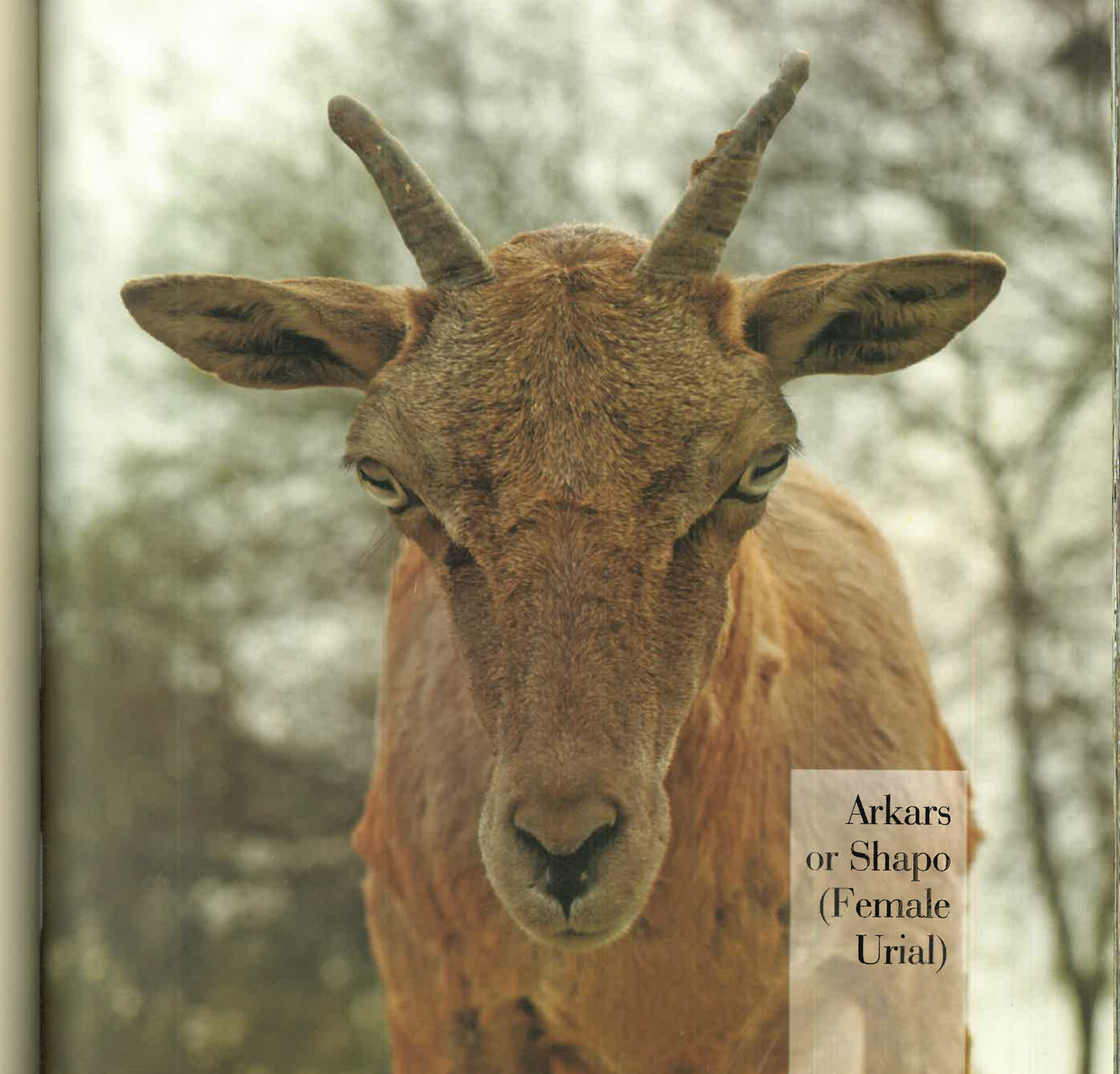
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Arkars
or Shapo
(Female
Urial)



Chinkara
(Gazelle)



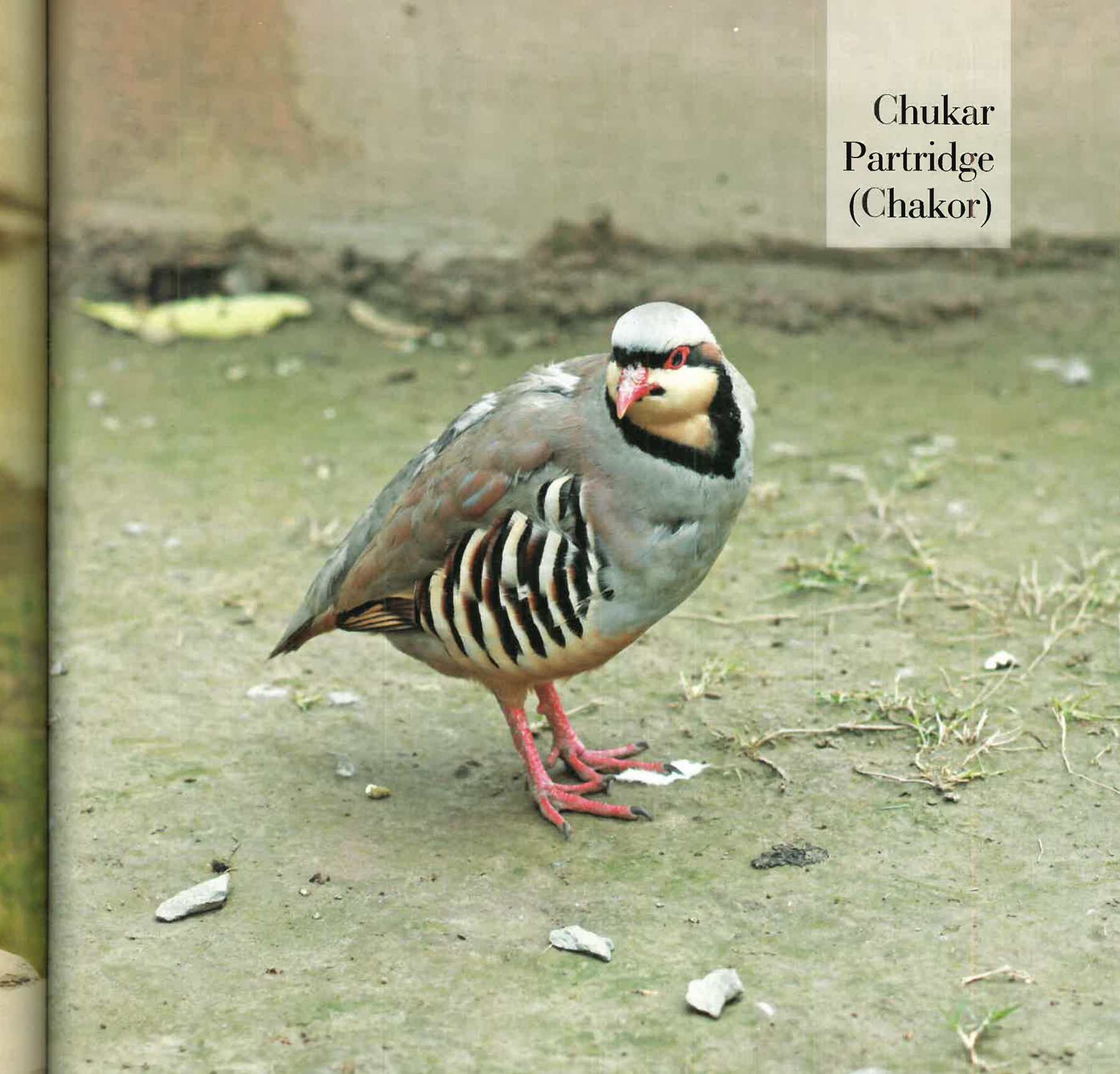


Peacock



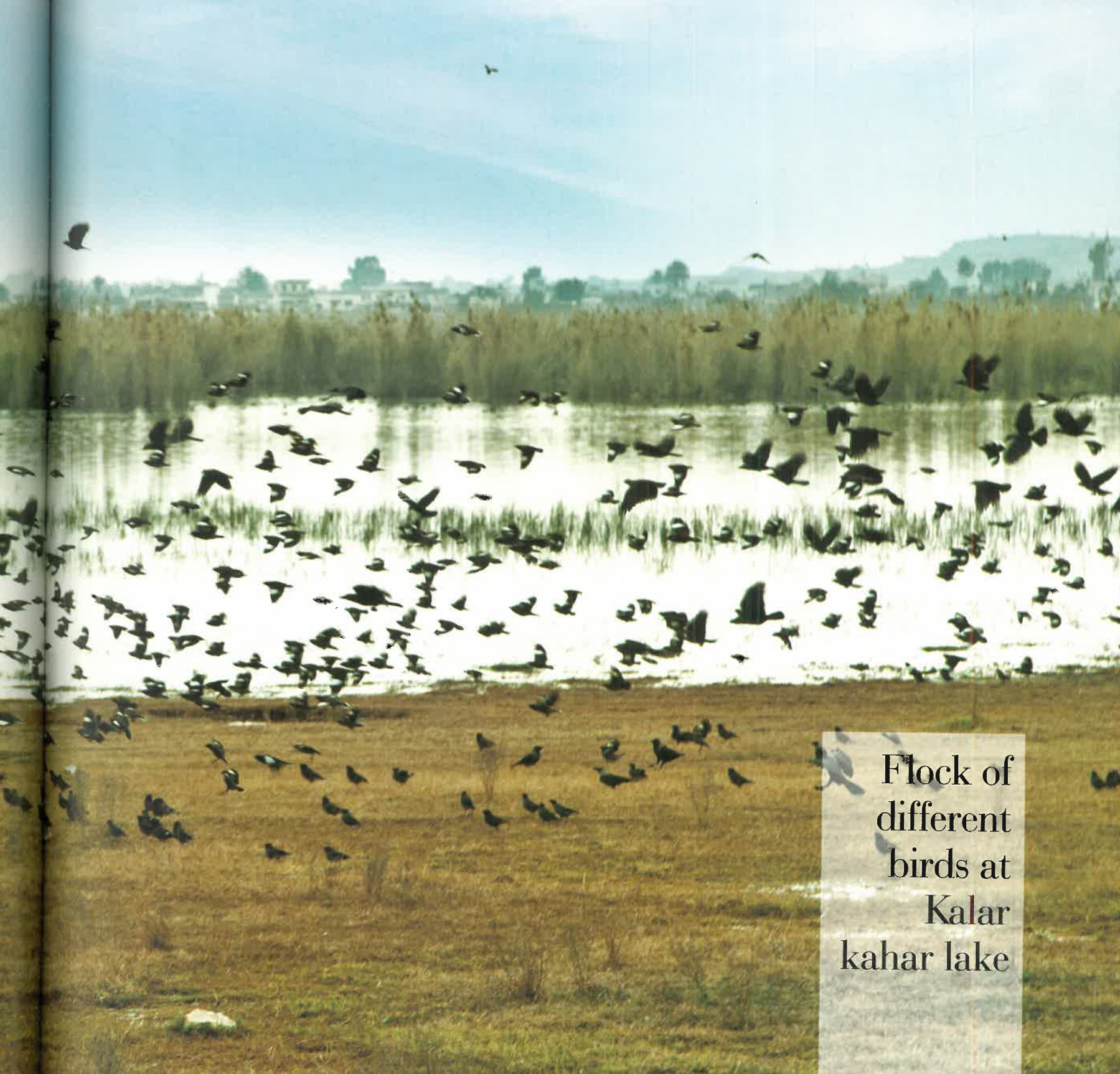


Brown Partridge (Boora Teetar)

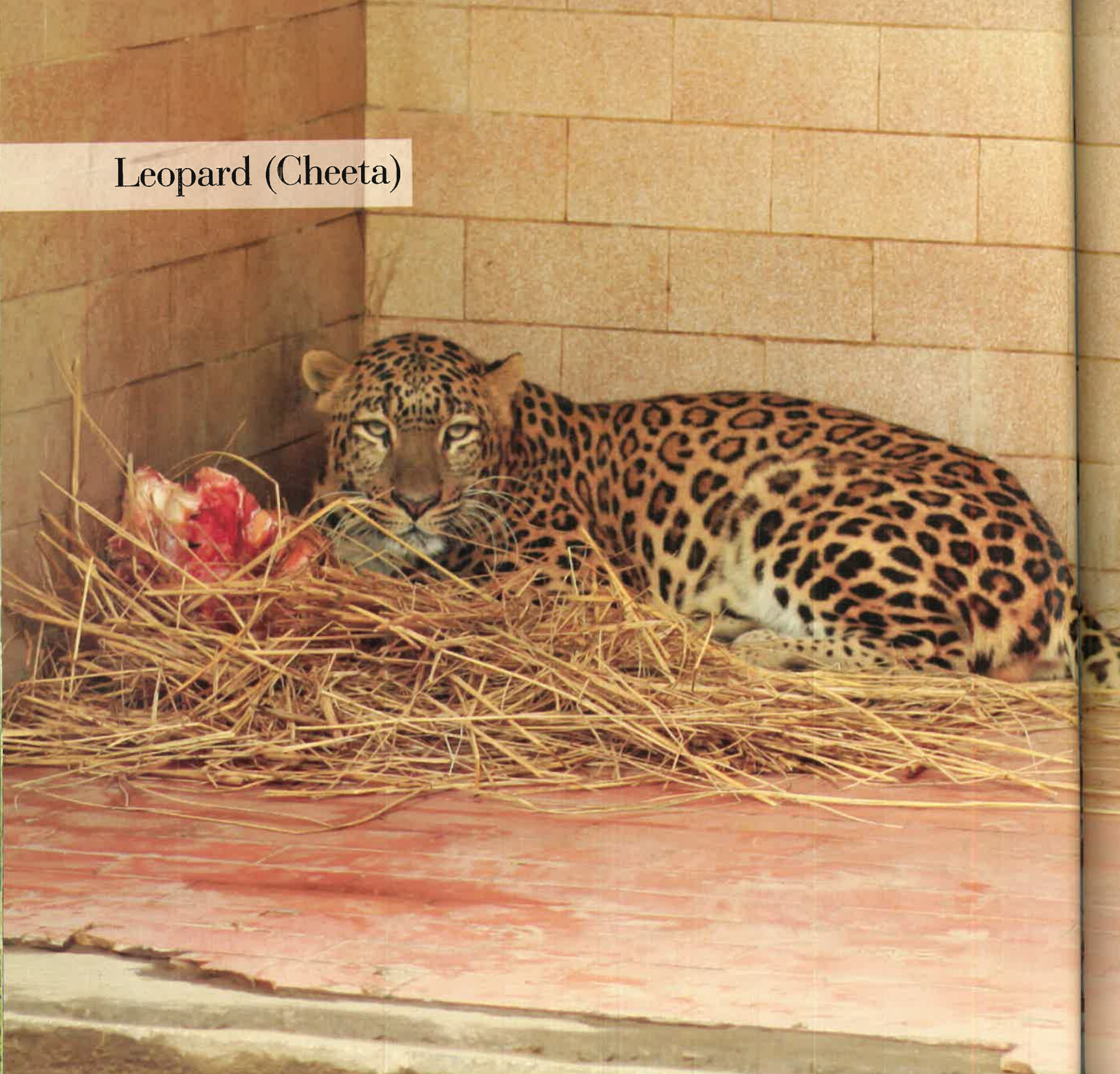


Chukar
Partridge
(Chakor)





Flock of different birds at Kalar kahar lake


Leopard (Cheeta)


Wolf (Bharia)


Kite (Cheel)


Crow (Kawa)


Neelkanth



Cuckoo

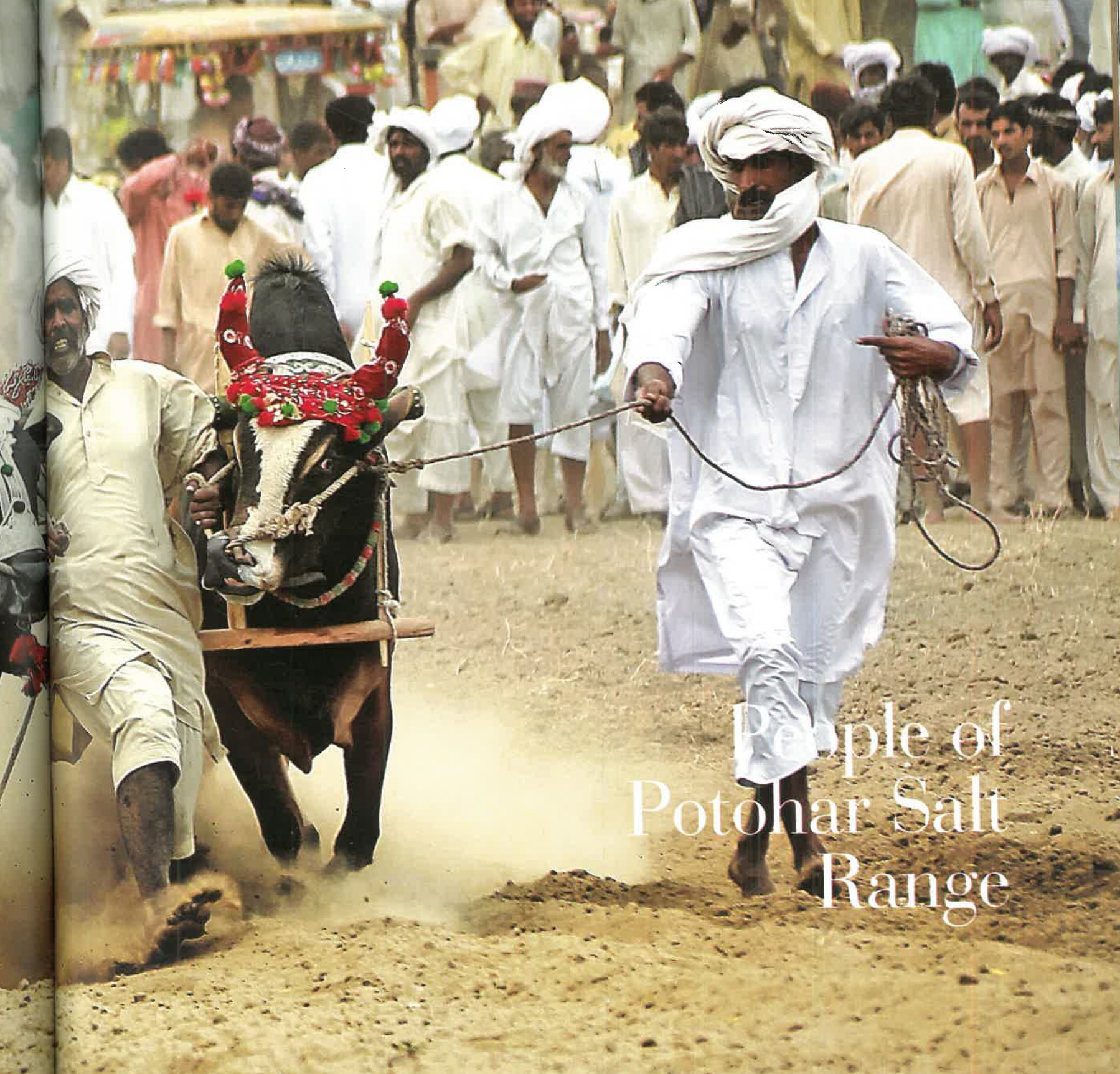


Wild Pigeons



Cranes (Koonj)





People of Potohar Salt Range

People

- Janjua Rajput
- Awan
- Khukhar
- Khokhrin
- Janjua Rajput

The Janjua (also spelt Janjooa, Janjuha, Janjuah) are a clan found among the Rajput and Jat communities of Afghanistan, India and Pakistan. Their warlike nature and dominant rule of their kingdoms against other tribes earned them a powerful reputation. The Mughal Emperor Jalaludin Mohammed Akbar's record keeper Abu Fazl celebrated the Janjua Rajput as among the most renowned Rajputs of South Asia.

Early history

The Janjua claim descent from the Pandava dynasty through Arjuna, who was mythological cousin of Krishna.

Although there is no definitive source to confirm the ancestry of the ancient King Porus of Punjab, the JanjuaRajputs claim that their ancestor, RaiPor is the Porus who fought Alexander in Punjab in 326BC.





Further, "The Punjabi ruler was Raja Porus, said to be a direct descendant of the Pandava kings".

The Mughal Emperor Jalaludin Muhammad Akbar enjoyed close relations with the Janjua warlord Malik Darwesh Khan who in turn renamed a capital of his kingdom Jalalpur in his honour.

Awan

Awan Punjabi Gurmukhi, is a South Asian Zamindar tribe, putatively of Arab origin,living predominantly in northern, central, and western parts of Punjab, Pakistan, Khyber Pukhtunkhwa and azad Kashmir regionsThe Awans subscribe to the belief that they are the descendants of the fourth Caliph, Ali, and as such, a number adopt the title, Alvi.

Origins

There are different theories pertaining to the origin of the Awans:

Arab origin

A letter written by the Sajjada Nashin, Pir Sial Sharif Khawaja Zia-ud-Din, to Qazi Mian Muhammad Amjad,





requesting him to lend the book Kihalastah al-Nisab, a treatise written by Jamal ad-Din Hasan ibn Yusuf ibn 'Ali ibn Muthahhar al-Hilli, on the descendants of Ali ibn Abi Talib; this rare tome also covers the descendants of Ali ibn Abi Talib, who migrated to lands outside Arabia - including the subcontinent - following the rise of the Umayyad Caliphate. The treatise is the oldest work dealing with the history of the Awan tribe.

The Awan historiographers maintain that the Awans are descended from an individual named Qutb Shah, who originally resided in Herat, served in the army of Mahmood of Ghazni, and was a Hashemite descendant of the Prophet Muhammad's (PBUH) cousin and son-in-law, Ali (wife other than the Prophet's (PBUH) daughter, Fatimah).

As Sir Lepel Henry Griffin states:"All branches of the tribe are unanimous in stating that they originally came from the neighborhood of Ghazni to India, and all trace their genealogy to Hazrat Ali the son-in-law of the Prophet (PBUH). Kutab Shah, who came from Ghazni with Sultan Mahmud, was the common ancestor of the Awans."

It is asserted that Qutb Shah and six of his sons accompanied and assisted Mahmud in his early eleventh century conquests of what today forms parts of Afghanistan, Pakistan and Northern India. It is claimed that in recognition of their services and valour, Mahmud bestowed upon Qutb Shah and his sons (who, according to tribal traditions, settled primarily in the Salt Range) the title of Awan, meaning "helper".

Tribal history holds that Qutb Shah and his sons married local women who converted to Islam from Hinduism. Qutb Shah's sons are said to have settled in different regions of the Punjab and to a lesser extent, what now constitutes parts of Khyber Pukhtunkhwa; Gauhar Shah or Gorrara, settled near Sakesar, Kalan Shah or Kalgan, settled in Kalabagh, Chauhan colonized the hills close to the Indus, Mohammad Shah or Khokhar, settled by the Chenab, and Tori and Jhajh settled in Tirah. Their descendants not only came to heavily populate these regions, but a number of Awan sub-clans that trace their origins to these six individuals, give their names to various localities such as Golera in Rawalpindi, Khewra in Jhelum, Banjara in Sialkot, Jand in Attock, and Dhudial in Chakwal. Some of Qutb Shah's sons are supposed to have assumed names that reflected the Hindu heritage of their mothers and the Awan sub-clans that trace their origins to these particular individuals, bear the names of their eponyms.

Amongst those who support the Awan claim to Arab ancestry, are H. A. Rose, Malik Fazal Dad Khan and Sabiha Shaheen. Although Rose was more cautious in assigning an Arab origin to the Awans, he was willing to concede that the tribe may well be Alvi Sayyids, who

having sought refuge in Sindh from the Abbasids, allied themselves to Sabuktagin and assisted him in his Indian adventure, for which he bestowed the title of Awan on them (Rose considering it plausible that the name of the Awan tribe was derived from the word 'Ahwan', meaning "helper". And although the Feroz Sons Urdu-English Dictionary lists the Awans as a Rajput clan, it does state that the title of the tribe is of Arabic origin, being the plural of the word 'aun', and defining "Awan" as "helpers" Making reference to W.S. Talbot's assessment of the Awans, Rose also commented:

"But in the best available account of the tribe, the Awans are indeed said to be of Arabian origin and descendants of Qutb Shah."

Malik Fazal Dad Khan supports the traditional account of the Awans' origins, but with some modifications. He considers the Awans to be of Arabian origin and traces their lineage to Ali, but according to him, Abdullah Rasul Mirza was the remote ancestor of the Awans; in the eighth century, he was made a commander of the army of Ghaur by Caliph Haroon-ur-Rasheed, the title of Awan being conferred upon him, and his descendants consequently being called Awans. Sabiha Shaheen (who addressed this issue as part of her MA Thesis) deems this theory tenable. Furthermore, she states that Qutb Shah fled to the Subcontinent along with a small group of people due to Mongol attacks and joined the court of Iltutmish. The majority of his descendants came to refer to themselves as Qutb Shahi Awans

Indigenous origin

However, there are those who attribute an indigenous origin to the Awan tribe; these include Alexander Cunningham, Harikishan Kaul, and Professor Ahmed Hasan Dani. Alexander Cunningham looked upon the Awans as a Rajput clan. He writes, "According to the Emperor Babar the Jud and the Janjuha were "two races descended from the same father," who from old times had been rulers of the hills between Nilab and Bhera, that is, of the salt range." On one-half of the hill lived the Jud, and on the other half the Janjua." The Awans now occupy western half of these hills towards Nilab, and from all I could learn, they would appear to have been settled there for many centuries. They must therefore be the Jud of Baber's memoirs, for Jud was not the true name of the people, but was applied to them as the inhabitants of Mt. Sakeswar, which was called Jud by the Muhammadans on account of fancied resemblance to Mt. Jud, or Ararat in Armenia". However he accepts that,"In the total absence of all written records, I have almost nothing to offer in favour of this identification, except its great probability."According to Robert George

Thomson, "General Cunningham's argument leads him to class the Awans as Rajputs and cousins of the Janjuas, and to represent them also as residents of three thousand years standing, this is almost certainly erroneous.

Kaul was of the opinion that the tribe was of either Jat or Rajput origin, pointing to the fact that in Sanskrit, the term Awan means "defender" or "protector" and asserting that this title was awarded by surrounding tribes due to the Awans successfully defending their strongholds against aggression. However, it is also stated in Census of India, 1901, that "In the Salt-range Tract, however, the higher Rajput tribes, such as Janjua, are carefully excluded; and Jat means any Muhammadan cultivator of Hindu origin who is not an Awan, Gakkhar, Pathan, Saiyad."

Dani claimed that following the spread of Islam in the region where the Awans predominated, the tribe made a conscious decision to associate itself with a Semitic past, and hence Awans came to refer to themselves as "QutubShahis." Citing Kaul's conclusions, James Wikeley said of the Awans that:

"After the Muhammadan invasions, they seem to have been converted by SyadKutb Shah, after which the Awans began to call themselves KutbShahi, i.e., the followers of Kutb Shah."

Other theories

Arthur Brandreth believed the Awans to be remnants of Bactrian Greeks. Robert George Thomson writes that, "Mr. Arthur Brandreth thinks that they may be descended from Bactrian Greeks. But Mr. Lepel Griffin considers that all real Greeks would have refused to stay in the Punjab.

History

A certificate issued in 1905 by the Deputy Commissioner of Shahpur, C.H. Atkins, to Khan Sahib Qazi Zafar Hussain, the youngest son of Qazi Mian Muhammad Amjad. This document also demonstrates the influence wielded by the Awan tribe in the Punjab, during the era of the British Raj.

The Awans have a strong martial tradition; as Christophe Jaffrelot states:

"The Awan deserve close attention, because of their historical importance and, above all, because they settled in the west, right up to the edge of Baluchi and Pashtun territory. Legend has it that their origins go back to Imam Ali and his second wife, Hanafiya. Historians describe them as valiant warriors and farmers who imposed their


OUR HERITAGE
THIS GUN WAS AWARDED TO DULMIAL IN RECOGNITION OF SERVICES RENDERED BY ALL RANKS FROM THIS VILLAGE DURING AND PRIOR TO FIRST GREAT WAR 1914-1919
THE GUN WAS BROUGHT FROM JHELUM AND PLACED HERE UNDER THE SUPERVISION OF HONORARY CAPTAIN MALIK GHULAM MUHAMMAD

supremacy on the Janjua in part of the Salt Range, and established large colonies all along the Indus to Sind, and a densely populated centre not far from Lahore."

According to Denzil Ibbetson, the Awans may well have accompanied the forces of Babur, and the Awans of Jalandhar, who claimed to have shifted from the Salt Range at the behest of one of the early Emperors of Delhi, were particularly notable for being in the imperial service at Delhi.

The Awans were amongst those the British considered to be "martial races" and as such, formed an important part of the British Indian Army. In particular, the Awans formed part of the core Muslim group recruited by the British during the First and Second World Wars.

With reference to the British Raj's recruitment policies in the Punjab, vis-à-vis the British Indian Army, Professor Tan Tai Yong remarks:

"The choice of Muslims was not merely one of physical suitability. As in the case of the Sikhs, recruiting authorities showed a clear bias in favour of the dominant landowning tribes of the region, and recruitment of Punjabi Muslims was limited to those who belonged to tribes of high social standing or reputation - the 'blood proud' and once politically dominant aristocracy of the tract. Consequentially, socially dominant Muslim




Grading of Oranges





tribes such as the Gakkhars, Janjuas and Awans, and a few Rajput tribes, concentrated in the Rawalpindi and Jhelum districts in the northern Salt Range tract in the Punjab, accounted for more than ninety per cent of Punjabi Muslim recruits."

According to Philip Edward Jones: "The Awan Tribe is perhaps the most heavily recruited tribe for the Pakistan Army."

On a rural level, Awans belong to the Zamindar or landowning class, and many Awan families to this day live on and cultivate land, which their ancestors have held for centuries. They often carry titles typical to Punjabis who own tracts of ancestral land such as Malik, Chaudhry and Khan. The modern surname system often results in members of the same family with different surnames, some choosing their position as a surname i.e. Malik or Chaudhry, and some choosing their tribal name of Awan.

Though the origins of the Awans may be a matter of some debate, it has long been recognised that the composition of the tribe is wholly Muslim. The most extensive study of the tribe was conducted during the era of the British Raj, and as a result of census data collated during this period; the Awan tribe was invariably classified as being entirely Muslim. In the opening to his account of the Awan tribe, H. A. Rose comments:

"The Awans are an important tribe, exclusively Muhammadan."

Similarly, John Henry Hutton has said about the Awans: "They are exclusively Muslim and probably the descendants of some of the earlier Muslim invaders of the tenth century or earlier."

Geographical distribution

The bulk of the Awan tribe is to be found in the Punjab (Pakistan). Its population is concentrated in the districts of Rawalpindi, Attock, Chakwal, Jhelum, Sargodha, Khushab (particularly the Soon Valley), Mianwali (Awan clans residing here are believed to have been almost the sole occupants of the Mianwali Salt Range Tract for over six hundred years), Gujranwala, Hafizabad, Gujrat, Sialkot, Narowal and Layyah, and is also scattered throughout the rest of Punjab.

Tracts in regions such as Attock, Jhelum and Mianwali are so heavily populated by Awans that they have long been referred to as Awankari. Pre-Partition, an Awankari existed in Jalandhar and an Awanbara in Hoshiarpur. Awankari is also a dialect of Punjabi. Though these areas are their ancestral homelands and many own farms and other property there, numerous Awans live in the major cities of Pakistan such as Lahore (where a section of the

Awan tribe has established a settlement, aptly named Awan Town), Islamabad, and Karachi.

The Awan tribe is also to be found in great numbers in Khyber Pukhtunkhwa, particularly in the Hazara Division, Peshawar valley and the districts of Nowshera, Kohat, Abbottabad, Haripur, Mansehra, Bannu, Swat, and Mardan. A smaller portion of the tribe resides in Azad Kashmir, and to a lesser extent is also present in the Pakistani provinces of Sindh and Balochistan. In addition, Awans can also be found in Afghanistan and some parts of India.

Khokhar

The Khokhar or Khokar are a people of Punjab region of Pakistan and north-western India. The Khokhars were designated as an agricultural tribe.

Relationship to the Gakkhars

Many campaigns were undertaken against the Khokhars by Sultan ShahabuddinGhori in the Punjab and ultimately he was killed by the Khokhars of the Salt Range in March 1206.

Jasrat is among the historical figures that are today regarded as being Khokhar.

The Jhelum River in Punjab, Pakistan

Coin of Mu'izzuddin Muhammad Bin Sam (Sultan Shahabuddin Muhammad Ghori), circa 1173-1206, Issued from Delhi following coin typology of Prithviraja.

Historical records

In 1240 AD, Razia, the daughter of Shams-ud-din Iltutmish marched with her husband Altunia to recapture the throne from her brother Muizuddin Bahram Shah; she is reported to have headed an army composed mostly of mercenaries from the Khokhar tribe of the Punjab.

"In 1246-7 Balban mounted an expedition as far as the Salt Range to chastise the Khokhars"."His last campaign was undertaken with the object of subjugating the turbulent Khokhars of the Salt Range."

Although Lahore was reoccupied by Dehli, for the next twenty years Lahore remained in ruined condition,

being sacked on several occasion by the Mongols or by their Khokhar allies.Around the same time a Mongol commander named Hulechu occupied Lahore in alliance with Khokhar chief Gulchand, the onetime ally of Muhammad's father.

An 1876 engraving of Khokarrajputs, from the Illustrated London News.

Khukhrain

The Khukhrain are an ancient group of eight specific clans of the Khatri caste who originally hailed from the areas of the Salt Range and particularly the town of Bhera in Punjab. This area was the Sind Sagar Doab (Indus-Jhelum interfluve) and the Jech Doab (Jhelum-Chenab interfluve) region of Pakistan that comprised Khushab, PindiGheb, Talagang, Chakwal, PindDadan Khan, Peshawar and Nowshera. The name "Doab" literally translates to "land of two rivers" ("Do" two, "Ab" river; Punjabi). In former India, Sind Sagar Doab and Jech Doab were the main region where Khukrains were in large number. The language spoken in the region was majorly Doabi. The names of the eight clans are: Anand, Bhasin, Chadha, Kohli, Sabharwal, Sahni, Sethi and Suri. Later four new subclans originated those were Chandok (Chandhoke, Chandhok, Chandiok), Chhachi (Chachi, Chhachhi): a sub section of the Kohli clan, and Ghai.

History

Clan details

Thama	Sections	Gotra
1.....	Anand	
.....	Bhasin	Suryavanshi
2.....	Chadha	Virbans
.....	Sahni	Surajbansi
3.....	Suri ...	Chanrabansi
.....	Sethi...	Chandrabansi
4.....	Kohli ...	Chanrabansi
.....	Sabharwal...	Chandrabansi

The main place of their ancestral geographic location was the town of Bhera, situated in the Jech doab region (Jhelum-Chenab interfluve) of Punjab, which now lies in the Sargodha District of Pakistan. The history of the Khukran is inextricably intertwined with the ancient town of Bhera.

Bhera is also the historical town to which Porus or Purushotthama of the Puru tribe belonged. Purushotthama (c. 325 BCE) was the king of Kekaya the land of the Puru tribe, one of the Janapadas (kingdoms). Its location was in what is now middle Punjab, the areas between the rivers Jhelum and Chenab and its extent varied from time to time. The word Purushotthama means "Supreme Being". Purushotthama was 7 feet 6 inches tall according to Arrian.

The Kekaya are said to have occupied the land now comprised by three districts of Jhelum, Shahpur and Gujerat, now all in Pakistan.

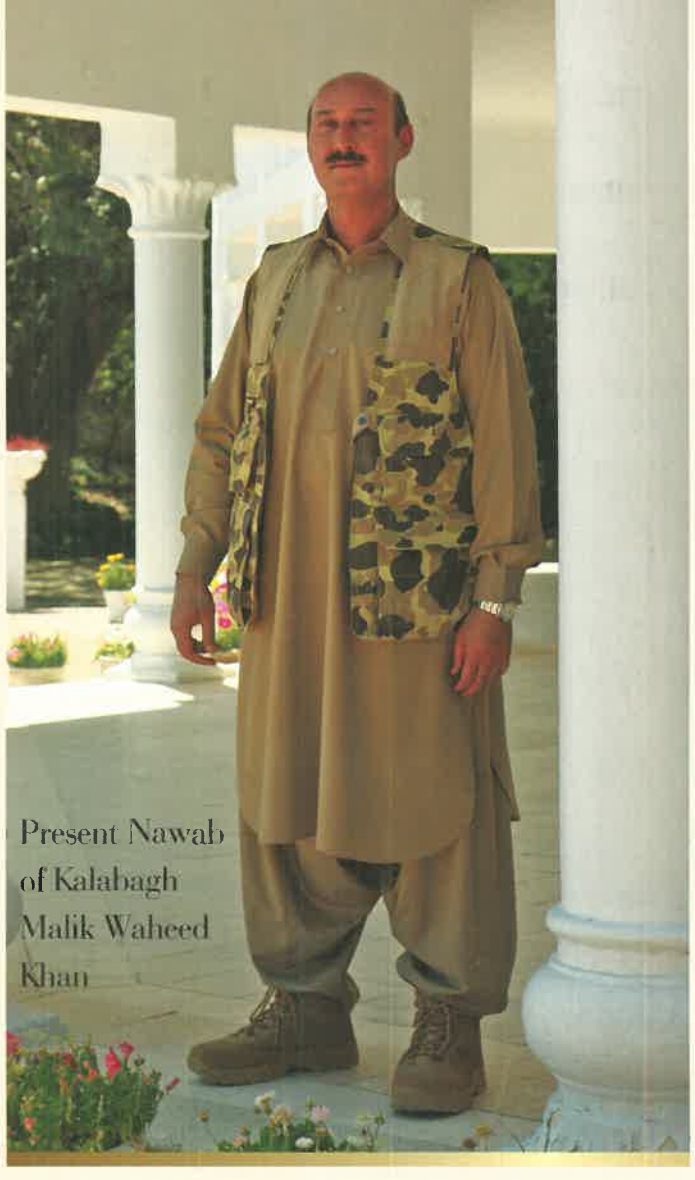
The Purus is a tribe or a confederation of tribes mentioned in the Rigveda. The RV 7.96.2 locates them at the banks of the Sarasvati River. The Puru were ostensibly defeated by king Sudas at the Battle of the Ten Kings.

The palace of Sopeithes which the Greek historian Arrian mentions as the place on the Hydaspes is supposed to be at Bhera. The Greeks refer to the Jhelum River as the Hydaspes River where Alexander the Great fought Porus in Battle of the Hydaspes River in 326 BCE.

Eminent personalities of Potohar salt range

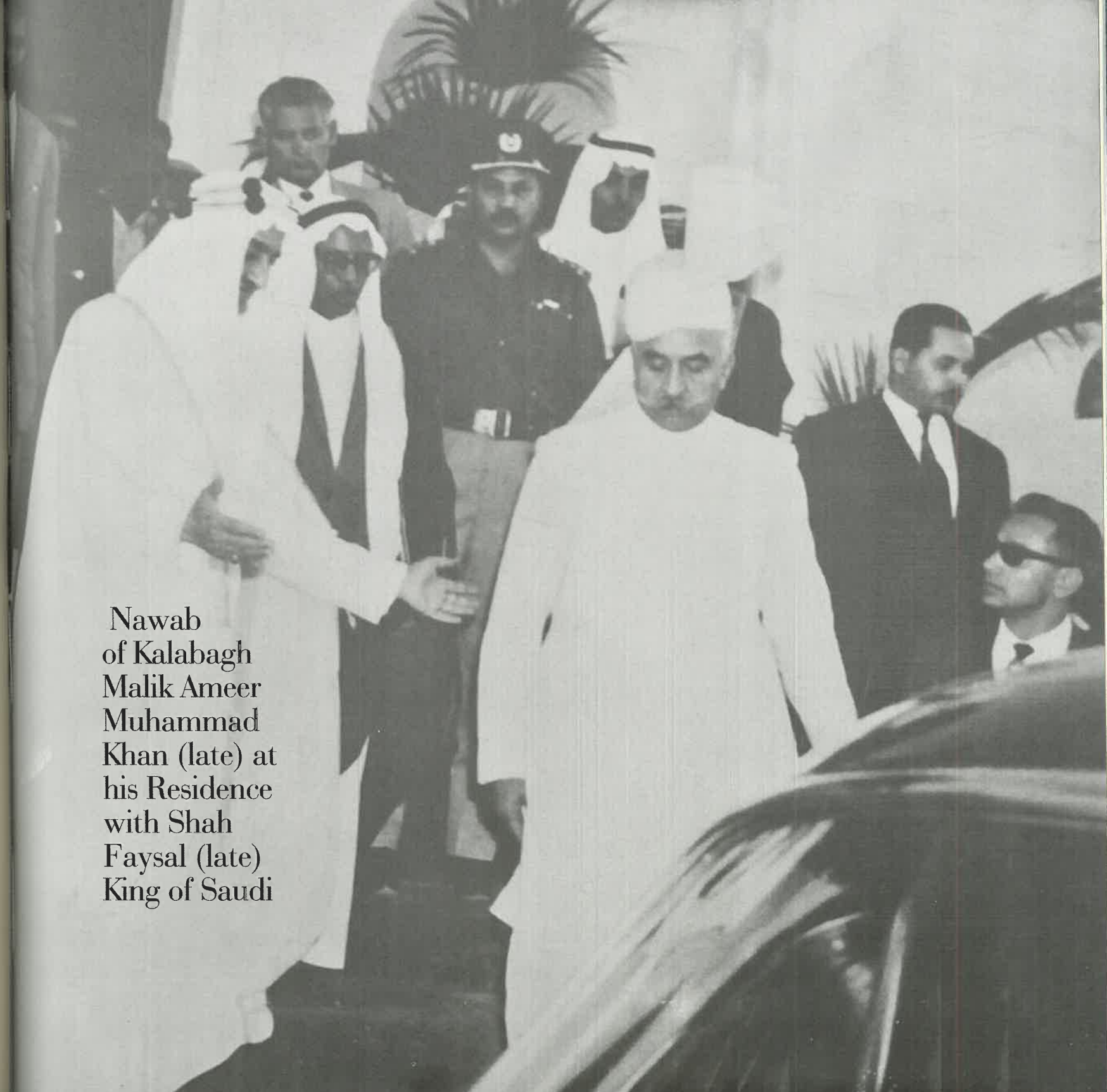
Salt range endowed some of the great personalities for this country. Among those personalities some of the eminent personalities are: Maulana Shihab al-Din was a well-kenned philomath of the time who had studied at Deoband and had achieved the rank of alim, through his studies of Islamic law (fiqh, hadith, Qur'anic tafsir, logic, philosophy and other subjects). Dr. Fazlur Rahman Malik (September 21, 1919 – July 26, 1988) was a well-kenned philomath of Islam. Rahman was born in the Potohar Plateau of subcontinent (now Pakistan). He was the eldest son of Maulana Shihab al-Din. Abu Salam Naeem Siddiqui, an eminent religious philomath and a poet, who accommodated Jamat-e-Islami. Abdul Qadir Hassan, a great columnist, who used to indite in Daily Jang Newspaper and now in Daily Express. Ahmed Nadeem Qasimi, a distinguished poet and a writer/novelist. Malik Amir Mohammad Khan Awan withal kenned by some as Nawab of Kalabagh was a prominent feudal lord, politician and the seventh chief of Kalabagh, in Mianwali District of north western Punjab, Pakistan. He belonged to the Awan tribe. He withal accommodated as Governor of West Pakistan. He belonged to the nobility of the sword

as his ancestors were warrior chiefs for proximately 900 years. Manmohan Singh Prime Minister of India was born in Gah village, District Punjab. Allah Bakhsh Malik, Secretary to the Government of Punjab was born in village Khara Tehsil & District Chakwal. Air Chief Marshal Nur Khan, Former Governor West Pakistan was born in in a small village (called "Dandi") in the Tamman range of Talagang District of Punjab British state, British Indian Empire (Now Pakistan, District Chakwal). Lt. General Abdul Qayyum, Former Chairman Pakistan Steel Mills was also born in District Chakwal. Malik Lal Khan (Late) of Sarkalan, the 1st Coal Lease owner of the Wanhar region was a personality with hundreds of attributes unveiled. Revered as a mentor, he was an authoritative chieftain of his Jhurwal and Phulial clans of Awan tribe. Stories of his dictates with his 11 nephews are still of stimulus interest in Wanhar region. Even after 30 years of his death, still his native land, his village Sarkalan, is branded by his name. Cited as an exemplar for children now-a-days, stories of his moral stature, selflessness and metal-like hardened leadership of his whole clan, puts him forward as a personality venerated by elders and youngsters alike. A custodian of the rural ethics, his life has become a tale, still serving as a lode-star for the generations to come. Pir Fazal Shah (Late), who was the Raees-e-Azam of Wanhar, was awarded

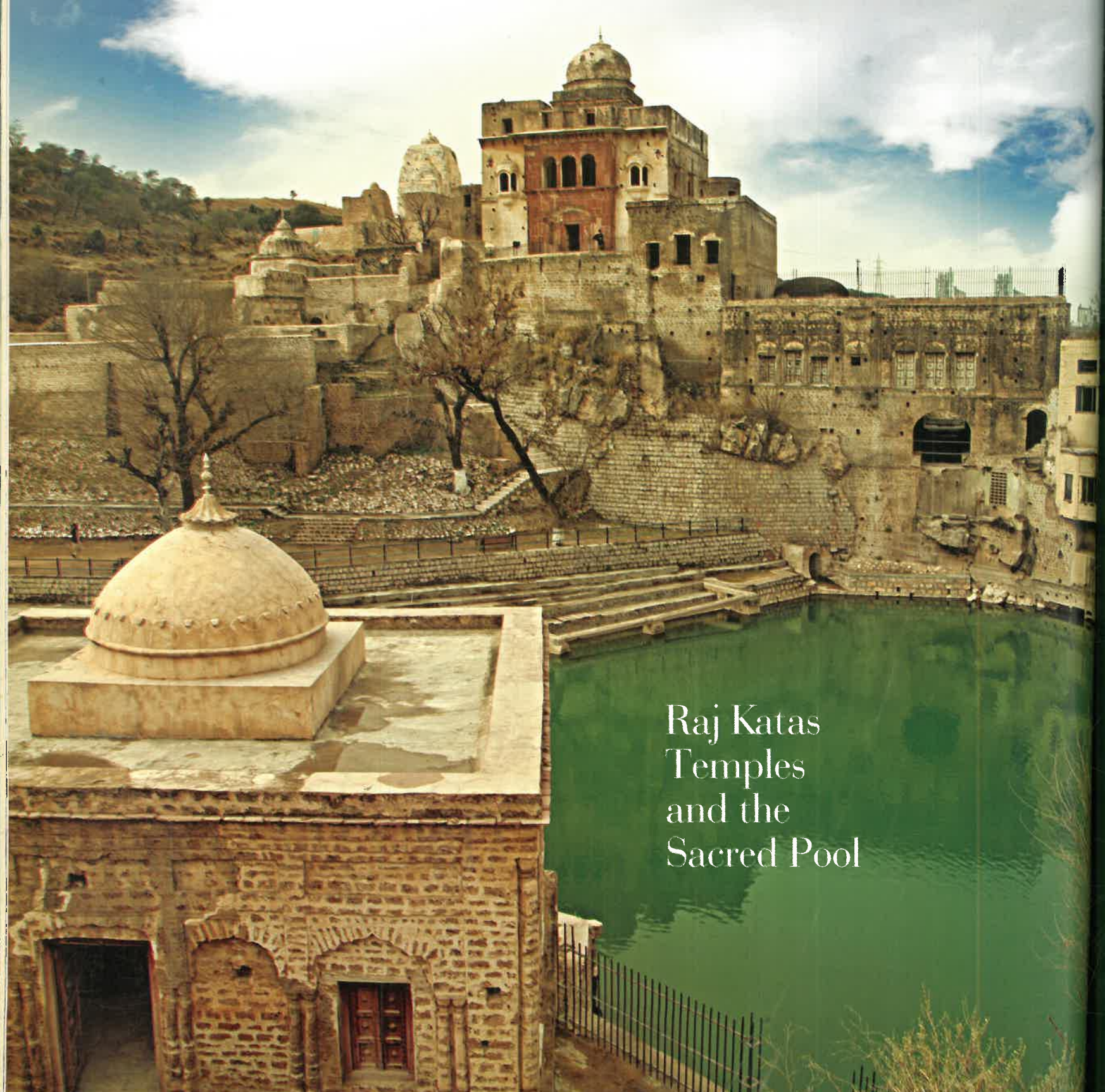


Present Nawab of Kalabagh Malik Waheed Khan

the title of Khan Sahab by the then British government. He was also the Zaildar (chief) of Wanhar. More than 22 villages were under his jurisdiction. Malik Shahbaz (Late) of Buchal Kalan is still venerated as the strong leader who played an important role in shielding the region against the onslaught of boorishness by resisting the unchecked opening of cinemas in the rural areas.



Nawab
of Kalabagh
Malik Ameer
Muhammad
Khan (late) at
his Residence
with Shah
Faysal (late)
King of Saudi


Raj Katas
Temples
and the
Sacred Pool

Salt Range Through The Centuries

(An Archaeological Aspect)

Salt Range Through The Centuries
(An Archaeological Aspect)

Salt range is a geological enigma, but an archaeological paradise. It is still un-probed and undisturbed. In the past, only Cunningham and Stein could venture to carry out some explorations which remained confined to a limited area. Cunningham was mainly interested in the itinerary of Hieun Tsang (7th Century A.D) and Stein was engrossed with the pursuits of Alexander the Great, in this region. Thus our knowledge of the history of this area stretched between the 4th century B.C and 7th century A.D.

Paleontological Discoveries of Fossils Sites in the Entire Salt Range

A number of sites which yielded fossils of plants and animals in this area, included Samarkand, Chahl Abdal, Daryala, Thir Chak, Khokhar Zer, and above all the site of Dhok Bun Amir Khatoon. Previously the area around Chinji has been well noted by similar finds. Among the fossils sites, the site of Bun Amir Khatoon has got the maximum publicity for pretty good reason. All the experts, archaeologists, paleontologists and geologists, have confirmed that Banu Amir Khatoon is the largest site of fossils deposits so far discovered. From here, the fossils have been mainly comprised hip, vertebra, ferum, tibia & fibula bones of some giant extinct animals related to elephant, camel , deer etc. but fossilized bones of similar animals are also numerous. These animals so far tentatively identified by experts include animals, mastodens, huge deer, rhinoceros, giraffe and smaller than those of modern day crocodile etc. These fossils have been tentatively dated to about 8 million years back at a time when the large water reservoirs of the salt range - a remint of the Teythus sea, was drying up leaving behind ever-drying shallow ponds and lakes at deeper places like the ravines around present day Bun Amir Khatoon. These diminishing water resources forced both the smaller animals and their larger predators to get together at one place- around these shallows lakes. This explains the presence of fossilized bones of hunters and

hunted animals, the predacious and predatory animals. The ravenous and ravaged once lived side by side.

1. Bun Amir Khatoon complex of sites
2. Jhalo site or bun Amir Khatoon 2
3. Andarwar or bun Amir Khatoon 3
4. Daryala kahun
5. Khokhar dam

Neolithic Period in Salt Range

The artifacts from these three sites can be dated safely between 7000 B.C 3000 B.C and appertain to that less known phase of history of Pakistan called Neolithic period. It was during this period when , for the first time , " man " started leading a semi- settled life and domesticating animals and crops for his daily use. The earlier phase of human history in this region, the hunter man of the Old Stone Age, is already well known from numerous stone tools sites on the banks of the Soan River. Thus, here, in the wilds of the salt range, the long trail of the history of life – from plants/ animals to hominids, to "man" the hunter, to the "man" – the food-gatherer – is being unfolded for the first time. The discovery of half a dozen sites of the Kot Dijian civilization (3000BC – 2500BC) further brings down this trail of human history to the path of civilization.

1. Pindi
2. Marri
3. Guthanwala qila
4. Nikka
5. Nila site

Historic Period Sites

Beside these prehistoric sites, dozens of sites of early historic period were visited and recorded in various parts of the area surveyed. Among the already known sites, the most important is Murti near Choa Saidan shah. A lot of material, sculpture and curved architectural fragments – collected by Sir Aurel Stein in 1930, are lying unstudied in the godown of Lahore Museum. Only a fraction of the collection is on display in Hindu Gallery. The extensive site of Dulmial is not far away from Katas. Cunningham obtained a lot coins going as far back as the Indus Greek kings of the Punjab and Gandhara in the 3rd century B.C. Aurel Stein, in particular, obtained from this site a copper coin of Greek Queen Agathocleia and some coins of Indus Greek king Stratton, as well as coins of Indus Scythian and Gupta kings. This site has all the potentials

of being identified with the city of Sinhapura- the capital of the Salt Range visited and described by Huien Tsang during his travels in this region in 629-645 A.D.

Another extensive site of this very period Kallu Kot near Thir Chak is a large and imposing one. It is skirted by Gambir River and Alan Kas. It is a stupa site- Buddhist or Jain. It has yielded numerous sculptures, pottery and other miscellaneous articles – all excavated illegally by the treasure- hunters. The site is still worth probing further. The most important discovery from this site a Neolithic period Celt or hand- axe (pl.) and half of a stone mace-head.

Another important and imposing site is Kutanwala Pind on the bank of River Soj near Bhaun (pl.). Cunningham, though never visited it himself, obtained from here 250 coins ranging from Indus Greek kings in the 2nd century B.C. down to the times of Humayun in the 16th century A.D. We picked up granite polished hand-axe from this very site showing thereby that its antiquity goes as far back as Neolithic period. It is a settlement site and has a rich cultural deposit.

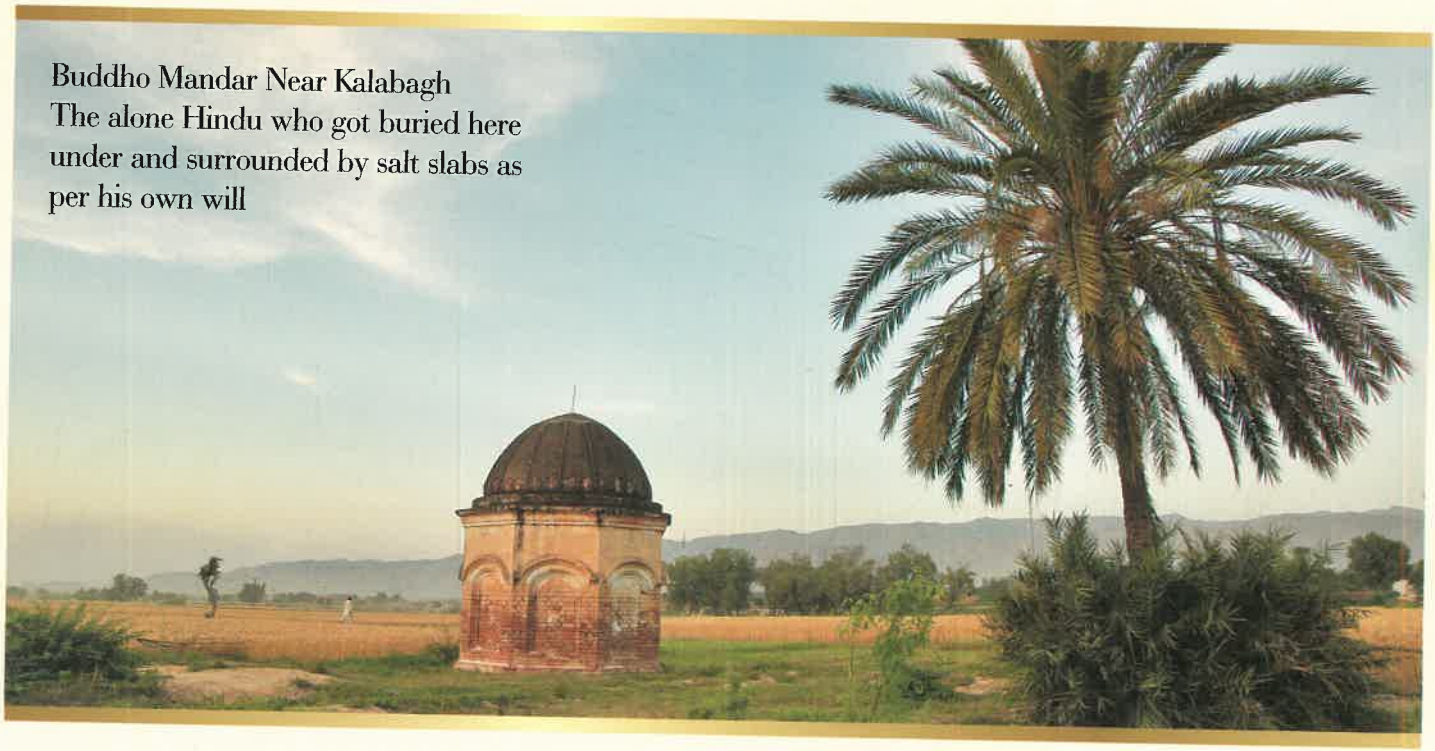
Another important site is Pind Jahanan (p) at a short distance from Bhaun town. It measuring 244x 207 meters and is some seven meters high; so far it is least disturbed. Pottery picked up from surface is more refined on majority of the sites in this area. Here well- fired and red burnished ware and painted shreds are in abundance. A fragment of a female arm with folds of a drapery, picked up from the site has been fashioned in a style reminiscent of the terracotta figurines from the site of Kallu Kot.

Still another extensive site is called Kot near Thir Chak Hunjira on the bank of Gambir River. It is the site of ancient Thir Chak as mentioned by the author of Kaigohar Nama. Although it is a single period site but is quite extensive. Rooms, halls and city walls are visible all over the site, but finds – even potsherds, are relatively few. It appears to be contemporary of the Hanjira Graveyard which lies closely and hence can be dated in the Muslim period, say 12th or 13th century A.D. The settlement appears to have short lived.

An equally imposing settlement backed by a proper fort above its mountain skirting is the city of Samarkand. It also appears to be a purely Muslim period site. Naturally defended by high mountains on all its four sides, further made impregnable by a fort perched on top of one of the crests and fed by the perennial Samarkand Kas, the settlement has been tentatively identified as the capital city of Khwarezm Shah during his fight with Changez Khan

in 1212 A.D. The name of the site Samarqand further strengthens our identifications.

Bhal, near Mastal on Bharpurs–Chinji Road is another important site. It is clearly divided into two periods. Pottery, characteristic of the two periods, earlier pre-Muslim and later Muslim periods, is abundant in two parts. A number of coins have also been picked up from this site but these are much corroded. Though a little away from the present day Kallar Kahar, it is tempting to identify it as the site of ancient Kalda Kahar of our histories dating back to the times when this region was part of the government of Kashmir under the suzerainty of Sind.



Buddho Mandar Near Kalabagh
The alone Hindu who got buried here under and surrounded by salt slabs as per his own will

Aiam Maira, Nila on the Soan River, Ratta Chura III on the confluence of Ankarr and Trakarr Nalas, Daryawala near Lawa, six ancient mounds around Qadirpur near Chinji, Khichi Mound, Guphanwala or Dhol Badshah, Nikka above the mausoleum of Tutanwali Sarkar on the bank of picturesque Dharabi Kas, Dhok Sandrana, Dhok Sar, Dhok Ganji, Mehro Peelo, Hail Darogi, Pind Chak Baqir Shah, etc. are another promising sites. It is unfortunate that due to the non-availability of a trained Surveyor with the team, contour maps of all these sites, even a few selected ones, could not be prepared. This is the job which awaits some future archaeologists. Similarly, due to non- availability of a person, trained in pottery sorting and pottery drawing, as well as constraints of time, pottery from all these sites could not be sorted out, classified and studied properly. What is important to note is the fact that whole Chakwal district is littered with settlements, military and religious sites of all period from Neolithic period down to the 19th century.

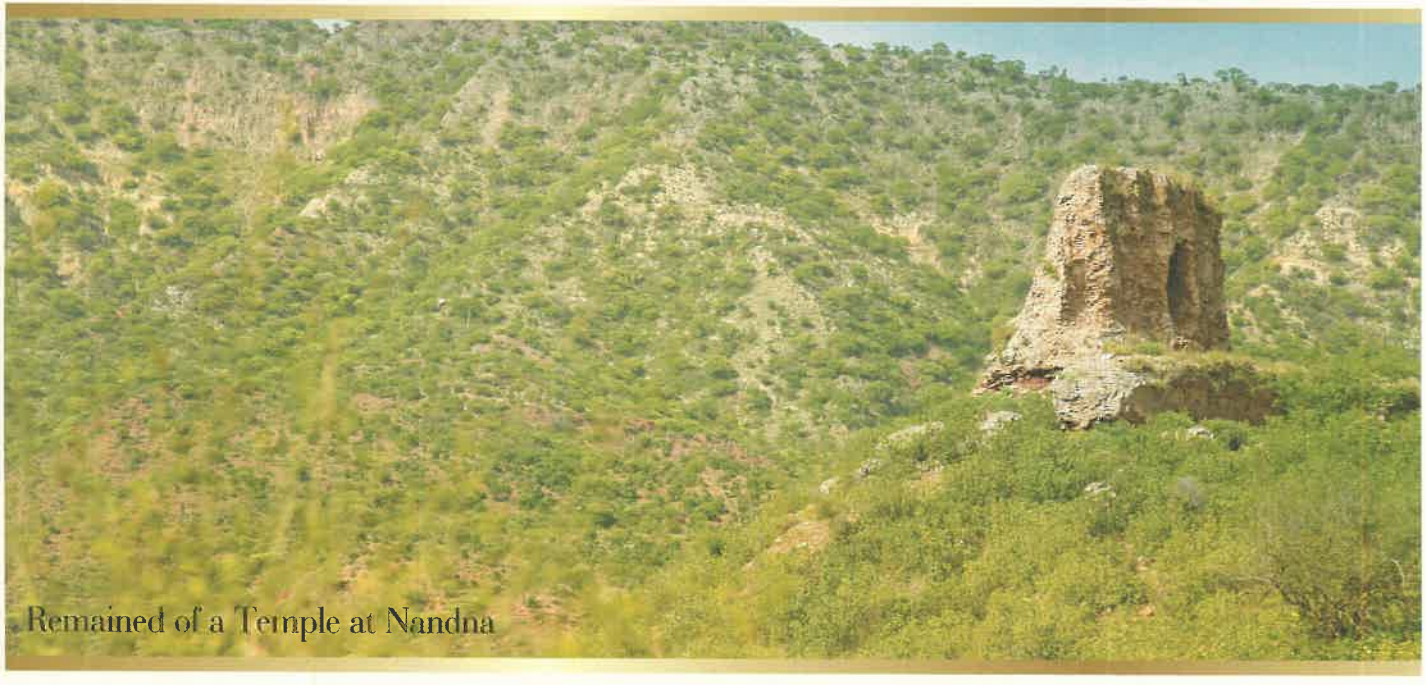
Majority of the settlements sites are located on the banks of perennial nullahs some, particularly the early Indus period sites, are located at the confluence of two rivers so that if water supply in one dries up , other is still available.

Temples of Salt Range:

Ever since General Abbott visited salt range in 1849, and Cunningham completed his second report of the archaeological survey of India in 1862-63, salt range and its Hindu temples have become synonymous. There are several of these still preserved in this area. All these were built by the rulers of hindu shahi period (with their seat of power in Udhabhanda pura- modern Hund, on the right bank of the Indus river near Attock) from 650 to 950 A.D. these include temples inside the forts of Nandana, Malot, Amb Sharif, northern Kafir Kot, near Chashma Barrage & Southern Kafir Kot at Bilot Sharif. Among these only Malot falls within the territory of Chakwaal district. Some other temples stand independent. These are Satghara- seven temples- at katas, Shiv Ganga temple near Panj Shahpur, Sassi- da-kalara, temple near Shah Mohammadi Wala on the Soan River and the site of similar temple at Ratta Chura near Talagang. The last mentioned temple has already vanished, leaving behind only a heap of carved bricks.

The top of the hillock on which Malot temple is constructed has also developed a serious vertical crack quite close to the temple. All except Sassi-da-Kalara &

Ratta Chura temples are built of dressed & carved stones. The other two temples are built wholly with carved burnt bricks. Only the Shiv Ganga temple has been completely covered with thick layers of lime plaster. All temples, without any exception have each one square cell with the porch in front, a corbelled dome resting on four corbel pendentives & an upper story with similar arrangements. Only the temple at Malot has an independent block placed on the East of the main temple and used as gateway to the temple. It was profusely carved on the inner side with holly plain exterior in opposition to the temple building which has profusely carved sculptures on the exterior but has a plain interior.



Remained of a Temple at Nandna

All the four exiting groups of Hindu temples of the entire area have one or the other unique feature which distinguish one from the other. Only Malot temple is located inside the fortified city and has gateway

attached to it. It was dedicated to Siva Langham. Shiv Ganga is the only one which is located in a cool glen on the bank of a perennial rivulet instead of occupying top of a mountain or a promontory of a hill. It was dedicated to goddess Kali. Only Katas presents a group of seven temples (Satghara) besides having an earlier Buddhist stupa. Among all the Hindu temples of the salt range, only the Satgara temples at Katas and Shiv Ganga temple remained in veneration of the Hindu community as late as 1947. Katas was a sacred place for Hindu worship of Siva after Jawala Mukhi in Kashmir. Both still have large endowments of landed property attached to them.

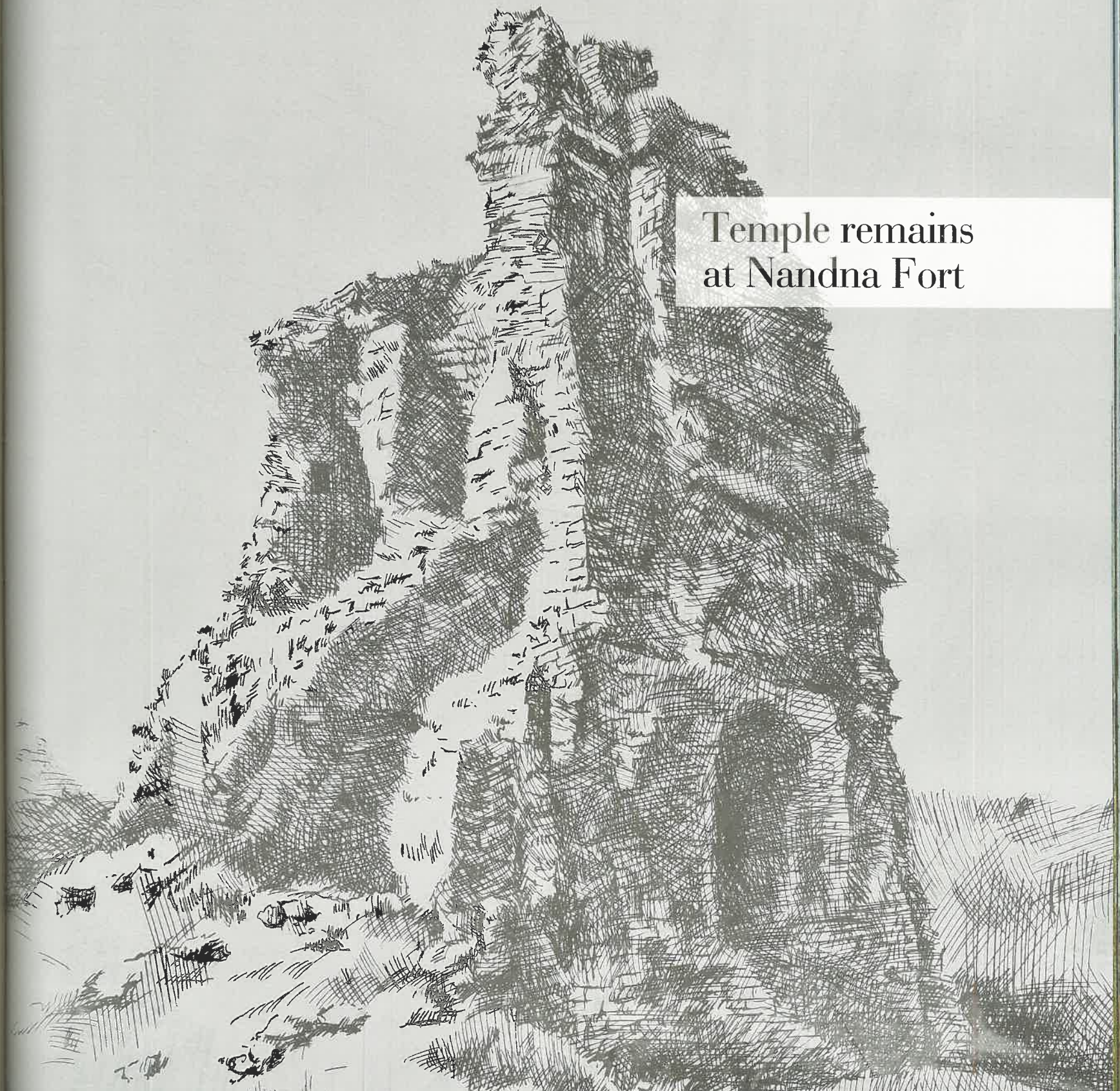
All Hindu temples of the salt range are in characteristic Kashmiri style of architecture of the late 7th to 10th century A.D and remind us of the period when Northern Punjab was under cultural & political control of Kashmir.

Some more space were needs to be done at the site of Murti in Ganhala valley near Choa Saiden Shah. Judging from the beautiful sculptures exhumed from this site in 1930 & now dumped in Lahore Museum, the temple at Murti must have presented a glamorous spectacle in the 7 century A.D. the surviving sculpture and carved architectural fragments remind us of the grace, serenity and beauty of late Gupta Art. These are the only surviving examples of this art in Pakistan beside a head from the strata of Harappa. This site was plundered by the Hindus themselves. A lot of material from this site was re-used in the construction of a bridge and some houses at Choa Saidan Shah and the new temples at nearby katas. Some sculptural fragments can still be seen reused in the temple of Rama Chandra at katas.

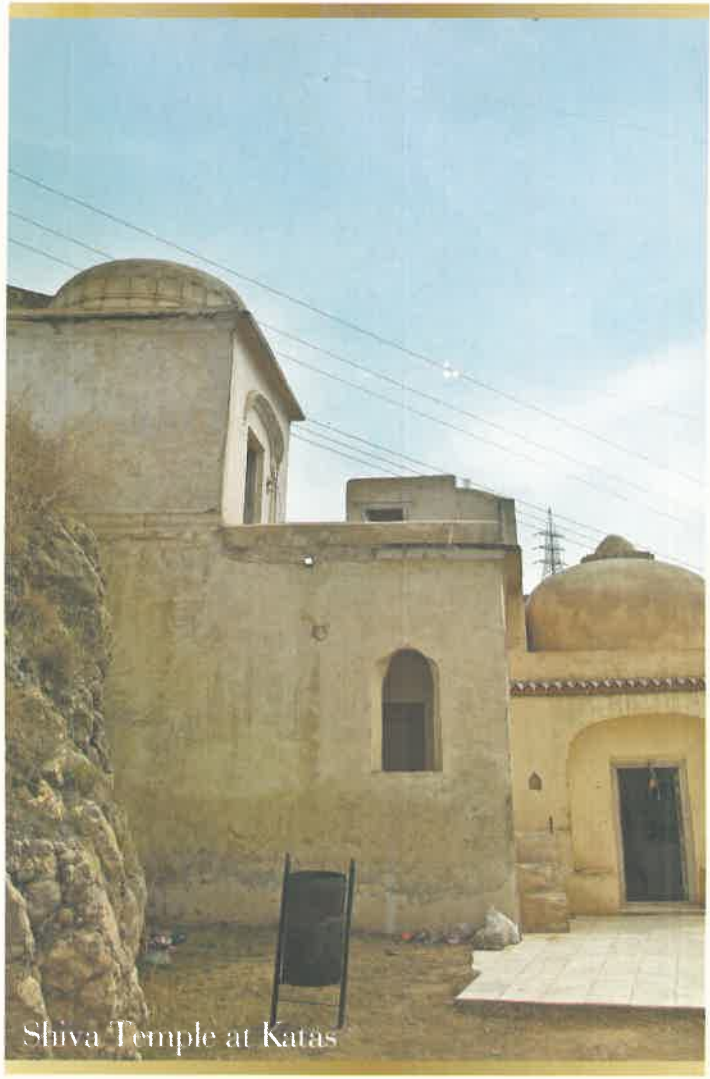
There were at least three groups of structures at Murti – a temple and a Stupa and a monastery. The entire material of the temple was exhumed by Aurel Stein in 1930 without recording its plan. The other two sites have yet to be located and probed. Whether or not Murti was the site of White-robed Jaina monks, as described by Huein Tsang in the 7th century, is yet to be ascertained.

The octagonal domed temple inside the Fort of Kusuk is of much later date and belongs to a different category.

One of the most important discoveries of Chakwal Survey is the huge Buddhist, or Jaina site of Kallu Kot . large number of structures are visible on the site which include the base and staircase of a stupa, some cells of a monastery, etc. though badly disturbed in recent times by treasure- hunters, but still the site has great potentials and may yield some useful material if excavated properly.

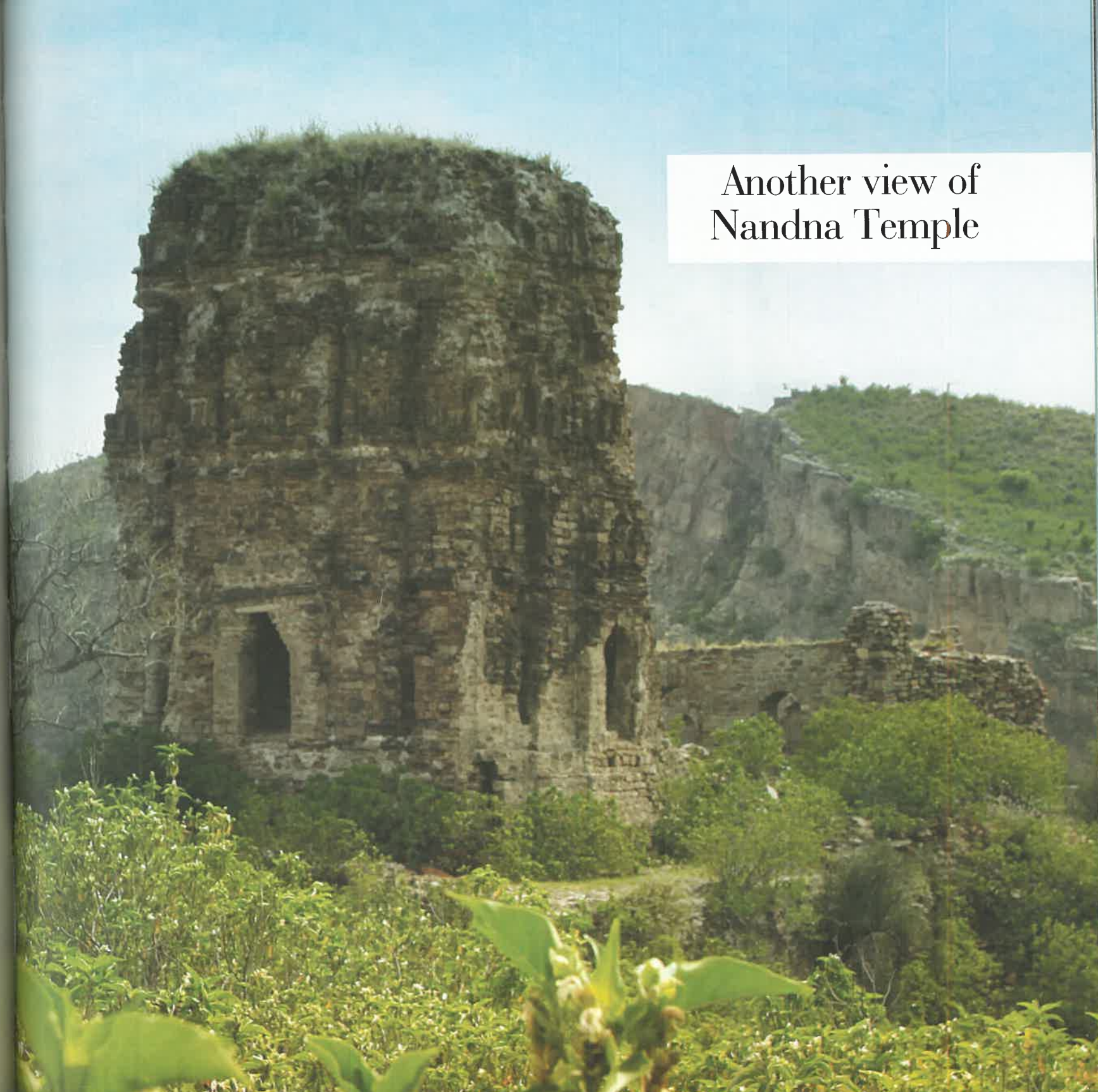


Temple remains
at Nandna Fort


Shiva Temple at Katas

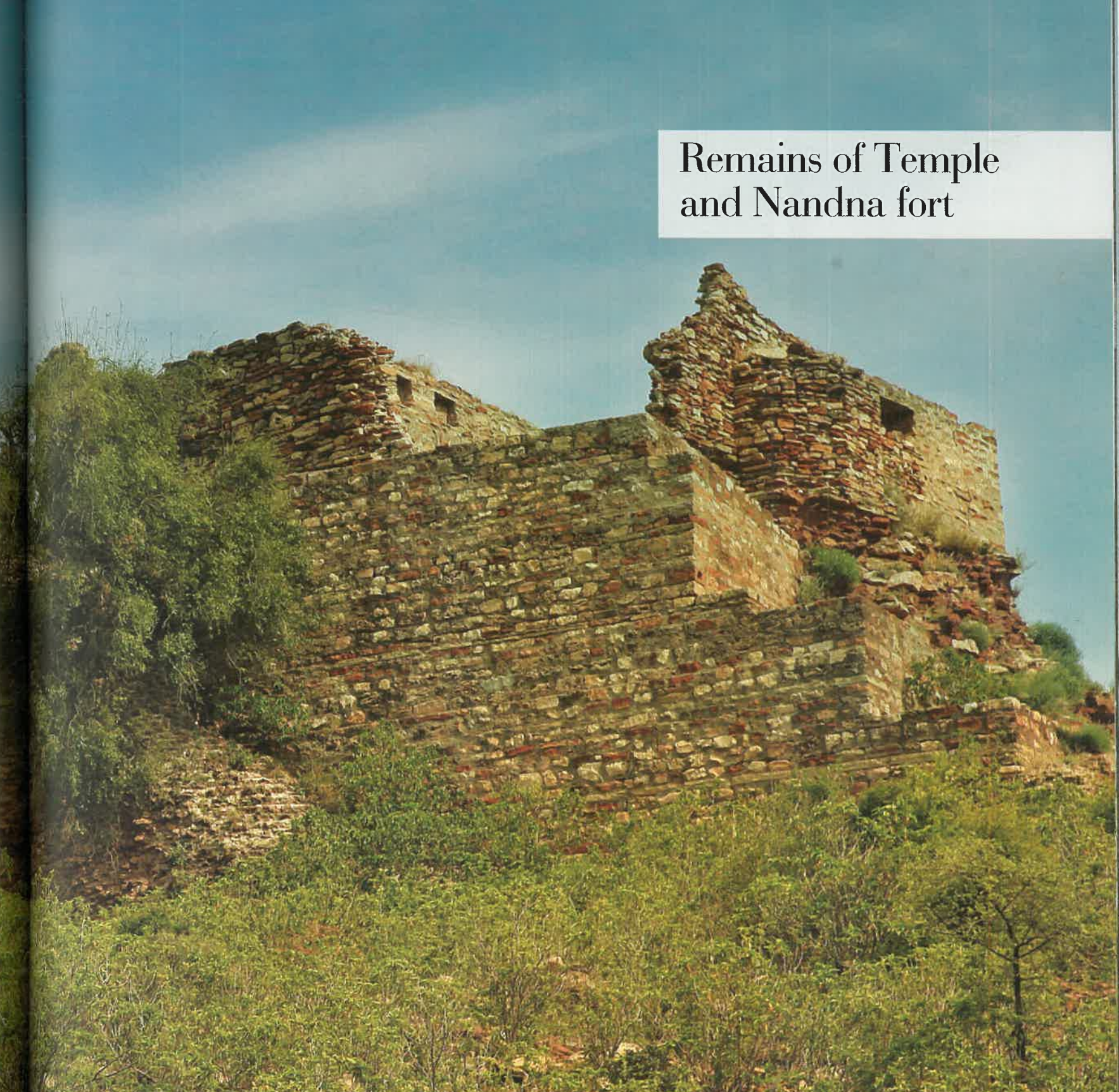
The material so far recovered from this site include stone, stucco and terracotta sculptures, metal ornaments, pottery etc. In style the material resembles Gandhara sculptures but at the same is reminiscent of the material exhumed from Murti. Thus, in the main, the site of Kallu Kot is contemporary with the later phase of Gandhara which survived till the later period of Gupta Art. However, the most important discovery on the site is a polished stone hand-axe and a half Mach-head of circular shape which indicates that either the Kallu Kot was occupied in its earlier history in the Neolithic period or the material of this period was picked up during the 6th – 7th century A.D. from some nearby but still unidentified site and deposits at Kallu Kot. However, following are the significant historical and archeological sites of the salt range.

1. Shri katas raj
2. Satghara temples
3. Temple of Rama
4. Haveli hari singh nalva
5. Shiv – Ganga
6. Warala site
7. Malot fort and temple
8. Murti site
9. Dulmial



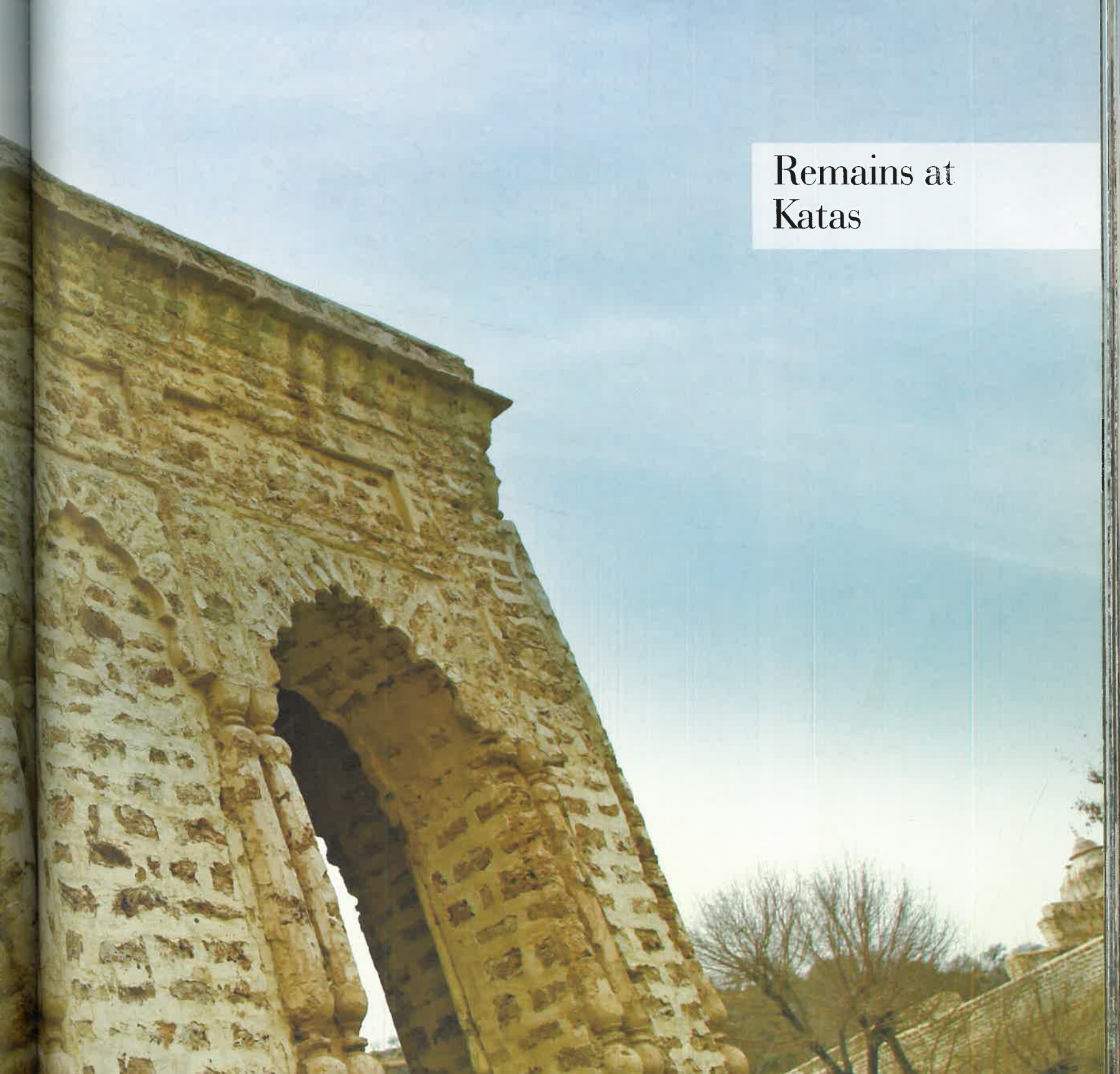
Another view of
Nandna Temple





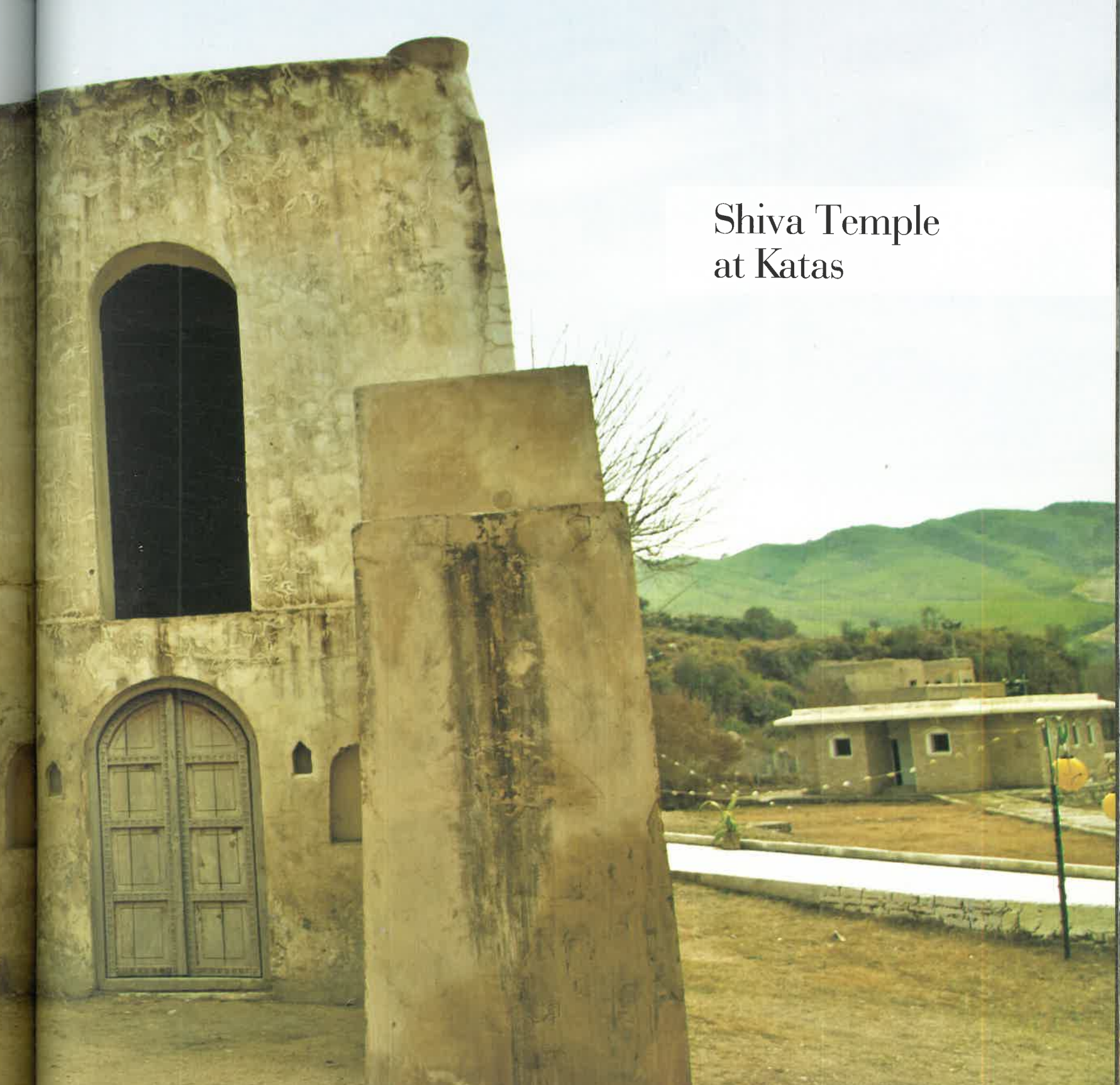
Remains of Temple
and Nandna fort



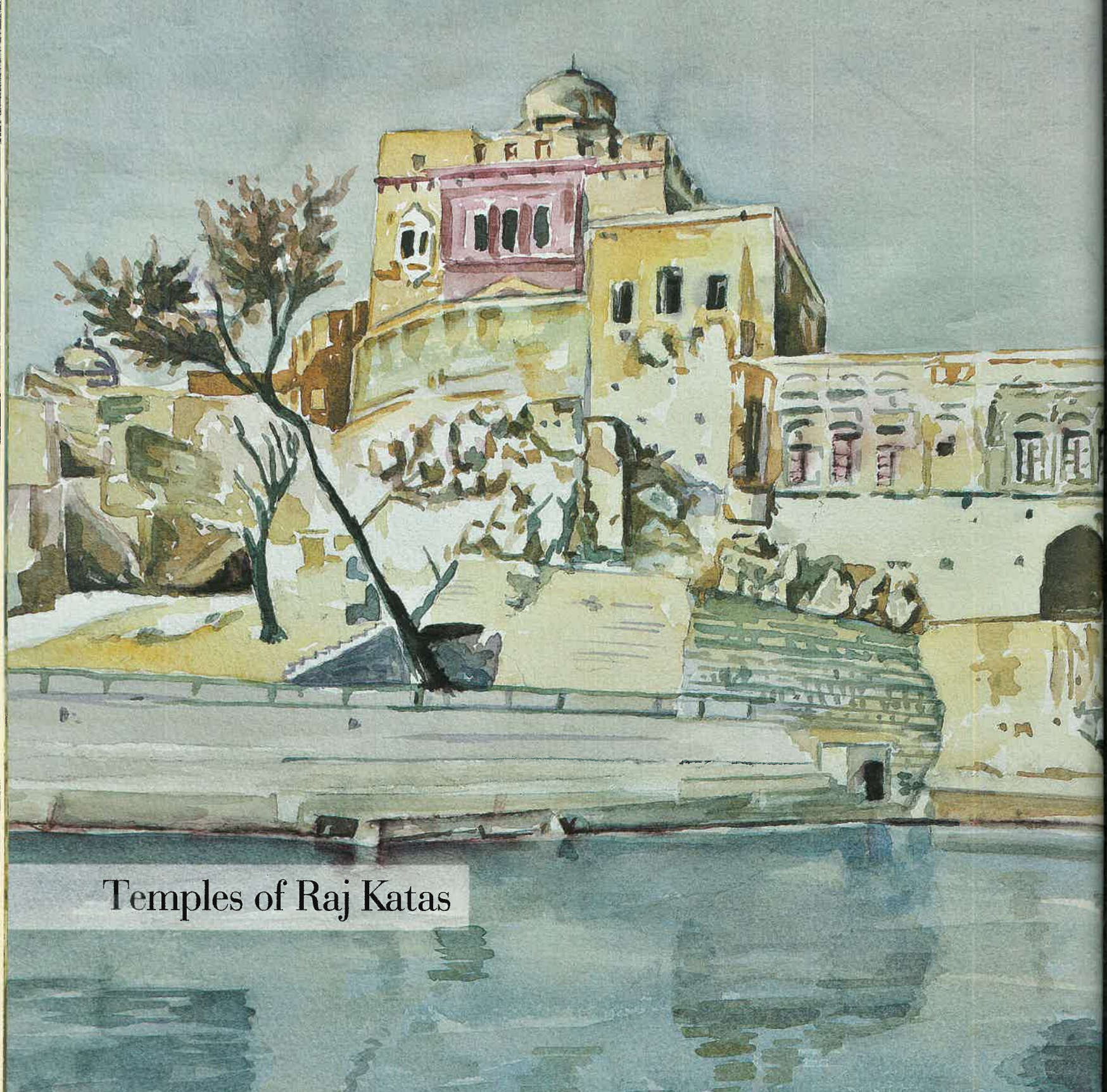


Remains at Katas

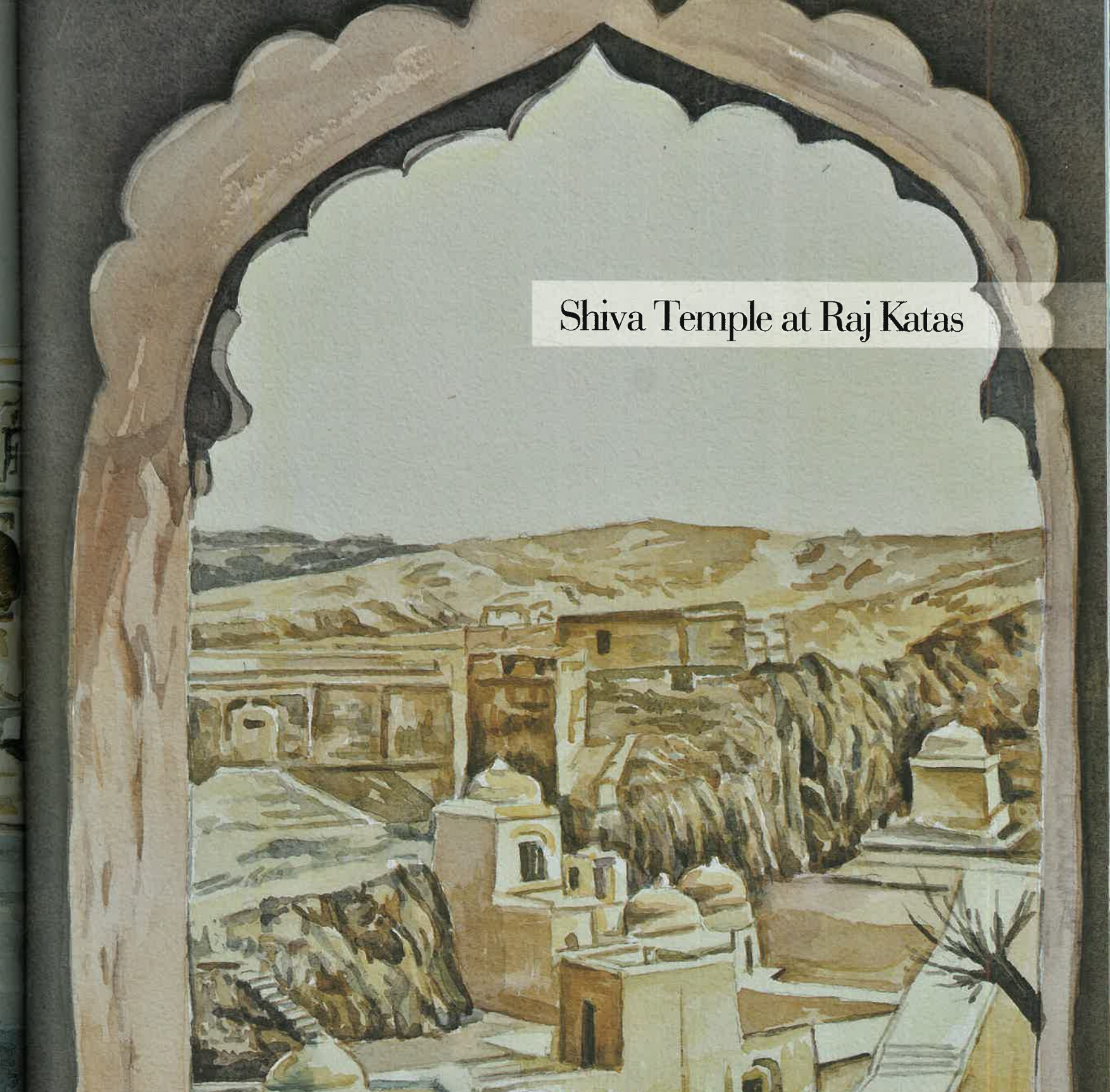




Shiva Temple
at Katas

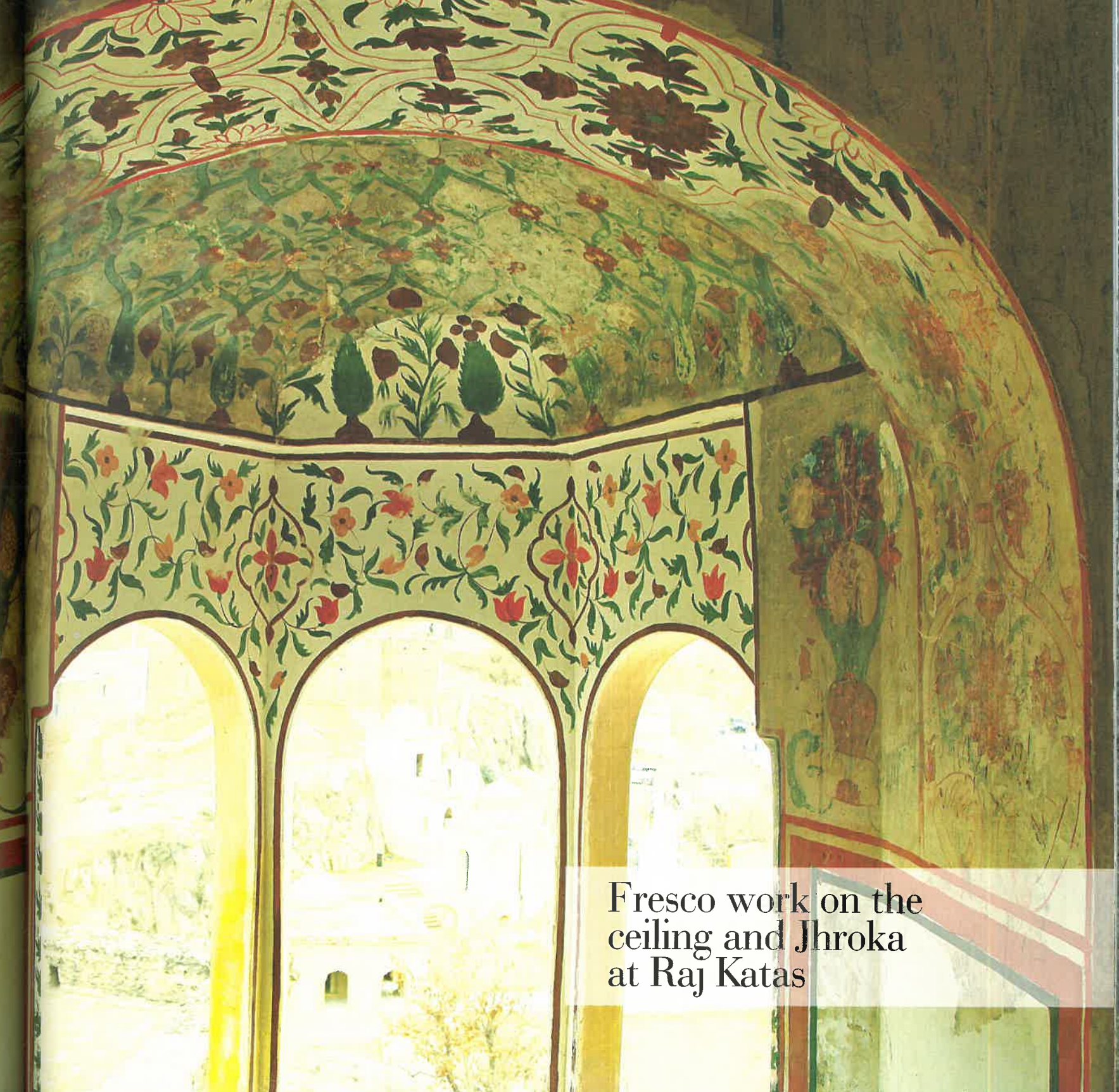


Temples of Raj Katas



Shiva Temple at Raj Katas

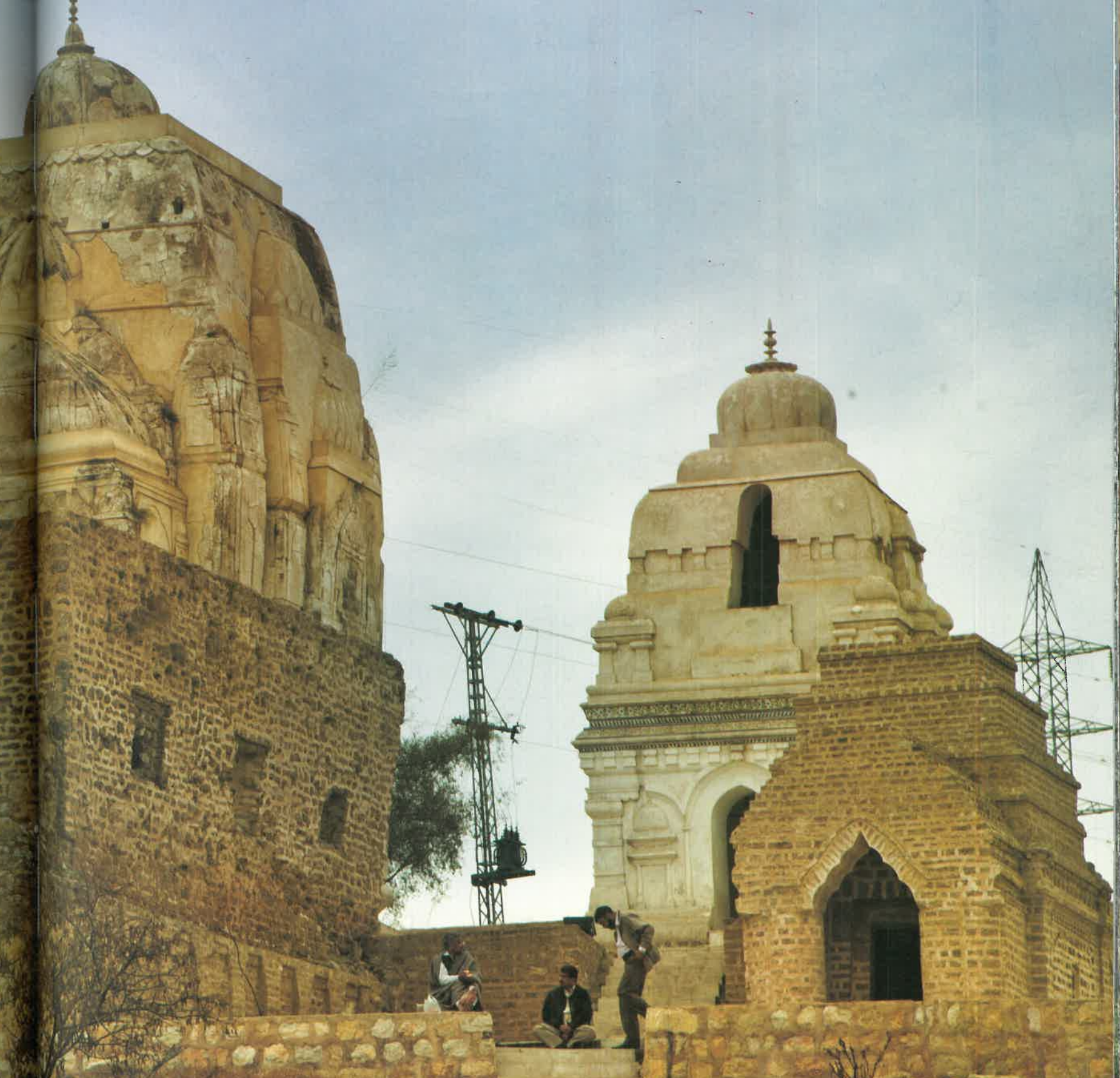




Fresco work on the ceiling and Jhroka at Raj Katas

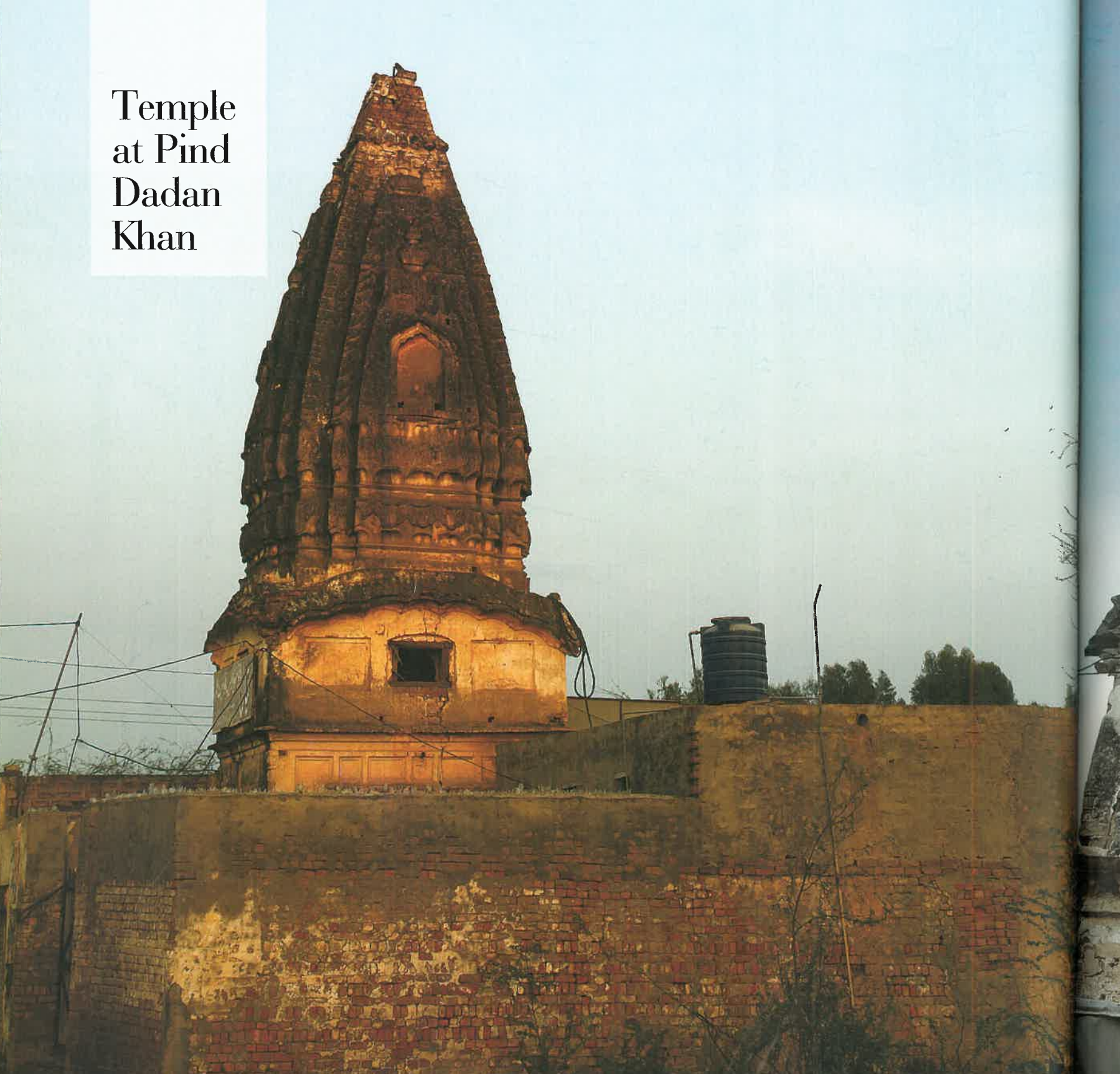


Satghra Temples at Raj Katas

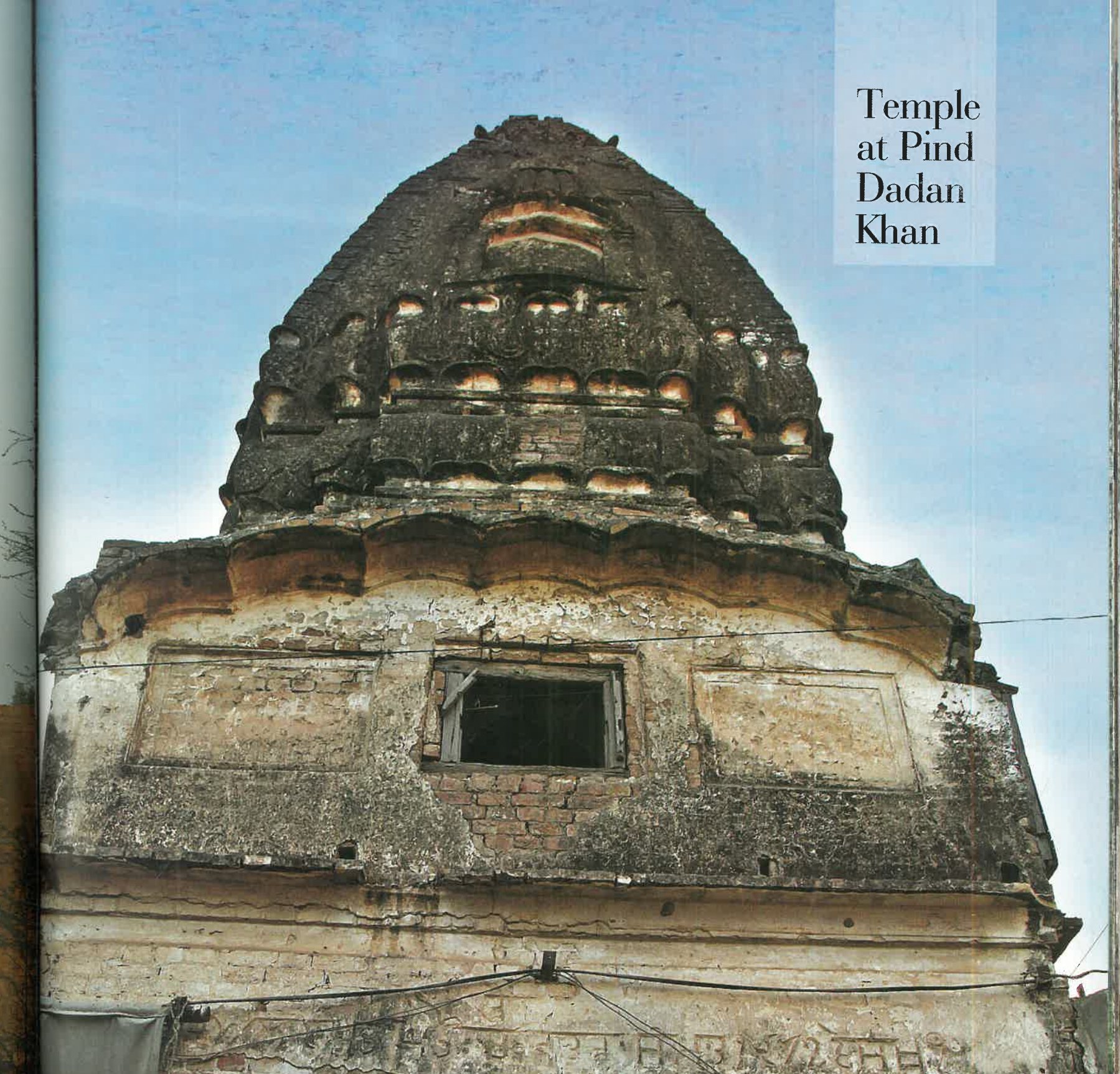




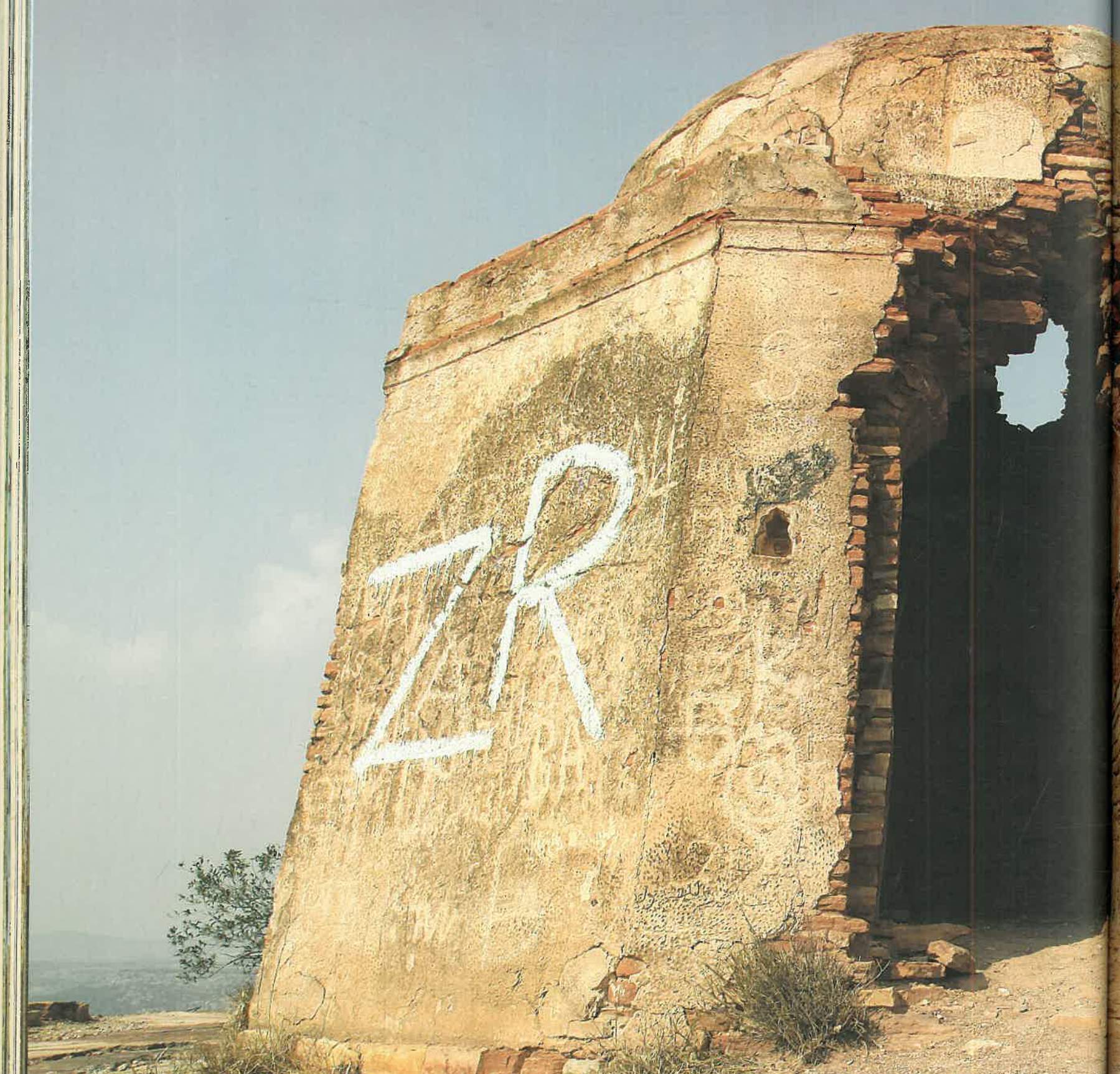

Remains of Temple Amb

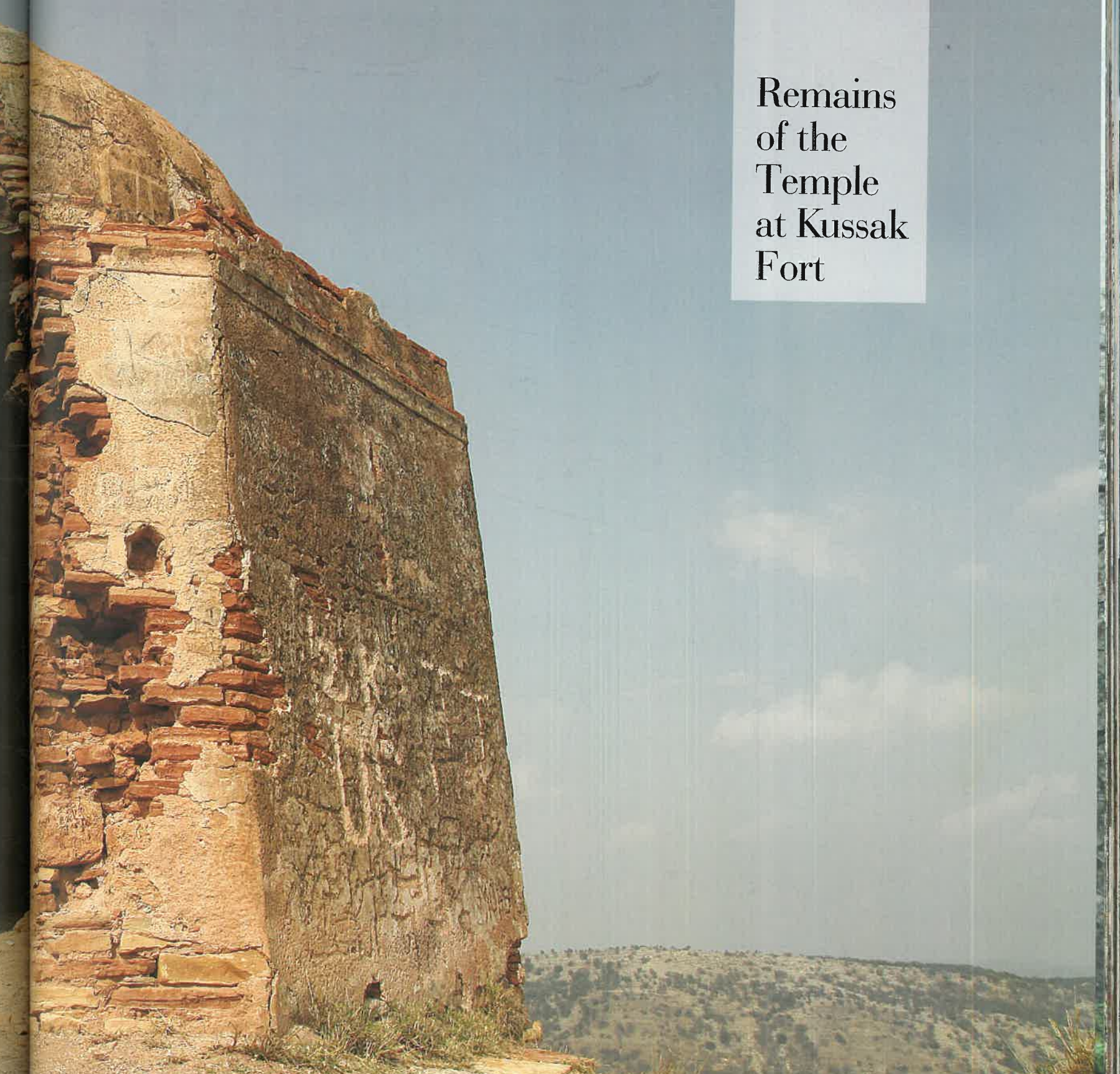


Temple at Pind Dadan Khan



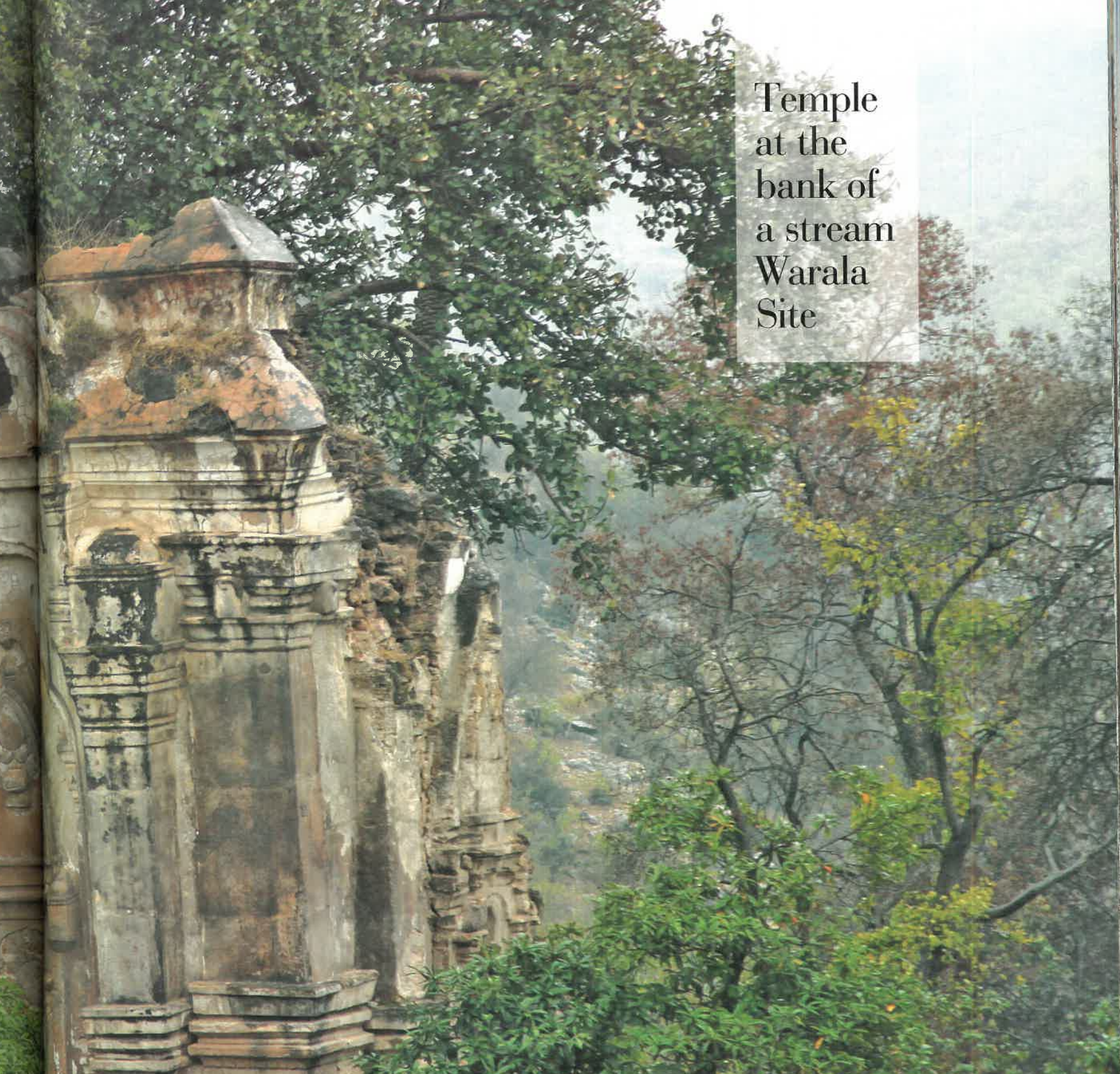
Temple at Pind Dadan Khan


ZR



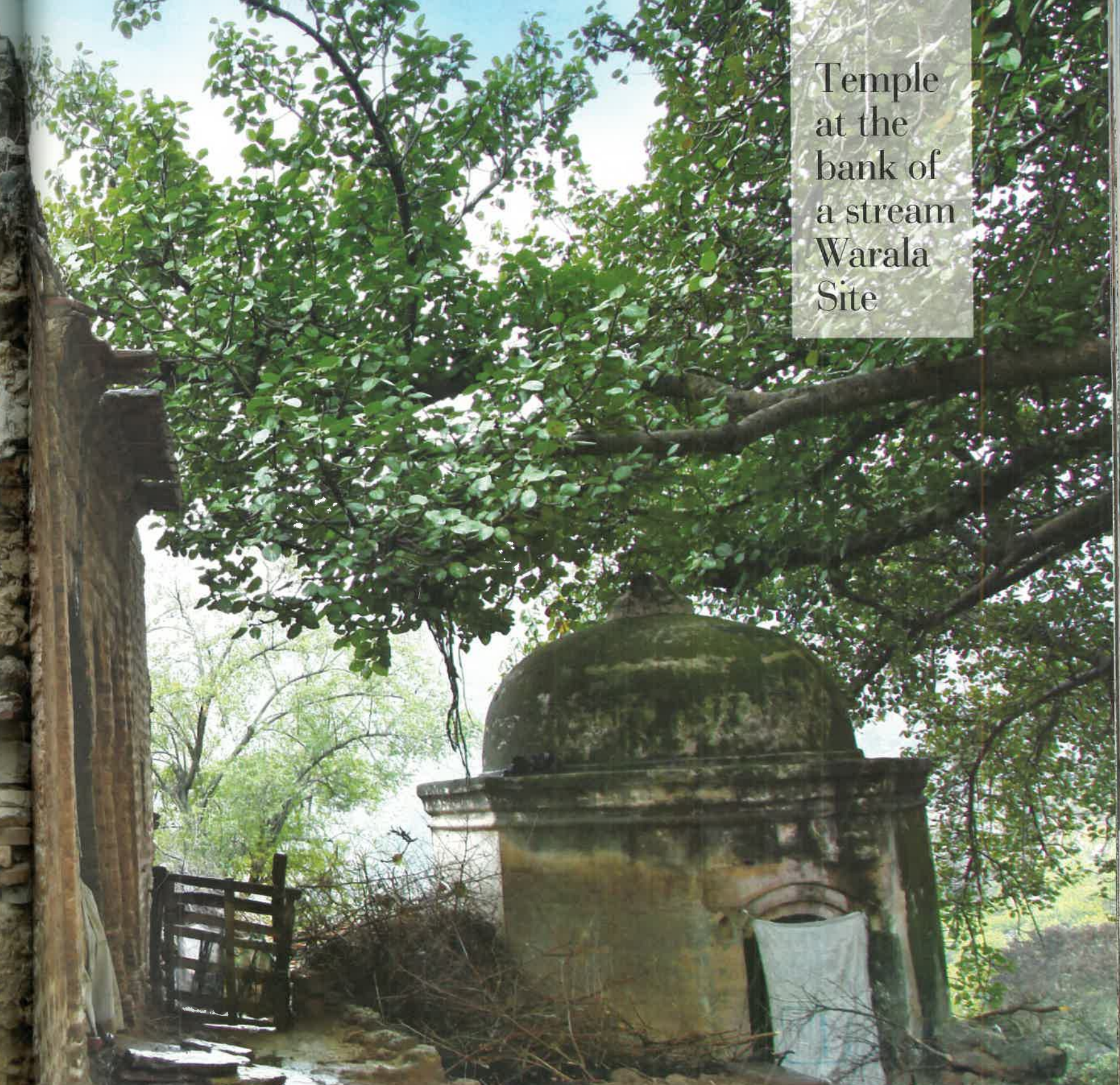
Remains of the Temple at Kussak Fort



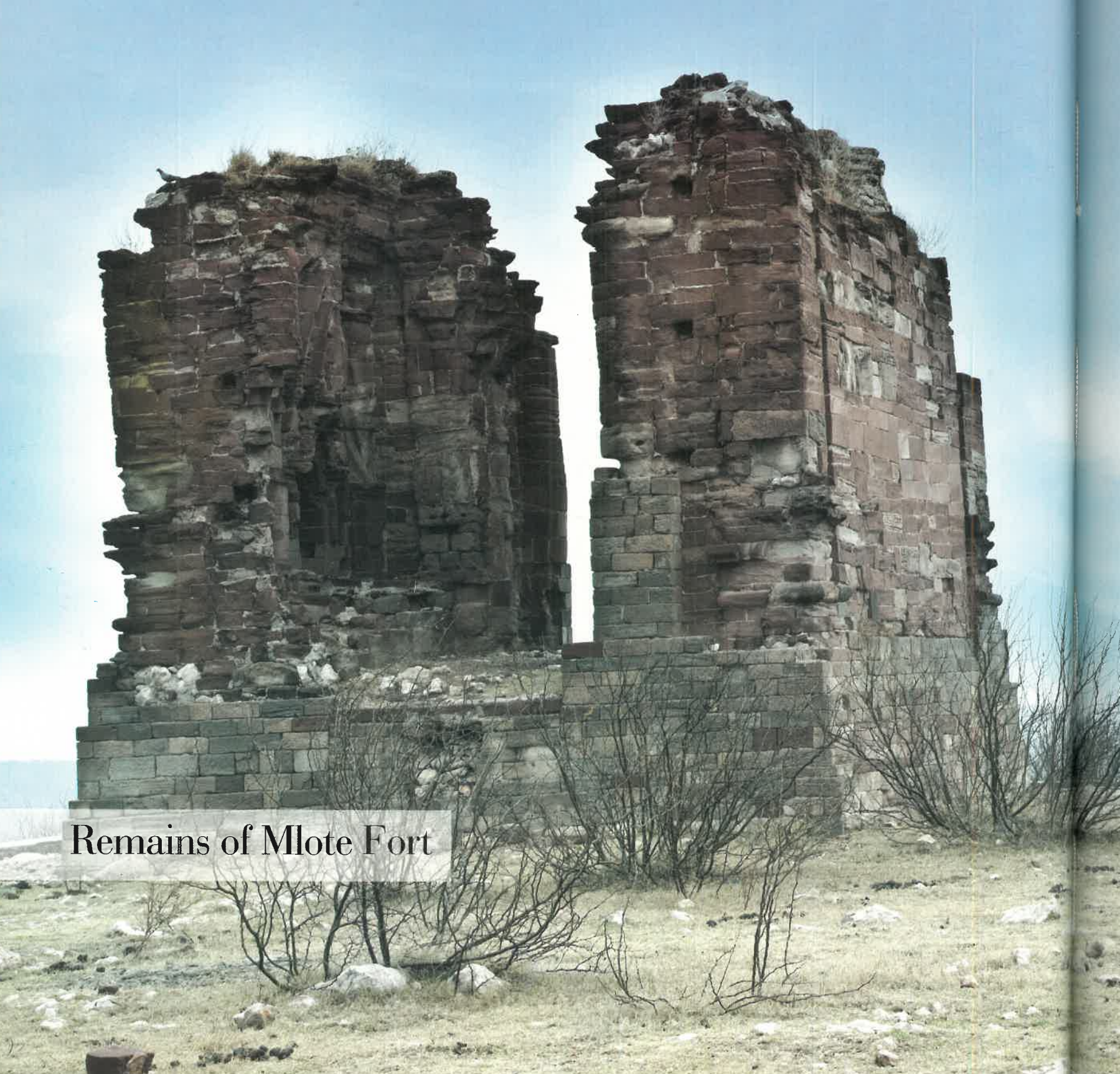


Temple at the bank of a stream Warala Site

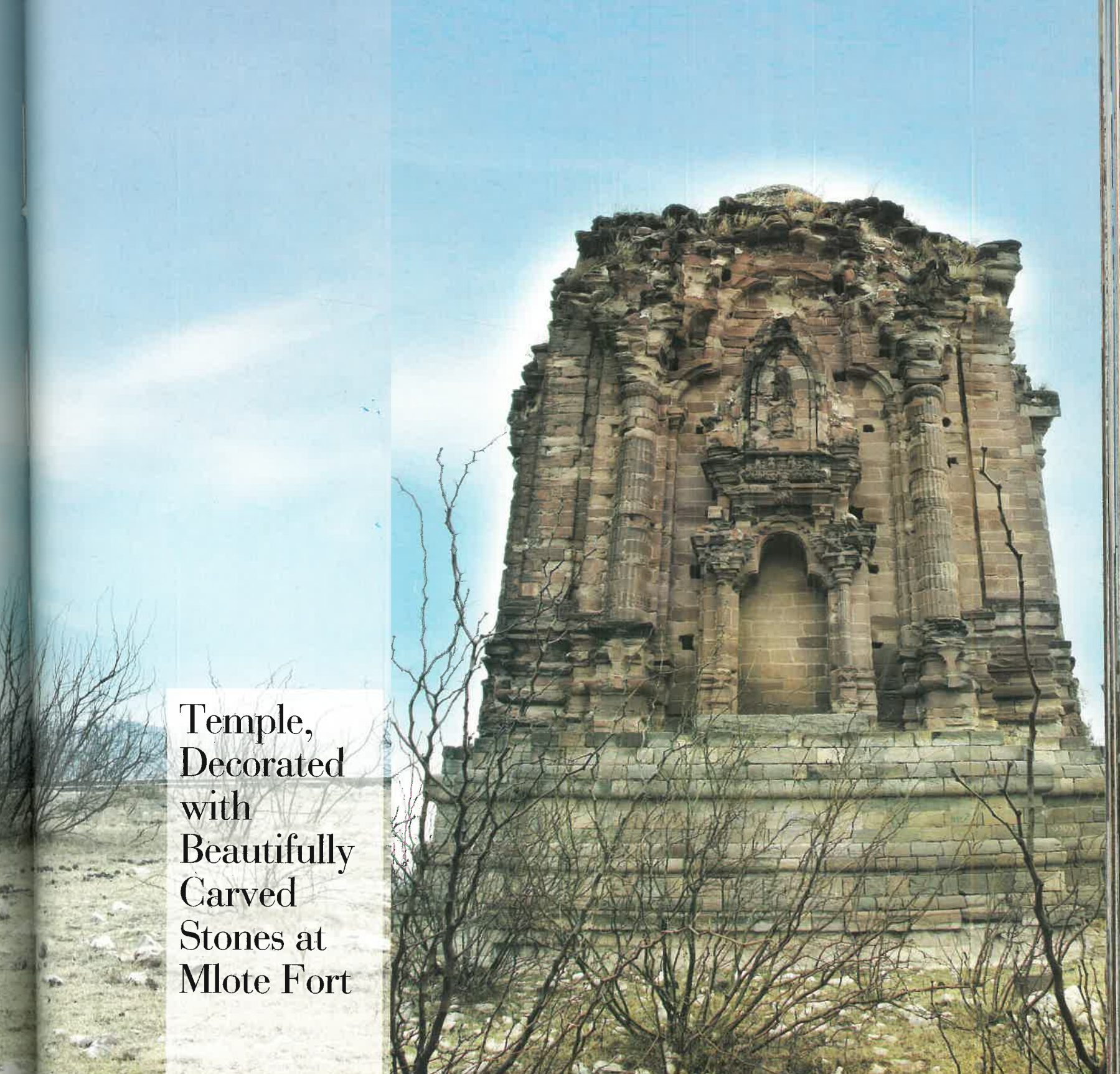




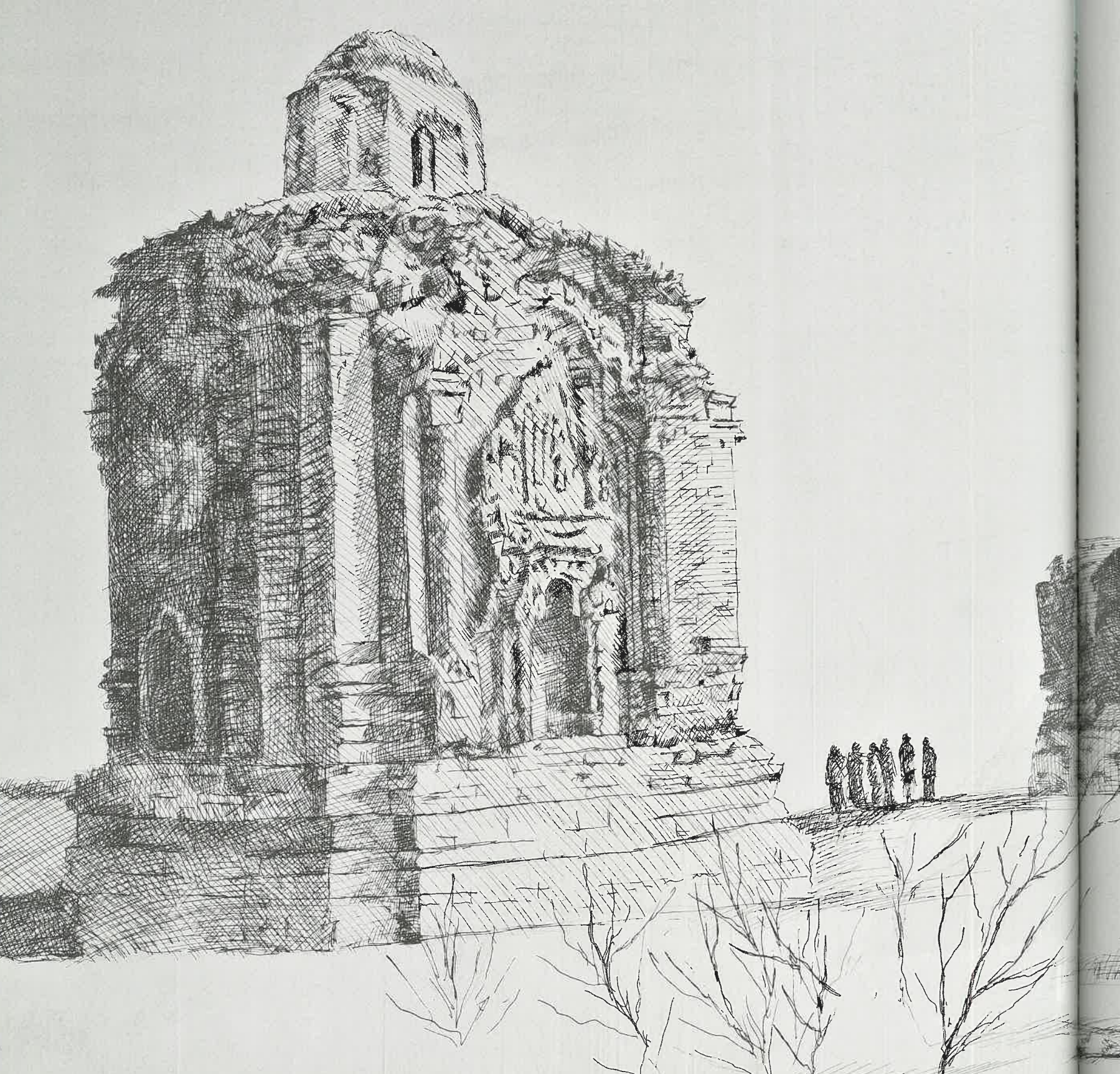
Temple at the bank of a stream Warala Site



Remains of Mlote Fort



Temple, Decorated with Beautifully Carved Stones at Mlote Fort



Remains of Temple Malote Fort

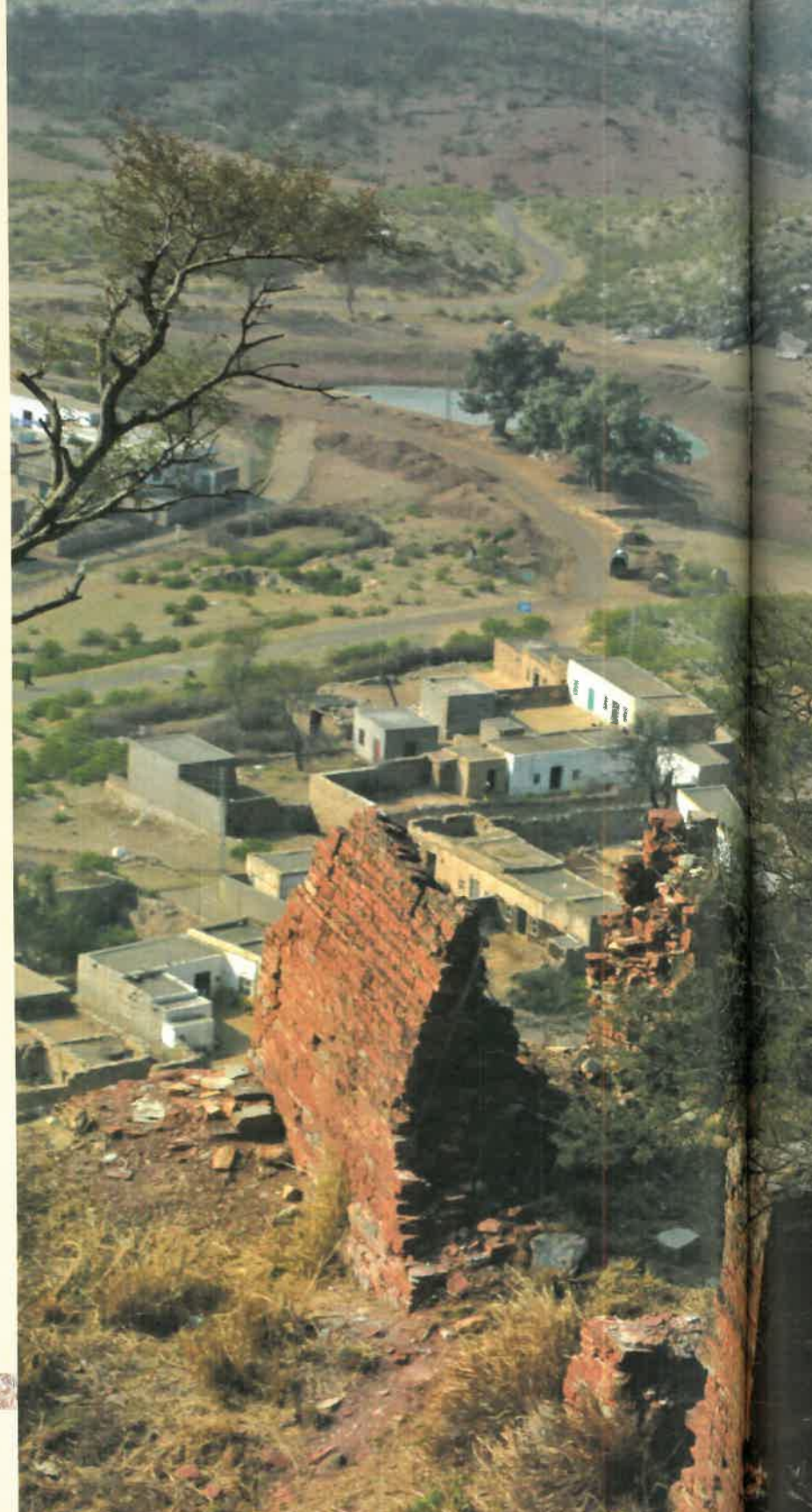


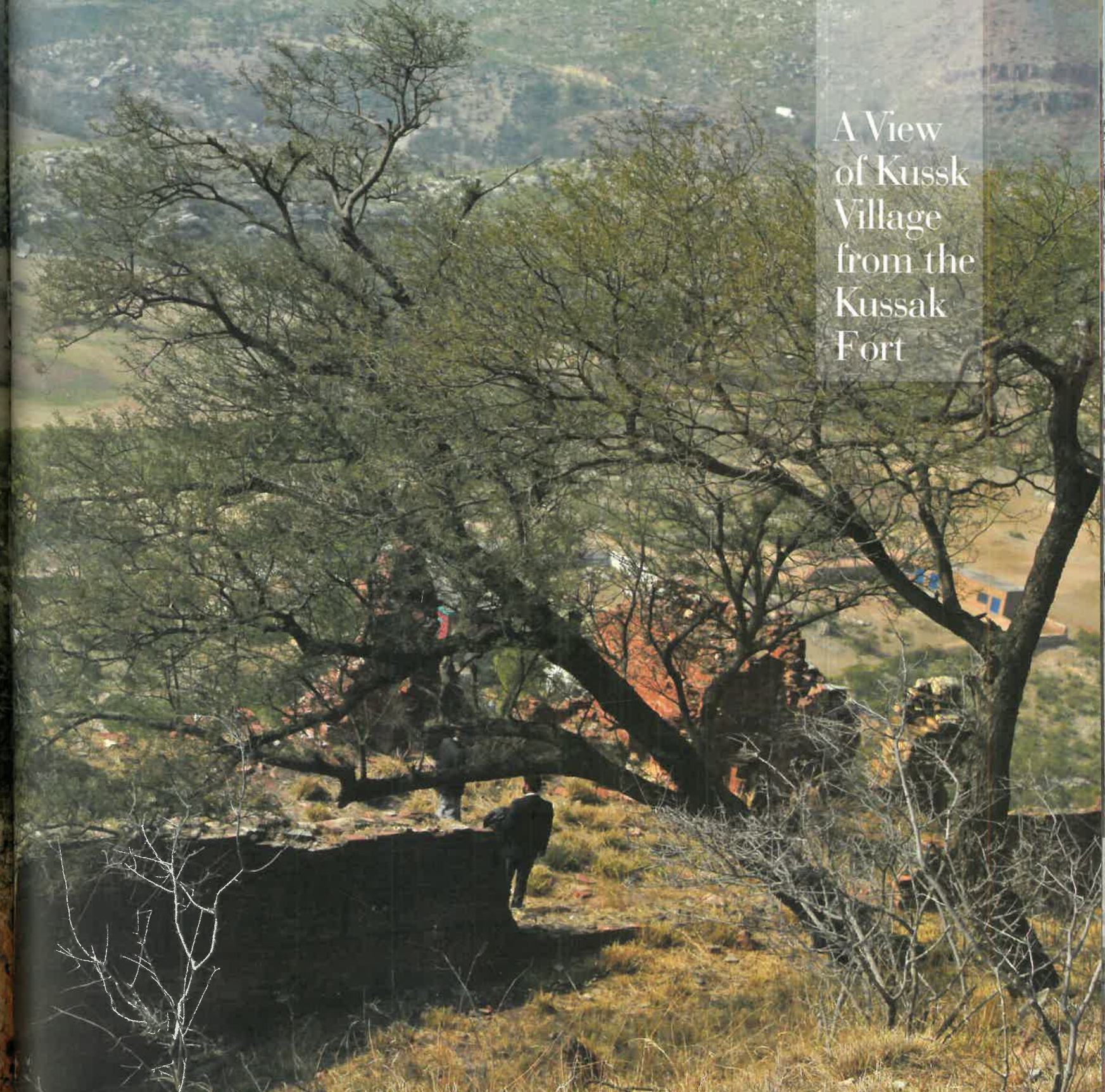
Forts

All forts in the Chakwal District have one point in common. These occupy strategic position on top of lofty mountains which are protected from more than one side with natural vertical cliffs. All are built of stone block. These blocks set in the form of dry masonry. All have built tanks inside for storage of water. In all of these forts, there are very few permanent rooms. It appears that all were used in emergency and for defensive purpose.

Forts ranging in date from the Bronze Age period (3000 -2500 cc) to the 19th century A.D.; the earliest fort recorded is Kallu Wala Dir near Lawa south of Talagang (pI). It is a semi-circular fortress with four bastion and a single entrance with a subsidiary smaller opening from the associated material- chert blades, cherts cores, and potsherds, this small fortress on top of an isolated lofty hill lock can safely be dated in the 3rd millennium B.C and belong to the early Harappan (kot digi) period.

The fort of mallot (pI) perched high on a vertical cliffs of the salt range, commands a breath-taking view of the lower reach of the salt range as well as the beautiful sprawling flood plan of the river Jhelum around Lila



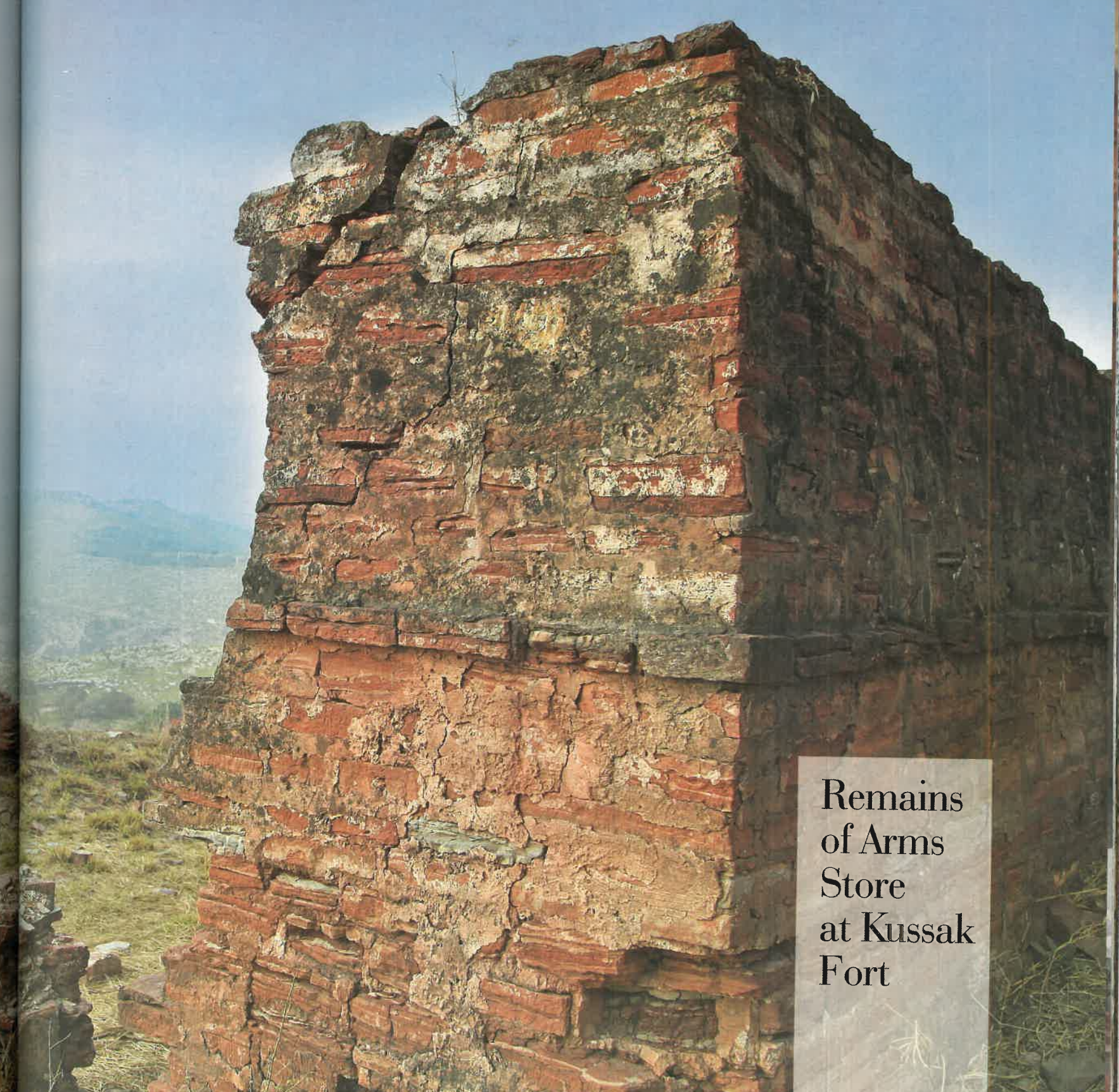


A View of Kussk Village from the Kussak Fort

and Toba, it certainly belonged to the series of similar forts and Mangla, Nandana, Northern and southern Kafir Kots are built during the reign of Hindu Shahia dynasty immediately preceding in invasion of Muhammad of Gazna in the early year of 11th century. At present only part of its entrance gate, on bastion and part of the fortification wall has been preserved, the Siva temple with its gate way is inside the fort and is among the most beautiful surviving Hindu Temples of the Salt Range. The very existence of the unique temple is now in danger on the account of a serious vertical cleft that has recently (April 1995) appeared on the top of the mountain on which the temple rests.

A contemporary fort also exists around the settlement site of Katas of which no very little remains on the site itself. The fort of Kusuk (p) is very characteristic of the salt range. It is the most well preserved fort that was certainly used as late as 19th century as a strong hold of Janjua tribe in their wars against sikh .it is perched high on an isolated lofty hillock which overlooks the plans below towered the east. For the selection of site, it also appears to belong to the same period as that of the Mallot fort. The site of Thir Chak Kot was also originally fortified but only an outline of the same is left on the side.



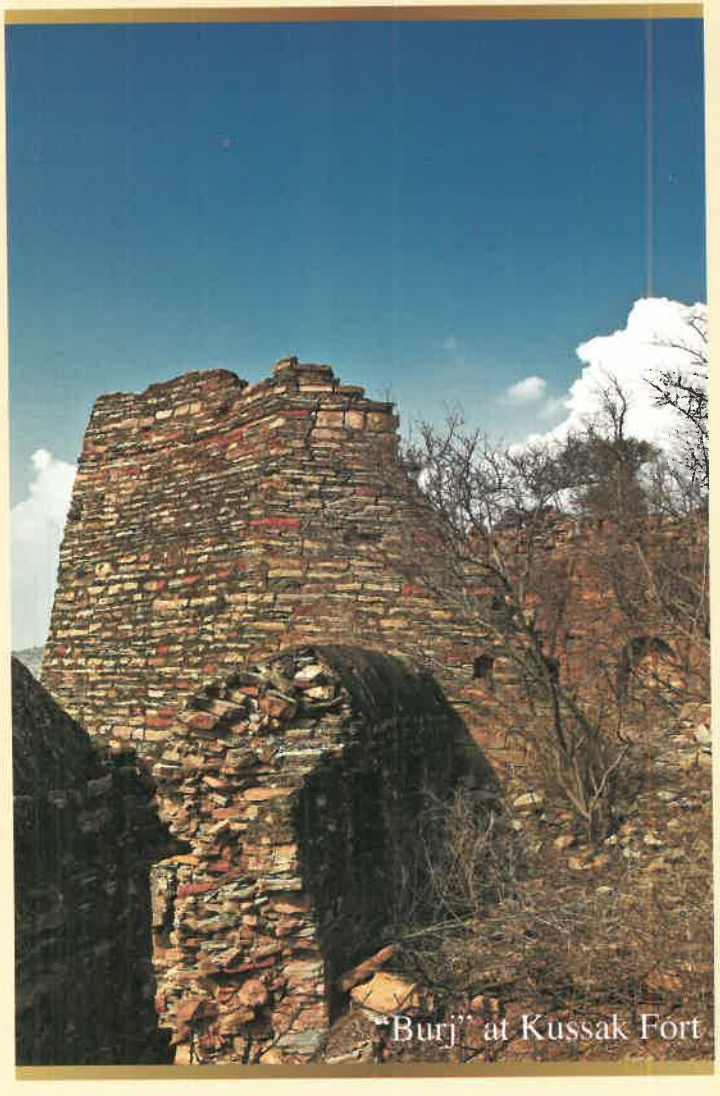


Remains of Arms Store at Kussak Fort

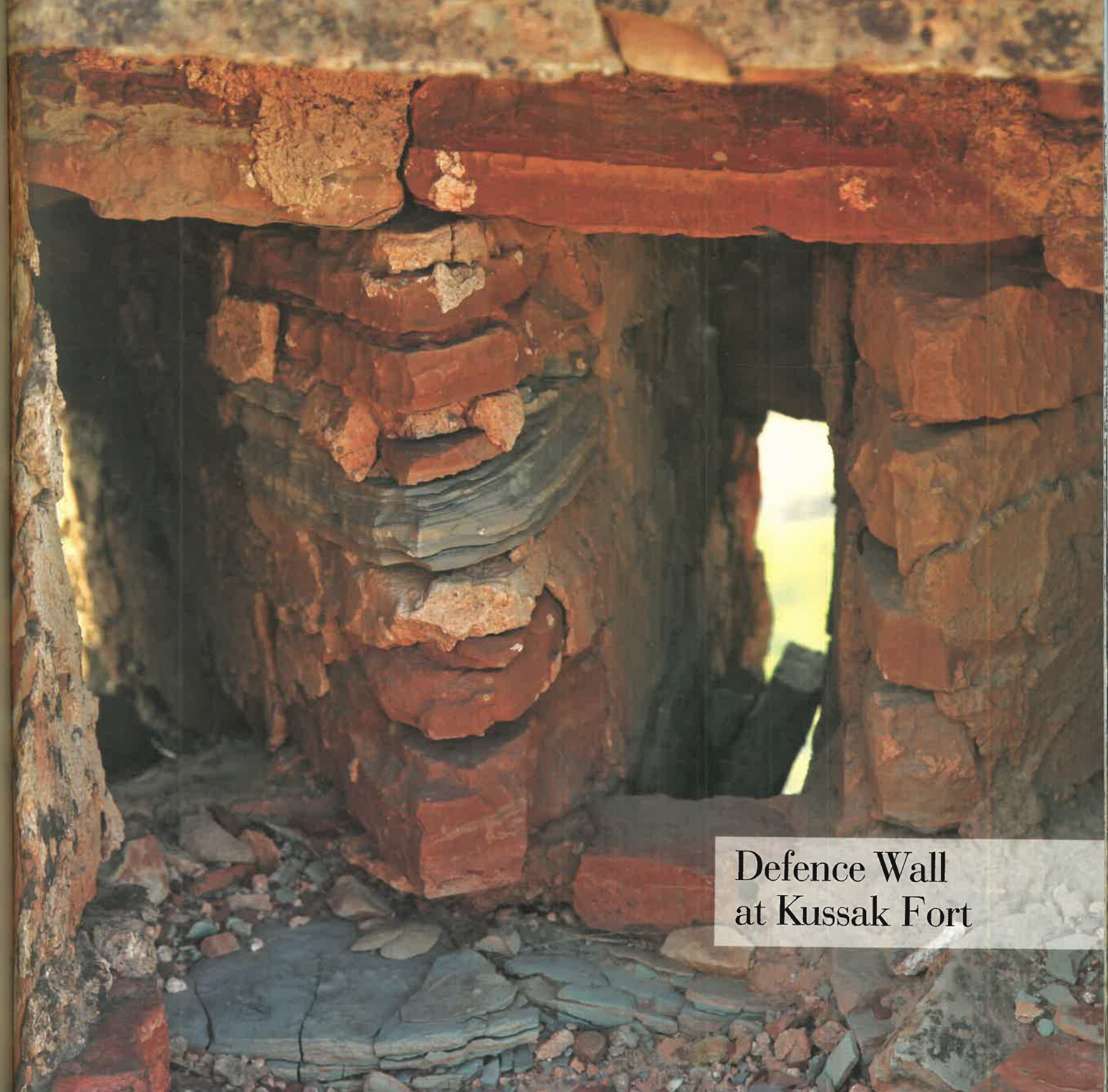
Its period is also difficult to ascertain. It was certainly a single period site and may belong to the period of the graveyard at Thir Chak called Hinjra. If so it may belong to a period of early 12th and 13th century.

The most characteristic fort of this period is at Samarkand. It is most difficult to reach even today. The site of the fort selected with a purpose to protect from the North the city which occupies the bottom of the valley below the fort. The fortress itself appears to have no other role. There is a smaller fort called Qila Rasa on an adjoining spur of the hill. There are good reasons to believe that the fort and city of Samarkand belong to the 13th century A.D. and was founded by Khwarezm Shah.

The latest in the series of the forts surveyed in this region is the fort of Sikhawala near Mohni Bagh closed Kalar Kahar lake (fig). It also occupies an isolated hill, like the fort Kallu Wala Dir and Kusuk fort. In shape it resembles the former for being semi-circular in shape and having only on entrance gate. There is a tank inside in it for storage of water. It is claimed to have been constructed by the Sikhs in the early 19th century.

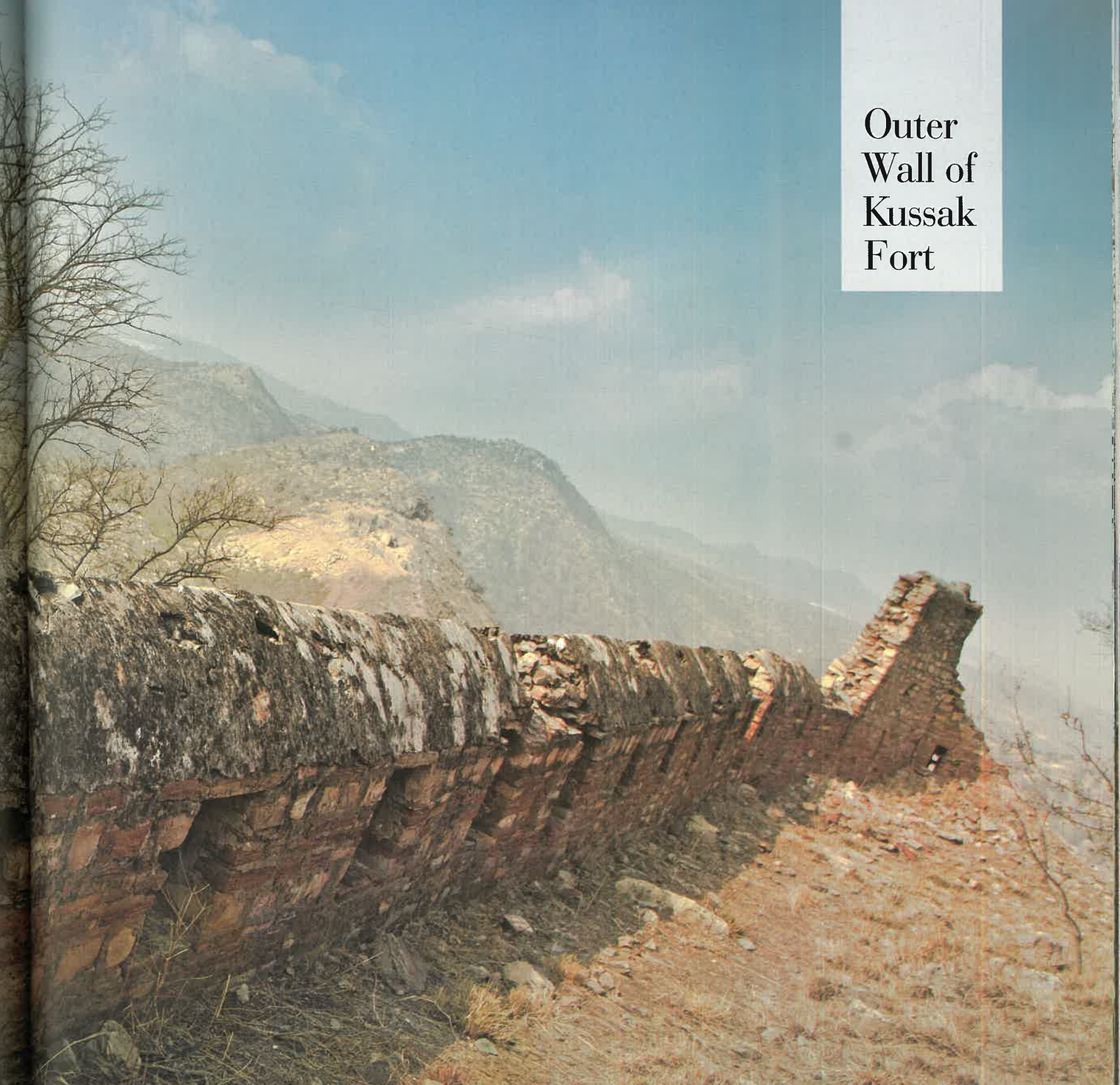


"Burj" at Kussak Fort

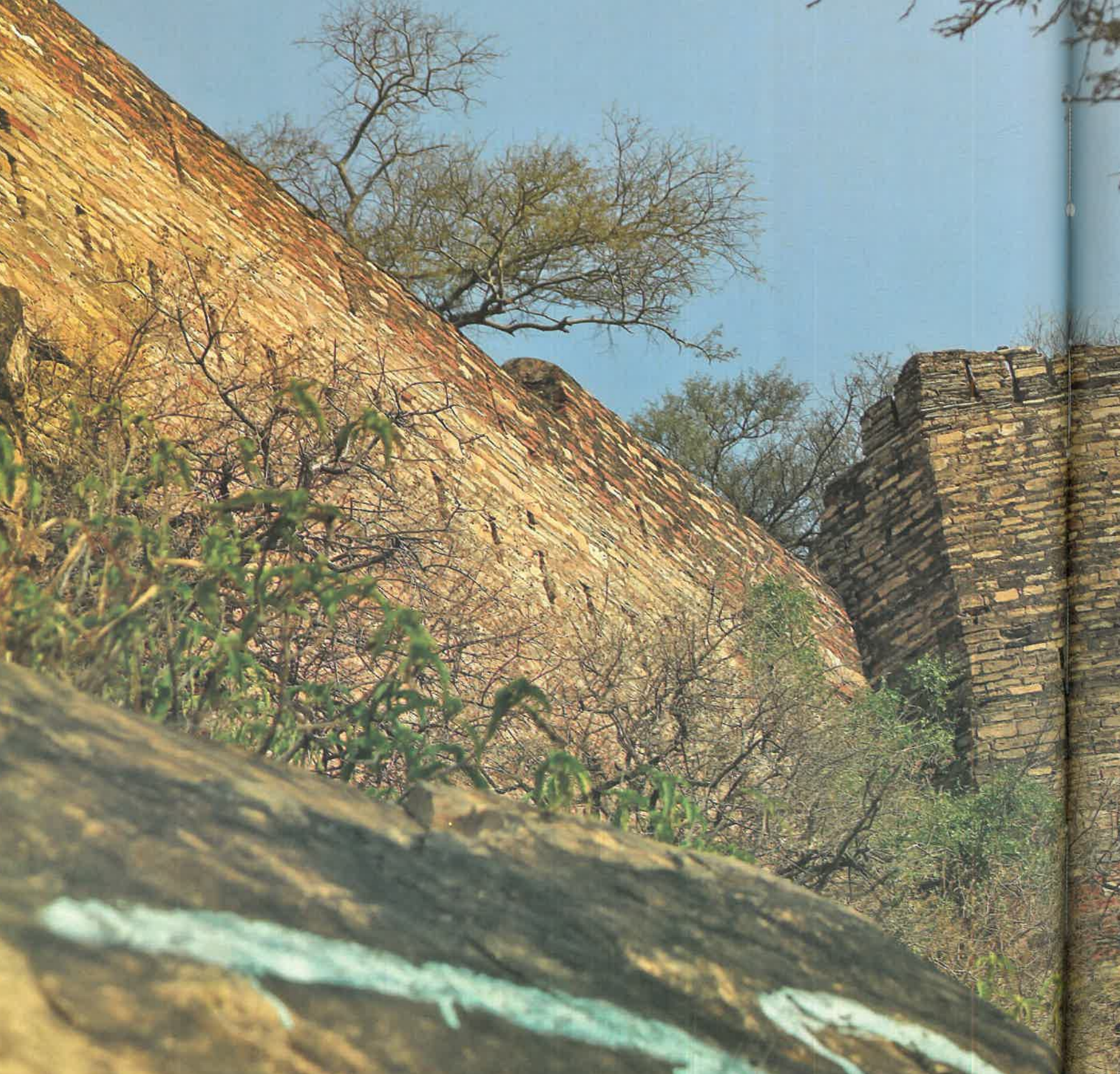


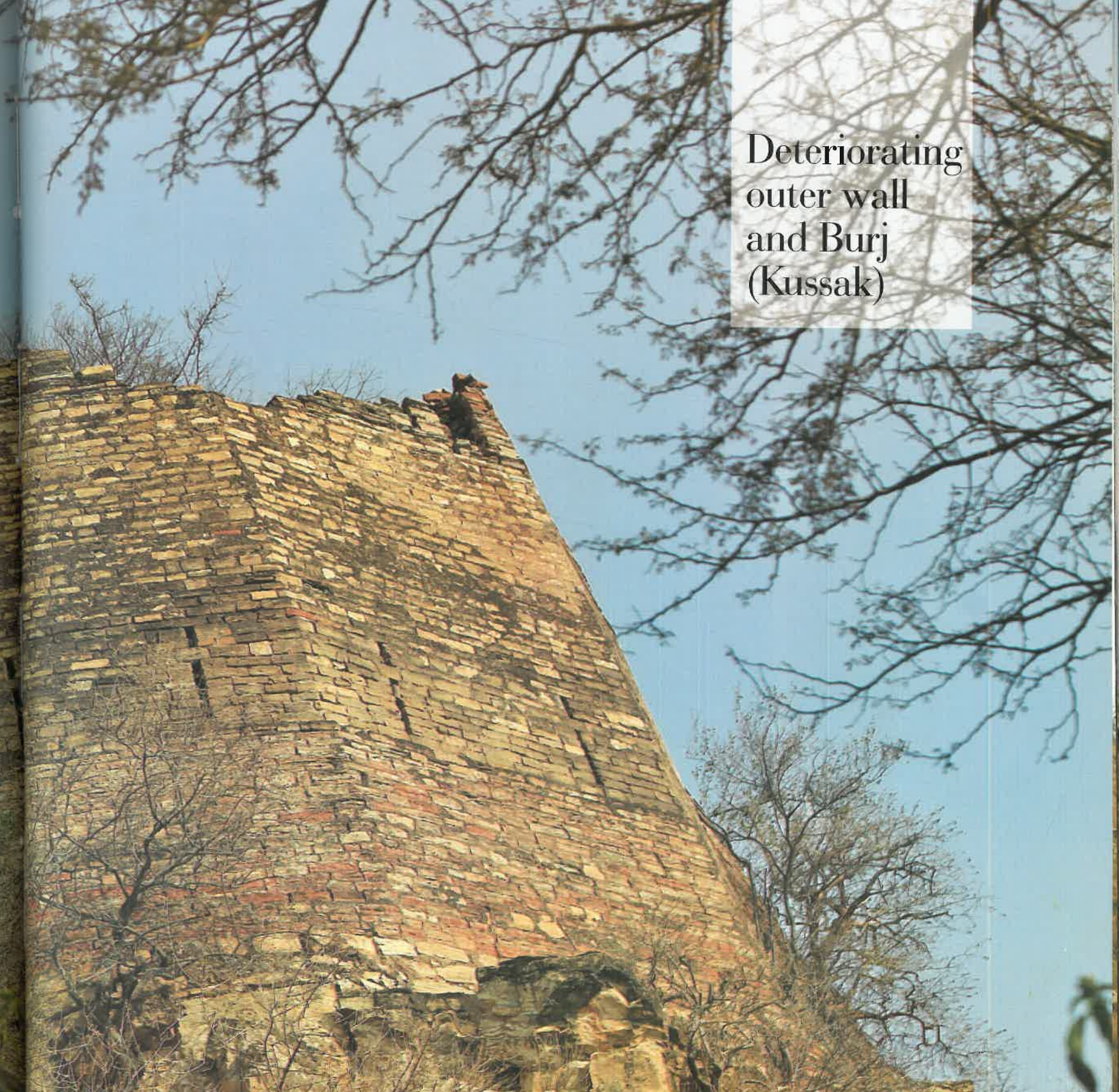
Defence Wall
at Kussak Fort



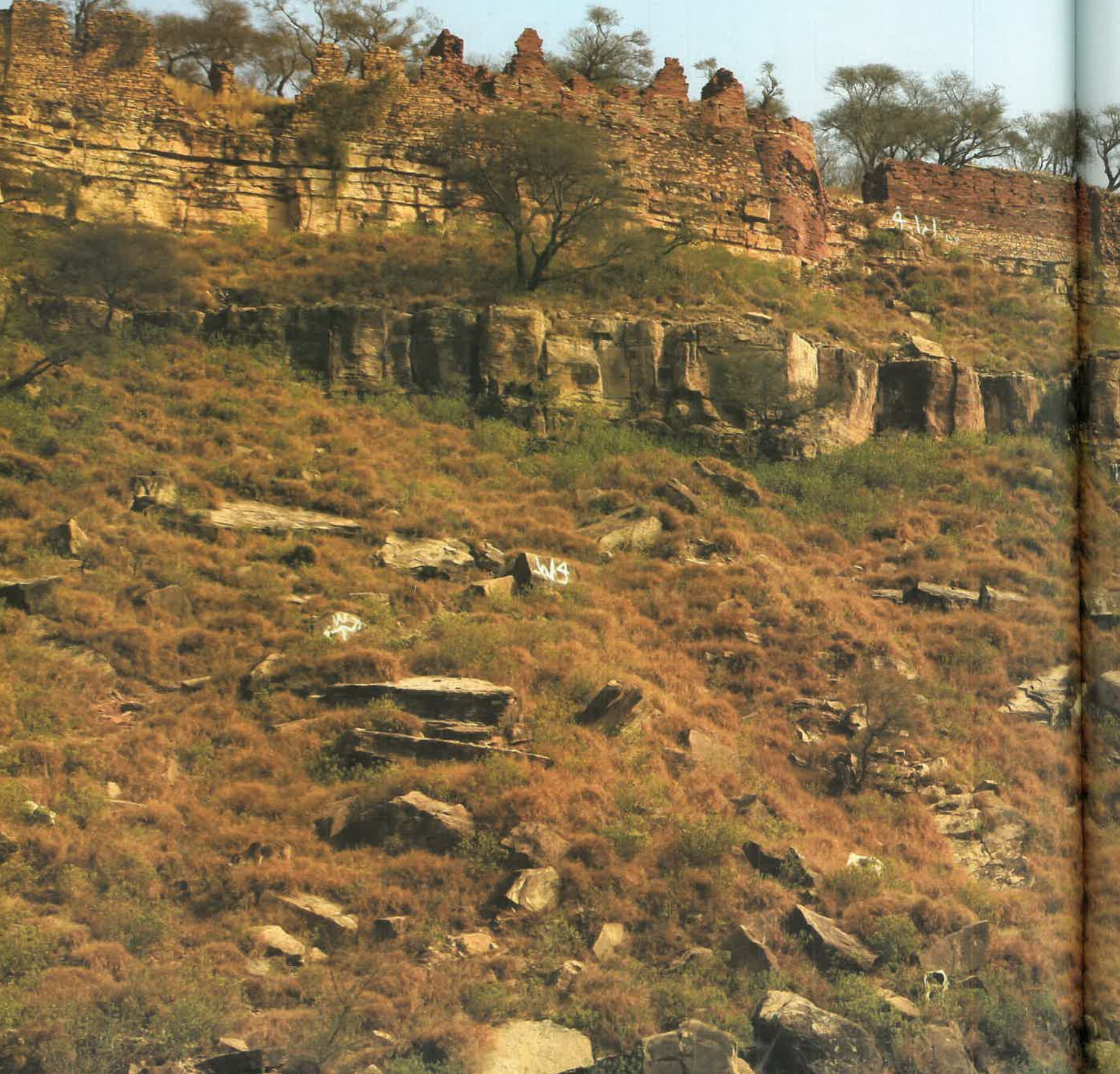


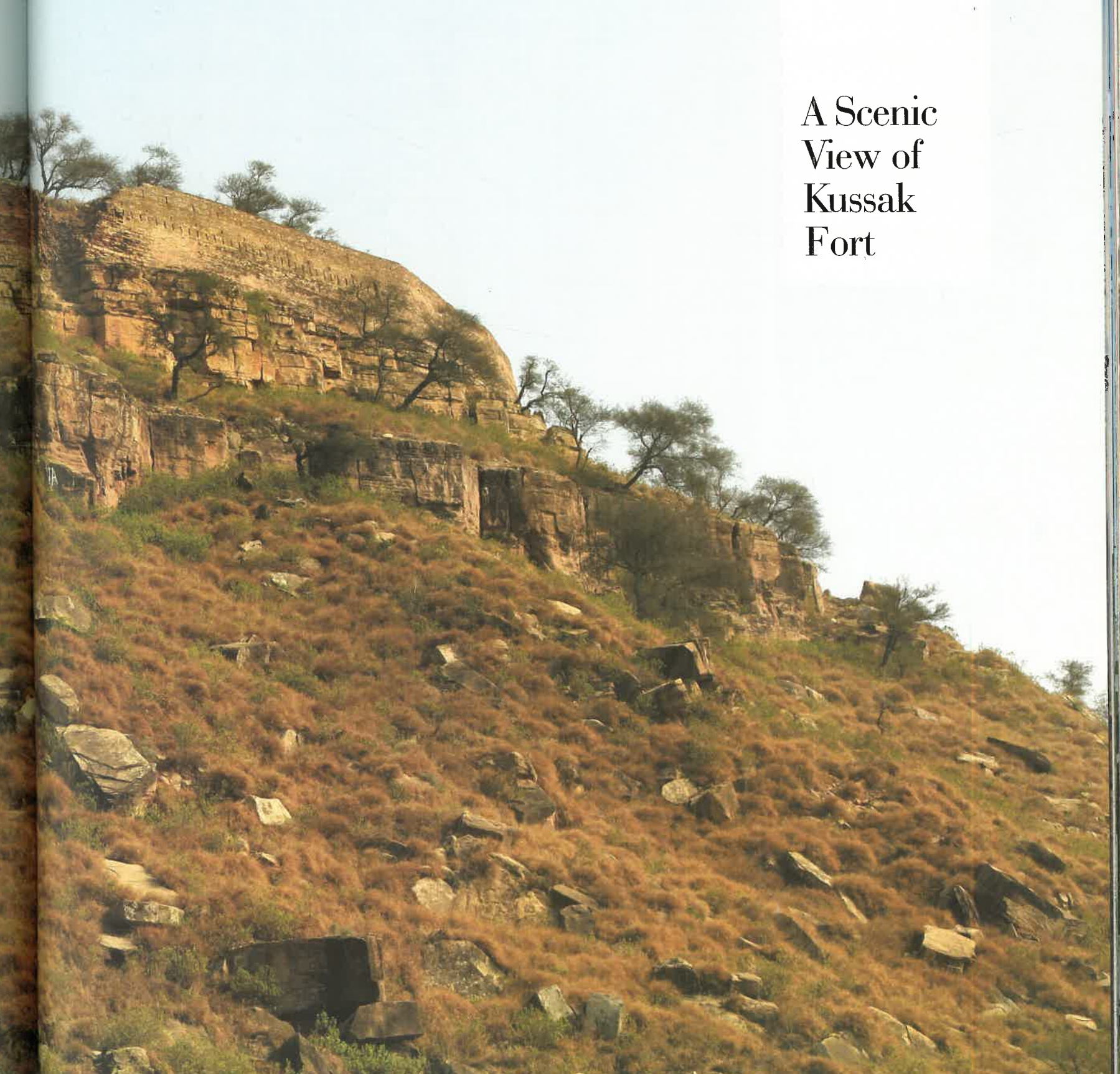
Outer Wall of Kussak Fort



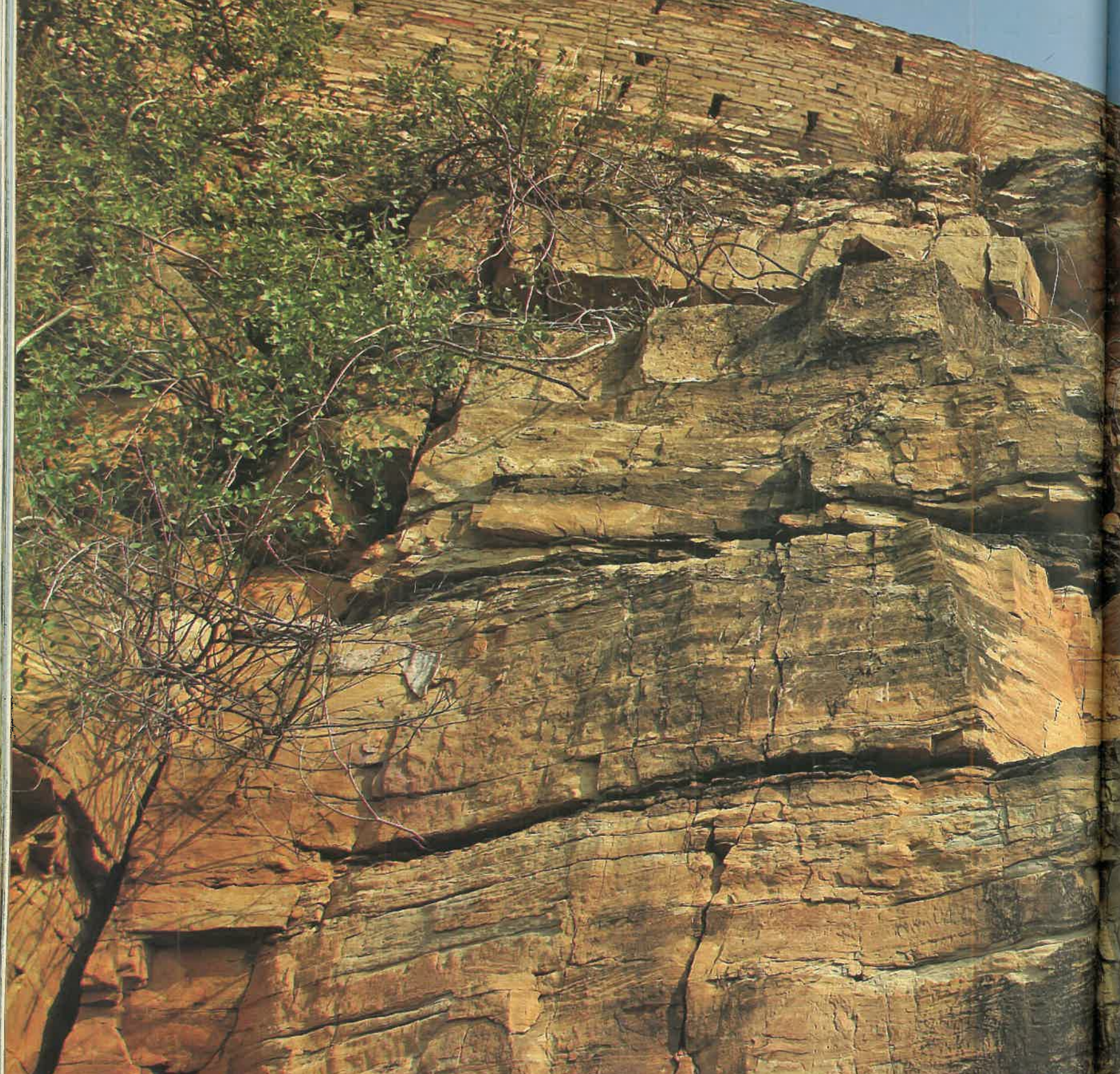


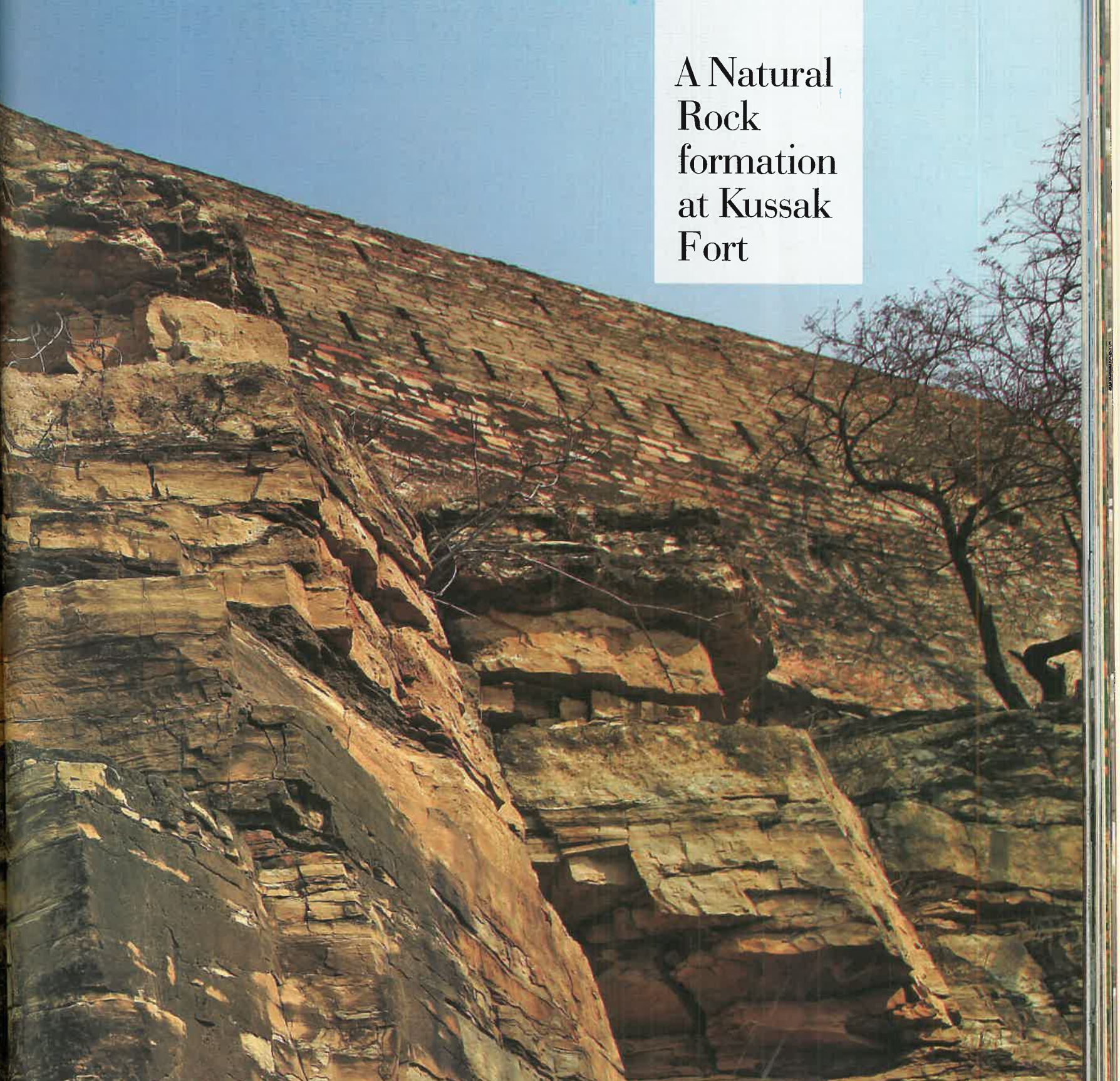
Deteriorating outer wall and Burj (Kussak)





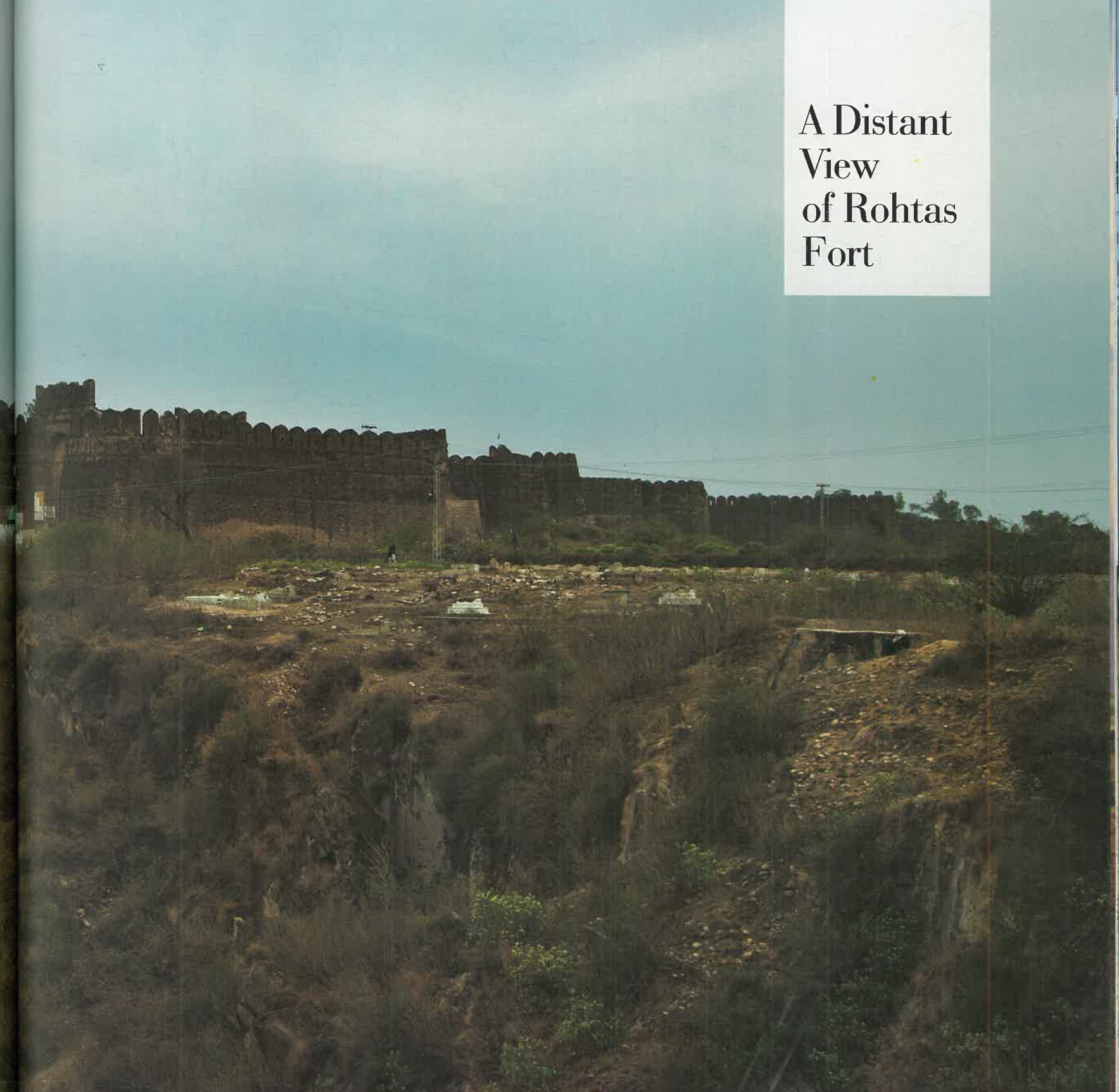
A Scenic View of Kussak Fort



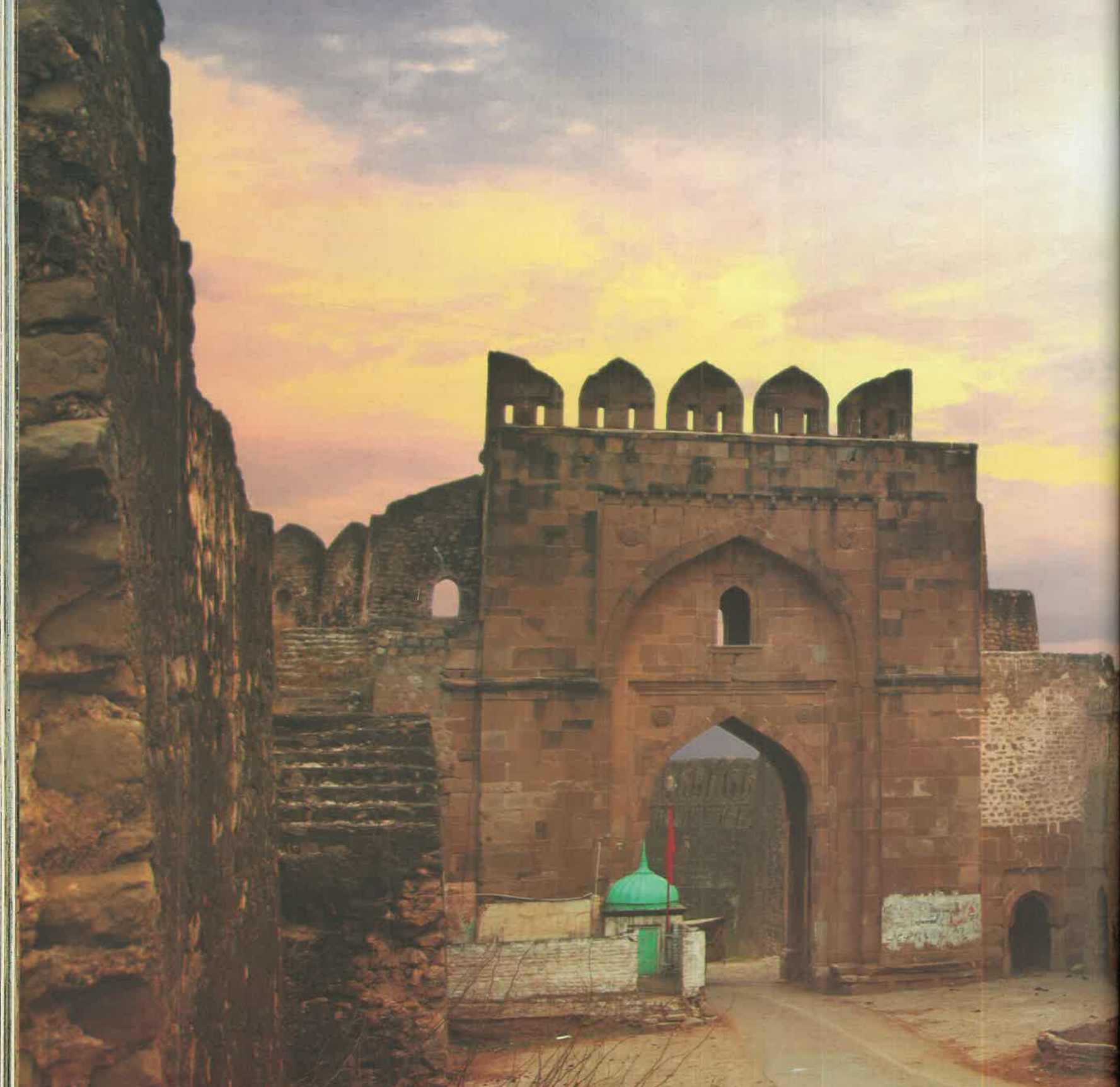


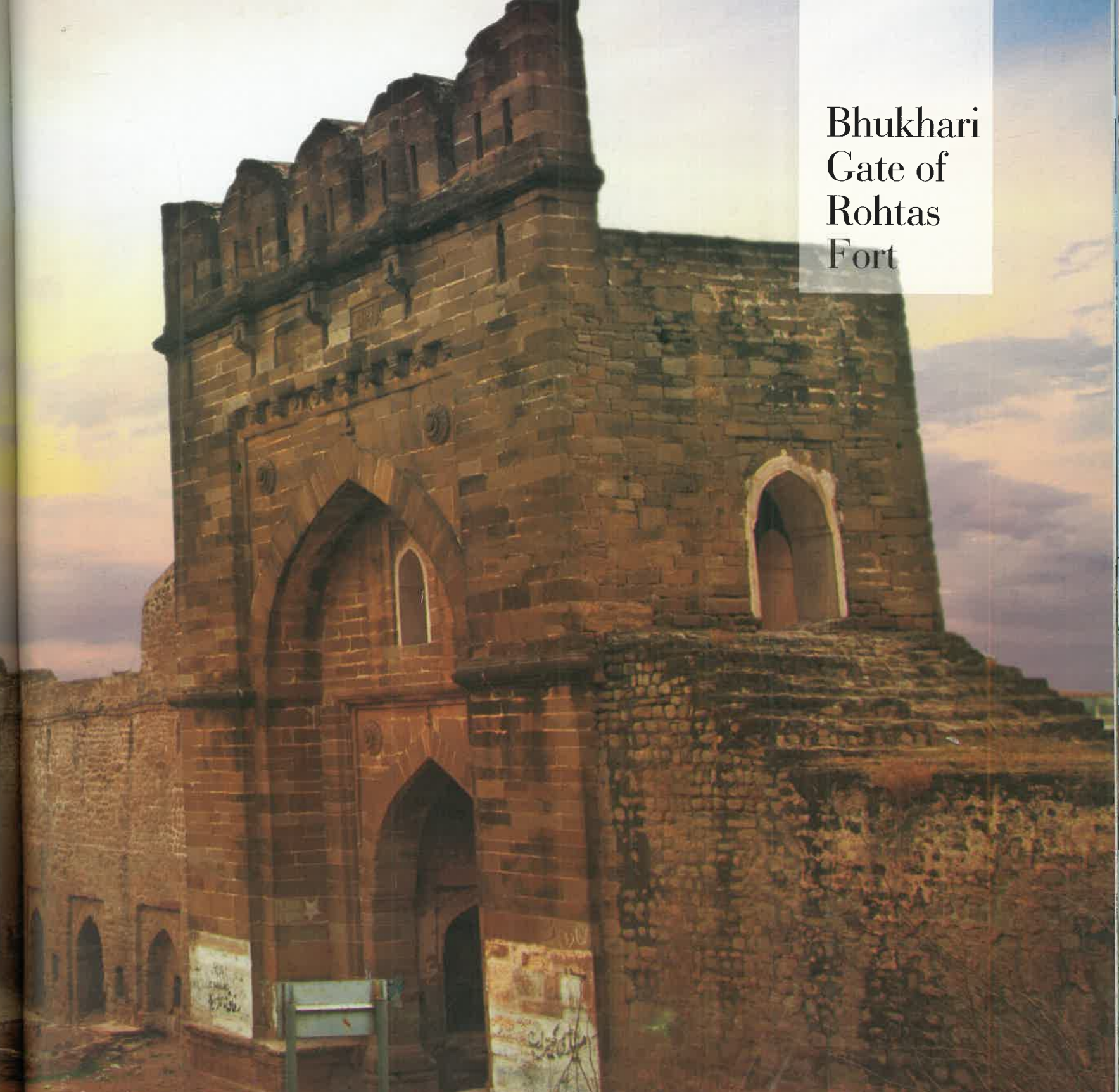
A Natural Rock formation at Kussak Fort





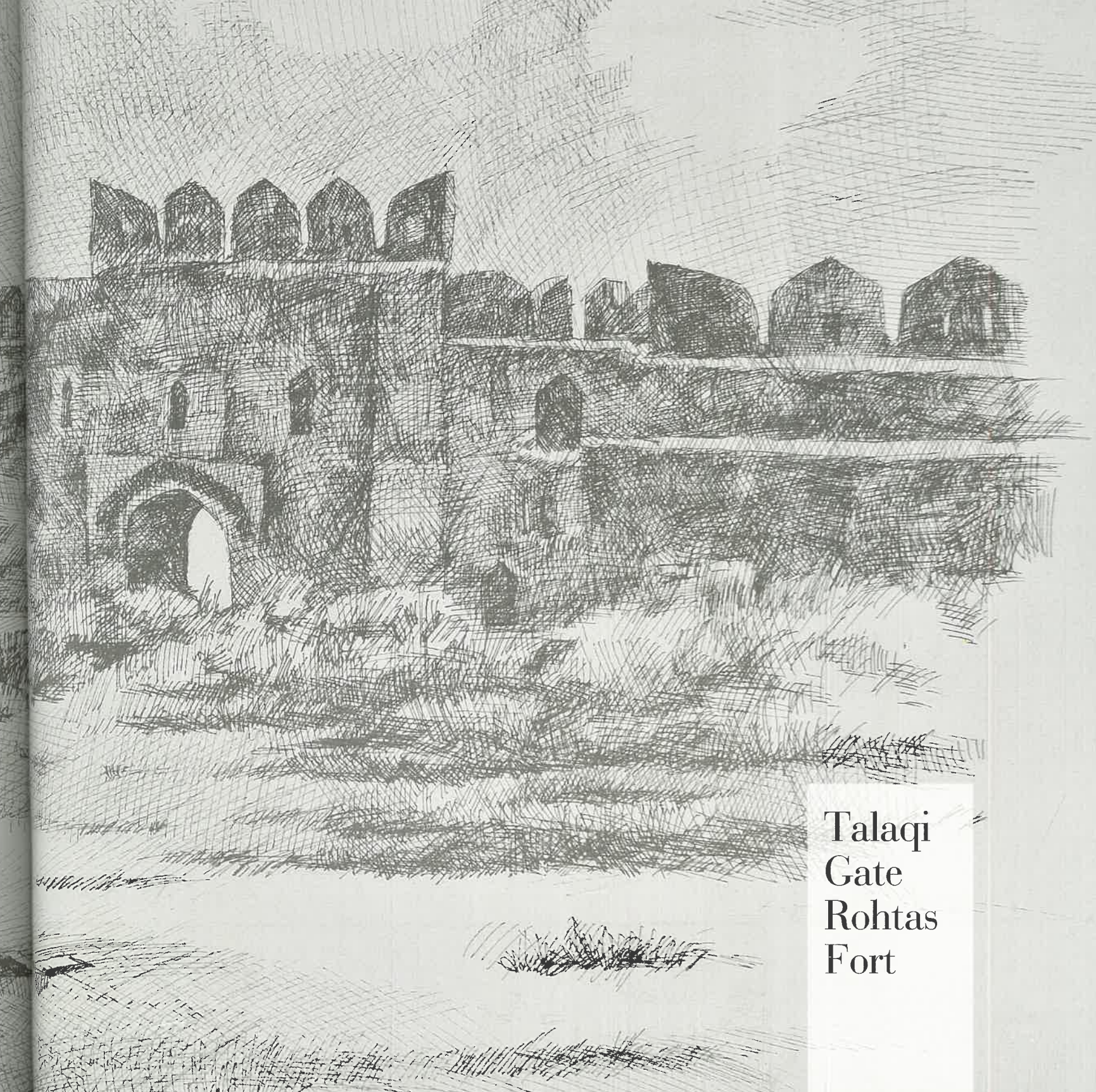
A Distant View of Rohtas Fort





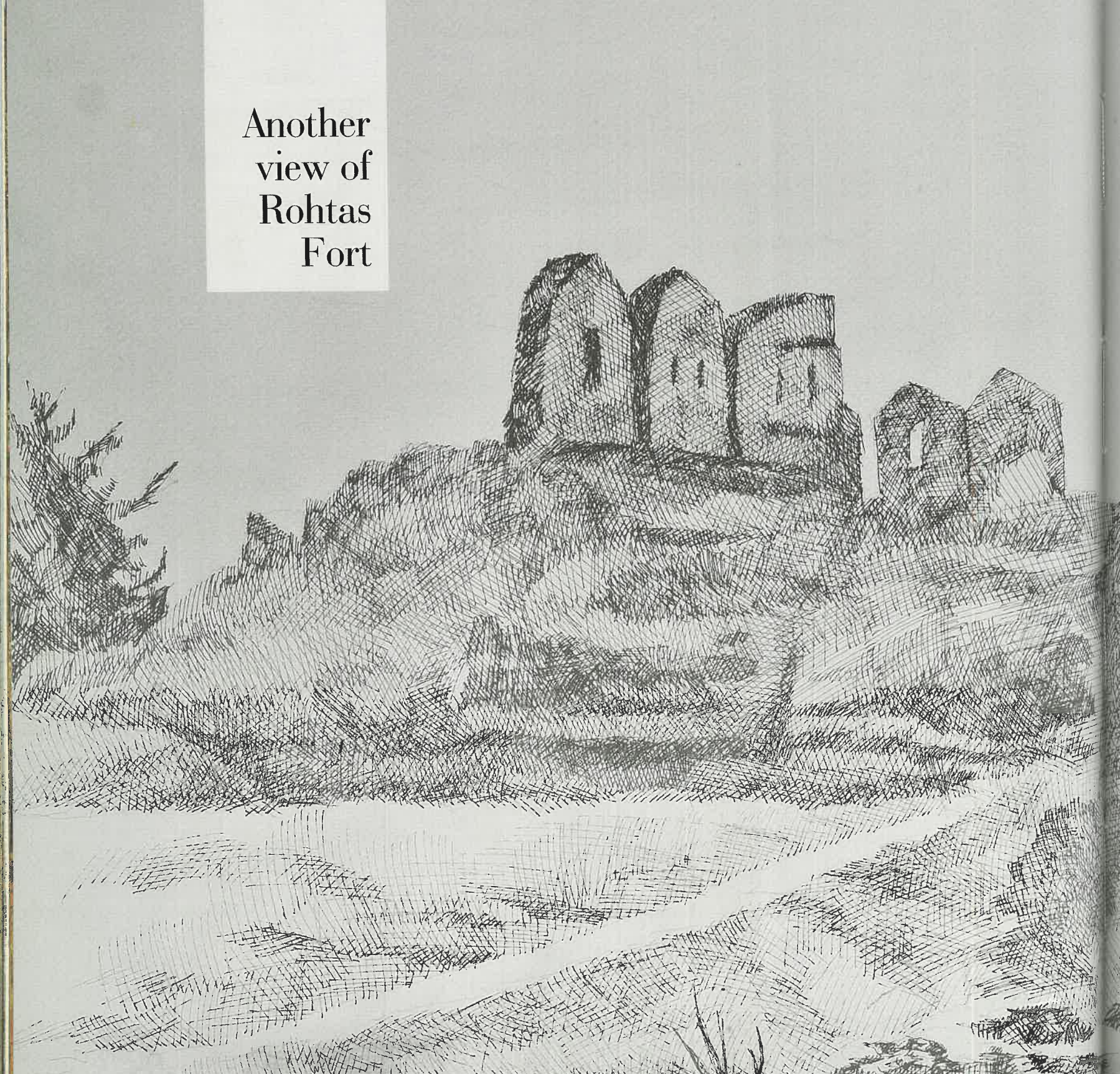
Bhukhari Gate of Rohtas Fort

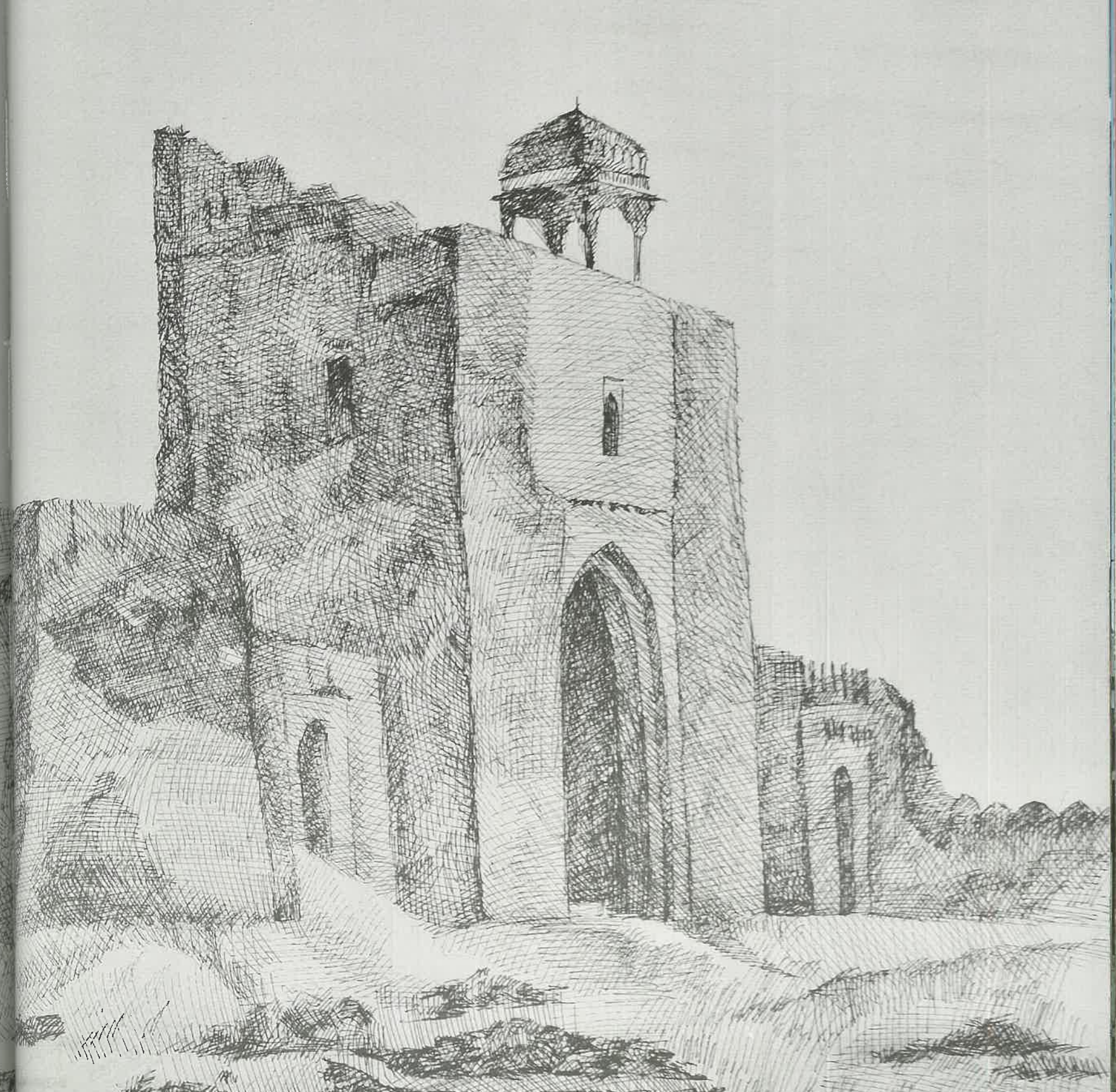




Talaqi
Gate
Rohtas
Fort

Another view of Rohtas Fort





Remains of Premier Small Rohtas Fort



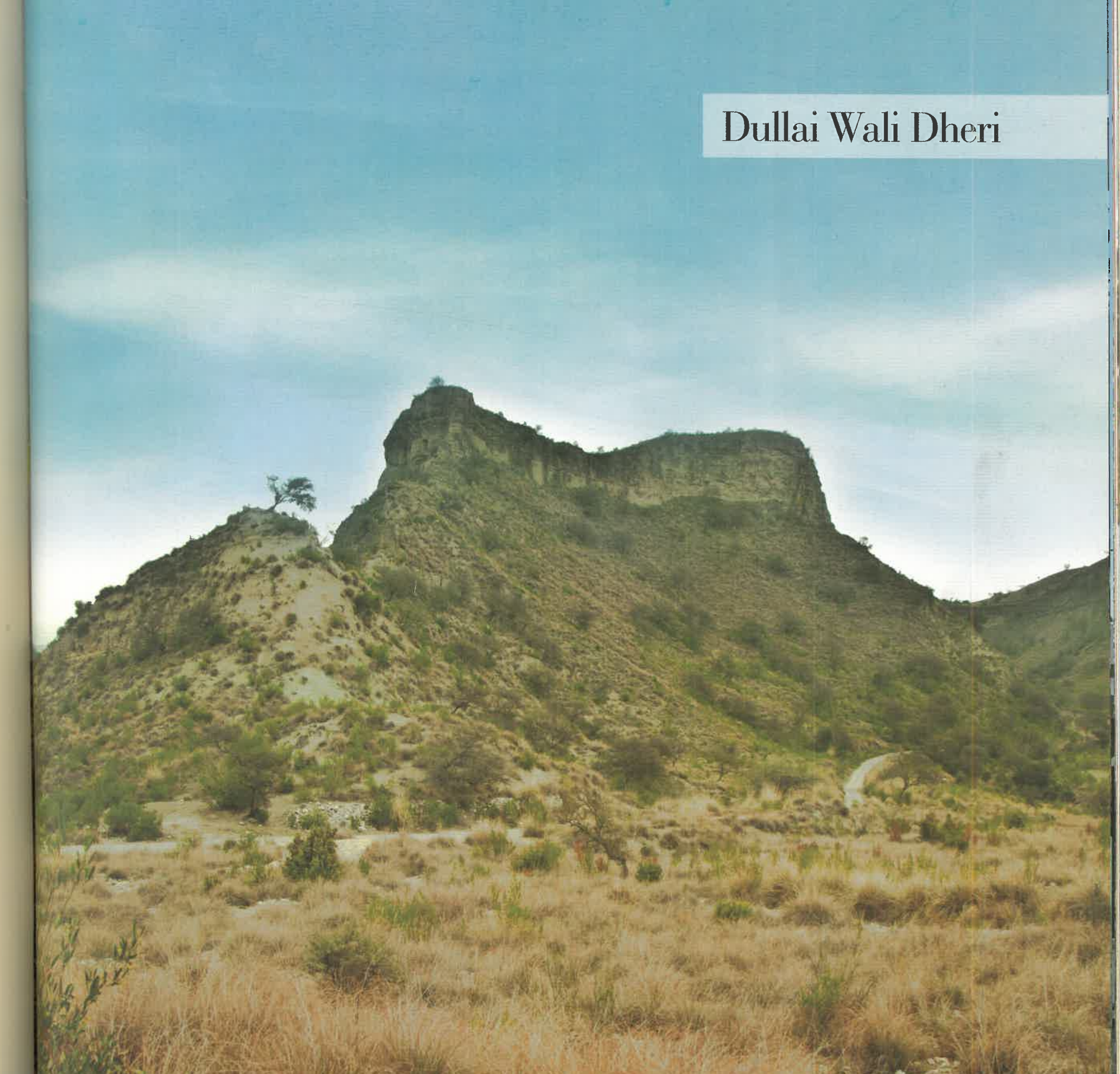


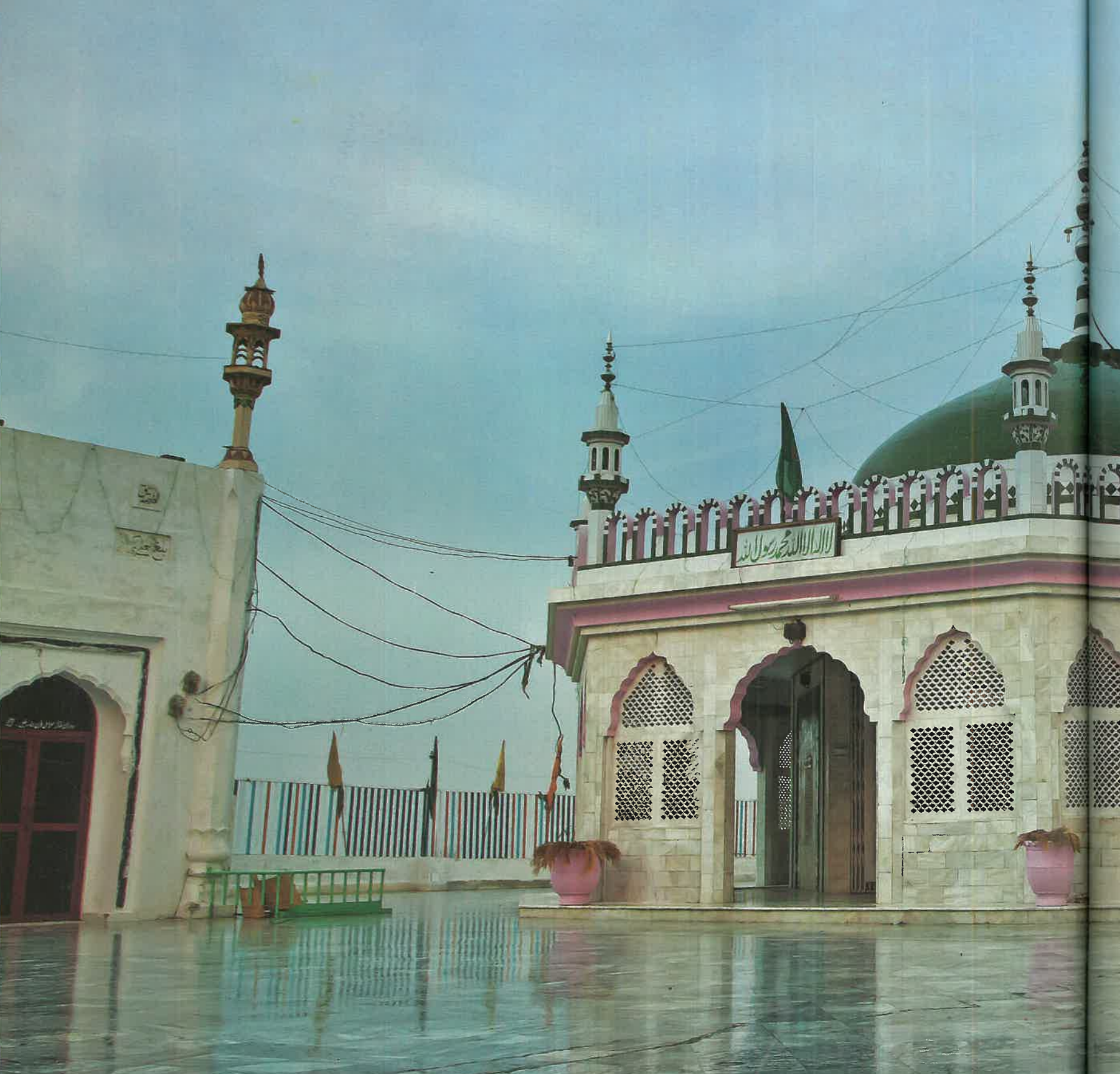
Muslim Monuments

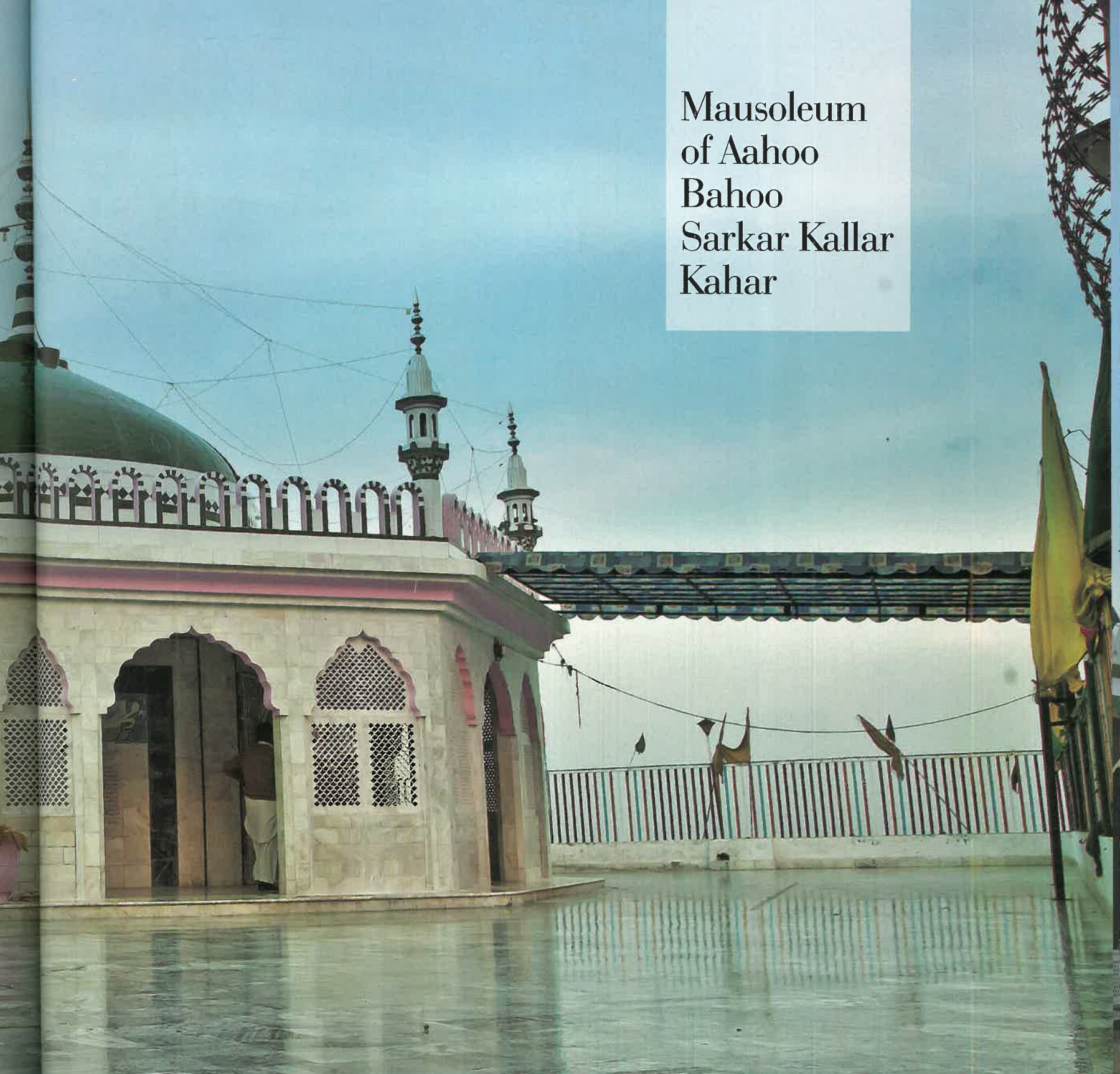
Despite early contacts with the Islamic world and being on the direct route of the marches of Muslim armies from the North and north-west towards India, district Chakwal is devoid of such magnificent buildings which are a hallmark of Muslim architecture-mosques, mausoleums, gardens etc. it is strange that despite the presence of forts like Nandana, Malot, Amb, Kafir Kot, and magnificent temples, the Muslims of the area were never stirred to outdo the Hindu architects. Non-construction of new forts by the new comers is understandable because of the pre-existing forts in the area in sufficient number were enough to cater their martial needs, but this cannot be said about the religious buildings. Even the tradition set by Babar constructing at Kallar Kahar, the ever first Mughal garden in subcontinent appears not to have been followed in this region by his successors. The only Muslim period fort is perhaps at Samarqand and the only free standing mausoleum of real antiquity is Hanjira at Thir Chak both of the 13th century. At several places we were shown a few heaps of stone identified as mosques but whose plans were difficult to recapitulate. The only historical mosque worth naming is the Shahi Mosque in Khichi believed to have been built in 1141 A.H. But there is nothing significant in its architecture. Even relatively modern mosque such as one at Nurpur Saithi and another at Qadirpur, have something more to offer in the form of carved wooden doors, painted wooden ceiling and fresco paintings on the walls.



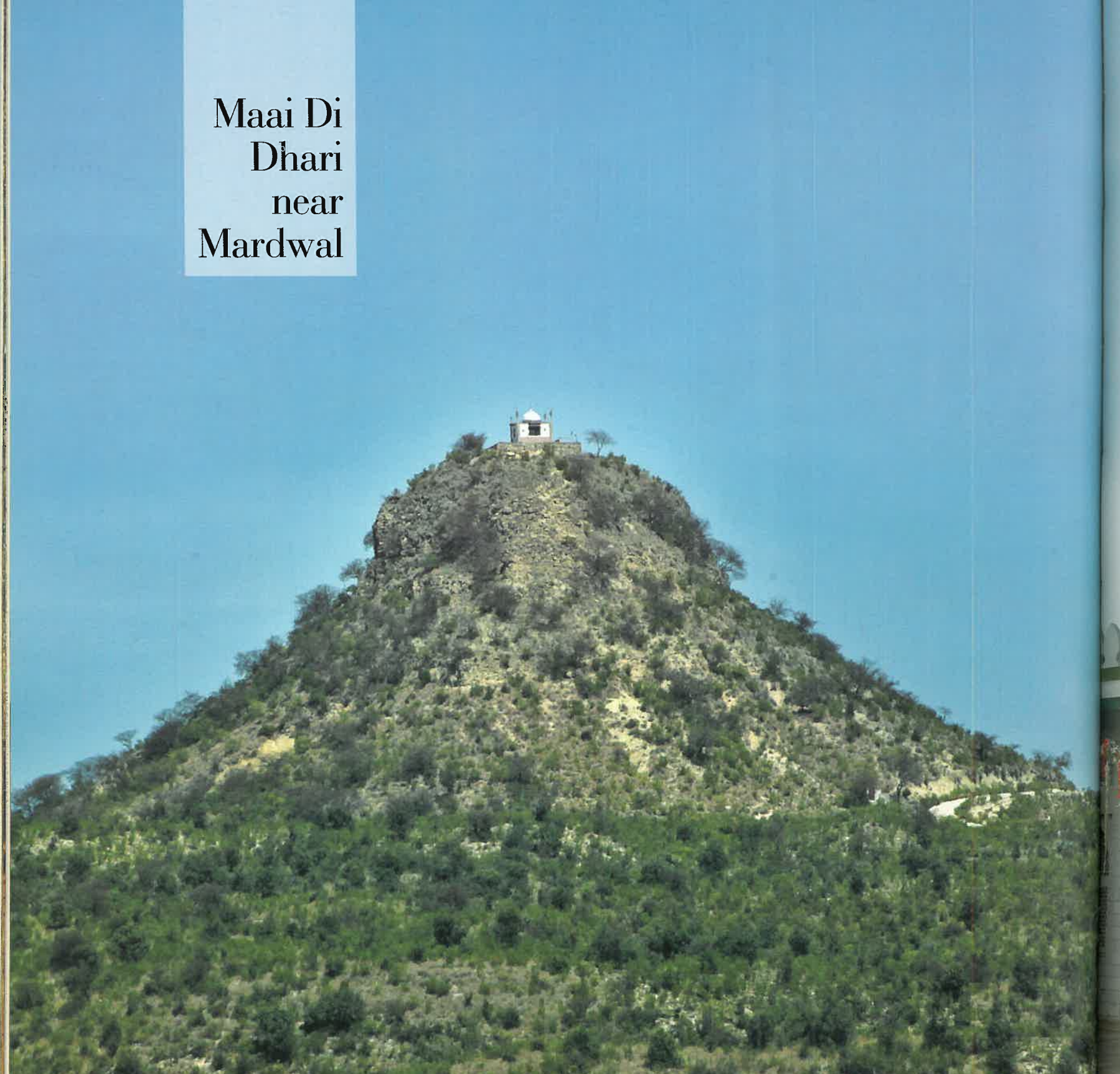
Statue of Sher Shah Suri (Rohtas Museum)


Dullai Wali Dheri

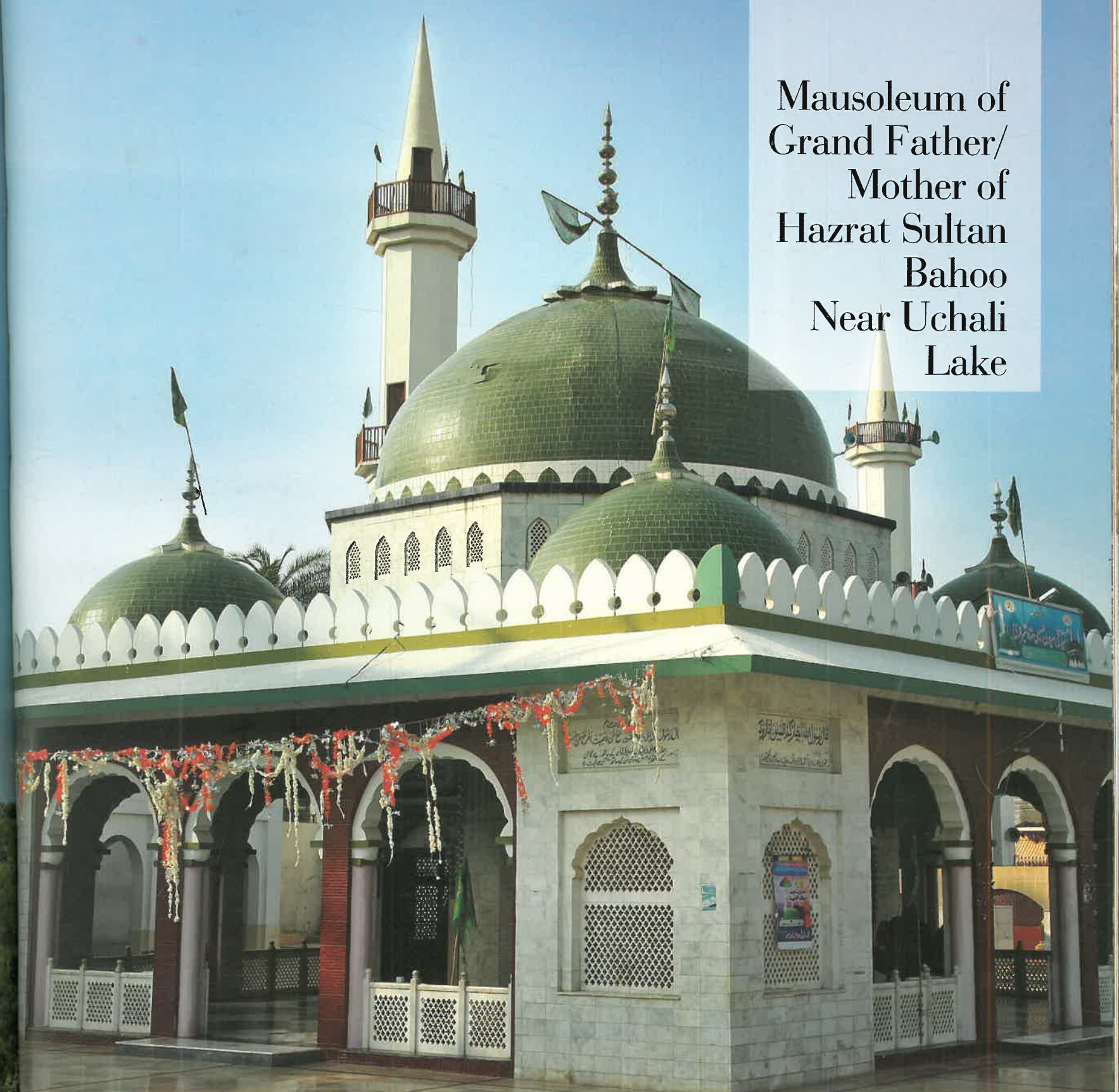

لا الہ الا اللہ محمد رسول اللہ



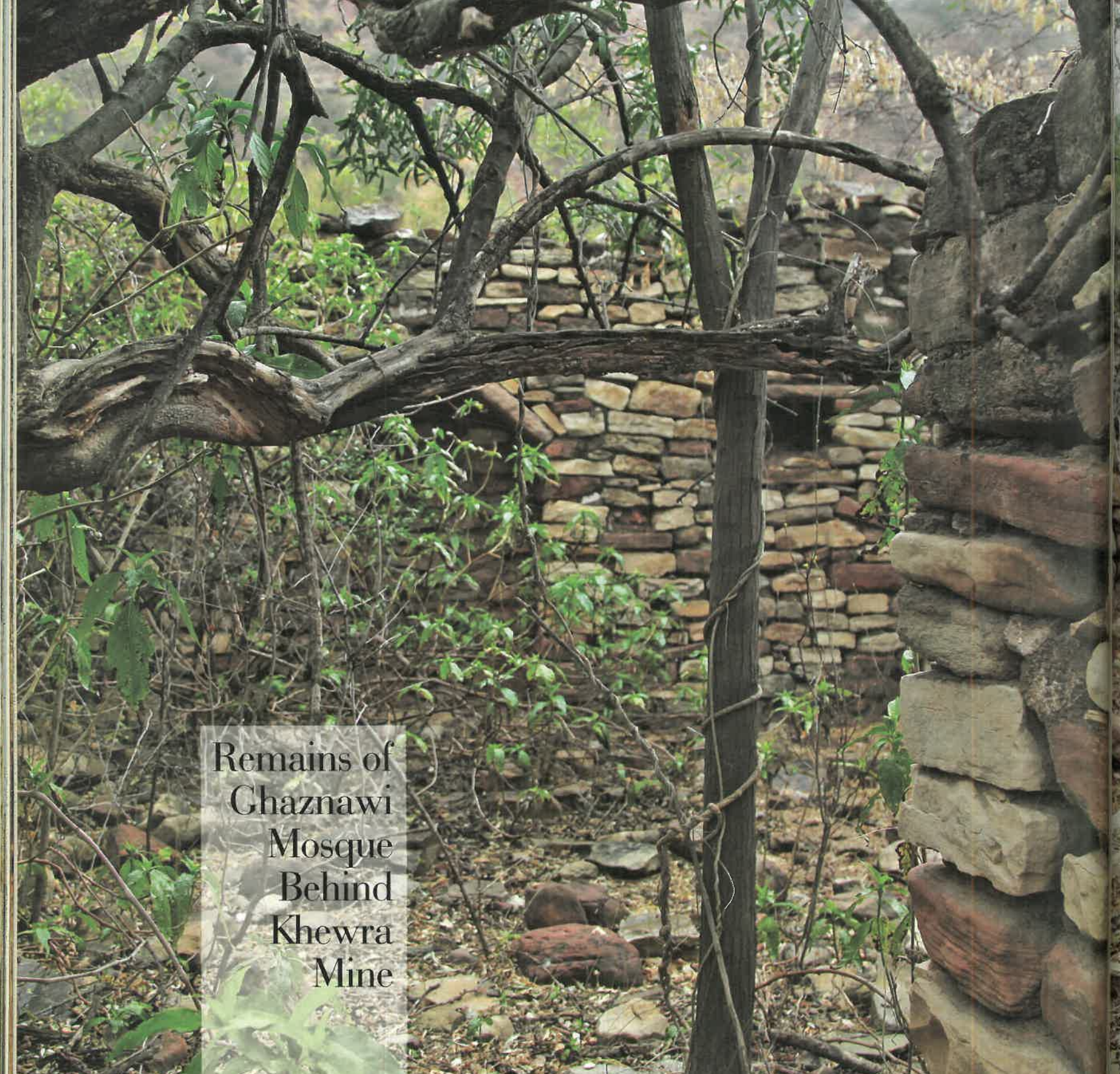
Mausoleum
of Aahoo
Bahoo
Sarkar Kallar
Kahar



Maai Di
Dhari
near
Mardwal



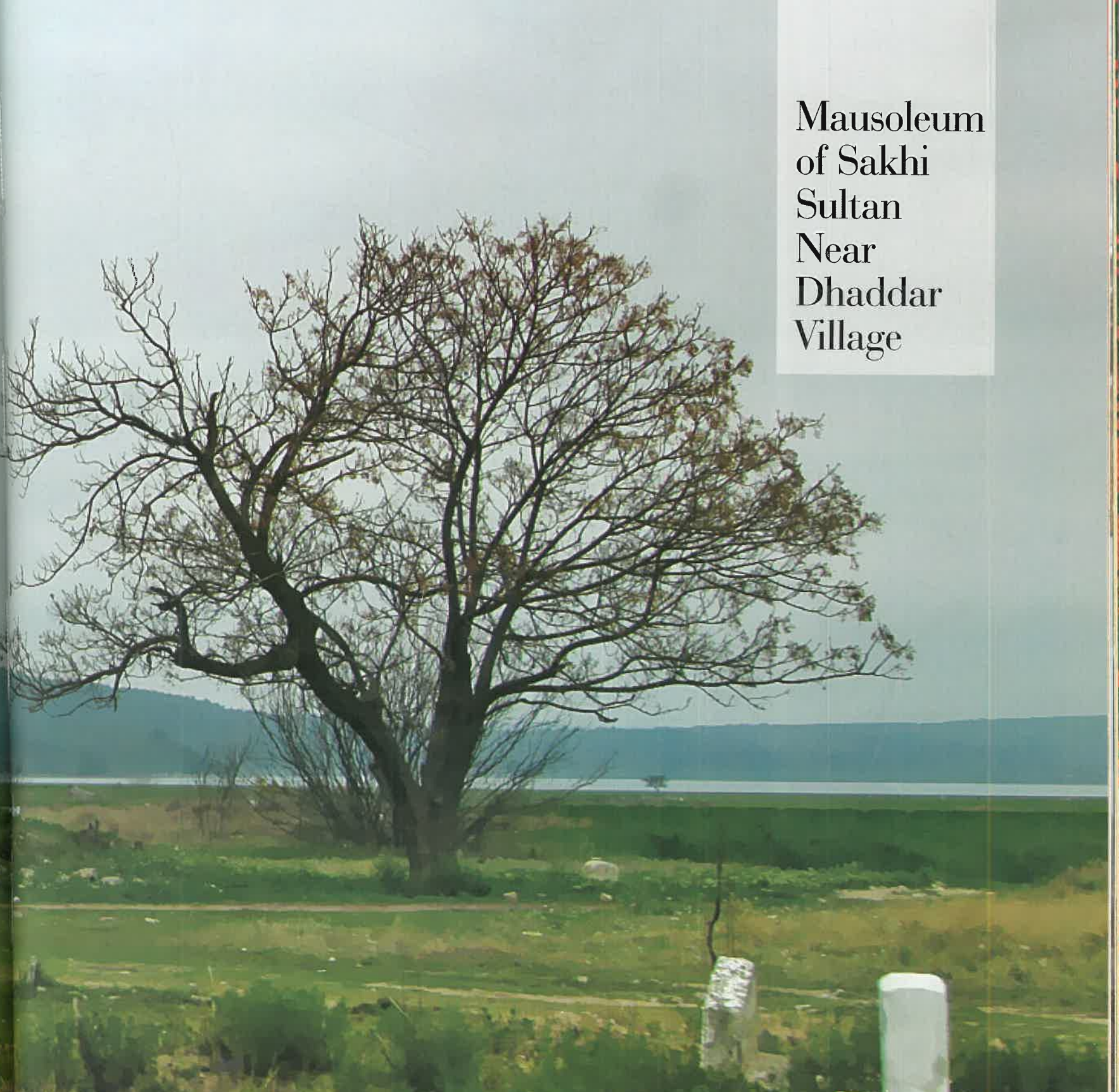
Mausoleum of Grand Father/ Mother of Hazrat Sultan Bahoo Near Uchali Lake



Remains of Ghaznawi Mosque Behind Khewra Mine







Mausoleum of Sakhi Sultan Near Dhaddar Village

Stepped – Well or Baolis

Chakwal District once possessed a number of stepped-wells or baolis which are spread over quite a wide area. The best one is the Trap Baoli on the western bank of River Soan. It is a beautiful baoli and fortunately quite well preserved. It is a large boali only next to Laosar Boali at Wah as far its depth is concerned. It was probably built during Shah Jahan's period. Another outstanding baoli is near the village of Vaula. Built in 1895 by a Hindu benefactors named Rup Lal, its architecture is unique in the sense that it has two sets of staircases- one sloping and the other vertical both reaching the water level in the well. There were originally arrangements for a Persian Wheel to draw for irrigation as well as for bathing. Besides, there was a square pavilion at the head of the sloping staircase.

The square baoli at Kallar kahar is actually a spring-well with a few steps it is attributed to Sher Shah Suri's time. Same is the case with the baoli at Qadirpur. The baoli at Anjhial is small but interesting in the sense that its staircase takes a right-angle turn before going towards water level in the well. It has no pavilion at present. A baoli near Chakwal has recently been filled up leaving behind only a well nearby and depression marking its staircase. The baoli at khichi is only now partially preserved. A 20th Century *baoli* also exists in the Main Bazar of Talagang adjacent to District Council Rest-House.

In the adjoining Soan Sakesar Valley, District Khushab, few such baolis are located. The most imposing is the one in the courtyard of the Jami Mosque at Uchhali. Its staircase has now been blocked but its deep-well and its windows for ventilation of the staircase are still preserved. There is another interesting baoli in the village of Khurra which is still the main source of water. Its staircase has two divisions, one for going down and other for coming up. Another baoli near the same village, but in opposite direction of the former has now been abandoned. It was built of rubble masonry and has its staircase with a

right-angle as seen at Ajhial in District Chakwal. A small baoli with a dated inscription also is still preserved in the Agriculture Research Farm at Kathwai.

In the vicinity of the Salt Range, there are several other well-preserved baolis. There are two baolis inside Rothas Fort and one located outside Sarai Sultan. The large size baoli at khojki is a little farther from Rothas fort but nearer the foot of Tarrakki hills. Along the eastern face of the Salt Range, the most well-known baoli is in the village of Wan Buchran, whereas, another, now filled up with exception of its two boundary minarets is at Gunjial. Both are of Sher Shah Suri's period. An early 20th century baoli is located at Hadali near Khushab. Still another baoli is reported near Bhurarrian- the site of old Bhera near Ahmadabad on the west bank of river Jhelum. This shows that a vast area on either side of the salt range was provided with a series of baolis of various sizes for the facility of travelers and nearby residents such as Baoli at Vaula, Tobar Bangalows, Kuppar Village, Baoli at Chakwal, Ajhial Baoli , Kallar Kahar Baoli & Kot Skihanwala.



Crafts and Skills of Potohar Salt range

Crafts and Skills of Potohar Salt Range

People of almost all nations and regions feel proud of their culture and craft and the influence of this nostalgia rather Topophilia makes them a claimant of the best craft / culture holder. Alike others, when we, as Pakistani, claim for the same remains nearly under the shadows of neither nostalgia nor Topophilia rather it bases on the strong footings of highly rich craft culminated after a prolonged interaction among local craftsmen and others who came here while accompanying the invaders of different nations in dozens, as being a bread basket, the Indo-Pak Subcontinent in general and particularly Punjab had always been a tempting territory for the invaders of the history known i.e. Greek, British, French, German, Portugees, Dutch nations and tribes of Middle Asia such as Mangoles, Aibaks, Ghaznavids, Mughals and other Muslims. These invaders, though causing much destruction, added a lot in the local crafts and culture. Under this non-optional rather compulsory interaction led to a craft/ cultural amalgamation with blessings in shape of new perspectives, diversifications and innovative dimensions in all fields of Arts, Crafts and Skills.

Though, whole the Pakistan, the potent formative segment of the Indus Valley civilization, is enriched with the numerous crafts in general but Punjab, being the most populous and prosperous province of the country enjoys an outstanding position among the rest. As the predominant occupation of the people of Punjab has always been Agro based so they always been in a position to spare their times after sowing the seeds in general and especially between the intervals of crops for their extra kitchen activities to satisfy their aesthetics through art, craft and festival. Such activities found highly favorable circumstances in Punjab in terms of affordability, patronage and acceptance.

While discussing the richness in arts, crafts, and other skills of Punjab, one feels not such sort of liberty to go long in salt range as a strange scarcity both in variety and quality does not allow discussing the same at large. Being a marshal belt of the Pakistan and even having the same status before partition, the inhabitants bear peculiar mind set. Softness in their language, accent and even in general behavior can hardly be traced. Joining

the forces by masses of this area is both because of arid based limited agriculture and non- availability of reasonable industrial / trade activities on one hand and mental temperament of the people, on the other hand.

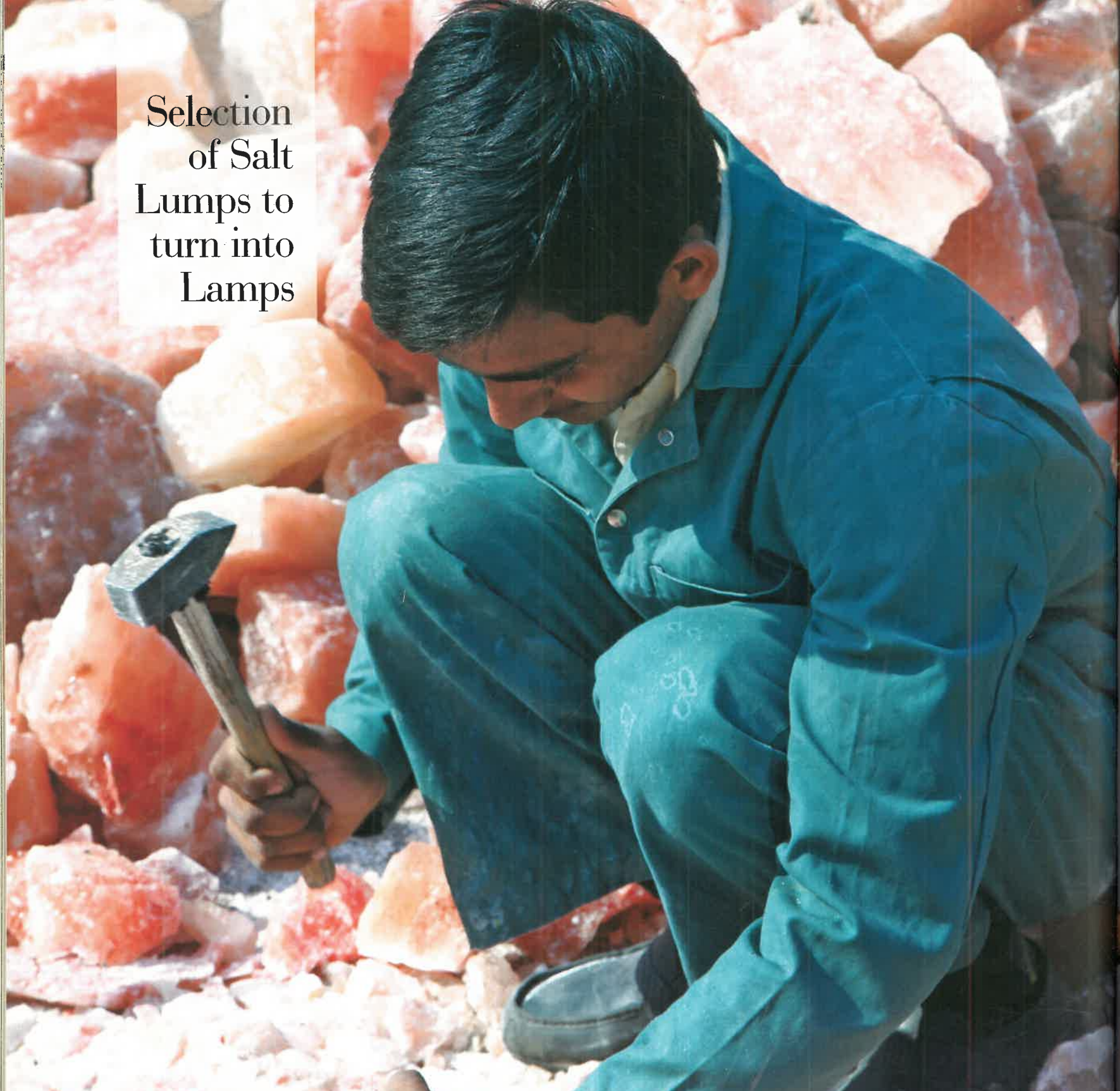
Still the aesthetic sense of the native people managed to create a great piece of art in shape of crafts. Area in the salt range that presented their skills includes Khewra, Chakwal, Kalar Kahar, Khushab, Sillanwali, Quaidabad, Kalabagh.

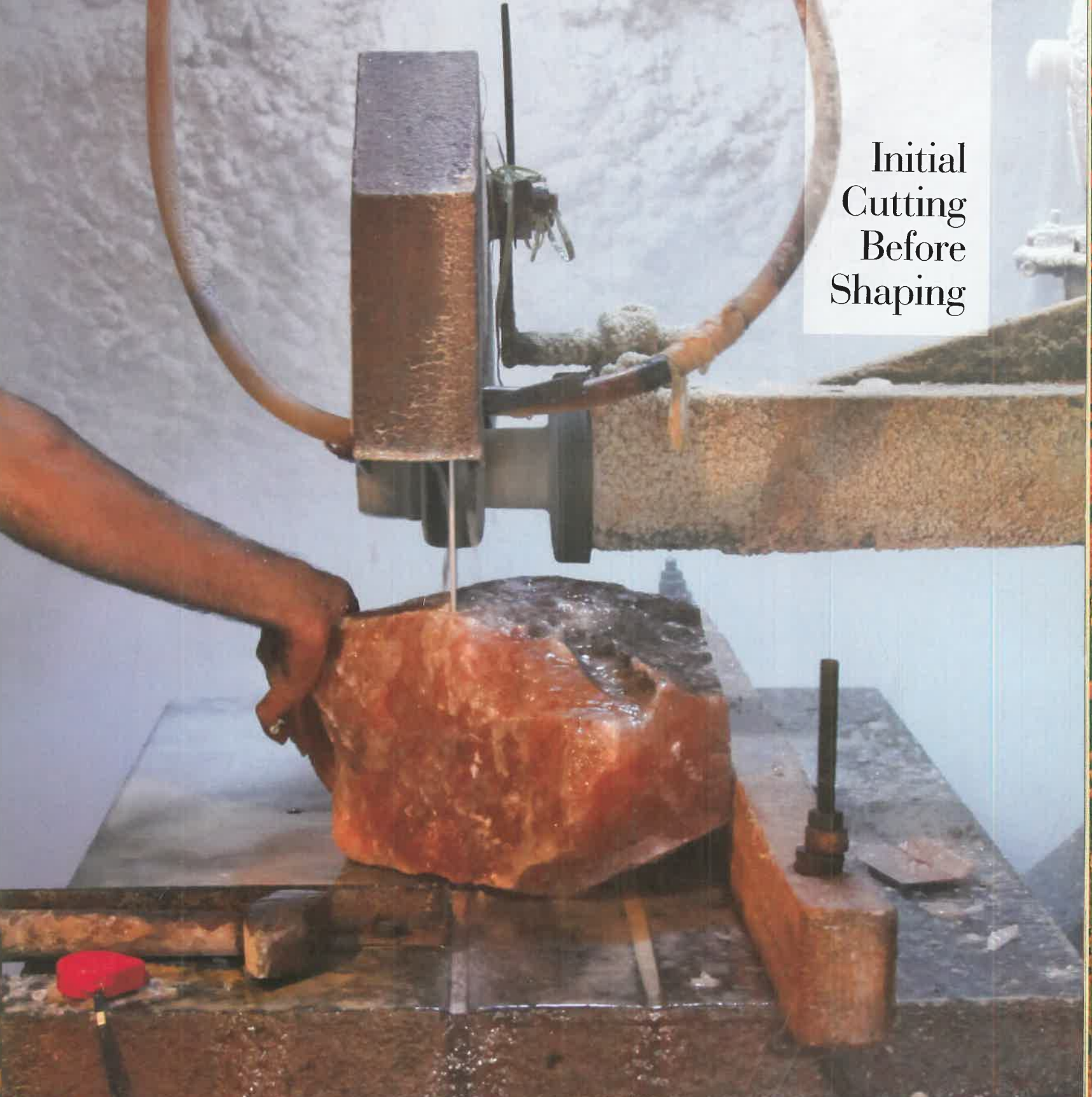
Khewra

Due to high percentage of salt in the soil less than 40% of the land of Tehsil Pind Dadan Khan is cultivatable so, majority of the inhabitants of Khewra and its surrounding villages earn their livelihood through mining and transportation of salt, coal and gypsum etc. Though a heavy industry is providing jobs to the local people in thousands mostly contractual but the company is again dependent on salt and gypsum. However, age of the craft of salt is like a baby among the other crafts of the Punjab, but 15-20 years ago industrial status has been given to the craft of salt. Due to the high quality of salt, cheap and hardworking labor and above all the latest research that has proven the positive health effects through the negative ions emission from the glowing salt lamps resulted in the great demand of salt crafts all over the world. Khewra at present is providing Salt Lamps, Candle holders/stands, Plates, Platters, Slabs, Tiles, Bricks, Blocks, Salt Soaps and many other crystal rock salt products to the tourists and customers.



Mannual Drilling for Blasting


Selection
of Salt
Lumps to
turn into
Lamps



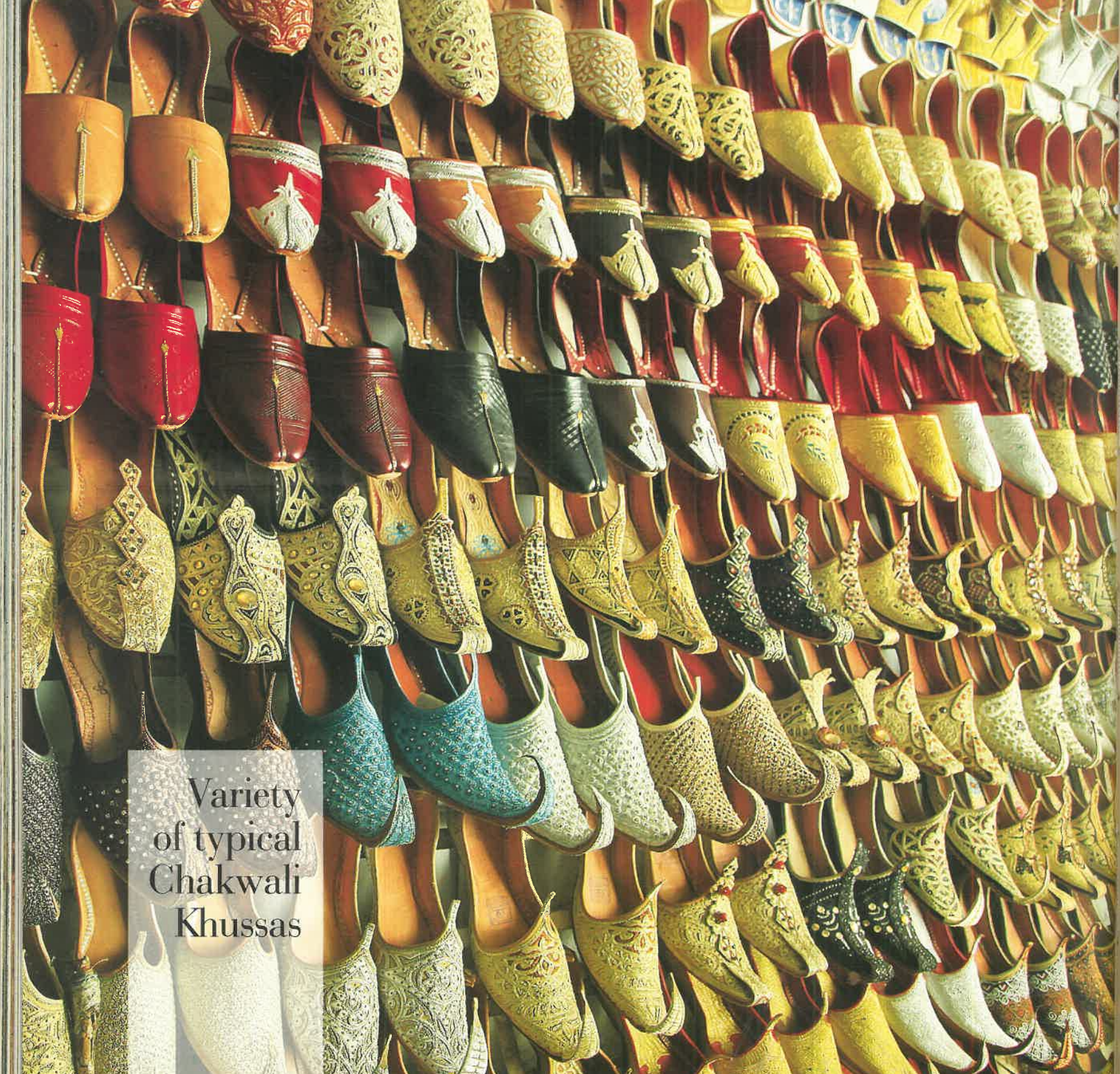
Initial Cutting Before Shaping



Drilling in Salt Lamp



Shaping



Variety of typical Chakwali Khussas

Chakwal

Chakwal is famous for many possessions but as far as craft and skill is concerned two things catch one's eyes i.e. Khussa and Rewari (specialty of chakwal; a sweet).

Khussa

Khussa is a style of South Asian handcrafted footwear produced in India and Pakistan. Khussa is made by artisans mostly using vegetable-tanned leather. The uppers are made of a single piece of leather or textile embroidered and embellished with brass nails, cowry shells, mirrors, bells and ceramic beads. Even the bonding from the upper to the sole is done by cotton thread that is not only eco-friendly but also enmeshes the leather fibers with great strength. Some product range also uses bright and ornate threads. In ancient times these were worn by multitude and royalty. As it evolved through the centuries and is being produced by individual artisans, products vary in designs and colours. It encapsules cultural diversity, local ethos and ethnicity. Chakwali khussa is basically famous for the peculiar shapes and fascinating embroidery with golden and silver thread. Jhaamra Sharif, a village located off Chakwal-Khushab



Embroidery on Khussa

road is the place that has given fame to the District Chakwal for the synthesis of Khussa. One of the notable personalities; Malik Amir Muhammad Khan Awan, Nawab of Kalabagh, Former Governor; West Pakistan (Now Pakistan) used to wear Chakwali Khussa along with "Kullah and Sherwani" even at Oxford University during his studies at a cost of prepaid fine for the whole study period for keeping his own traditional dressing instead of observing the uniform policies of Oxford University.

Chakwali Rewari or Pehelwan Rewari

Rewari is a traditional sweet which is basically made from Desi Ghee and till (sesame). Pehelwan Reweri from Chakwal is a "Soghat" (specialty) of the city for all in the winter season. Not only in Pakistan but Rewari has a demand from abroad because of its rich taste and odor of Desi Ghee.

Kallar Kahar

Kallar Kahar is a town and subdivision (Tehsil) of Chakwal District in Punjab, Pakistan. It is also capital



"Rewary" a Traditional sweet of Chakwal City

of Kallar Kahar Tehsil. Kallar Kahar is known for its peacocks, for its salt lake, and for the Takht-e-Babri, a flat stage built of stone by Emperor Babar to address his army while coming down from Kabul in the quest of the crown of Delhi. During his stay at Kallar Kahar, Babar also planted a garden, which still exists, called the Bagh-e-Safa. In his memoirs, the Tukht-e-Babri, Babar described Kallar Kahar as a "charming place with good air" and natural beauty. Kallar Kahar is also famous for



"Gulqand" a Traditional Jam of Rose / Bhaeekar Petals (Speciality of Kalar Kahar)


موراں والی سرکار کی سوغات
سابقہ متولی دربار سخی ہو باہو سرکار موروالی
نظام انہضام کی تقویت
شیخ غلام ربانی عرقیات سٹور
نزد تخت بابری روڈ کلر کہار
Extract of
Rose and
Baheekar
Flower

its liquors; like "Arq-e-Gulab, Gulkand (Flower Petal Jam), and honey (from the flowers of bhaeekar plant)". Specialty of the "Gulkand" of Kallar Kahar is; in all other parts of the world "Gulkand" is made up of Rose Petals only but in Kallar Kahar "Gulkand" is also made up of flower petals of Bhaeekar Plant. Native people of Kallar Kahar make the above mentioned products for the business and medicinal purposes.

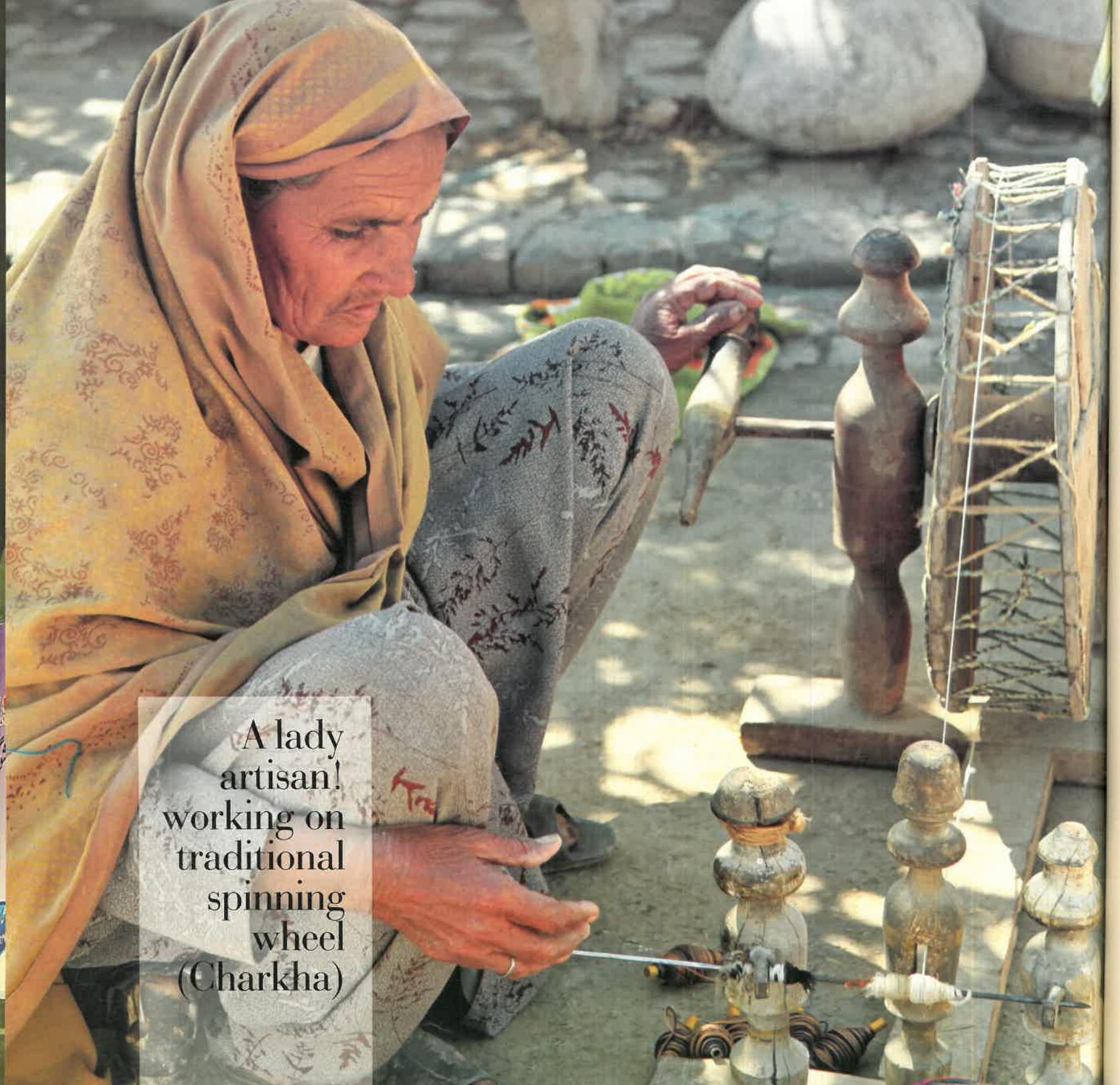
Khushab

During colonial rule Khushab town was the headquarters of the tehsil of the same name in the Shahpur District of British Punjab. The town situated on the right bank of the Jhelum River was on the route of the Sindh-Sagar branch of the North-Western Railway. During that time it had an extensive trade, exporting cotton, wool, and Ghee to Multan and Sukkur; cotton cloth to Afghanistan and the Derajat; and wheat grown in the Salt Range, which was considered particularly suitable for export, principally to Karachi. Now the district is divided into three tehsils, Khushab, Noorpur Thal, and Quaidabad and a Sub-Tehsil Naushehra, where the latter was established in March 2007. Previous to the creation of the Quaidabad tehsil, it contained a total of fifty-one



Thread Shuttles for Salara Fabrication

Union Councils. Khushab is now famous for Salt crafts (in Tehsil Quaidabad and Joharabad City), Lungi/Salara (Shawls), Khes (Majnun Khes), Truck Body, Daree, Khairi Tillawali (shoe). Renowned manufacturers of salt craft are Malik Khalid Mehmood Chan and Pir Shams-ul-Arifeen under the company name "Fahad traders and Hamdani Salts" respectively placed in Quaidabad. Khushab is also famous for its sweet "Dhoda" and



A lady artisan! working on traditional spinning wheel (Charkha)

"Pateesa." They contain instant energy and are very tasty. A famous wrestler from that district introduced it for the first time in 19th century.

Majnu Khais

Majnu Khais is usually defined as a patterned khais, prepared as a hand loom with pure cotton thread (called soot or coarse thread). This type of khais was an acclaimed textile export in the Mughal period and was very popular In England. Majnu Khais is especially popular among aristocrats and rich ones, who being very fond of this artifact having the utility too are the main patrons of Majnu Khais in Khushab and its surroundings. Majnu Khais motifs are designed in geometrical forms, whether the motifs are in the shape of a flower or a checked pattern. Usually two colors are used in combination. Favorite color schemes are red and black, red and yellow, orange and green, blue and white. The names of the designs used in such kind of khais are jhangwala, bukhari, gulzar, badami, atth kalia patter, chirri badami, deora and Chhota pinjra among others.

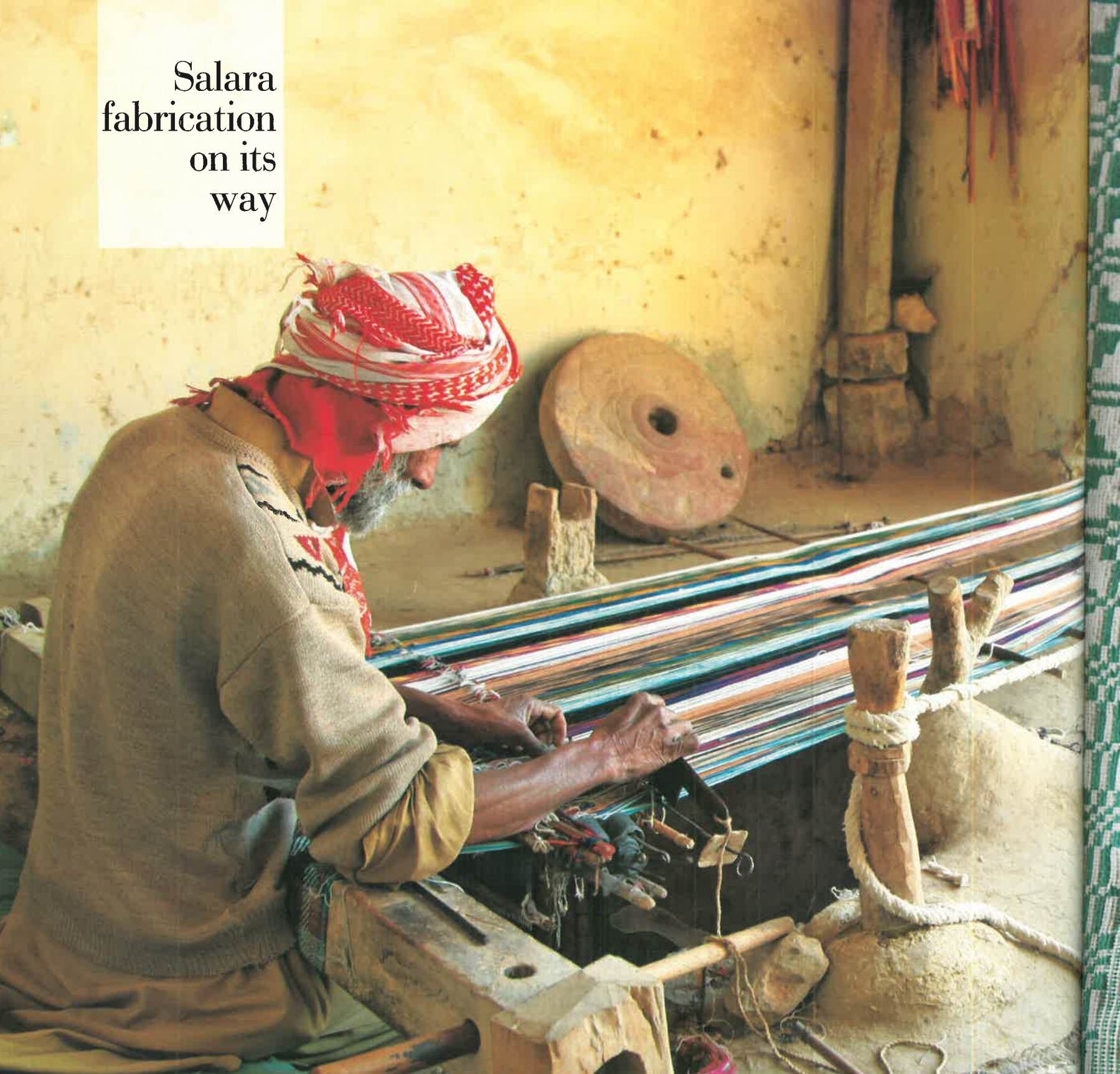
These types of khais are usually more in demand and



Cotton / Wool Shuttles for Majnu Khais

are comparatively costly. Although these designs are limited and somewhat primitive, this is an attractive craft and people still like to buy Majnu Khais for household purposes. Until a few decades ago, the dowry of the bride was judged on the number of sets of Majnu Khais she could bring with her.

Salara fabrication on its way




Majnu
Khais with
Different
Variety

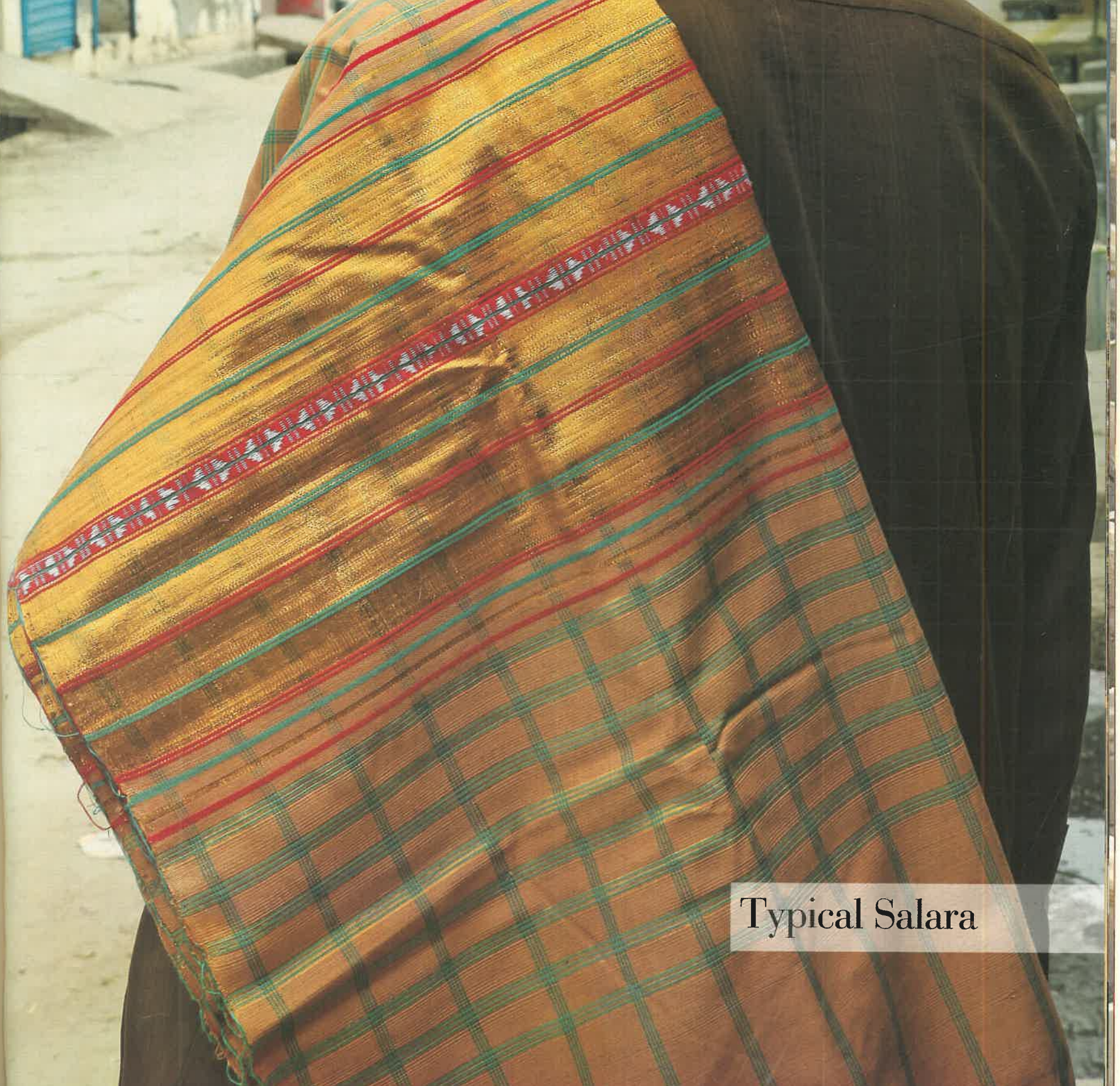
Salara

It is a woven cloth worn both by men and women in the villages of Punjab. Men usually hang it on their shoulders while women tend to use the Salara as a cover for their head and shoulders. The town of Khushab was very famous for making Salara with borders profusely woven in tilla (golden and silver synthetic thread) and generally worn on ceremonies. Yellow and red, black and red, green and black are among the most popular color schemes.

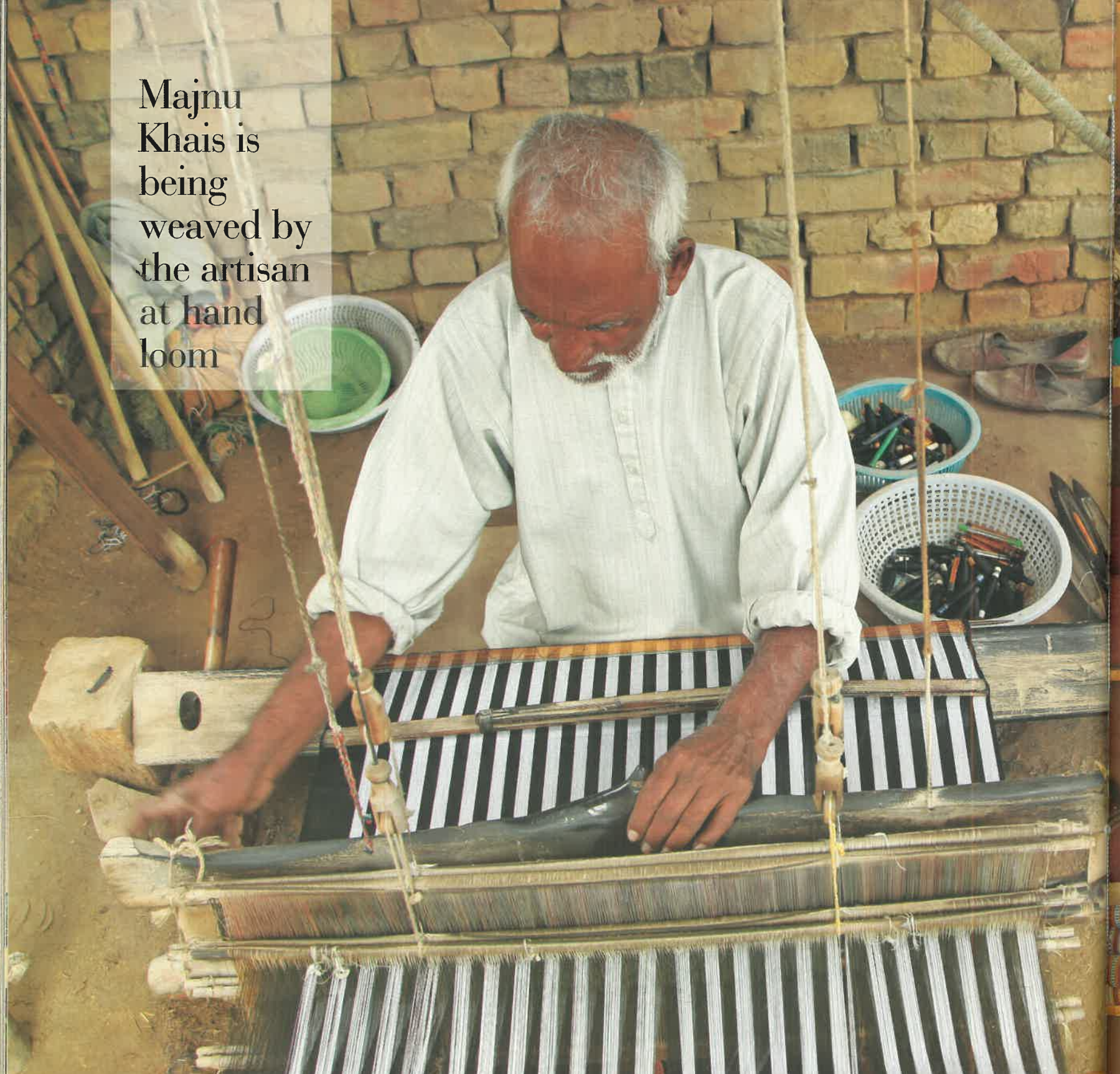
A Salara is woven on a pit loom using ordinary weaving techniques and staple yarn. For the warp, 40 threads and for the weft 30 threads are used. It takes three days to prepare tani (the warp threads), after which the crafts men can complete one Salara in a single day.



Loaded Shuttles for Salara Fabrication



Typical Salara



Majnu Khais is being weaved by the artisan at hand loom



Filled Shelves of Majnu Khais at small town Huddali (Jouharabad)

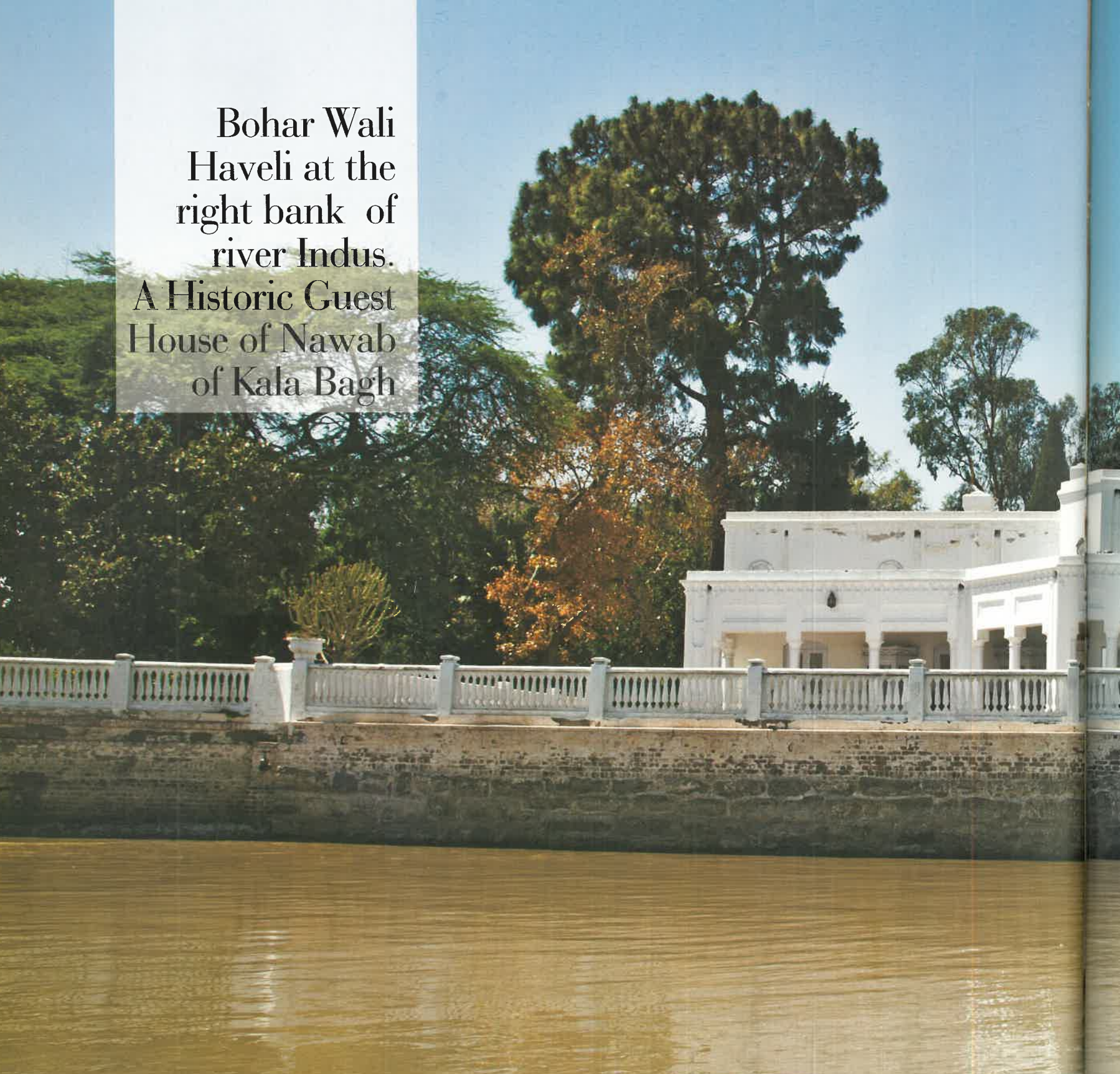

Khairies
Speciality
of Kala
Bagh

Kalabagh

Kalabagh is famous for its red hills of the salt range and scenic view of the Indus River traversing through the hills. It also produces handicrafts especially footwear (Khairi and Khussa), salt crafts and Makhadi Halwa.



Manufacturing of Khairy



Bohar Wali Haveli at the right bank of river Indus. A Historic Guest House of Nawab of Kala Bagh



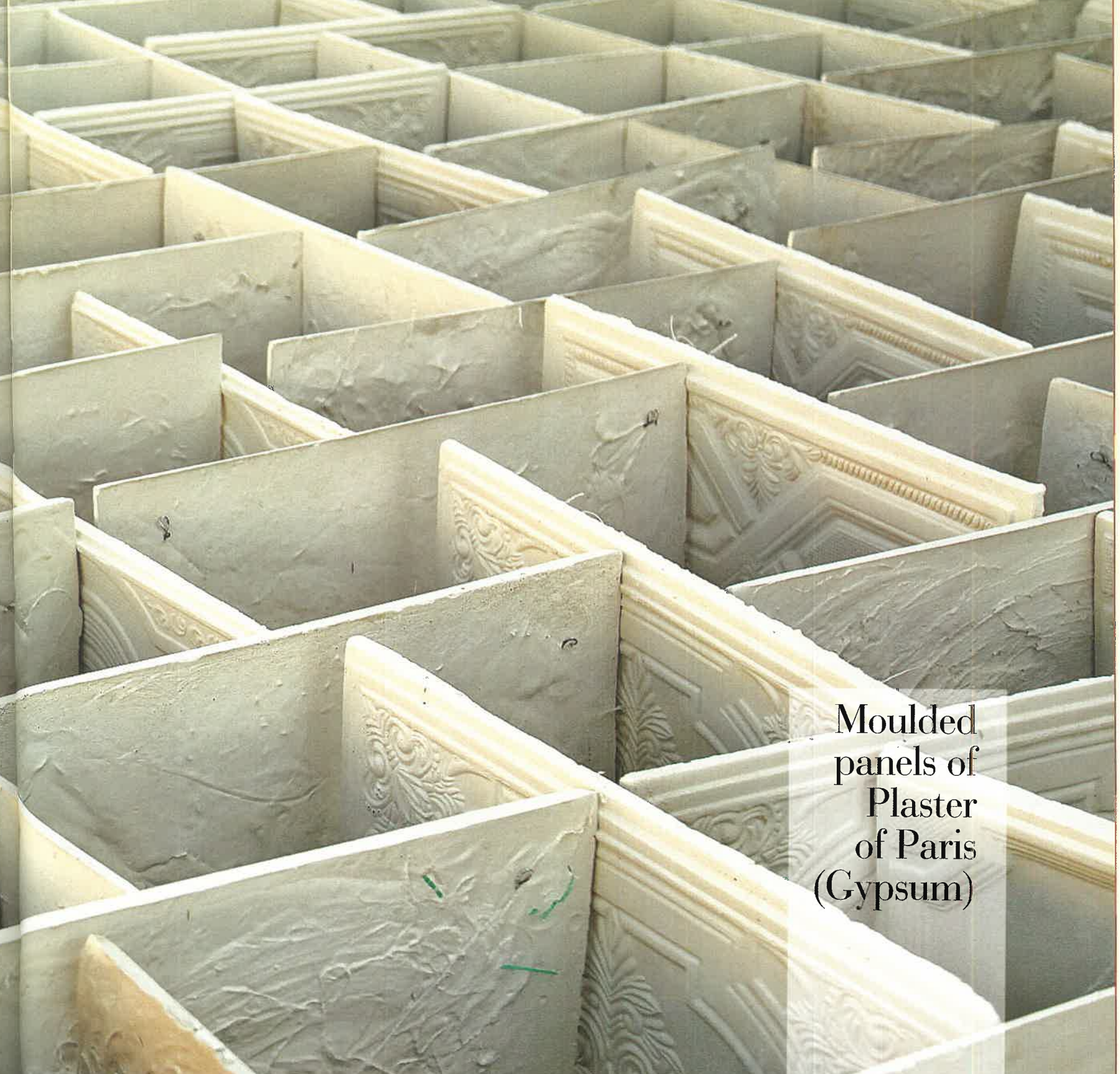


Artisan Decorating the Claypot



Pottery





Moulded panels of Plaster of Paris (Gypsum)





Salt for Health



Salt for Health

A 2009 Cochrane (Cochrane Library) outline concluded that there's meager proof to work out whether or not salt therapy in treating asthma attack is effective which a lot of analysis is needed; mainly randomized controlled trials (Beamon SP et al, 2009). Every day the miners make their long, slow journey... down 1500 meters (4921 feet) deep underground, beneath the Khewra foothills. Their mission is to bring forth one of our planet's most potent minerals... a mineral formed over many thousands of years ago when light and energy from the sun dried up the primal ocean.

Salt has really gotten a bad repute over the last few decades. It's been pegged as a culprit in hypertension (high blood pressure) and many people across the nation are on a low salt diet. Some food companies are so dedicated to producing low-salt foods that they end up making no-taste foods. Gluten-free processed dinner (like a hamburger helper mix) was tested and it was absolutely terrible until a teaspoon of salt was added in to it. Then it was excellent.

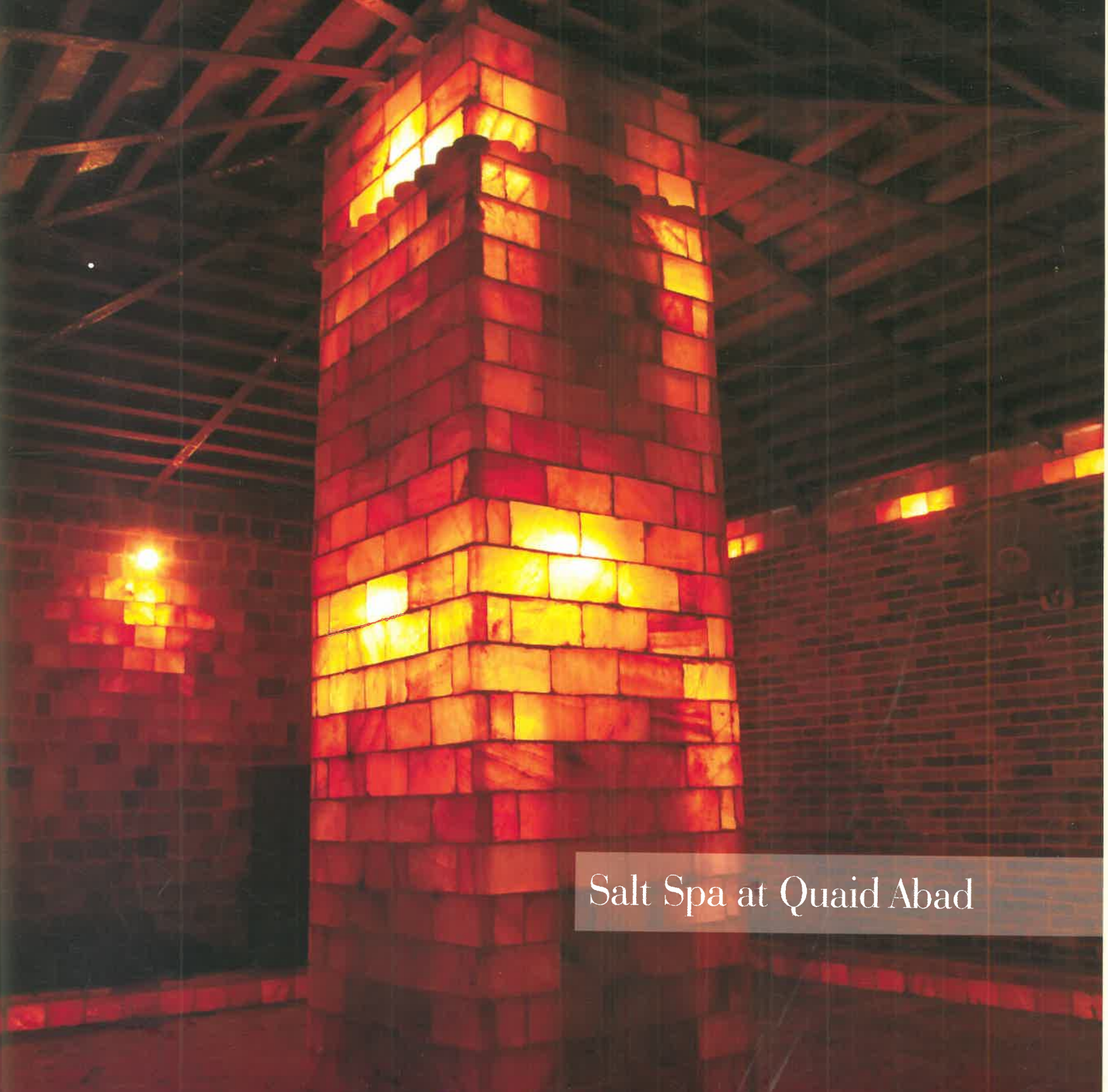
Low salt not only means low flavor, but too little salt can lead to death quicker than an adequate salt intake:

A study published in 2006 in the American Journal of Medicine tells us that "sodium intake of less than 2300 mg (the daily recommended allowance) was associated with a 37% increase in cardiovascular disease mortality and a 28% increase of all-cause mortality.

Why do we need salt?

Salt has mainly two minerals, sodium and chloride. It is found in seawater and in mineral deposits within the earth, which are from ancient seas – therefore all salt is really "sea salt" at its origins.

We all know our bodies are mostly made up of water, but do you know it's actually salt water, with a very similar composition to the ocean? That's why when someone is ill, they receive a saline, or salt-water, solution, directly into their bloodstream.



Salt Spa at Quaid Abad

Salt is actually essential to life:

Salt is necessary to retain hydration, the reason why salt is in things like Gatorade and other electrolyte drinks doctors use to treat patients suffering from dehydration, diarrhea, etc.

Salt is key to carrying babies to term, salt regulates blood sugar, important for diabetics not to have low salt intake, salt contributes to a healthy thyroid because of iodine, salt acts as an antihistamine. It's even a sleep aid; a few grains in a glass of water before bed helps us sleep more soundly, and to certain extent protects from heart attack. It's certainly important to mention that many people, processed food eating Americans in particular, get too much sodium, and the wrong kind. Salt, like many other foods, has a "real" or "whole foods" way to find it and a "fake" or "processed" version.

Types of Salts

If all salt is ultimately "sea salt," what's the big deal with the million kinds of salt one can find in a specialty store?

Some salts are different simply for their flavor or texture, intended for the gourmet cook to be able to choose the right salt for a given dish.

However, on the nutritional spectrum, there are three main categories of salt worth exploring:

Table salt

The common white salt we use in our day to day life. Table salt is only sodium and chloride, usually mined from rock salt or seawater. It then has the other naturally occurring minerals stripped from it, which are often sold to vitamin companies at a premium price.

This refining results in a bitter taste, which is one reason for the fillers, including dextrose (good old corn sugar). Anti-caking agents are also usually added, and it's sprayed with synthetic iodine to make up for the minerals taken out. Any anti-caking agent serves to prevent absorption of water, which defeats salt's purpose to help our bodies retain water. They're not good for us.

Sea salt

The label "sea salt" is a marketing campaign strategy to convince people to pay a higher price for "health food" than a helpful statement of truth. Again, since all sodium chloride ultimately came from a sea at some point, all salt is sea salt. The common white sea salt sold for 2-3x

the price of iodized table salt is refined in a similar way to table salt, removing most of the minerals in the process. White sea salt is no healthier than table salt, and is lacking the iodine that your body does need.

Unrefined sea salt

Harvested sea salt that is not refined actually has 84 different minerals in it (instead of TWO). As usual, when we take something out of a natural food product, we end up with problems (see below on high blood pressure). Unrefined salt will always be colorful, with shades of pink, brown, or grey, depending on the source. Some brands that help us make sure we are getting real, unrefined sea salt include Real Salt, Celtic Sea Salt, and Khewra Salt.

The bottom line is that real, unrefined sea salt provides a natural balance of minerals that keeps us healthy instead of making us sick.

Not everyone buys into "healthy salt." Here's an alternative view from Mayo Clinic: "Sea salt is produced through evaporation of seawater, usually with little processing, which leaves behind some trace minerals and elements depending on its water source. These insignificant amounts of minerals add flavor and color to sea salt, which also comes in a variety of coarseness levels."

Significance of Iodine

Iodine began to be added to salt simply because people were having goiter problems due to iodine deficiencies, and salt was the one thing iodine could be "stuck" that everyone would use. Real, unrefined sea salt is a natural source of iodine, but we likely don't get all that we need if we consume unrefined salt. Iodine is also found naturally in many other foods, like eggs, seaweed, yogurt, strawberries and mozzarella cheese. As usual, we're not locked into getting a nutrient from just one food source in nature. Here's a pretty fun to read article on iodine and Real Salt.

Does Salt Increase Blood Pressure?

Many people struggle with high blood pressure and talk constantly about how they have to watch their salt intake. Unfortunately, they focus mostly on the salt shaker and not on all the hidden sodium content certainly in the

restaurant food they rely on after a hard day's work. They also don't know anything about the different kinds of salt.

Folks with high blood pressure are often told to lay off the salt, and for good reason. A lower sodium diet – when people go from table salt and processed foods to less salt – does reduce blood pressure.

The risk of high blood pressure is actually a cardiovascular incident like heart disease or a heart attack, and lower-sodium diets were actually shown in at least six studies in the last 10-20 years to increase the risk of heart attack and/or have no positive impact on overall cardiovascular health.

A study in American Journal of Clinical Nutrition from 2000 debunks the myth that high sodium intake causes high blood pressure. They found that blood pressure is affected by a balance of nutrients with sodium, including calcium and phosphorus. The conclusion: "Thus, it is adequate consumption of all essential nutrients rather than modification of any single nutrient that should be the focus of population-wide dietary recommendations for blood pressure reduction."

Simply using real, unrefined sea salt as your body craves it can improve your health and certainly doesn't sound like it will increase your blood pressure.

Working of Salt Lamps

Call them new age, old age, or anything in-between, fact is, Khewra Salt Lamps are just the latest, albeit most exotic, forms of negative ion delivery systems. There's scientific evidence floating about the holistic health community that claims a lamp or two installed in one's home can offer amazing health benefits, particularly if you suffer from a variety of bronchial and sinus conditions. Imagine standing atop a mountain and breathing rarified air. Exposing oneself to a Khewra Salt Lamp is regularly compared to this type of experience. If you need more energy and less congestion in your life, converts are convinced that you're just one Khewra Salt Lamp away from Hunza, so try it out if you can't afford the visit to Hunza Valley.

History of Salt Therapy

Generations ago, people regularly turned to salt water, mineral water and salt mines to seek remedies for chronic congestion problems. Distances were often prohibitive, particularly for folks suffering a variety of illnesses - so

clinics were established in towns around the globe to deliver salt-based remedies to sufferers. The name given to this type of rehabilitation was "Speleotherapy". Salt has been used over so many centuries to dry bronchial tubes and rid sinus cavities of bacteria and microbes; it's a natural evolution to the Khewra Salt Lamp which uses a low-voltage light bulb and/or candlewick to disburse negative ions emanating from the salt crystals.

Therapeutic properties of the salt lamps

Hyped as the most pollutant free form of salt on the earth, Khewra salt contains over 84 minerals and trace elements. Found at locations so high there's not a trace of pollution or environmentally compromised material in the air, Khewra salt is light years away from the chemically-altered salt reduced to a sodium and chloride mix most commonly found on grocery shelves and rarely flaunted as being beneficial to the human body. Khewra salt, some proclaim, approximates primal oceanic elements our bodies were exposed to during the earliest stages of man's evolution, which is why it claims to have so many healing properties when negative ions are disbursed from its crystals. To add to its mystique, authentic salt crystals come from the deepest mines on earth located under the foothills of the Khewra Mountain range. Crystals are hand-harvested from mineral deposits on salt cave floors that have been dated by geologists to the Precambrian Age.

Rejuvenation Benefits

Since the beginning of recorded history, the beneficial properties of salt have been well known and documented. Early civilizations greatly valued salt, and used it as a trading currency as well as a preservative for food. And generations ago, people regularly turned to salt water and salt mines for many reasons. For years, many European countries have used salt mines and hot salt springs to promote a sense of rejuvenation. People rest and rejuvenate in salt mines and caves (in spa-like ambiance in many cases), for periods of time to help aid their mood and overall sense of calm. This type of rejuvenation in salt mines and caves is common. People travel from all over the world to visit salt mines like the ones found in the Himalayas, Austria, and Germany. In Germany, the hot salt springs are so revered, companies often send overworked employees there to rejuvenate. Why are the salt mines so beneficial? Quite simply... the very dry, negative ion environment of a salt mine is the factor. Well... even if we are not able to travel to Asia

or Europe to take advantage of salt mines, we can still take advantage of these negative ions to help improve the air you breathe. The solution involves pure Khewra's and Kalabagh's crystal salt; the same type of salt Khewra miners go deep into the earth to uncover. Before we discover more about this unique and very decorative solution, let's mine deeper into...

The impact of Negative Ions on the air we breathe

Ever breathe and experience the air around a thunderous waterfall... on a serene mountain top... at pulsating seashore or after a wild thunderstorm? Remember how refreshing it is! Well, what we experienced was likely the result of negative ions. See, the forces of nature through phenomena like rainstorms, waterfalls, lightning, sunlight, ocean waves, and wind, create negative ions. Prior to a thunderstorm, we can feel the buildup of tension in the air -- the positive ions in the air are reaching their peak. Once the storm hits, the air produces electrical charges in the atmosphere and rain falls. The resulting oxygen-rich air bursts with negative ions. And once the storm passes, we can feel the sensation of calm and clarity in the air. The rush of negative ions helps neutralize and balance the positive ions. Many published articles and scientific studies report how negative ions in the air can have positive effects. One demonstration of that is how they potentially increase the growth rate of certain plants.

In most of these studies, sophisticated negative ion generators were used in controlled group environments -- not something you can readily recreate in your own home. But the studies certainly give you a sense of the power of negative ions and their potential for cleansing the air you breathe. As I suggested above, there is something we can do on a smaller scale using crystal salt to release negative ions into our own indoor air.

It's obviously very important for our health to breathe clean fresh air -- free from pollution, pollen, and dust. And some of our highest exposure to polluted air is within an area directly under our control... your home. According to the U.S. Environmental Protection Agency (EPA), on average we spend 69.54% of our time indoors at home. When we add indoor workplace time into the mix, we could spend over 90% of your time indoors... with some estimates even as high as 96.89%. So, with all this time spent indoors, common sense dictates that we should safeguard the air we breathe.

Here's a simple 11-point checklist that goes a long ways toward helping us improve the air we breathe in our own home or workplace

1. Bring in some nature -- First step for us is to bring in some plants. Plants help contribute to our improved air quality by removing certain chemicals in the air.

2. Don't allow smoking inside -- Seems pretty obvious, but second-hand smoke can create serious health issues for everyone in home.

3. Circulate refreshing air -- This could not always easily be done in extreme hot or cold climates. A simple solution is to open up windows on opposite walls for cross ventilation for a few minutes a day can provide us with a dramatic reduction in indoor air pollution.

4. Take off your shoes -- Bringing in dirt, dust, and other pollutants from outside could have its impact on the quality of our indoor air. It's best to remove our shoes before entering home.

5. Regularly clean and replace furnace and air filters -- This is an area that typically gets neglected. However, it's a critical item to address, because it can have a profound negative impact on our air quality.

6. Use of clean ventilating fans -- Plus, make sure these fans vent to the outside and run them accordingly whenever the need arises.

7. Avoid using toxic cleaning products -- Scrutinize cleaning product labels. If we search long enough, we will find non-toxic alternatives to common cleansers.

8. Vacuum and dust regularly – We need not skimp on our vacuum. We might want to try a bag-less filter model that doesn't blow fine dirt and dust back into your air.

9. Store toxic solutions and chemicals outside – If we check the back of our storage areas and underneath our sink we may be shocked what we will find that should not be kept indoors.

10. Manage your pets -- Things like shedding hair and cat litter can add to our indoor air pollution. Anything we can do outdoors will only help improve we air quality.

11. Consider using an air purifier -- A quality air purifier can help remove indoor pollutants from the air you breathe. This device though a bit expensive, but can be considered as a good investment.

But there's more than just indoor air pollution from chemicals, pet dander, dust, and smoke... There's another form of indoor air pollution I've not talked about that we should be aware of and this is where crystal salt could really help improve the quality of our air.

Due to the electronic age, most of us live and work in environments dominated by electronics -- giant HD televisions, computer monitors, cell phones, PDAs, etc. While actively using these electronic devices, invisible electromagnetic frequency waves bombard your body. Terms used to define this type of air pollution include "electro-smog" and "electronic air pollution." Whatever we call it, this is serious invisible pollution of our air. While watching television or working on our computer, our body could be exposed to frequency vibrations 20 times higher and faster than your own brainwaves. Frequency vibrations our body simply isn't used to. Excessive amounts of positively charged ions like this can potentially cause…

- Increased nervousness...
- Added bodily stress...
- Annoying sleep interruptions...
- Lapses in concentration...
- Increased free radical accumulation in our body

There are many ways to counteract these impacts to our body... like making sure we take plenty of breaks when using electronic equipment... and getting away from the device to grab some fresh air, even if for a brief period of time. Something else we can do to help offset excessive frequency vibrations while actually using an electronic device is to use beautiful decorative lamps, called crystal salt lamps. These lamps can help counteract the electronic vibrations and excessive positive ions in selective areas of our home.

The basic premise behind a salt lamp is to help cleanse indoor air and provide an attractive soothing light in our home. Using some of the most diverse measuring methodologies available, worldwide scientific tests have shown how crystal salt lamps can increase the number of negative ions released into indoor air. So, how do salt lamps actually work? It's really quite simple... a heated crystal salt lamp...

- Attracts humidity causing the surface of the salt crystal to become moist
- Creates a buildup of ions and removes moisture from your air
- Binds excessive positive ions with their negative ions
- Helps to neutralize the "electro-smog" in air and reduces allergens and irritants
- Creates potential soothing effects of multi-colored salt crystals

From a more scientific standpoint, three natural action principles are at work with crystal salt lamps:

- Ionization -- The emission of ions is primarily caused by the alternating actions of the heated salt's ability to first attract and absorb water, and then evaporate it. The salt goes into a solution as it mixes with the water molecules. Sodium, as positively charged ions, and chloride, as negatively charged ions, become neutral and are released into your environment -- which helps reduce pollutants such as allergens and irritants from air.
- Electromagnetic oscillation -- Every form of life on the planet depends on the electromagnetic field of vibration (known as the Schuman resonance frequency). Due to electronics and industrialization, our body receives artificial electromagnetic wavelengths with many diverse frequency values. Because of the neutral atomic structure of crystal salt, a heated salt lamp helps you harmonize and balance these artificial frequencies, and neutralize "electro-smog".
- Transparent-crystalline structure developing the light waves -- It's well-known that you need the light waves of the rainbow spectrum (300-700 nanometers) for your health and preservation of body. Our cells are supplied by light with new energy in the form of electromagnetic wavelengths. The wavelengths of salt crystal colors fall within the upper nanometer zone (600-700 nanometers) -- producing positive and soothing effects.

One of the biggest challenges with crystal salt lamps is their limited range. You can't simply place a single crystal salt lamp just anywhere in your home and expect to promote improved air quality throughout your entire house... it doesn't work that way. But you can place a few lamps in selected areas where you spend the most time... family room... home office... bedroom, etc. By doing this you accomplish the following...

- Maximize the benefits from negative ions where we spend the most time

- Help neutralize the impacts of "electro-smog" from television and computers in specific areas where they're located
- Enhance the beauty and serenity of selective rooms with the strikingly attractive colorful lamps

There's nothing quite like the soft, incandescent flicker of a candle. Whether we delight in dining by candlelight or savor their soothing, warm glow while working on reading, candles have long graced just about every room in homes. Now we can enjoy yet another benefit – specifically from a very special type of candle holder. Just like the lamps I've discussed above, that salt crystal candle holders help to counteract the dangers of "electro-smog" in living environment. When lit, they impart negative ions, helping to cleanse the air you breathe. And their beautiful rich hues of pinks and oranges bring feelings of soothing comfort and support, positively enhancing our mood. Salt crystal candle holders come in two sizes: single candle or three-candle size. Simply drop one or three tea light candles (depending on the candle holder) into salt crystal candle holder and the warmth from the candle reacts with the natural crystal salt, releasing negative ions into the air. The longer the candle burns in the salt crystal holder, the more plentiful the emission of negative ions. It helps clear the air and dilute odors naturally.

The right placement of Salt Lamp for maximum benefits Place a Salt Lamp in your bedroom to help clear sinuses during the night when the body's defense system is most relaxed and receptive and to help intensify sleep experience. Install one in the room in which we relax -- family room, living room, and den-to freshen the air and make family time, reading and hobbies more pleasurable. Enjoy reduced fatigue--especially during that 3 p.m. slump--by putting a Salt Lamp to work in home or office. We will not only feel transformation of, but it will reduce the amount of electro-magnetic pollution office equipment. A lamp kept nearby when studying can increase our powers of concentration. Meditation practitioners extol the virtues of the Salt Lamp when used in conjunction with yoga, deep breathing and other meditative efforts. Allergy sufferers are said to benefit greatly from exposure to this clean, naturally-ionized air.

Salt mines and caves

These natural deposits of mineral halite are derived from evaporated ancient lakes and seas. The unrefined rock salt, primarily sodium chloride, also includes varying concentrations of other mineral salts such as calcium and magnesium, manganese and sulfates which have additional therapeutic properties, depending on the source.

The special characteristics of the micro-climate of a salt mine include stable air temperature, humidity and lack of airborne pollutants such as pollens, and are unique to each mine. At depth the air pressure is also significantly higher than above ground which has been found to benefit sufferers of respiratory diseases in studies conducted at the Dead Sea which is below sea level.

There are records of improvements in the breathing of miners in Roman and medieval times. Dr Feliks Boczkowski — a physician at the Polish salt mine at Wieliczka — wrote in 1843 that the miners there did not suffer from lung diseases and his successor set up a spa based upon these observations. Modern use of this therapy started in Germany when Dr. Karl Hermann Spannagel noticed improvement in the health of his patients after they hid in the Kluterthöhle karst cave to escape heavy bombing (Josef Cáp et al, 2007). It is now practised in places such as Bystrianska in Slovakia, (Robert Valjent, 2007) Wieliczka in Poland, (MM Skulimowski,1968) Solotvyno in Ukraine (Helen Fawkes, 2006) and many other East European countries (Iuri Simionca et al. 2012).

Salt spa/Asthma cure centre in the Khewra mines has been established at the governmental level to cure the asthmatic patients. Patients are asked to pass 100 hours in the salt mine assisted with electrification; 100 hours are divided in to many intervals i.e. 8 hours a day. After the therapy 75% of the patients are cured 100%; the rest of 25% are examined for another span of 100 hours. Another 75% among the rest 25% are completely cured and the rest of the patients lose the chronic stage of their asthma.

Conclusion

Since one's objective is to be exposed to as several negative ions as attainable being emitted from his/her Salt lamp, it bears repeating: opt for one with the biggest quantity of exposed salt surface and choose a color by the foremost intensity within the hue. In addition, place the lamp as near the person in would like of the therapeutic effects as attainable, as a result of even an oversized lamp can solely completely impact the air of individuals in shut proximity to that -- maybe a couple of feet at the most. Like all various health treatments, apply due diligence after you search as a result of many of us are becoming on the Salt Lamp bandwagon and not all of them are constructing these with the protection of the user in mind.



PSIC Contribution in Salt Crafts Development

PSIC initiated a scheme "Salt Crafts Khewra" for design, value addition and product development of salt range crafts - aiming to explore the possibilities of innovation in rock salt products, as the Salt Handicrafts of Khewra, QuaidAbad, and Kalabagh region is peculiar in nature and possesses great potential for growth. A limited talent exists for the production of Rock Salt crafted items as compared to the market available for sale. The articles produced in Rock Salt are lamps, sculptures and decorative items that have an aesthetic appeal that fascinates the visitors, tourists, & foreigners.

This endeavor is helping the artisans of the area to develop and enhance their skill and improve the quality of their products viz-a-viz design development, craftsmanship and therefore in turn the demand of Rock stone crafts is rising and the artisans are being benefited.

Project Team strived hard for the provision of concrete support to the cluster's associates, i.e. getting them participated in various exhibitions / fairs and providing them advisory services regarding innovative designs and establishment of market linkages leading them to access international market through commercial counselors, foreign consulates, via social media marketing ie renowned web portals and facebook page enabling them to cope with international rivalry by providing 'them valuable assistance in refined packaging, branding, labeling the salt products 150 innovative designs have been developed. 135 Salt Crafts Manufacturers / Exporters, 90 Households Business Holders along with 300 Artisans have been registered.

Now, Rock Salt is being utilized in multi-dimensional applications, such as Rock Salt Allergy Centre, Salt Spa, Salt Bricks for Households and office decor. Campaign



through Road Shows was launched in prominent points and places of the city. Various Health Care Centers, Hospitals (Public & Private) and Health Clubs were got approached to make them aware of the health effects of the salt lamps and salt spas. Salt Crafts are exclusively handcrafted from 100% natural salt and are kept close to its natural state. It's rich texture and warm glow has a soothing effect on the body. These lamps are highly suitable for daily use anywhere one wants to preserve natural air quality as they purify the air in a natural way.

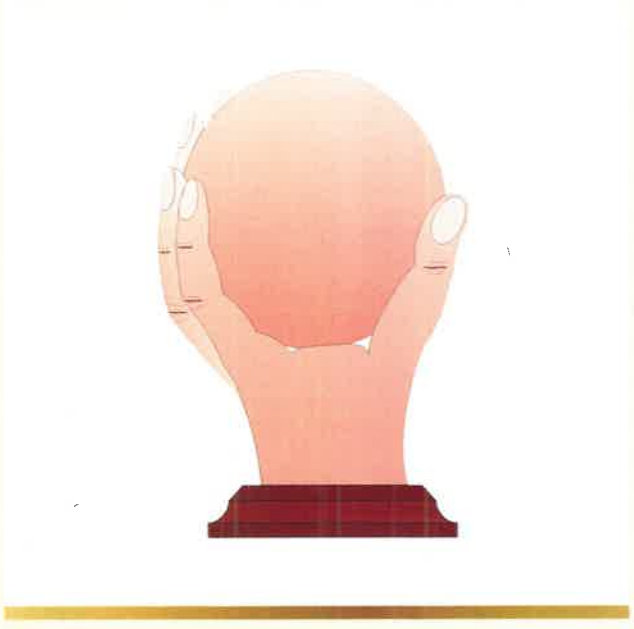
Through this Scheme, PSIC Besides Prementioned Intervensions and Publications Remained Successful in Preparation of 150 new and Innovative Designs and More than 100 Prototypes and the Same Were Exhibited in the Following Fairs and Exhibitions.

- IPO Exhibition, Islamabad
- Lahore Shopping Festival, Expo Lahore
- Iran Fair-2012, Expo Centre, Lahore
- SME Financial Expo, Lahore.
- Architects & Builders Exhibition'2012.
- Parliament Pre-Budget Session's Activity, Islamabad.
- Eid Youth & Family Festival'2012 Bhurban
- Health Care Expo'2012 which was held on 3-4 October 2012.
- Nankana Sahib. Janamdin Festival Exhibition
- SME Conference / Seminar on IPR, organized by Industry Department, Punjab, SMEDA and PSIC.
- Sarir-e-Khama Exhibition at University of the Punjab, College of Arts & Design, Lower Mall, Lahore. (10th – 12th December, 2012).
- Dawn Life Style Exhibition at Expo Centre, Lahore (5th- 6th January-2013)

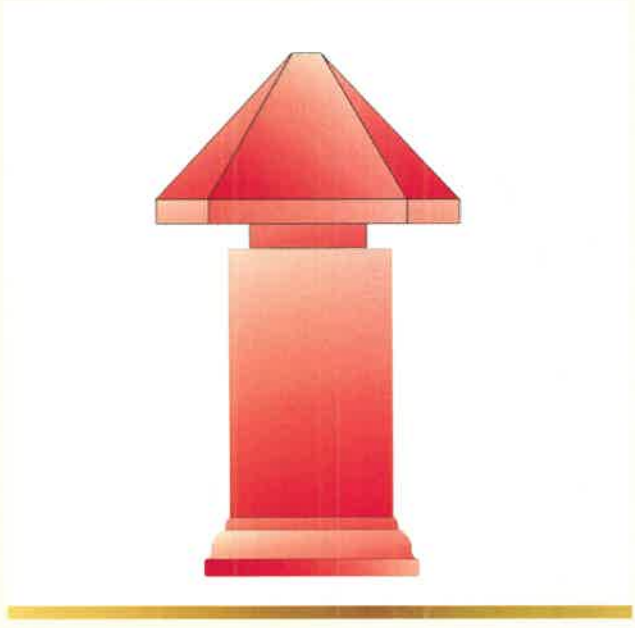


- Dawn Life Style Exhibition at Jinnah Convention Centre, Islamabad (09th -10th February 2013)
- Saarc Exhibition, Islamabad
- Education Expo, Lahore 14-18 February' 2013
- Rang-e-Lahore, Gillani Park, Lahore
- Kamal-i-Fun
- Punjab University









Innovative Product Development









Innovative Product Development



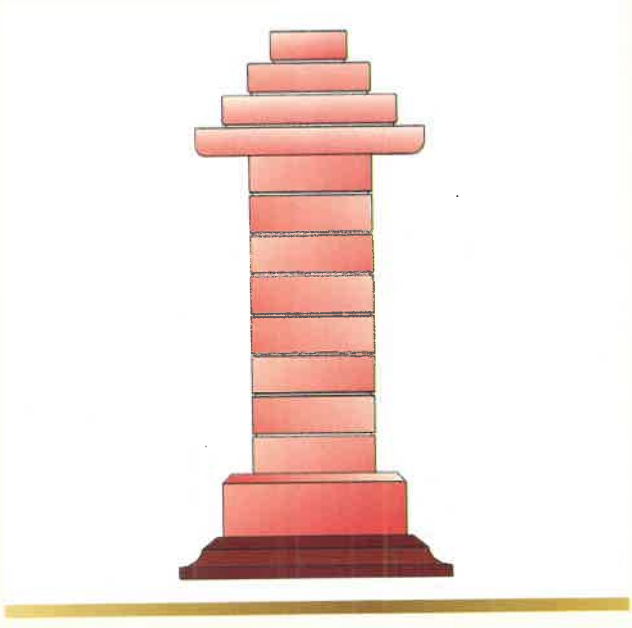


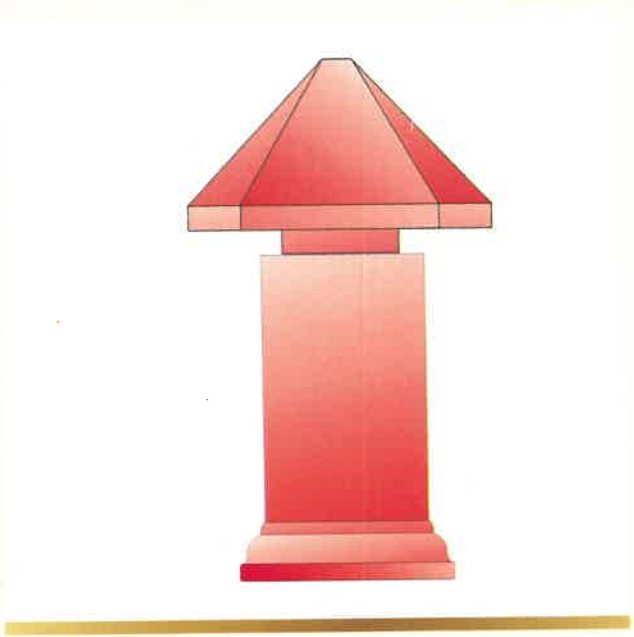


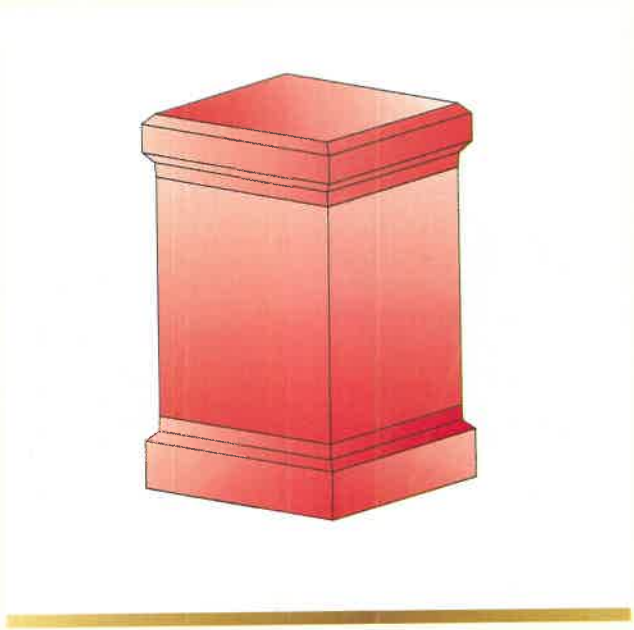


Innovative Product Development

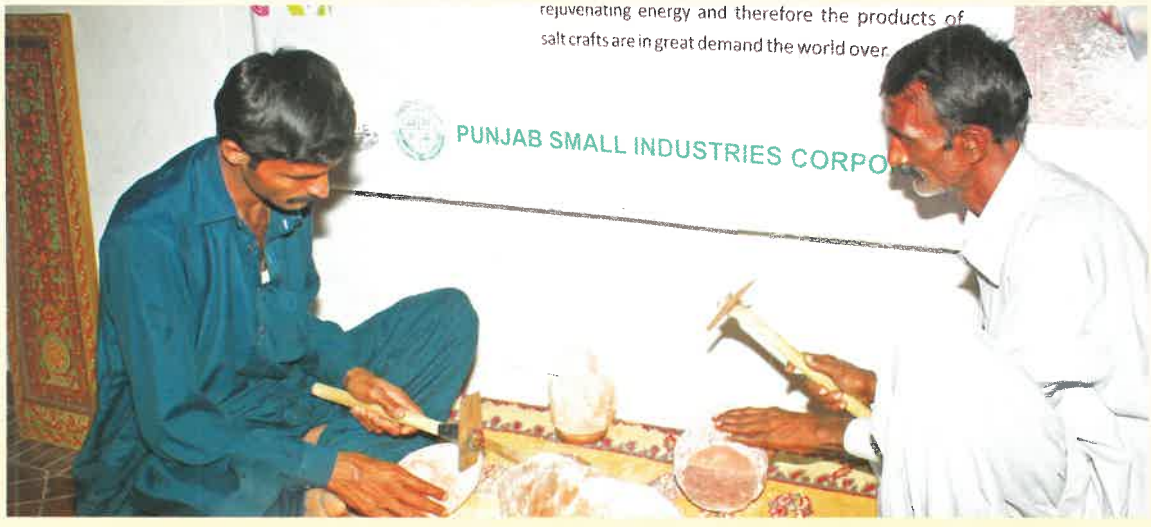








Innovative Product Development



Artisan at work



General Managers of Punjmin while visting the Salt Craft Stall



Visitors of the stall being briefed



Organizers of the Exhibition Held at Old Tollinton Market



Advisor to the C.M Punjab and Mr. Habibullah Gillani, M.D TDCP being briefed by the Project Director



Mr. Naeem Bhatti, Director Lahore Zoo, while briefing the research team about Fauna of the salt range



Advisor to C.M Punjab, while awarding trophy to the Project Director



Artisan, receving the certificate from Ch. Nazir Ahmad (TI)

Kamal-E-Fun Exhibition

The Government of the Punjab celebrated Spring Festival 2013 named as "Rang-e-Lahore". Various departments of GoP, contributed in this Festival. PSIC also participated in this Festival along with PHA at Jillani Park, Lahore and in Parda Bagh, Lahore on Women Day. PSIC in collaboration with PHA and Lahore Museum organized a Craft Exhibition named "Kamal-e-Fun" under the umbrella of Rang-e-Lahore, Festival from 15-17 March, 2013 at Old Tollington Market adjacent to Lahore Museum, the Mall, Lahore. The salt craft artisans demonstrated their skills live in this exhibition, artifacts of craftsmen were displayed. PSIC's ADP Scheme's Salt Crafts Khewra and Stone Crafts Taxila were the main organizer of the events.

Kamal-e-Fun Exhibition

The honorable Secretary Industries, Commerce and Investment department along with Managing Director, PSIC and Director, Lahore Museum, in the presence of media personnel's and general public, inaugurated the Exhibition. They visited all stall and artisans at work. The project team nicely arranged its stall, placed flex's and exhibited newly developed prototypes at the occasion.

People at large, visited the exhibition including foreigners, Mr. Jameel, GM Technical, PUNJMIN, Mr. Saleem-ur-rehman, Chief Architect, GoP and Mr. Ismaeel and showed keen interest, admired and appreciated the project's efforts. Glowing Salt Lamps attracted many people of attention.

Awareness Campaign

A Campaign was launched to Display Salt Range Products along with informational Marketing Material (Brochures and Leaflets) at Various Hospitals, Health Centers and Health Care Centers (Gyms) and Clubs such as Alrazi-Health Care, National Hospital, Shapes and Sukh Chain Club Lahore and following at Rawalpindi.

- Gulf Medical Centre, 63-C2, Sadiq Abad Chowk, Rawalpindi.
- Bilal Medical Centre, Satelite Town, Rawalpindi.
- Ahmad Medical Complex, Sattelite Town, Rawalpindi.
- Agha Khan Family Health Centre, Chandni Chowk, Sattelite Town, Rawalpindi.

E-mail correspondence Account was created at project's website. Social media account on facebook as (PSCI ADP SC KHEWRA) was created. Continuous searching and Exploring Domestic and International contacts is done for promotion purpose such as contacted CIBCO Germany and various importers from (Ali Baba) portal to provide information about Pakistan Rock's Salt and its 100% Natural Composition. Suitable site for establishment of industries estate got identified by the district management of Khushab adjacent to the grid station of Quaidabad especially for the salt craft manufacturers. More than 250 salt craft manufacturers have expressed their will for establishing their manufacturing units for salt craft in writing.

Developed linkages with renowned relevant organizations such as PMDC, PUNJMIN, ICI and National Museum for Natural History, Islamabad for strengthening the Marketing ties and collection of essential data. Chambers of Commerce and Industries of Lahore and Islamabad were also taken on board.

Road Shows for Awareness / Promotional Campaign at Lahore

The project team carried out a mobile promotional campaign on project vehicle having, branding on vehicle with projects & PSIC's logo pasted. These activities were initiated from 23-March-2013 to 30-March-2013.

Project team informed the people at large about the diversified medicinal effects of salt crafts too. The prototypes developed under the scheme were also exhibited at said points and promotional literature (Brochures, Leaflets & product catalogues) were distributed among general public for awareness, interested buyers were refered to the Pakistan Handicrafts Shop (PHS), Davis Road, Lahore and Salt Manufacturers, especially those who were developing project's prototypes and participated in the exhibitions. This promotional campaign was successfully executed as many people expressed their deep interest and admired the prototypes and spirit of the project team.

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Crafts of Salt range
KHEWRA