



The old walled city

Ronald Lewcock

of Ṣan‘ā’

Unesco

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Cover photo: High houses and minarets in the centre of Sana

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Preface

لا بدّ من صنعاء ولو طال السفر
وإن تحنّى كلّ عودٍ وانعقد

*San'a' must be seen, however long the journey,
though the hardy camel droop, leg-worn on the way.*

This traditional poem quoted by several poets and writers from Yemen is an invitation to go on a journey to discover this exceptional city because of the wealth and density of its cultural heritage. It also indicates the aim of this book, written by one of the best-known scholars of Islamic architecture in the Arabian peninsula, Professor Ronald Lewcock.

But today San'a, described by the poets as the 'pearl of Arabia' with its white and ochre minarets, domes and tower-like houses, is threatened by the irreparable decay that modern development inflicts on historic cities. This situation has prompted the Government of the Yemen Arab Republic to request Unesco's assistance in undertaking technical studies and preparing a plan of action in order to ensure the survival of the old city of San'a as a coherent whole because of its unique quality.

It is also the purpose of this book to explain that the full rehabilitation of San'a', including both restoration of houses and monuments and the regeneration of the entire array of economic and cultural resources, will present technical and financial problems which the Yemen Arab Republic is not in a position to resolve alone.

For this reason, at the request of the government, the General Conference of Unesco adopted a resolution authorizing the Director-General, in collaboration with the Government of the Yemen Arab Republic, to undertake the necessary technical studies, within the available budgetary limit, to work out a detailed plan of action for the preservation, restoration and presentation of San'a', and to establish the modalities for its promotion as an international campaign.

For the Yemen Arab Republic, indeed for the whole Arabian peninsula, the historical and cultural significance of San'a amply justifies the launching of large-scale efforts to save it, and it is hoped that this book, by setting forth the objectives of the campaign, will help to marshal the country's technical and financial resources as well as foster the prospects of international assistance.

A special account has been opened at Unesco Headquarters for financial contributions to the campaign. Readers who wish to offer their support should contact the Division of Cultural Heritage, Unesco, 7 place de Fontenoy, Paris, France.

Appeal

by Mr Amadou-Mahtar M'Bow,
Director- General of Unesco,
on behalf of the International Campaign
to Safeguard the City of San'a'

The line of poetry quoted in the Preface urges us to discover the proud city that stands in the heart of a great mountain range: San'a', the prestigious capital of 'Arabia Felix' and one of the oldest cities in the world. Legend holds, in fact, that it was founded by Ham, son of Noah.

San'a' - standing at the crossing-point of two routes, one running between the Indian Ocean and the Hijaz and the other linking Ma'rib with the Red Sea - was the capital of the Sabaean kings and the land where the Himyarites established their rule in their turn.

The city was occupied by the Abyssinians, subsequently being liberated by Seif ibn Di Yazen with the help of the Sassanians of Persia. Even in the earliest years following the hegira, San'a' was a centre from which the Islamic faith spread outward. Nevertheless, it continued to be a city of a variety of religious communities, where all the faiths of the Book rubbed shoulders and all the inhabitants contributed to the general economic prosperity and beautification.

During that period San'a' played a prominent role in the propagation of the Qur'an's message. A number of its buildings that are still

standing were erected during the lifetime of the Prophet Muhammad: one example is the Great Mosque, a jewel in the heart of the old city which was embellished and enriched under the Umayyad and 'Abbasid Caliphs and the later Yemeni governors. In addition, San'a' features pleasing vistas of caravanserais, *hammams*, suqs, palaces and dwellings surrounded by rich gardens, all harmoniously laid out with subtle ingenuity within the walls surrounding the city.

It was essential to avoid encroaching on arable land while simultaneously providing for the security of the city's inhabitants, and Yemeni architects rose to the challenge by creating a site characterized by geometrically varied, multi-storied buildings whose courses of dressed stone form an attractive complement to the brilliant white of their projecting friezes and the delicate latticework of their arched windows.

But San'a' is also a twentieth-century capital, where the most up-to-date achievements of a contemporary metropolis stand side by side with traditional sanctuaries, *madrasahs*, markets and dwellings. It is the juxtaposition of these two worlds that gives the city its originality, but the main urban activities are tending to move

by degrees outside the walled enclave, with the result that the ancient part of San'a' is in danger of falling victim to a process of slow deterioration.

Over the past decade the Yemeni authorities have infused San'a' with fresh vitality, endowing it with many features worthy of a modern city. But the Yemeni authorities are also determined to safeguard the historic, artistic and architectural treasures of their venerable capital, to launch an emergency programme designed not only to rehabilitate and restore the most important of the threatened monuments and dwellings but also to upgrade the urban infrastructure of the historic centre of San'a'.

The General Conference of Unesco, at its twenty-first session in 1980, adopted a resolution authorizing me, in collaboration with the Government of the Yemen Arab Republic, to work out a plan of action for the preservation and restoration of San'a'.

This plan is designed to safeguard the unique character of San'a', not only by preserving its historic centre but also by introducing there the facilities it needs in order to adapt to the requirements of modern life.

Its implementation will be facilitated by the establishment, following promulgation of the presidential order of 16 December 1984, of a Council chaired by the Prime Minister and including several Ministers and prominent citizens of Yemen.

Conservation and rehabilitation work will include repairs to major buildings such as mosques, *madrasahs*, palaces, *hammams* and dwellings, while the modern infrastructure will include water-supply and sewerage systems as

well as the renovation of electrical distribution, telephone and transport facilities. Supplementing these efforts, social and medical services will be upgraded, traditional crafts will be promoted, and cultural centres and a new museum will be established.

The financial and technical problems that must be overcome before these objectives can be attained are so massive and so complex that they call for a worldwide effort of solidarity. Accordingly, the Government of the Yemen Arab Republic has asked Unesco to support its work by appealing to the solidarity of all states and all peoples.

That is why I stand here today, at this imposing site, to launch a solemn appeal for international solidarity.

I invite all the Member States of Unesco and all peoples, their governments and national communities, public and private institutions, intergovernmental and international non-governmental organizations, and also foundations and financial institutions, to participate, by making voluntary contributions in cash, equipment or services, in the gigantic effort that has been undertaken by the Government of the Yemen Arab Republic.

I invite museums, art galleries, academies, libraries and all institutions concerned with the preservation, progress and dissemination of culture to organize exhibitions on San'a' and to contribute to the task of safeguarding and restoring it.

I invite all children and all young people, those of the Yemen Arab Republic and neighbouring countries in particular, to contribute to the task of safeguarding what can now be re-

garded as part of the heritage of all mankind, to collect money by a wide variety of means, to organize competitions, and to participate in all activities that may help to strengthen national and international action on behalf of San'a'.

Unesco, which in the past has launched many appeals for the preservation of significant monuments in all parts of the world, can take pride in having contributed - thanks to international solidarity - to the execution in Nubia of the largest archaeological rescue operation of all time, and subsequently to the restoration of one of the world's loveliest monuments to human spirituality, namely Borobudur in Indonesia. Unesco is continuing its efforts on behalf of the safeguarding of Venice in Italy, Sukhothai in Thailand, Fez in Morocco, which is one of the

most striking Islamic capitals, and many other ancient cities as well.

I hope, once again, that all those who are concerned for the preservation of the cultural heritage of mankind will contribute, according to their means, to the international campaign for the safeguarding of San'a', so that this city will be able to preserve, for the benefit of generations yet unborn, its historic treasures and its bewitching charm.

A. A. M' Bow

Amadou-Mahtar M'Bow

San'a', 19 December 1984

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Introduction

San'a' is the city Of Yemen - there is not to be found in the [highland of] Yemen, nor in the Tihamah nor the Hijaz a city greater or more populous nor with jiner properties, nor any nobler of origin . . .

Ibn Rustah, 'Kitab al-A'laq al-nafisah',
written after A.D. 903 (A.H. 290)

It is hard to believe that, until a few years ago, it was generally held that 'Arabia, at the rise of Islam, does not appear to have possessed anything worthy of the name of architecture'. These are the first words of the 1958 edition of K.A.C. Creswell's classic, *Early Muslim Architecture*.

At that time, only a few specialists knew of the great pre-Islamic civilizations of South Arabia, whose wealth was built on trade, and were aware that in the fifth and sixth centuries A.D. a kind of classical culture, with its own unique stone temples, had flourished there.

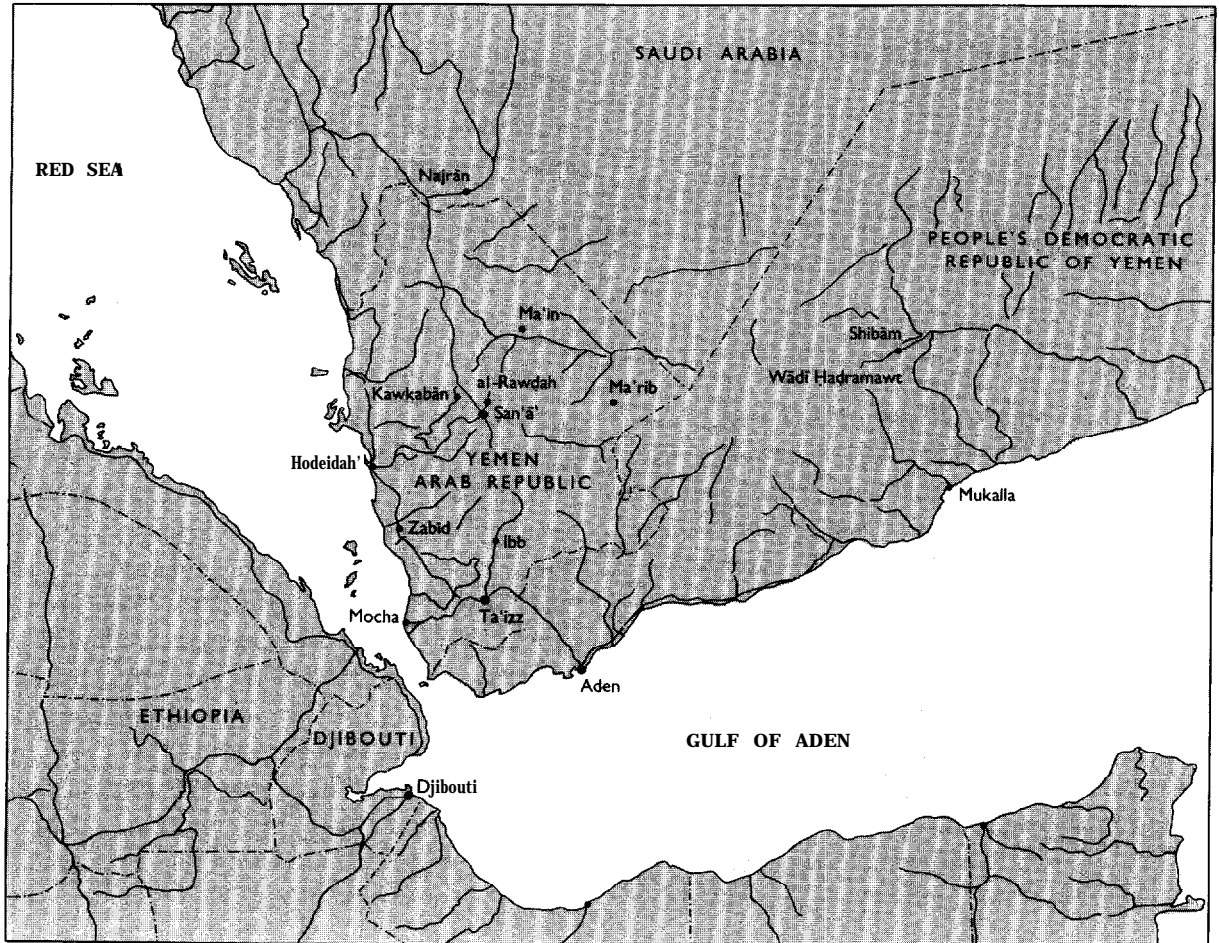
The last two decades have exposed a great deal more evidence of the ancient architecture, and - since the end of the Civil War in the Yemeni highlands removed all barriers to European entry - the outside world has become aware for the first time of the surviving wealth of Islamic buildings and the continuing medieval way of life of which it had been almost wholly ignorant before.

One of the reasons for the growth of this civilization, which is likewise a reason for its preservation in relative seclusion, lies in the geography of the Arabian peninsula.

From Mecca southwards a mountain range

runs parallel to the Red Sea, reaching heights of more than 3,000 m. It induces a mild climate and traps the monsoon rains. From ancient times this region has held 80 per cent of the population of the Arabian peninsula. To the east, in wādīs near the Indian Ocean, lay the groves of frankincense and myrrh which supplied Ancient Egypt, Greece and Rome, reached by travelling up caravan routes along the eastern edge of the mountains. Later, the same routes witnessed the passage of luxury goods from India and China, and the gold and silver of the Mediterranean returning in exchange.

Mecca was a trading city on this route, heavily reliant on alliances with the rulers of the great kingdoms of the south for its prosperity. The Prophet Muhammad's father had travelled to Yemen before Muhammad was born, his great-uncle was said to have been buried at San'a', and South Arabia was one of the first areas to be brought under the influence of Muhammad's new teaching. It was from this region that the bulk of the soldiers who conquered vast territories for Islam were naturally drawn, eventually settling in Kufa, Basra, North Africa, and as far away as Spain.



I
Map of the southern part of the Arabian peninsula.
showing the position of San'a'.

The country of North Yemen is divided into four natural regions, all parallel to the Red Sea. The lowland strip, known as the Tihamah, is an arid, semi-desert, coastal region bordering the Red Sea. It has a hot and humid climate, with temperatures often reaching 50 °C. The midland, known as the Jibal, or mountains, has a milder climate with heavy rainfall during the rainy season from June to September.

The highland region averages between 2,200

and 2,700 m above sea-level and lies to the east of the crest of the Jibal. The largely volcanic mountain blocks to the west have been eroded to deposit thick layers of sandy soil, very much like loess, with the same property of soaking up moisture and retaining it like a sponge. This accounts for the great fertility of parts of the highlands, even though the rainfall is limited to a relatively short period in early and late summer. Ibn Rustah wrote: "The rain falls at predictable times: they have timetables for it and are never wrong. During the summer months it rains for one month, and in autumn a full four months; it does not rain again until the same time the following year."

In many areas it is possible to dig wells and thus to create, from the plain which would otherwise be almost bare in the dry season, gardens and oases that bloom all the year long. The climate is temperate with dry and mild weather, though the differences between daytime and night-time can sometimes reach 30°C. During the dry season there is little ground cover, but the first spring rains blanket the whole plain and the slopes of the mountains with the fresh green of vegetation, much of it aromatic and fruit-bearing, which remains throughout the summer. The city of San'a' is situated in the centre of the highland zone. Its air is considered to be like that of spring because it is so temperate and sweet.*

Further east a low range of mountains separates the highland zone from the deserts which descend in a long slope to the Arabian Gulf hundreds of kilometres to the north-east. Sheltered against the edge of the mountains lie the regions of the Jawf and of Ma'rib, site of the

legendary Kingdom of Saba', where irrigation at an early period made possible the development of one of the early civilizations, with urban settlements in the second millennium B.C. Today, with ancient dams and reservoirs silted up or broken, only a few scattered settlements survive; these depend for their existence on the small wadis which come down from the western highlands.

Viewing the old walled city of San'a' for the first time creates an unforgettable impression. And this vision of a childhood dream world of fantasy castles is not dispelled even on closer acquaintance. In the farmlands outside the city, on either side of the roads leading to it, buildings of all shapes - circular, rectangular, square - rise out of the flat highland plain to seemingly impossible heights constructed of apparently weak materials. Not merely does the stonework of the lower levels consist of rough rubble with loose mortar, but for most of their height the buildings are made of mud - layered mud, mud bricks of all sizes - and of mud-straw plaster, infinitely eroded by the monsoon rains until deep indentations mark the channels down which the autumnal torrents find their passage to the earth.

Sometimes a building is so weathered that in places the whole thickness of the wall is revealed, and eventually it has to be abandoned. But the ruin survives to its full height for decades, reflecting the centuries of accumulated

1. Ibn Rustah, *Kitab al-'A'laq al-nafisah* c. A.D. 903 (A.H. 290).
2. *Ibid.*

1

The roof-tops of San'a' with Mount Nuqum in the background. The *mafraj* rooms standing on the roofs are clearly visible.

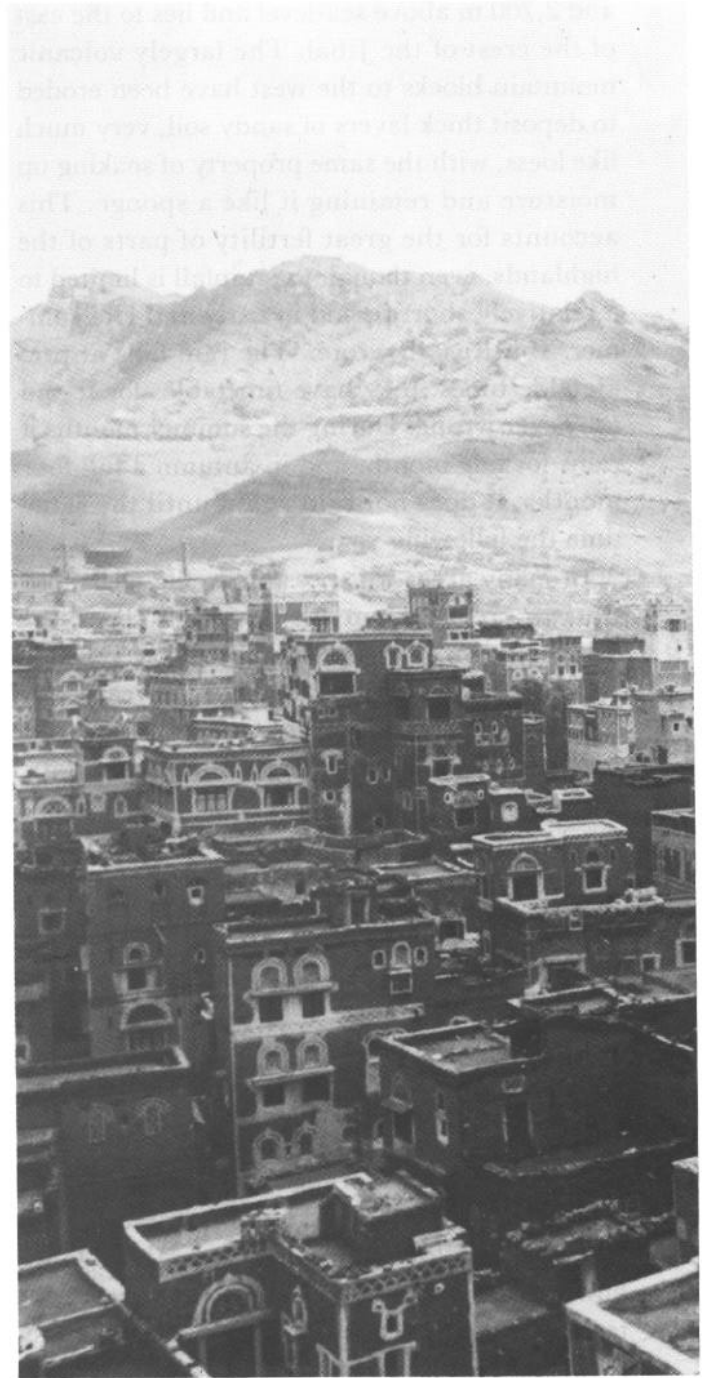
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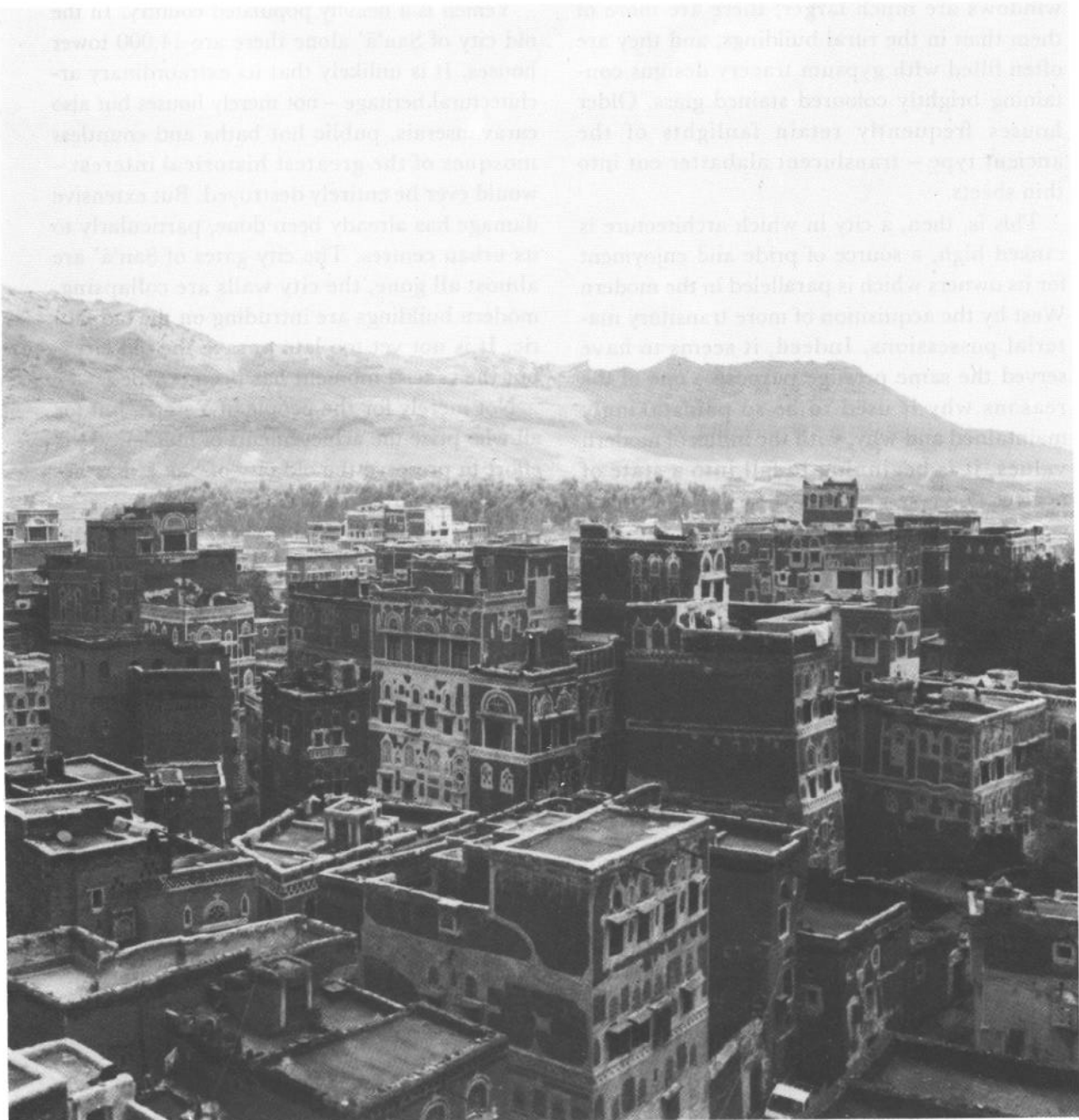
knowledge that underlay its strength and permanence.

The houses may consist of square or circular towers culminating at the top in rectangular rooms crazily cantilevered beyond the walls. Across the mudwork the Yemenites have laid decoration, sometimes projecting zigzag courses to mark the divisions between storeys, or gypsum-washed cornices, or corner pinnacles, with white frames around the large windows high up in the walls.

The old city of San'a' is distinguished by a dozen minarets which soar well above even the remarkably tall houses. It is surrounded by an ancient wall pierced by gates, many, alas, now destroyed. Here the houses are still as unreal as those of the countryside, rising as high as nine storeys, but the materials are more refined: well-built ashlar with fine joints below and baked brick above.

Almost every house looks fresh and sparkling, with bright white-washed decoration against the orange-red brickwork. There are more windows in these city houses, and the original wooden-shuttered openings are now glazed with clear glass. The fanlights over the





windows are much larger; there are more of them than in the rural buildings; and they are often filled with gypsum tracery designs containing brightly coloured stained glass. Older houses frequently retain fanlights of the ancient type - translucent alabaster cut into thin sheets.

This is, then, a city in which architecture is ranked high, a source of pride and enjoyment for its owners which is paralleled in the modern West by the acquisition of more transitory material possessions. Indeed, it seems to have served the same prestige purpose - one of the reasons why it used to be so painstakingly maintained and why, with the influx of modern values, it is beginning to fall into a state of neglect.

Yemen is a heavily populated country. In the old city of San'a' alone there are 14,000 tower houses. It is unlikely that its extraordinary architectural heritage - not merely houses but also caravanserais, public hot baths and countless mosques of the greatest historical interest - would ever be entirely destroyed. But extensive damage has already been done, particularly to its urban centres. The city gates of San'a' are almost all gone, the city walls are collapsing, modern buildings are intruding on the old fabric. It is not yet too late to save the old city - but the crucial moment has been reached.

Not merely for the people of Yemen, but for all who prize the achievements of humanity, the effort to preserve the old city of San'a' has become a matter of the greatest urgency.

The history and development of the city

*On the ground of Azal [San 'a' / may festival
ever continue, and for all time its rank remain exalted.*

'Ali b. Hasan al-Khafanji,
mid-eighteenth century

PRE-ISLAMIC HISTORY

Azal, an old name for San"a", is traditionally identified with the name Uzal mentioned in Genesis as that of one of the sons of Joktan (another was Hadramawt, from whom the famous region in South Yemen is said to have taken its name). Joktan, or Qahtan, was a descendant of Shem, the first son of Noah. Another of Noah's sons was Ya'rub, whose grandson was Abd Shams, also called Saba' (in Hebrew 'Sheba'). The Old Testament refers to the Queen of the land of Sheba as 'the Queen of the South', and the relationship of San"a" with Saba' (or Sheba) will be discussed below.

San"a" is certainly one of the most ancient surviving cities in Arabia. No archaeological exploration has yet been undertaken within the limits of the modern city, however, so that forming a clear picture of its origins and early history is difficult.

Lying as it does midway on the great central highland plain between the high mountain ranges to east and west, and at a point where the plain narrows until it is only a few kilometres wide, a fortification at the position of

San"a" could effectively control the movement of men and goods from one half of the plateau to the other. All scholars are now agreed that the name San"a" in ancient South Arabian meant 'well fortified'.

The site of San"a" had the additional advantage of controlling a major trade route from west to east, that is, from the ancient capital of the state of Saba' at Ma'rib, which lay on the edge of the great desert beyond the eastern highland ranges, to the ports in the Tihamah on the edge of the Red Sea.

The Kingdom of Saba' was probably in existence from some time in the second millennium B.C. It was the central kingdom of the Yemen, and thus controlled the passage of caravans, particularly those of incenses, such as frankincense and myrrh, from the areas where they were produced or imported in the south and east, through to the north.

Although many modern scholars doubt whether the Queen of Sheba who visited Solomon in Jerusalem could have travelled from so far away as Saba', there are elements in the description of her state that make the identification possible. According to II Chronicles 9 and

I Kings 10, she brought with her 'a very great train, with camels that bare spices, and very much gold, and precious stones'. The Qur'an, in Sura 34 (the Surat Saba) and Sura 27, adds accounts of the land of Sheba, apparently to be identified with Saba' in Yemen: a hoopoe bird reports to Solomon, 'I come to thee from Sheba with sure tidings. Lo! I found a woman ruling over them and she has been given an abundance of all things, and hers is a mighty throne.'

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By the time of the last century before the Christian era, two trade routes existed for the passage of spices and oriental goods to the north. The oldest and most favoured passed along the edge of the desert, and was controlled by the Sabaean capital city of Ma'rib. The second, generally less favoured route led across the highland plateau, and therefore needed separate control; this was apparently the role of the early town of San'a' or some fortified point close to it. An ancient inscription, now in the Aden Museum, refers to a temple of the ancient moon god, Ilmuqah, at Awa outside San'a', which duplicated the name of the principal sanctuary of the deity outside Ma'rib.

The state of Saba' was ruled by high priests or princes, *mukarribs*, a class which eventually furnished the first kings. Later, it is thought, the *mukarribs* existed as priests side by side with the kings. For centuries Saba' was a small country hemmed in on the north and south by the rival states of Ma'in and Qataban. Its wealth derived from the great dam built at Ma'rib, on the trade route which passed along the eastern desert. The dam was built of cut stone, secured with iron or copper cramps, and was more than 600 m long and 18 m high. It was provided with

a number of large sluices; through these the flood waters descending from the highlands after the monsoon rains, and temporarily held up by the dam, could be distributed over the fields and gardens of the city.

The prosperity of Ma'rib, which resulted from the building of this reservoir, was a favourite theme of the Arab historians, who gave glowing accounts of its rich fields and orchards, and its splendid buildings.

Pliny termed Ma'rib 'the mistress of cities, and the diadem on the brow of the universe', and Masaudi reported that a good horseman could not ride over the cultivated grounds in the vicinity of the city in less than a month. The inhabitants enjoyed an unexampled degree of happiness and prosperity; the rule of their monarchs was mild and equitable; they were loved at home, and feared and respected abroad; they waged no war in which they were not victorious, and every invading force (including the Romans) yielded to their arms.

From the Roman *Periplus of the Erythraean Sea* we learn that the Sabaeans monopolized the commerce of India, and acted as the intermediate agents between the merchants of India and those of Egypt: in the reign of Ptolemy Philometer (A.D. 177) the Hellenistic rulers of Egypt had imported Indian commodities not directly from India, but from Saba'.

The ancient religions of South Arabia all focused on the worship of a male moon god, with a consort, the sun goddess, Shams, who was the mother of the moon god's child, the evening star Athtar. Great temples to their cult, and to the cults of numerous deities who were 'lords' of the seasons, rains, agriculture, irrigation, crafts,

etc., were built all over the densely populated and cultivated lands of South Arabia. Those that have been excavated, or still survive in ruins, reveal a great mastery of architectural design, refinement and constructional techniques.

Sabaeen sanctuaries followed the characteristic Semitic form of a rectangular enclosure which was sanctified as a 'reserved space'. Part of it could be made up of covered or roofed porticos. There was a central altar, and often a well or pool of water for ablutions. Sometimes there was a sacred tree from which visitors' offerings or trophies from warfare could be hung. The sacred area became a place of asylum for men and animals, and trees growing in it were protected.

Tombs might be almost as substantially built as temples, or they might be hollowed out of the solid cliffside. Considerable attention seems to have been paid to funerary rituals.

A common religious practice of the Arabians was an annual pilgrimage. Tribes who shared belief in a common deity might reunite at a sanctuary sacred to the god or goddess. Processions played a leading part in ritual. Sometimes these appear to have been preceded by a period of fasting, abstinence from warfare, or sexual relations, or of all three. Commonly, pilgrimages or sacred festivals seem to have climaxed in a communal feast within or in front of the sacred area. Stone benches for the purpose have remained in position in a few cases.

Burnt offerings of incense and other substances, together with sacrifices, formed the focus of devotion. Libations of the altars followed. Communal prayer was held with the

congregation standing. At important shrines oracles could be consulted.

Household gods were worshipped in the home, and devotions to the gods of the sky were held on the rooftops. In many cases individuals made votive offerings, frequently giving thanks, but also seeking expiation for transgressions, many of them ritual.

The temples received gifts in money and in kind, held lands from which they drew their revenue, and served as repositories for legal and regulatory documents.

The two neighbouring states of Saba', Ma'in in the north and Qataban in the south, had a common interest in checking the rise to greater power of Saba'. After a long and sometimes turbulent military history, Saba' at first benefited, and later suffered, from the emergence of the state of Himyar in part of the territory of Qataban, some time between 115 and 109 B.C. It is possible that the weakening of Qataban in this way gave an opportunity for Saba' to attack and destroy its ally Ma'in.

The history of Saba' is complicated and as yet imperfectly understood. It seems that in the last century B.C. and in the early centuries of the Christian era there existed a 'greater Sabaeen' state which owed its cohesion to, and expressed its identity through, the shared worship of the moon god Ilmuqak. This expanded state included territory to the north and south on the edge of the desert and also a large part of the highlands, extending to the north and south-east of San'a'. The greater Sabaeen state took on more and more the appearance of a federation, with a number of its rulers being chiefs from the aristocratic clans of the highlands. At

some stage, probably before the end of the second century **A.D.**, San'a' became a second capital, as important to the state as Ma'rib.

By the third century **A.D.**, with the construction of the high fortified palace, Ghumdan, San'a' was established as one of the most important cities in Arabia. Many stone inscriptions of the time refer to it, though it may have been mentioned under another name, not yet recognized as the same town, in earlier centuries. It was clearly a royal dynastic centre increasingly chosen as the place of residence of the kings of the Sabaeans.

At this time the great King Yasir Yuhan'im and his sons seem to have controlled the whole of South Arabia; they styled themselves 'Kings of Saba' and Dhii Raydan and Hadramawt and Yamanat'. By the fifth century **A.D.** this title was further augmented by the addition of 'and of their Arabs in the Coastal Plain [Tihamah] and the Highland [Tawd]'.

The term given in the ancient texts for San'a', 'mahram', is an interesting one. It seems to indicate that the town had a special status of royal city, a place to which free access was restricted, for religious or prestige reasons. Apparently the cities of San'a' and Ma'rib were hedged around with a particular awesomeness from their status as royal residences.

One of the ancient inscriptions refers to the 'army lands' at San'a', possibly the agricultural areas set aside for the army to cultivate crops to provide themselves with food. Thus San'a' emerges in history clearly as a fortified military centre, where the king resided in his royal palace. Other inscriptions record the use of San'a' as a military base by the Sabaean

troops in campaigns to the south and west against the Himyarites and the Red Sea coastal tribes. The inscriptions record how they returned in triumph, received peace missions and hostages. There, at Ruhabah, apparently an open assembly space outside the town, honours were handed out to victorious leaders. In one case it is recorded that San'a' served as the base for the recapture of Ma'rib after it had fallen into the hands of the Himyarites.

During the fourth century **A.D.** the old polytheistic cults began to be replaced by the belief in one god. Judaism began to be observed in many areas, notably in San'a' itself, while Christianity also made an appearance and a number of churches were built. Even more significantly, there are indications that an Arabian monotheism developed. In the fourth and fifth centuries **A.D.**, a few Sabaean inscriptions appear dedicated to 'Ilah the Merciful, Lord of Heaven and Earth'. From this time onwards the stone dedicatory inscriptions, which had been so characteristic of South Arabia in preceding millennia, begin to disappear, and with them a source of accurate knowledge for the historian. It seems, however, that the centre of government may well have moved away from San'a' after the rise to power of the Himyaritic Empire, which had its traditional capital farther south at Zafar. Nevertheless, there are traditional reports of Jewish kings residing at Ghumdan in San'a' at this time. And with the subsequent Abyssinian conquest it becomes clear that San'a' was still regarded by them as the major city in the country.

Christianity was reputedly introduced, or in any case officially recognized, as a result of the

dispatch of an embassy from the Byzantine Emperor Constantius in around **A.D.** 342, headed by Theophilus Indus, an Indian bishop, and a native of the island of Diu. Although the political purpose of this mission was to strengthen the Byzantine Empire by allying the Himyarites of Yemen against the Persians, a secondary purpose was the conversion of the Yemenites, or, failing that, obtaining permission for the erection of churches for the use of the subjects of the Emperor travelling through, and residing in, Arabia Felix, as well as for such of the Himyarites as had been converted to Christianity. Churches were erected at Zafar, Aden and other places.

Judaism remained strong, however, and for another two centuries kings of Yemen reputedly embraced the Jewish faith, and were periodically intolerant of, and even persecuted, Christians. The most severe of these Himyaritic rulers was Dhu Ntiwas ('he of the flowing hair') who ruled from around **A.D.** 490 to 525. His religious fanaticism was such that all the Christians within his dominions felt its effects, not least the Roman merchants engaged in the Abyssinian and Indian trades. But the great atrocity of his reign was the general massacre of the whole Bani Thaleb tribe of Najran, who had embraced Christianity as the result of the preaching of a Syrian. After besieging the town with a force of 120,000 men, Dhu Nuwas promised the inhabitants that no harm would befall them if they opened their gates. However, upon their entering into an agreement to do so, he plundered the town, and gave the inhabitants a choice between Judaism and death. According to Playfair: 'Large pits were dug, and filled

with burning fuel, and all those who refused to abjure their faith, amounting, it is said, to 20,000, including priests, monks, consecrated virgins and matrons who had embraced a monastic life, were either cast into the flames or slain by the sword.' On hearing of the massacre, the Emperor Justinian in Constantinople wrote letters to the King of Abyssinia, imploring him to send an expedition into Yemen to punish Dhu Nuwas.

Abyssinia had originally been settled from South Arabia, and there are temples surviving there from the fifth century **B.C.** of markedly South Arabian type. According to Abyssinian chronicles, counter-conquests across the Red Sea were gathering momentum during the early centuries of the Christian era; by the third century **A.D.** large parts of the Tihamah were in Abyssinian hands. The highlands, however, always presented too daunting a prospect for the Abyssinians to attempt a conquest. The conversion of the Abyssinians to Christianity in the fourth century **A.D.** coincided with the beginning of the decline of the Himyaritic Empire, so that by the early sixth century **A.D.** the Abyssinians were in a position to gather their forces to recapture the whole of the Yemen.

The conquest of the highlands appears to have been finally triggered by the martyrdom of Najran. In 525 the conquest of Yemen was completed. In 537 an Axumite general called Abrahah seized the Himyarite throne for himself and undertook the construction of a great pilgrimage cathedral in San'a'. Tabari, in his history, relates that Abrahah, after obtaining the approval of his bishop to construct the church at San'a', wrote to the Byzantine Em-

peror informing him that he was about to build the cathedral and asking him for aid. Therefore the Emperor Justinian assisted him with artisans, mosaic and marble. Afterwards Abrahah wrote to the Bishop of Axum: 'I have built you a temple in San'a' the like of which neither the Arabs nor non-Arabs have constructed, and I shall not desist until I divert the pilgrims [Ha.,] of the Arabs to it and they abandon the pilgrimage to their own temples.'

24

The legend was invented, if it did not already exist, that Jesus had once come to visit San'a' during his years in the wilderness 'and prayed in the place of the church, so the Christians made the church in San'a' where his place of prayer was' (al-Razi, c. 1000 (390)).¹ As it was a site directly associated with the life of Christ, the architects felt justified in the construction of a martyrium; it was the extremely sacred nature of the church that made it the centre of pilgrimage.

With the construction in San'a' of the largest Christian building anywhere south of the Mediterranean, rivalling Mecca - with its sanctuary containing the ancient Kaaba - in sanctity, it was clearly Abrahah's intention to create a new centre of political-religious power in South Arabia. The creation of such a sanctuary had, besides a political purpose, the added economic advantage that pilgrimage centres were also markets and the recipients of votive offerings.

Abrahah must have been fairly successful in diverting pilgrimage away from Mecca, for an elder from that city incited a youth to enter the

cathedral to defile it in the ancient manner by defecating therein. When Abrahah heard that this outrage had been committed on behalf of the people of the temple of Mecca to show their scorn and contempt for the new shrine, legend has it that he was filled with wrath and swore to march into battle and lay waste to the sanctuary. He ordered his army to set out for the north. It seems that he took an elephant with him: for this reason the event is usually associated by historians with the year A.D. 570, which is known as *Am al-Fiel*, the Year of the Elephant. Despite initial victories, which enabled the army finally to reach Mecca, Abrahah was not successful in his siege of the city; a plague of flies, which some historians believe was a plague of smallpox, broke out, forcing the retreat of the Yemeni army.

Axumite rule in Yemen was brought to an end about A.D. 575 by a conquering Sassanian army from Persia, and for the next half century San'a' was the seat of government of a Persian viceroy. Under the Persians the ancient South Arabian astral worship, Judaism and Christianity were all apparently tolerated and there is some evidence of the introduction of Zoroastrianism. Nearly sixty years later, the last of the Persian viceroys, Badhan, whose palace was still the ancient tower palace of Ghumdan, was converted to Islam in A.D. 628.

PRE-ISLAMIC RELICS

Of the pre-Islamic temples in or close to San'a' we know nothing. No site has yet been identified, nor have any descriptions of them come to

1. Dates given in brackets throughout denote the year or century in the Muslim era (A.H.).

light. There are large numbers of capitals and column shafts, as well as parts of cornices, dressed building blocks and inscribed stones built into buildings all over San'a', scores of them in the Great Mosque alone, but many of them may be trophies brought from far afield. It is hard to believe, however, that this could be the case with all of them, so great is their profusion.

Of the great royal palace of Ghumdan, even its exact site and size are not yet precisely established, but the location of the general area of the mound of its ruins is not in doubt. No fragments from the palace of Ghumdan can be identified, yet archaeologists hope that some have survived and may eventually be recognized.

With Christian remains, identification is somewhat easier - for both stylistic and symbolic reasons. But, in addition, the site of the polygonal martyrion at the east end of the cathedral is pointed out by San'a'nis to this day, and the foundations (or lower walls) may actually still be seen, lining a pit 14 m across in a clearing in the most eastern quarter of the old city, not far from the citadel.

Among the most interesting of the Christian relics are seven column capitals in the Great Mosque of extremely stylized composite form, very close in size and structural technique to similar capitals remaining from the great cathedral in Axum. In addition, there are a number of other capitals and column shafts which appear to be of early Christian and Byzantine style, but less directly Axumite. A remarkable survivor is the wooden lintel of the main south door of the Great Mosque which is carved in an

2

Pre-Islamic antiquities in the Great Mosque: a capital of a type believed to date between 100 **B.C.** and **A.D.** 100 on an octagonal shaft, standing on an upturned capital of Christian Axumite type from the sixth century **A.D.**



ancient style depicting, among vine tendrils and leaves, rosettes and what appear to be foliated Latin crosses.

Several other mosques in the old city contain capitals or column shafts which appear to be reused from buildings of this late period.

ISLAMIC HISTORY

26

Badhan, the last Persian viceroy, who had embraced Islam, was confirmed in his governorship by the Prophet. Side by side with Islam, the existing older religions were permitted to continue to practise their beliefs. But eventually disturbances among the tribesmen and the urban populations led to the dispatch of some of the Prophet's followers to persuade the Yemenites by both force and argument to adhere to the Muslim faith. Among them, according to some early historians, was the Prophet's son-in-law, 'Ali ibn 'Ali Talib, who is said to have stayed in a house near the suq in San'a', on which the mosque of 'Ali now stands.

The period of the first three orthodox Caliphs was one of stability and steady growth of Islam in the Yemen. With the assumption of the Caliphate by 'Ali in 656 (35), a civil war broke out between his followers and those of Mu'awiyah, and San'a' adhered to the side of 'Ali. Mu'awiyah had to conquer San'a' by force in order to establish Umayyad authority there.

Thereafter San'a' continued to be ruled by governors appointed by the Caliph, first Umayyad and then, after the transfer of the Caliphate to Baghdad, 'Abbasid. The greatest of these governors was one of the outstanding

family of al-Barmakis, Muhammad ibn al-Barmaki. During his nineteen-year rule he undertook a great deal of construction, including a famous underground water supply, or *qanat*, known in Yemen as Ghayl al-Barmaki, which watered the south and west of the city from a source a few kilometres to the east. The governor is said to have sworn to spend only his own funds on this *ghayl* and its upkeep. He also erected a number of public drinking places in the town, and constructed a mint and a new palace for the governor. This was undoubtedly a period of great prosperity for the city.

Early in the ninth (third) century, one of the aristocratic Yemeni tribal dynasties in Shibam-Kawkaban, about 60 km to the north-west of San'a', gained local ascendancy and began a campaign to oust the 'Abbasid governors from Yemen. The leader of the family, Yu'fir ibn 'Abd al-Rahman al-Hiwali, laid siege to San'a' and captured it in 847 (232). The Yu'firid family then successfully ruled Yemen, or at least the highland plateau, from San'a' for the next 150 years. There is some evidence that the early part of their rule was a continuing period of great prosperity for the city. The latter part of their reign was marred by continual fighting and by the attempts of some of the tribesmen and the townspeople to bring in as ruler the first Zaydi Imam of the Yemen, al-Hadi ila 'l-Haqq, from his seat of government in Sa'dah where he had become established in 897 (284). Internecine warfare followed till 905 (302) when peace was once more established. With the whole of the territory of the central part of the Yemen held by the Yu'firids, prosperity returned to the city. This was not to last for long, however, for the

end of the period of Yu'firid control was marked by increasing chaos and bad government, a situation which continued until the conquest of the city by the Sulayhids in 1047 (437).

The Sulayhid was a Fatimid dynasty which had been founded two years earlier at the instigation of a Fatimid da'i sent from Egypt. Raising their standard in the mountains to the south-west of San'a', they captured first the southern part of the country and the Tihamah before mounting their assault on the capital. Forty years later the Sulayhids moved the capital from San'a' to Dhu Jiblah in the south, and left San'a' in the hands of a succession of governors. In 1098 (492) San'a' was lost to the control of members of three different families of Hamdan who successively assumed the title of Sultan. In spite of much fighting with the tribes, it seems that the city was under strong control and that the peace that was maintained there accounted for its continuing prosperity.

In 1173 (569), however, the brother of Salah al-Din (Saladin), Ttiranshah, led an expedition into Yemen to conquer it for the newly established Ayyiibid family domains. It is possible that Salah al-Din wished to safeguard the southern end of the Red Sea in order to keep open the trade route between India and the Mediterranean, which was a major source of Egyptian as well as Yemeni wealth. Also, since the Ayyubids had been instrumental in bringing to an end the religiously intolerable Fatimid Caliphate in Egypt, they wished to banish Isma'ilism from the Yemen. Turanshah captured San'a' after he had already conquered the whole of the western and southern part of the country, but it was soon recaptured

by the Sultan of Hamdan. It was another of Salah al-Din's brothers, Tughtakin, who consolidated Ayyiibid power in Yemen and in 1189 (585) finally established San'a' as his capital, building a new palace there which he named Dar al-Sultan.

Upon the Ayyubids' departure to rule from Ta'izz in the south, the city was captured by a large force of tribesmen supporting the Zaydi Imam. Although it was recaptured by the Ayyiibids a few years later, San'a' was to be for some decades a bone of contention between the Ayyiibids and the Zaydis, frequently changing hands and experiencing a period of great uncertainty and continual warfare. This was eventually resolved by the rise of the Rasulids as successors to the Ayyiibids and the creation of a new Rasulid state in 1228 (628). Peace was established between the new dynasty and the Zaydis which effectively excluded the Ayyiibids from the Yemen. The Rasulids continued the practice of ruling from Ta'izz in the south and San'a' was granted as a fief to the nephew of the ruling Sultan. Nevertheless, the Sultan did on occasion take up residence in San'a' as, for example, for a twelve-month period in 1248 (646). Subsequently San'a' remained a Rasulid fief, although it periodically suffered occupation by the Zaydi Imam, who would move in with his tribesman army to hold sway there for short periods while the Rasulid lord of the city was absent on campaigns in the north. Eventually, in 1323 (723), the Imam was able to assume control of the city once and for all. For over two centuries, until the entry of the Turks in the sixteenth century, it remained mainly under the control of one Zaydi group or another.

In 1515 (920) the governor of San'a' capitulated to an expeditionary force that had been sent to take Yemen by the Mameluke Sultan of Cairo. The Egyptians had previously conquered Ta'izz and the south of the country, where they had established a reputation for cruelty and rapacity. In San'a' they slaughtered large numbers of the defenders after the gates had been opened to them, and exacted crushing levies from the merchants. Hearing of the Ottoman conquest of Egypt, however, the commander of the Egyptian troops in San'a' delivered the address from the minbar of the Great Mosque in the name of the Ottoman Sultan, thereby acknowledging his overlordship, and then departed leaving behind only a small garrison in the citadel. In desperation, the garrison, together with the townspeople, sent a message to the Zaydi Imam, who all the while had been defying the Mameluke from Thula, to the north-west of San'a', and invited him to enter the city, which he did at the end of 1517 (922). Using San'a' as a base, the Zaydis began to build up a new state, absorbing in the south the ruins of the Tahirid Sultanate. In 1527 (933) the city was hit by a particularly severe plague which is estimated to have taken toll of over 11,000 lives. This Zaydi state lasted for only about thirty years. Already in 1538 (945) the commander of a great Ottoman naval expedition against the Portuguese had captured Zabid. Subsequently they took Ta'izz and then in 1547 (954) advanced on San'a', which was betrayed to them by one of the gatekeepers. The city was sacked and over 1,200 people were put to the sword.

The Turkish governor, Uzdimir, took up res-

idence in the citadel of San'a'. There the Turkish governors continued to reside until the Wazir Sinan Pasha, finding it uncomfortable, established a residence for himself outside the citadel.

In 1566 (974) the Zaydi Imam briefly regained control of the city and set about establishing a new state throughout the whole of the Yemen. The Sublime Porte in Istanbul responded by sending the Turkish commander in Egypt, Sinan Pasha, with a large force. The Imam, realizing that it would be futile to try to defend the city against this force, withdrew from San'a', and the Turkish governor was able to occupy it without bloodshed. He guaranteed the security of the citizens and prevented his troops from looting private houses.

Turkish rule was thereafter strengthened, but from 1597 (1006) a new candidate for the Zaydi Imamate, al-Qasim ibn Muhammad, known as 'the Great', proclaimed himself ruler. Support steadily grew among the wandering tribes to the west and north of San'a' until the very presence of the Ottomans in Yemen was threatened. Six years later, after al-Qasim's death in 1620 (1026), his son Imam al-Mu'ayyad was able to mount a widespread uprising against the Turks. San'a' was placed under a siege which lasted for three years, ending in a truce and the exchange of hostages. Before the truce was up, the Turkish governor had decided to retreat to the coast, and purchased his safe passage by returning the Irnam's treasure. Within a year Ta'izz had fallen to the Zaydis, and six years later the last trace of the first Ottoman occupation was removed with the evacuation of the Tihamah.

Western penetration of the Indian Ocean and the establishment of mercantile empires, first by the Portuguese and then by the Dutch, had profound effects on the prosperity of the Yemen. First, much of the trade was diverted by sea around the southern tip of Africa, and second, the European threat brought the Turks into the Yemen, where their oppressive measures and extortionate taxation ruined what trade survived. Indeed, the rise of Mocha as the port for the highlands in the seventeenth (eleventh) century may be directly attributable to the heavy taxation of Aden. By the mid-seventeenth century coffee had become one of the most important of Mocha's exports - it was now in great demand in Europe. Factories were opened there by the Dutch, French and British, but the Europeans very rarely penetrated as far as San'a'.

In the three and a half centuries of the Zaydi Imamate that followed, not all the Imams actually resided in San'a'. Most of those who chose to live outside, however, did so at not a very great distance in palaces in villages of the surrounding region. All the Imams from 1716 (1128) until 1852 (1266) actually resided in San'a'. This was a period of peace and stability, if not prosperity, and scholarship and poetry flourished.

After 1816 (1231), a succession of weak Imams allowed the centralized power to slip through their hands and the country fell into a state of anarchy, confusion and considerable poverty. Recognizing this, the Turkish Sultan decided that the time had come to embark on a second conquest of the Yemen. A fleet was dispatched and the Tihamah occupied. In 1849

(1265) the Imam was constrained to become a vassal of the Turkish Sultan, receiving in return half of the revenue of the country, the remainder going to the imperial treasury in Istanbul. A thousand Turkish soldiers were to be stationed in San'a'. The garrison duly arrived and within a day the San'a'nis rose *en masse* and slew every Turk except those taking refuge in the citadel and in a garden to the west of the Sa'ilah. Their commander retreated to the coast, where he died of his wounds.

The reprisals taken against the Imam and his advisers reduced San's' to even greater disorder. According to Playfair, 'Robberies and murders were of everyday occurrence, the Jews and foreign merchants were bespoiled of all they possessed, and this once magnificent city was abandoned to anarchy and confusion.' To make matters worse, the people were struck by a terrible plague, and disease and drought affected the crops. North Yemen reverted to an anarchy of tribal chieftains warring with one another and small city states with various rival Imams, each with his own tribal backing. The sufferings of the people of San'a' were severe.

The opening of the Suez Canal in 1869 (1286) meant that the Ottomans were henceforth able to send troops direct to South Arabia by sea to garrison the Tihamah. In 1870 (1287) the governor, Ahmad Mukhtar Pasha, was invited by the people of San'a' to enter it as their protector to give them some respite from the continual chaos and lack of security which they were suffering at the mercy of rival tribal sheikhs. The Pasha arrived in San'a' in April 1872 and, having secured the citadel and the main defensive points around the town, set about taking

over the whole government of the Yemen. His policy was to win over the common people to the exclusion of the aristocratic administrative class, whom he replaced by Turkish administrators. All the revenues of the country were expropriated by the Turkish authorities with only limited allowances given to the Imam and the sheikhs of the tribes loyal to the Turks, many of whom had to begin selling their lands in order to maintain themselves. But the Turks could manage only a precarious hold on the main towns of the highland plains, and with some difficulty protected their routes of communication to the south and west. In the mountains to the north in 1890 (1307), a new Imam was elected, al-Mansur Hamid al-Din. Within two years the tribes under his direction were able to besiege San'a' and a general uprising broke out throughout the Yemen. The Turks sent a former governor to the relief of the city and the Imam was forced to withdraw once more to the mountains.

The Yemenites then resorted to guerrilla tactics against the Turks, blowing up houses in the western garden suburb of San'a' favoured by the Turks, as well as others in the area immediately adjoining the citadel. The telegraph lines to the coast had to be patrolled continuously to prevent them from being cut, but none the less the tribesmen managed to seize them on several occasions. The post and telegraph office in San'a' was blown up as well as a number of official buildings. These adverse conditions were exacerbated by a severe famine which resulted in high grain prices. In 1904 (1322) Imam al-Manstir died and was succeeded by his son, Imam Yahya Hamid al-Din. This popular

young man soon attracted an enormous following among the sheikhs and tribesmen and was able to give orders for the besieging of Turkish-held towns. His cause was aided by the shortage of food and water. So severe were the conditions in San'a' that many people, rich and poor, left. At the height of the siege a delegation of Turkish officers with a learned Sayyid left the city and surrendered to the Imam. They consented to hand over San'a' to him including all the artillery and ammunition contained therein.

The Turks once more sent a relieving force which moved up from Hodeidah to the western edge of the San'a' plain, thus intimidating the Imam who had meanwhile disbanded the tribesmen; he consequently felt that he had no alternative but to retire once more to the mountains. The Turkish governor re-entered San'a' and re-established order, but the returning population found that much damage had been done. It was said that half the population of the city had died in the siege and the fighting.

Fighting continued in the outlying districts and in 1911 (1329) San'a' was once more besieged. There followed a change in Turkish policy and the Imam was persuaded to agree to a truce. A meeting between the two leaders led to the arrangement of the so-called Treaty of Da'an. Yemen was henceforth to be divided into two administrative districts: a Zaydi region with its own capital cities including Haraz and Ta'izz, and a Shafi'i region administered directly by Turkey. At the end of the First World War, the Turkish governor agreed that the Imam should rule San'a' and that the citadel

with all its artillery should be handed over to him. In November 1918 he entered the old city amid the joyous acclamations of the people, proceeding first to the Friday Mosque for prayer. Thenceforth Imam Yahya ruled from San'a' until his assassination in February 1948. He maintained an iron grip on Yemen, restricting the movement of his people to other countries and the entry of foreigners into the highlands. He was opposed to the introduction of modern improvements and also attempted to control both the powerful tribal sheikhs and the great Sayyid families. It is therefore not surprising that opposition to the Hamid al-Din dynasty was fomented among leaders of many kinds throughout the country.

The assassination of the Imam was the key act of a widespread conspiracy of leading citizens to take over the government. In San'a a new Imam, Abdullah al-Wazir, was declared in the Great Mosque. He led a defence by a few soldiers and trainees of the military college. It was simultaneously intended to murder all the sons of the Imam who might oppose the leading citizens, particularly the heir apparent, Ahmad, who was at Ta'izz, but this was not carried out. The main body of conspirators in San'a were therefore at the mercy of the new Imam Ahmad when he called the tribesmen to his banner and began to invest San'a from every side. When three of Imam Yahya's sons, who had been imprisoned in the citadel, managed to persuade the garrison to come over to their side and to begin to fire on the town, Abdullah al-Wazir saw no alternative but to surrender. The city fell to Imam Ahmad on 14 March 1948 and was then sacked by the tribes-

men; the top storeys of many of the largest and finest houses were burnt out and their contents looted. In the suq the great caravanserais (singular: *samsarah*) were pillaged, and some have been closed ever since.

Imam Ahmad turned his back on San'a and for the next thirteen years took up residence at Ta'izz, which became the capital of the country. San'a remained the administrative centre of the highlands, but there was little expansion or prosperity.

Imam Ahmad died a natural death in 1962; his son, Badr, was proclaimed Imam in San'a and allegiance was paid to him by a large number of leading religious men, sheikhs and officials. A few days later a conspiratorial group of young army officers attacked his palace at Bir al-'Azab with six tanks. The Imam and his guards put up a spirited defence, but were unable to call for assistance because the telephone lines had been cut. In the early morning of the following day the Imam slipped out of the palace and escaped from the city to rally the tribes to him. The revolutionaries, at a loss for a leader, brought in their chief-of-staff who had been appointed by the Imam the preceding week, and he became the first President of the Yemen Arab Republic, with its capital at San'a.

The Civil War which followed between the adherents of the Imam and those of the Republican Government lasted until the end of 1969. It was concluded by the establishment of a coalition government. With the ensuing peace and the opening of the country to contact with, and aid from, the outside world, a remarkable technological development took place which has

resulted in the rapid modernization of almost every aspect of the country's life.

THE DEVELOPMENT OF THE CITY

Archaeological excavation has so far not been permitted on the San"a plain within or around the city. Some aspects of the urban growth of San"a can therefore only be conjectured, with sparse assistance provided by the examination of excavations for foundations and telephone cables. Nevertheless, geographical and historical descriptions of San"a, especially those from early Islamic times, combine with surface evidence to provide a plausible picture of the development of the city.

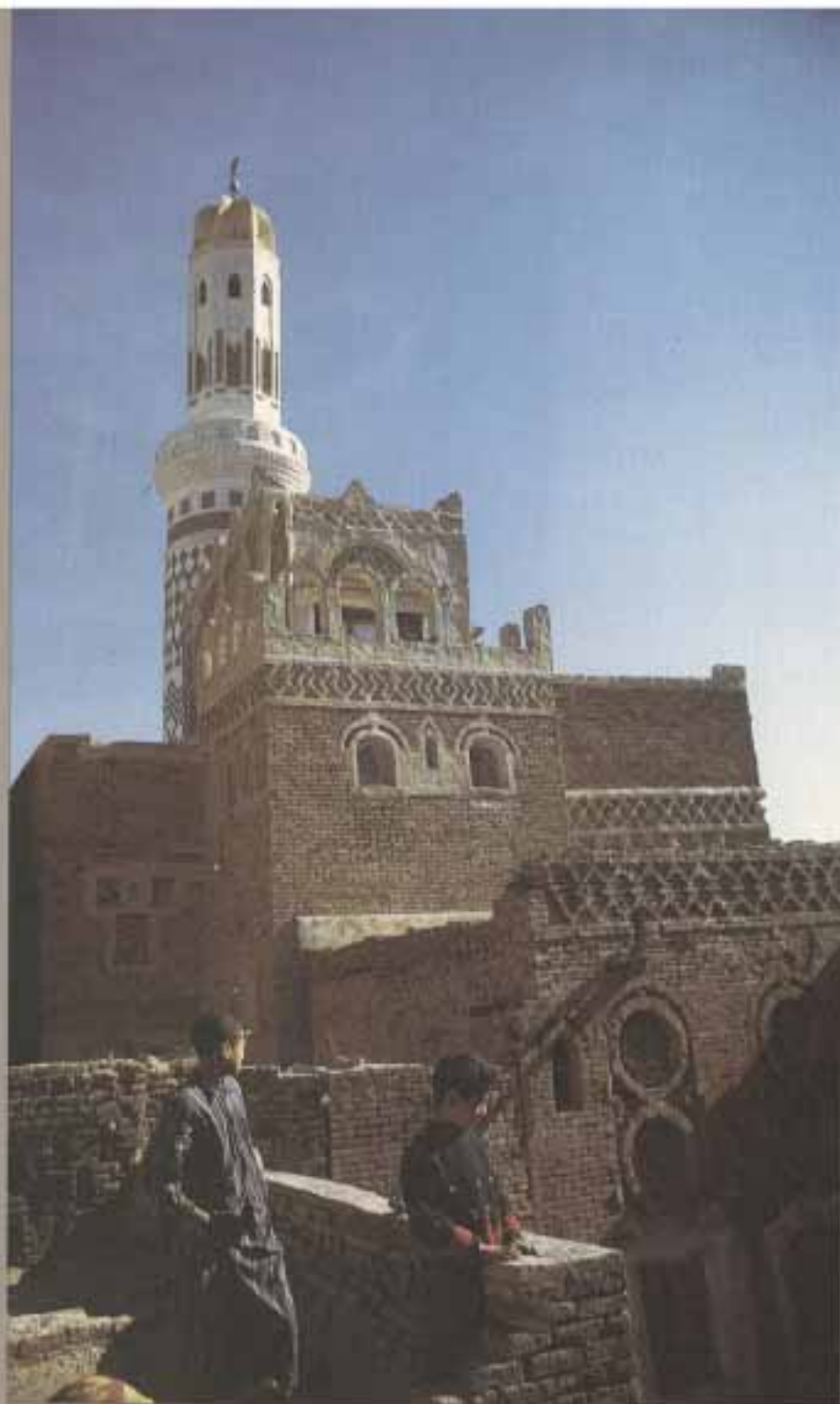
As the name San"a is an ancient one, and means 'well fortified', and as the town is located so as to control the crossing point of two main trade routes at a place where the highland plateau is narrowest, it seems reasonable to look for the most dominant position on the plain where a fortification might be built as the likely kernel of development. Such a position is not far to seek, for the highest point of the citadel, the Qasr, dominates the plain in exactly that way. So important a position is it that the Turkish occupying forces extensively rebuilt the roughly square fortifications on this knoll less than 100 years ago, leaving, however, because of their massive construction, two circular, ancient towers called *nobah*, built with stones weighing many tons each. It seems unlikely, from the type of masonry jointing, that these are actually remnants of the pre-Islamic fortifications. They appear, rather, to be work executed

by the first Yu'firid ruler of San"a c. 849 (233); of him al-Razi wrote in the early eleventh (fourth) century that 'when Ibn Yu'fir took the Qasr apart and uncovered it, he found the building of a foundation on a hill'. That foundation, therefore, would probably be all that remained at that time of the Sabaeen fortress. The ancient identification of 'Qasr', whose name is usually given as 'Qasr al-Qalis', with the site of the present building is established beyond question, and al-Hamdani, writing in the late tenth (fourth) century, states that 'Ghumdan and the [Qasr] al-Qalis were two fortresses in San'a', which he goes on to say were built by, respectively, the ancient Ljimyrite King Tubba' and the Sabaeen Queen Bilqis - clearly suggesting that the Qasr al-Qalis is the older of the two.

Extending down the hillside below the knoll on which the two *nobah* are situated there is a fortified passageway, linking the fort on top of the knoll to a much larger enclosed and fortified area below and to the west of it. Examination of the contours shows that this lower fort also stands high above the surrounding ground, though it is difficult to say how much this is due to the accumulation of debris over many centuries, and how much to the site's having been chosen as a defensive hill.

But the link itself proves to be very old, for on the southern side there is an ancient gate, Bab al-Sitran, built of the same kind of immense blocks of stone with very fine jointing - rather like cyclopaean masonry - and therefore almost certainly part of the Yu'firid fortifications, if, indeed, it is not earlier. This gate is typical of those in other ancient Yemeni cities

3
*The minaret of the
Salih al-Din mosque,
with, in front, the upper levels
and malraj of
Bayt al-'Aḥiri, seen from
Bayt Fay' (see Fig. IV).*



4

*The Great Mosque:
looking up at the
alabaster top lights in
the centre of the qiblah
wall. The alabaster
is blackened with the
soot of centuries.*



34



3

*The citadel seen from
within the city, showing
on the left the fort
containing two nōbah
which sits on the
highest knoll overlooking
the town. The lower
part of the citadel
runs down the hill to
the right.*

in its use of a defensive screen wall beyond the gateway, making it necessary for the user to move parallel to the wall for some distance before passing out into the open country between the two outer bastions.

The separation of the citadel into these two areas, the upper fort on its hill, and the much larger, irregularly shaped fortified area below it, linked to the former by a fortified corridor, suggests that the lower area represents the original walled city, or else the most important defensible quarter within it, following a pattern of development in which the city area of one period becomes the citadel of a later, much larger city. This pattern of development existed in many ancient Greek cities, as well as throughout the Middle East in cities such as Jerusalem and Fustat. The early historians, like al-Razi, use another term, 'Qasabah', which seems a term distinct from 'Qasr', and perhaps they are using this former term to describe the lower fortified city.

There used to be an ancient tradition among the Jews of San'a' that their people were the first to live in the citadel. This seems quite likely to have been the case, if we accept that part of what is now the citadel may once have been an ancient lower city; until recent centuries the Jews were not segregated from those of other faiths, which formed with them one homogeneous group. As the city grew, houses would likely have spread out onto the plain beyond the citadel wall, perhaps the small houses of craftsmen, bakers and shopkeepers at first, surrounding the open space outside the gates which would be used for a market on certain occasions. This development seems to have taken

place to the west of the citadel gate to form the quarter known in ancient times as al-Qati'. As this space became built up, the market was moved away farther to the west and north, to the edge of the northern wadi. It has remained on this site ever since.

During the period of great prosperity in the third century **A.D.** the city seems to have expanded to cover a large area to the west of the Qasr. In the middle of the century the great royal tower palace of Ghumdan was erected on top of a rocky point to the west of the al-Qati' quarter. According to the early historians it was a square building with one side in dressed red stone, another in green stone, a third in black stone and the last in white stone. At the corners there were four bronze lion's heads which appeared to roar when the wind blew. 'There were ten (or seven) floors, between each two floors there being forty steps. In the morning its shadow reached right across the plains to the mountains on the far side.' At the top of the palace there was a room with windows. Each window was set in a door of alabaster and the door itself was set in a jamb made of teak and ebony. The ceiling of the room was a single large slab of marble (alabaster?). 'When the birds flew over, their shadows could be seen on the ceiling.' Ghumdan was destroyed either at the command of the Prophet or afterwards during the days of the first Caliphs, although there seems to have been some kind of fortification on the site until the twelfth (sixth) century.

By the mid-third century **A.D.**, when San'a' was an important centre for the highland trade routes from the Indian Ocean to the Hijaz and from Ma'rib to the Red Sea, many caravans

must have had to be accommodated. The ancient method of doing this in Arabian cities was to halt the caravans at the city gates, where the camels could be grazed and the goods stored in temporary shelters from which they might be sold.

After the Axumite conquest of South Arabia in the early sixth century **A.D.**, San'a' became the capital of the Axumite viceroy. The cathedral which was subsequently built in the city is described by historians as being about 80 m long and 25 m wide. The building was elevated on a platform and approached up a flight of steps; it was built of coloured masonry with alternating triangular stones to produce courses of decoration to terminate the façades at the top. Internally, there was a nave with columns which led into a large chamber (a narthex?), which had arches on which tree and shrub motifs were applied in mosaic, with gold stars between them. From this chamber one entered a domed space 14.5 m in diameter decorated with mosaic on which crosses were depicted in gold and silver. The dome had a large alabaster opening on the eastern side, 5 X 5 m in size, so bright that it caused anyone looking at it from the centre of the floor to cover his eyes. It was described as 'conducting the light of the sun and the moon inside the dome'. The domed room contained a pulpit of ebony and white ivory. Its steps were of gold and silver. Another account describes a floor of coloured marble, marble pillars and the interior shining with glittering gold, silver and coloured glass.

The site of the domed eastern end of the building is today identifiable by a large pit lined with coursed rubble masonry which lies 175 m

to the west of the present citadel wall. It is just over 14.5 m in diameter from south-west to north-east. West of the open space in which this pit is situated is a block of houses rectangular in shape on the eastern, southern and western sides, which exactly corresponds to the dimensions given for the church. The southern side is precisely on an east-west axis and slightly more than 10 m south of the east-west axis of the pit. This rectangular block has at its western end an open square entered by four streets from different directions. It seems probable that this forms the original square facing the entrance to the church.

The eastern boundary of the market, that is, the clearing that marks the present Suq al-Milh and hence probably the north-western limit of the ancient al-Qati' quarter, would then have lain less than 100 m west of the square in front of the church. Immediately to the south of the Suq al-Milh is an extensive open space now partly filled by the twin mosques of Janah and al-Madhhab. This open space seems unlikely to have been built on in ancient times, and probably represents the western limit of the ancient city, beyond which the palace of Ghumdan stood with its own walls and gardens.

Al-Razi tells us that the Jews had their synagogue next to al-Kanisah (the cathedral), which would place the synagogue in the centre of the old quarter of al-Qati'.

The Abyssinian camp is known to have lain to the north of the early city, though the site was afterwards selected by the Prophet Muhammad for the construction of the open-air prayer space in which the 'Id (festival) prayers were to be celebrated - an ironic comment on the War

of the Elephant. The subsequent fifty-year rule of the Persians is commemorated in the records only by the name of the garden of the Persian governor, Badhan, which lay to the west of Ghumdan.

SAN'A' IN THE FIRST CENTURIES OF ISLAM

San'a' of the mansions and towers tall

Ahmad al-Rada'i,
late ninth (third) century

The Great Mosque was erected as the mosque for Friday prayer on the instructions of the Prophet in the garden of the Persian governor, i.e. in the garden of the palace of Ghumdan, and immediately adjacent to Ghumdan on the west. Some historians, however, report that within twenty years the palace itself was demolished, probably as part of the Caliph 'Uthman's campaign to destroy buildings which might act as centres of national resistance to Islam.

The oldest part of the city, al-Qati', was inhabited by Persians, as well as, apparently, by Christians and Jews. A new quarter, clearly quite large, grew up to the north and west of it, extending around to the south beyond the Great Mosque, and this was known as al-Sirar', after the wadi which flowed down from the north side of the Qasr; this quarter was inhabited mainly by the tribesmen of the Bani Shihab.

An open-air prayer space (*musalla*), called the Jabbanah, was constructed outside the walls to the north, on the camp of the Abyssinians. The

mosque of Farwah ibn Musayk, which still stands - albeit in altered form - was built in the open countryside just to the north of the Jabbanah. During 'Abbasid times, the houses of the governor and his staff were beyond the limits of the city on the north, surrounding the Jabbanah. According to al-Razi, these were

the most imposing of the houses of San'a' . . . they were the dwelling places of such governors as came from Iraq, and their entourage coming in delegation with these governors along with . . . merchants and men of wealth and substance. Their houses were upon the road right and left, stretching up to the sky, with dwelling places and high rooms of the most splendid construction and the most beautiful workmanship . . . the shade of . . . Jabbanah came from a shadow extending from those houses upon the right and left because of the height of their roofs and the loftiness of the building . . . they had fashioned rings of brass like a hollow statue in the form of a bull. On each of these doors there was a ring of brass like this statue. When any of them was struck with the ring it gave out a sound and a strong echo.

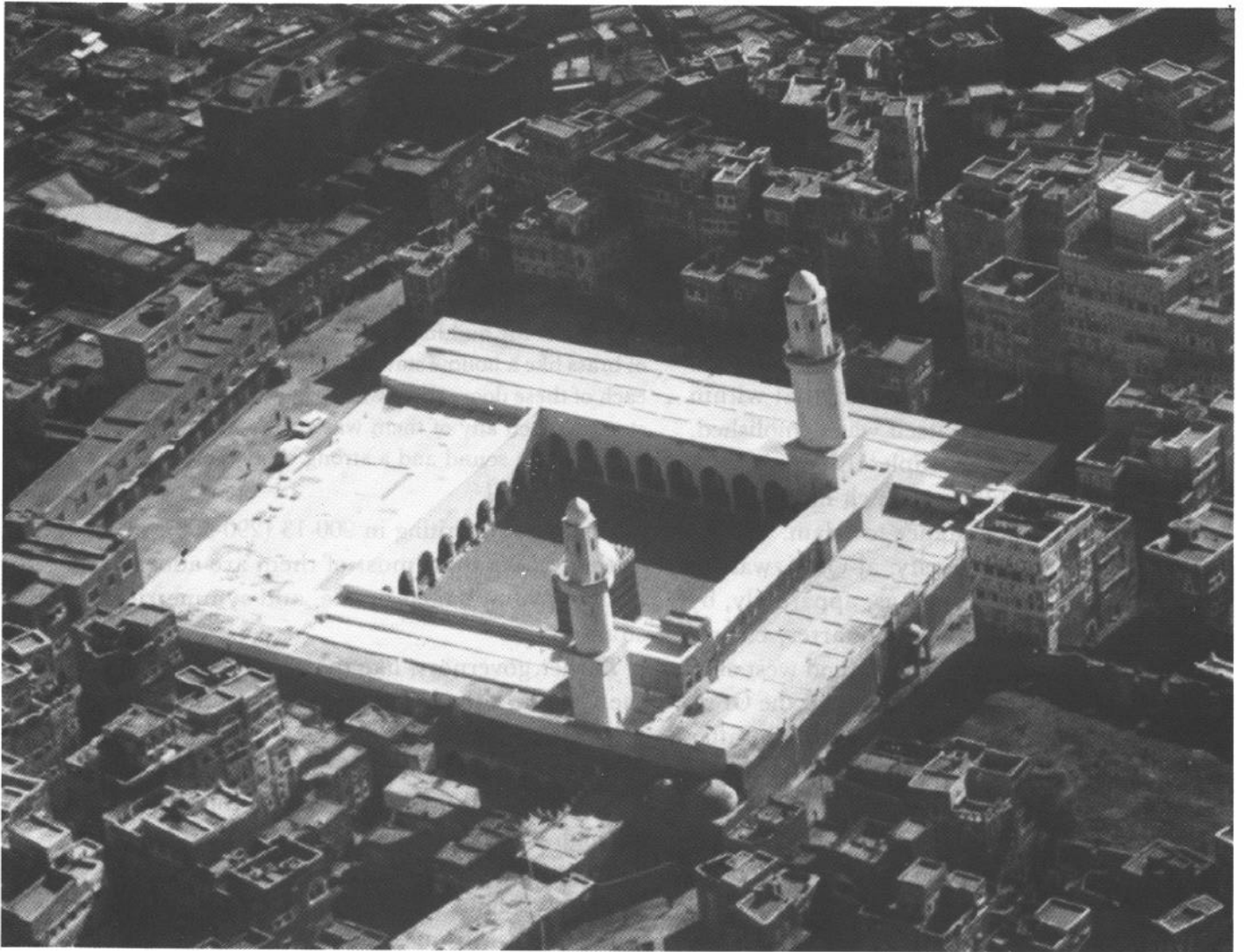
Ibn Rustah, writing in 900-13 (290-300), says of the houses that 'most of them are adorned with gypsum, baked bricks, and symmetrical stones'.

Earlier governors, like the one appointed by the Caliph 'Uthman, had their dwellings near the Great Mosque, beside the western door. It was, of course, the normal practice for the representative of the Caliph to enter the mosque through the door in the *qiblah* wall; for this reason, at least one of the governors of the 'Abbasid Caliphs had his residence to the north of the Great Mosque, and adjoining it.

6

The Great Mosque seen from the air, looking east, with the built-up mound of Ghumdan beyond it and to the right of centre, and the suq beyond that to the left. The great bulk of the Samsarat al-Majjah can be seen top left.

By the latter half of the ninth (third) century the city of San'a" was walled. To judge from Ibn Rustah's account, the northern wall probably ran a little to the north of the suq area as we know it today and then around to flank an extensive open space to the north of the al-Qati' quarter and outside the gates of the citadel, which was known as Maydan San'a', where



tribal disputes used to be settled. The Friday Mosque stood near the southern city wall and there was a main gate near by, as there is today, opening to the south.

Al-Razi, on the authority of al-Hamdani, says that San'a' grew in the first period of Islam for 290 years. This probably meant that the city was expanding to the north (we know that there were houses outside the walls, for 'Say1 Nuqum * . . . spread between the dwellings of the Bani Walid'). The city must also have been continually expanding to the west. In the late eighth (second) century Governor al-Barmaki built the mint in the Suq of the Straw Sellers, and a new mosque in the same suq, on the place where gypsum was beaten for plaster. Today, suqs of these types are normally situated beyond the limits of the built-up area of Yemeni cities. Governor al-Barmaki also constructed Ghayl al-Barmaki, which had to be extended three centuries later to take it to the present Bustan al-Sultan. On these two pieces of evidence it seems likely that the 'Abbasid city did not extend to the course of the present Sa'ilah, or that it did so only in the form of a few scattered dwellings beyond the densely built-up area. The western gate at this time is believed to have been slightly to the east of the present Qubbat Talhah. Governor al-Barmaki is given credit for other improvements to the water supplies of San'a', suggesting that the city had recently expanded rapidly beyond its earlier water resources. At the time, the largest cemetery, given as a wad foundation, lay beyond the city to the south and west. Other smaller cemeteries were situated outside the southern and northern gates.

It is likely that the reports given by al-Razi

of the census taken of the people in the quarter of San'a' as numbering 70,000 during the reign of the Caliph Harun al-Rashid are not far from the truth. Elsewhere al-Razi says that the census taken during the reign of the governor after al-Barmaki (i.e. the early ninth (third) century) showed that there were 85,000 poor (or ordinary) people in San'a'. This is about the same population as existed there within a year of the end of the Civil War in 1970. Another statistic given by al-Razi is that a count made after 895 (282) showed that there were about 30,000 houses. This does not seem an unlikely figure, allowing for the expansion described by al-Razi earlier. In 1972 there were 58,500 houses in the whole of the city.

THE CITY IN YU'FIRID TIMES AND BEYOND

A number of eye-witness descriptions of the city have come down to us from the Yu'firid period. The Yu'firids conquered the city during turbulent times in the mid-ninth (third) century. Immediately after they became masters of San'a', the city was reconstructed and a substantial fortified wall built around it.

Al-Hamdani tells us that the city continued to grow until a few years after 902 (290) when it was destroyed. Early in the tenth (fourth) century a survey of San'a' showed that there were 700 shops, 106 mosques, 12 public baths, 45 sesame mills, and 133 tanning sheds. Ibn Rustah, who describes San'a' at the height of this expansion (at the beginning of the tenth (fourth) century), says that the:

town has a street which splits it into two halves and penetrates through to a wadi in which the floods flow on the days of rain . . . called al-Sirar . . . the entrances to the lanes of the town also open on to it. The market adjoins the north side of the street. Facing the Friday Mosque and about ten cubits from it is a fortress, the foundation of which is rock, being known as Ghumdan.

It appears that the street that Ibn Rustah describes ran west to east through the centre of the town, beginning at the gateway next to the present site of Qubbat Talhah. After passing between the Great Mosque on the right of it and the suq on the left, and traversing the old al-Qati' quarter, the street emerged into the open gathering place in front of the gate of the citadel. The eastern part of this street is still in existence. Ibn Rustah makes it clear that the lanes which opened onto this street on either side extended out as far as the city walls.

Tabari reports that in 901 (289) the Zaydis occupied San'a, and that in the subsequent struggle between the Yu'firids, the Zaydis and representatives of the 'Abbasid Caliph, San'a' changed hands no less than twenty times in twelve years; in 905 (293), for instance, it suffered a severe sacking.

Some statistics are given by al-Razi to show how reduced in size San'a' subsequently became, and it declined further after 955 (344). But it recovered in the second half of the tenth (fourth) century and by the time of al-Razi's writing (he died around 1067 (460)) he claims that San'a' was almost as big as it was before.

Al-Razi tells us that many mosques had to be renewed after the devastations of the wars. One of these was the ancient mosque of Farwah ibn

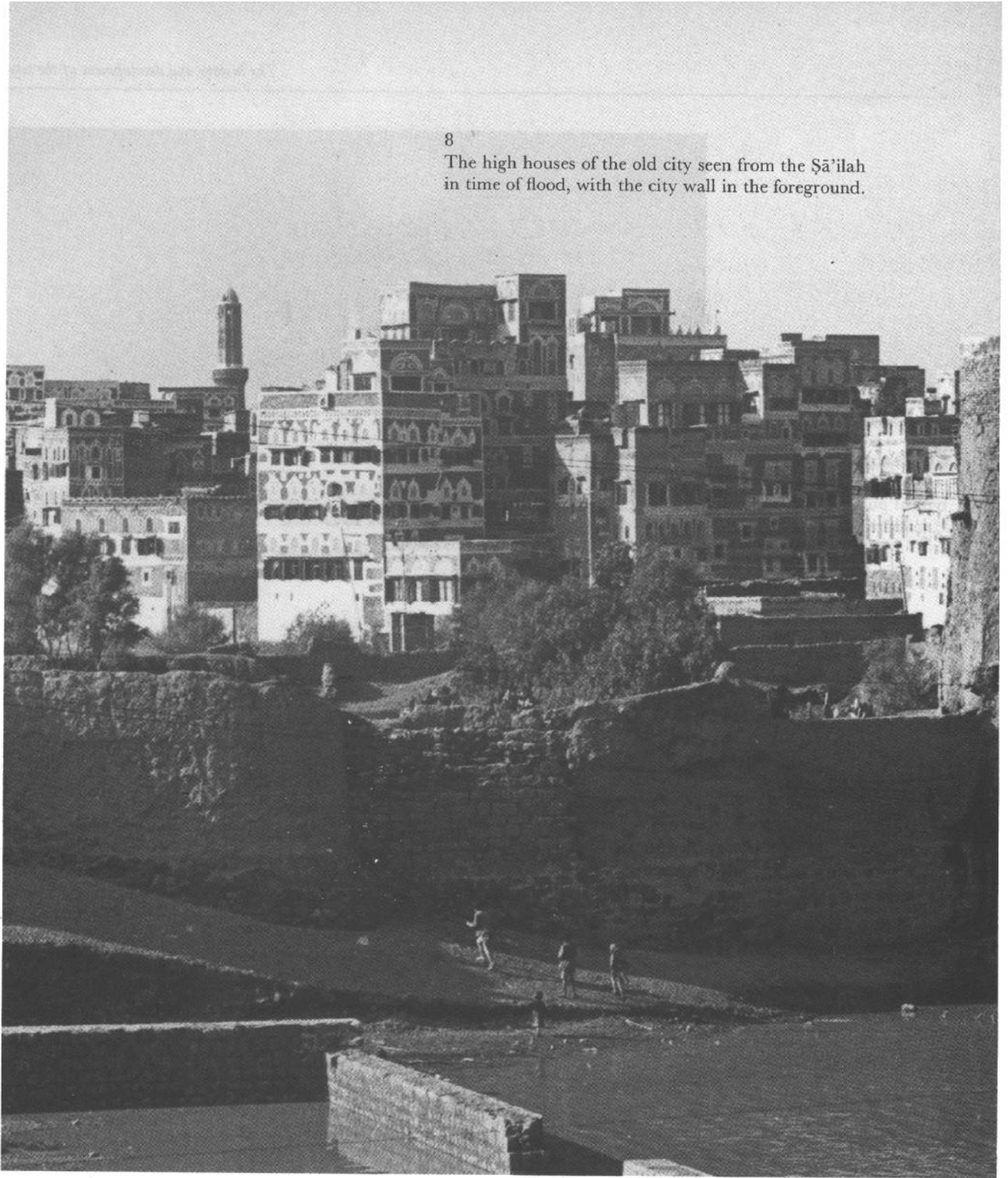
Musayk, to the north, which was rebuilt in 1016 (407). The Jabbanah was repaired in the same year, when the wall around it was rebuilt 'with plaster and stones'.

During these first centuries of Islam many smaller mosques were built throughout the city, with market gardens to provide the income necessary to sustain them, often occupying private ground accumulated from charitable bequests. These market gardens (*miqshamah*) acted as green lungs within the city, compensating for the narrowness of the streets and the height of the buildings. Some of the public baths also date from an early period, often likewise charitable foundations to help maintain the mosques. Each zone of the city had its own baths. Inside the baths, the hot rooms had hypocausts beneath the floor, heated by fires stoked with fuel obtained by drying nightsoil collected from the houses. The remaining ash was sold to fertilize the market gardens. The changing rooms of the baths were often fine vaulted and domed spaces, containing fountains and illuminated from above through glazed openings in the brickwork.

THE CITY FROM THE AYYUBID CONQUEST TO THE OTTOMAN CONQUEST

With the advance of Salah al-Din's two brothers into the Yemen, first Turanshah, who conquered San'a' in 1174 (570), and subsequently Tughtakin, San'a' was forcibly brought into contact once again with the mainstream Islamic world to the north. Tughtakin is said to

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The high houses of the old city seen from the Şā'ilah
in time of flood, with the city wall in the foreground.



have incorporated into San'a' the garden on the western bank of the Sa'ilah, subsequently known as Bustan al-Sultan after him (c. 1197 (594)). The Ayyubids built their great palace there. As conquerors, they would not risk living in the old town. There was also an Ayyubid camp to the north of the palace for the soldiers brought in by Salah al-Din's brothers; it became an urbanized area in the fifteenth and sixteenth (ninth and tenth) centuries.

The Ghayl al-Barmaki was extended until it reached the palace and a public bath which they had constructed in the new quarter. The bath had a fountain which fed channels running through the surrounding gardens; these gardens contained many varieties of trees, fragrant herbs and flowers.

The area west of the Sa'ilah may have been incorporated within the compass of the city walls before this time, however, -for Ibn al-Mujawir, writing about 1260 (660), says that the Sulaybid ruler 'Ali ibn Muhammad, who ruled 1047-66 (438-59))

encircled its walls with stone and gypsum and made seven gates for it:

1. Bab Ghumdan to the Yemen [south].
2. Bab Dimashq towards Mecca.
3. Bab al-Sabahah to Maballat al-Sabahah.
4. Bab Khandaq al-A'la' from which the flood waters enter.
5. Bab Khandaq al-Asfal from which the flood waters go out.
6. Bab al-NaSr towards Jabal Nuqum and Birash.
7. Bab Shar'ah to Bustan al-Sirr.

The first three gates were more important, or were given some sort of special treatment; cer-

tainly they were the main gates, so that B'a'b Ghumdan would have been the earlier name for the later Bab al-Yemen, Bab Dimashq the name for the later Bab Sha'tub, though possibly situated farther south (the first use of the later name dates from 1200 (596)), and Bab al-Sabahah the earlier form of the later Bab al-Sabab. The *khandaqs* indicate that this earlier wall crossed the Sa'ilah.

During the fighting for the recapture of the city which followed the Ayyubid conquest, the city wall and the walls of the citadel were broken down, or severely damaged, in 1174 (570) and again in 1187 (583). They were rebuilt again by 1198 (595)) however, when detailed descriptions of raids on the city make it clear that the city walls were of considerable height.

In 1204 (601) there was a serious flood which destroyed houses

to the east and west [at the north end of the Sa'ilah]; a world of people and beasts perished, and it reached the height of a man's stature in Masjid al-Sawma'ah [Ibn al-Husayn] it took what was around it and then it broke the wall of the *khandaq* and came out of it.

By this date there were suburbs on both sides of the Sa'ilah.

The palace in Bustan al-Sultan did not have a long life, for in 1215 (612) it was destroyed in an attack by the Zaydis. Subsequent references to a palace on the site, however, suggest that it was later rebuilt.

According to an early Jewish history, the Jews moved from the area of the Qasr before the mid-twelfth (sixth) century, and settled at a

place called al-Marbaki, after a watercourse of the same name, which there is evidence for believing ran out of the city through what is now Bab Sha'ub; this may explain why most Jewish shops remained in this area even after the removal of their houses to al-Qa' in the seventeenth (eleventh) century. Al-Marbaki may be simply a Jewish name for al-Sirar, in which case it would also have been used for the old wadi bed further west, or it may have been the name for the diverted waterflow leaving the city through Bab Sha'ub. In any case, Jewish houses tended to be concentrated in the areas east and west of the road running from Bab Sha'ub south into the suq from before the twelfth (sixth) century until the Jews' expulsion from the old city in 1679 (1090). Reputedly old Jewish houses are pointed out to this day in all parts of the walled city, some of them with identifiable Jewish features. In particular the north-western area as far as the Sa'ilah had many Jews dwelling there at the time of the expulsion, and it was there that at least one Jewish synagogue, now the mosque of al-Jila', and two Jewish baths (Shukr and al-Jill') were situated. Mori Salih in his history confirms that the centre of Jewish concentration in the old city slowly withdrew from the area east of Bab Sha'ub and moved farther west during the sixteenth and seventeenth (tenth and eleventh) centuries.

To the west of the walls of Bustan al-Sultan two resort areas are said to have developed before the Ottoman conquest of the sixteenth (tenth) century, Bir al-Shams and Bir al-'Azab, each of which had about twenty large houses surrounded by gardens. The Abhar quarter, west of the Great Mosque, is reputed to have

been the site of the palace of the governor of San'a', before the Ottoman conquest.

THE OTTOMAN CITY

The first Turkish occupation lasted ninety years, beginning in 1539 (946). Although Pedro Paez commented around 1590 (1000) that the city declined after the Turks had taken it, it does not seem from the amount of new building work datable to this time that this decline can have persisted very long.

The city walls were 4 m thick, made of clay, and 'to outward shewe as fair as a stone wall'. At the lowest levels there was a plinth of 'hard grey stone'. Near the city gates the walls were built to full height of 'bluish stone'. On the inside there was a continuous plinth of stone and gypsum to a man's height. Small round (semi-circular?) towers projected from the wall as bastions at roughly 40-m intervals; some of them were battlemented and some entirely built of stone. The clay walls had to be repaired every year after the seasonal rains.

At this period the Turkish governor often lived in the citadel. Near it, in 1597 (1005), the governor Hasan Pasha erected the great domed mosque of al-Bakiriyyah. As a setting for his mosque, he is reputed to have laid out a fine wide street which was lined with trees throughout its length, from the gate of the citadel to Bab Sha'urb. The open square in front of the citadel gate is also said to have been formalized at this time, and Hasan Pasha built Hammam al-Bakiriyyah (Hammam al-Maydan) on it as a waqf support his mosque. The area of these

urban improvements became the fashionable Ottoman quarter of the city.

The western end of the city, Bustan al-Sultan, still largely consisted of open gardens and orchards, albeit contained within the walls. There, 'the principal people have their gardens, orchards, and kiosks or pleasure houses'. The Turks also favoured Bir al-'Azab and Bir al-Shams to the west of the walls for their country villas.

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In 1581 (987) a great flood of the Sa'ilah destroyed the buildings and gardens around and beyond the southern *khandaq*, the floodgate through the city wall. It also destroyed many houses flanking the wadi bed within the city.

In 1619 (1029) there was another damaging flood of the Sa'ilah which finally destroyed the ancient arches of the northern *khandaq*. As a result the governor ordered the widening of the wadi bed; subsequently the southern and northern *khandaq*s were rebuilt to accommodate the new dimensions of the wadi.

THE CITY DURING THE SECOND ZAYDI DYNASTY

The Turks withdrew from the Yemen in 1630 (1040)) and San'a' once more became the seat of an independent Imam. There now began a period of prosperity for the city which lasted for nearly two centuries; this is well attested by the quality and quantity of buildings erected during this time. Considerable damage was done, however, by a flood which came down the Sa'ilah, around 1674 (1085), and destroyed the southern *khandaq*.

In 1679 (1090) the Jews were exiled from the old city and their property there was confiscated. After a temporary sojourn in the Tihamah they were permitted to return to San'a', but not to the old city. Instead they built a Jewish quarter on the western side of Bir al-'Azab, close to al-Bawniyah, a village that appears to have been in existence before this time; the new quarter became known as Qa' al-Yahud. It soon had its own suq, fourteen synagogues, and houses 'as handsome as the best in San'a'".

An impressive new palace was built in a garden outside the western wall of the city, surrounded by its own defensive wall; it appears to have been constructed by the Imam al-Mutawakkil al-Qasim, who came to power in 1708 (1120)) but it is possible that it dated from the preceding century. This palace, known as the Mutawakkil palace from the traditional title of the Imam, al-Mutawakkil 'ala Allah ('he who relies on God'), had at its centre a tall square block. At the beginning of the nineteenth (thirteenth) century another palace was built there, which still stands.

Between the wall of the palace enclosure and the city wall lay an open parade ground, enclosed by gates at both ends, the north one called Bab Sogair (Shaqadif) and the one on the south Bab Intabah. Beyond the latter gate was a wide space which formed a public square outside the ancient Bab al-Sabah, the western gate of the city. In this square were erected, before 1726 (1139), the public baths of al-Mutawakkil and the tomb of the Imam al-Mutawakkil al-Qasim.

In 1761 (1175) the Imam, a ruthless tyrant, in consequence of his displeasure with one of his

Jewish ministers, ordered the destruction of all the synagogues and all storeys on Jewish houses higher than 9 m above ground level. The synagogues were afterwards rebuilt, but the Jews henceforth observed the edict that their houses should remain low.

At the beginning of the nineteenth (thirteenth) century walls were built around Bir al-'Azab and al-Qa. The old Bab al-Sabah remained, but a new western gate, Bab al-Shararah, was built on the other side of the Maydan al-Mutawakkil, which now became completely enclosed by walls.

There were three open squares inside the new walls around Bir al-'Azab. Between Qa' al-Yahud and the rest of the area there existed a long public area known as Sulbi Qa' al-Yahud, and inside Bab al-Rum and Bab al-Shararah there were wide parade grounds. Parts of all three remain to this day.

There were also other wide spaces in the old city, which have since been built over. In particular the area between al-Filayhi and the northern edge of the suq was an open *maydan*, following the line of the ancient wadi bed.

In 1810 (1225), San"ā" still seemed to a visiting German 'the finest city I have seen in the Orient . . . even Constantinople would not be excepted if it were not for its mosques', and in 1836 (1252) Cruttenden speaks of the city with unstinted admiration, in spite of the brief sacking by tribesmen it had been subjected to in 1818 (1234) and 1835 (1251): 'the houses are large, and the windows of those of the higher classes are of beautiful stained glass'. Many of the mosques had their 'domes gilt, particularly those with tombs of Imams'.

But in 1850 (1267), a weak Imam lost control of San'a' and retired to al-Rawdah. The city was given over to months of anarchy and violence. Eventually in 1851 (1268) it was extensively sacked, and again in 1853 (1270).

When S.M. Stern saw it in 1858 (1275) he described Bir al-'Azab as 'a large tract of waste land, varied by cemeteries and fragments of former dwellings'. Even allowing for exaggeration, his impression is shared by other mid-nineteenth-century travellers: 'Now half-ruined. There are hardly any inhabitants in Bir 'Azab. . . . Three-quarters of Bir 'Azab ruined. . . . Public buildings like the mint were demolished by people looking for gold.' In 1872 (1289) Halevy wrote that 'the Imam's authority does not extend outside San'a' and Sha'ub has been sacked'. The village of Sha'ub lay at the northern gate of the city. Halévy also reported that, although the underground canal called Ghayl al-Aswad continued to flow, Ghayl al-Barmaki had dried up.

THE CITY DURING THE SECOND TURKISH OCCUPATION

In 1872 (1289) a Turkish governor-general once more entered San'a and the city became the centre of administration of the Yemen by the Sublime Porte until the final withdrawal of Turkish control after the Armistice of 1918 (1337).

The Turks did not do a great deal to improve the city, being preoccupied with quelling revolutions and repelling attacks by tribesmen on San'a itself. Reports of conditions in San"ā" in the first fifteen years of Turkish occupation

speak of the decayed state of the city, and of the greatly reduced population, as few as 20,000 according to C. Millingen in 1874 (1291), and between 23,000 and 24,000 according to Manzoni c. 1878 (1296). In 1878 (1295) enormous floods caused great damage to the city, more than 100 houses being ruined. But later the population recovered, General F.T. Haig estimating it at 30,000 to 35,000 in 1887 (1305), and the Rev. S.M. Zwemmer and H. Burchardt both thought it had increased to at least 50,000 before the great siege of the city by tribesmen in 1904 (1322) drove many inhabitants away again. All informants tend to agree that the Jewish population constituted about one-fifth of the total, and the Turkish garrison less than one-tenth. Zwemmer and Harris stressed how flourishing the town had become by 1891-93 (1309- 11). The gateway of Bab al-Sabah was removed by the Turks, the name being transferred to Bab al-Shararah farther west.

The barracks built during the first Turkish occupation were also destroyed in 1878 (1295). They were replaced in 1887 (1305) by large new barrack buildings outside the city, on either side of the road south of Bab al-Yemen. A military hospital had already been built by then. These buildings still remain in use.

The fortifications of the city were further improved by the construction at regular intervals of towers, a 'few hundred yards outside the walls, somewhat resembling martello towers'. Most of them were doubtless destroyed in the siege of 1904 (1322), but several fine *nobah* of grey stone near the city may be identified with these towers.

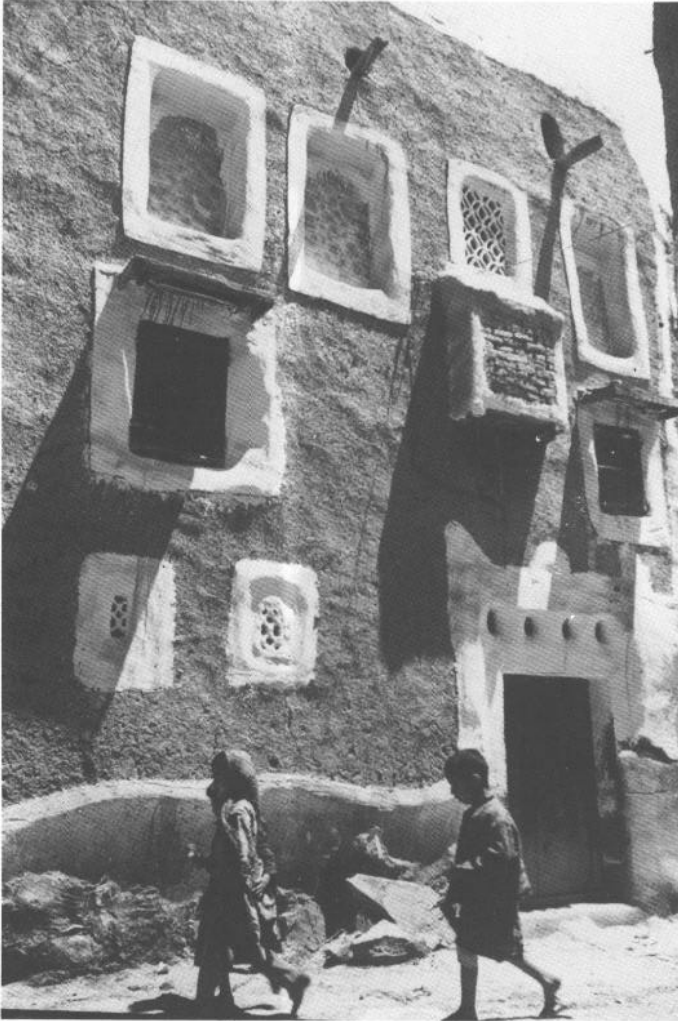


One of the first acts of the Turks was to restore the mosque of al-Bakiriyyah and the tree-lined road between the citadel, the mosque of al-Bakiriyyah and Bab Sha'ub becoming once again the centre of the fashionable quarter of the town; it was here that the foreign rulers had their shops and cafes, as well as the new military academy, two civilian schools and an industrial school.

Bir al-'Azab, outside the old city to the west, once more achieved its earlier importance as a residential suburb. 'Here reside the Wali and most of the senior officers.'

11

A typical Jewish house in Qā' al-Yahūd.



After the prolonged siege by tribesmen in 1904 (1322) the walls of the city were severely damaged, in some places being reduced to ground level. 'Before the siege there were some 70,000 inhabitants, now the number was reduced to 20,000', wrote A. Herbert, an eye-witness in 1905. 'Although San'a' eventually recovered its prosperity and the walls were rebuilt, another intensive siege in the name of the independent Imam in 1911 (1329) did widespread damage.

The gateway of Bab al-Yemen was afterwards rebuilt in brick and stone to a new design by a Turkish military engineer, together with a stretch of the wall on either side of it.

THE CITY UNDER THE HAMID AL-DIN IMAMS

The withdrawal of the Turks in 1919 (1338) was followed by a period of consolidation and reconstruction, The Imam built a splendid new palace next to the old site at Bustan al-Mutawakkil, and in this the first electricity supply in the city was installed.

Inhabitants flocked once more into San'a' and within a decade the population had risen to 50,000. The new Imam engaged in many public works to improve the city, building new hospitals and an orphanage, and extending the Great Mosque. On the whole, however, little change took place in San'a'. The city was sacked by tribesmen in 1948 (1368). During this attack many large houses suffered internal damage, the Samsarat Muhammad ibn Hasan was pillaged (and has been closed ever since),



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*A view of Bayt Jarafi in the Kharrāz quarter,
with a bustān in the foreground.*



and some fire damage occurred to houses, especially those in Bir al-'Azab. Life quickly returned to normal, however, with the physical form of the city much as it had been before. Modern improvements were generally frowned upon by the new Imam, who ruled from Ta'izz.

When the Jews left Yemen as a result of the Zionist exodus between 1949 and 1959, the quarter they left behind was regarded as a very desirable residential area by many of the people who already owned houses in the old city, even though the Qa' al-Yahud was made up of Jewish-style housing, which had been constructed to rather different plans than the tower houses of the old city. This quarter has continued to expand ever since.

THE CITY UNDER THE REPUBLIC

In 1962 (1382) the revolution against the traditional rule of the Imams focused on San'a', which was rapidly modernized with Egyptian aid. Artillery attacks on the city, especially in 1968 (1388) caused considerable damage, but not perhaps as much as might have been expected considering the capabilities of modern weapons.

The most marked physical change in the city was the demolition in 1966 (1386) of Bab al-Sabah, to allow the creation of a great public square, Maydan al-Tahrir, between the old city and Bir al-'Azab; to this were joined two new arms of a new shopping street, laid out as a wide dual carriageway with a central island planted with trees. This was soon to become the main commercial focus of the modern city, rivalling

the old market in importance. During the Civil War the Republican Government also constructed the first tarmac road around the outside of the city walls, to the south to Bab al-Yemen, and to the north to Bab Sha'ub.

After the cessation of hostilities in 1969 (1389) San'a' rapidly expanded to the west of its former limits with the erection of a university and a residential area around it. On the southern and northern sides of the walls of Bir al-'Azab, that is, to the south of the road to Hodeidah and to the north of the road to Wadi Dahr, new residential suburbs sprang up, including many new embassy buildings. Similar developments took place along the road towards al-Rawdah from Bab Sha'ub and along the roads running south from Bab al-Yemen. Both the Hodeidah road and the road to Wadi Dahr were chosen as sites for important new government buildings.

With the removal of the airport from a site south of the city to a site to the west of al-Rawdah on the northern side, and the construction of the new international airport, impetus was given to the development of the city to the north-west. The completion of an outer ring road on this side of the city in 1974 (1394) the southern part of the outer ring road having been built two years earlier, was the first stage in the growth of the city far beyond the limits it had traditionally occupied.

The city has since been spreading very rapidly west, north and south, and even to the east up the slopes of Nuqum, especially after 1976, and more and more low modern dwellings are being built. The changes in the kinds of houses are interesting: one favourite type results from

the Turkish occupation, when a Turkish-style two-storeyed house became fashionable. There is now a modern version in which the living quarters are on the upper level with shops, stores or a garage underneath.

The rapid expansion of population in recent times is graphically shown by the following figures:

- 1962: 55,000 inhabitants (estimated)
- 1970: 70,000 inhabitants (estimated)
- 1972: 91,795 inhabitants (August)
- 1975: 134,558 inhabitants
- 1982: 250,000 inhabitants (government estimate)

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Of this population it is believed that approximately 42,000 live today in the old walled city and a further 8,000 within the area of the Jewish quarter, al-Qa'. Many are old families, but there is a certain infusion of immigrants from the country districts replacing San'a' nis who have chosen to move to newer-style houses outside the walls.

Social structure and way of life

Take care of your neighbours before taking care of your own family.

Yemeni proverb

Since before recorded history, highland Yemen of the mountains and plateaux has been settled by a large number of fiercely independent tribes. Although it is a land of cultivators living in villages, administration is difficult because of constant feuding. There is often only an indirect relation with the central government through the tribal sheikhs. It used to be said that a tribesman was first a tribesman, and only after that a follower of the central religious leader and ruler, the Imam. Although the Imams could theoretically call on the valour of the northern tribes for their support, loyalties were inconstant and fickle. Attempts to collect taxes were a frequent cause of friction, often leading to the casting off of fealty to the Imam: the histories are full of accounts of tribes swiftly changing their allegiance. The tribesman was always armed, intensely jealous of his honour and prepared to avenge insults to himself, his family, his tribe or his faith, in more or less that order.

Highland and lowland Yemenites adhere to the Zaydi and Shafi'i schools of Islam respectively. Zaydi beliefs are not significantly opposed to those of the Shafi'is; in general there

has been little physical discord between them on religious matters. An important theoretical point of difference is that for the Shafi'is, who are Sunnis, the Qur'an is the word of God dictated to the Prophet Muhammad, whereas for the Zaydis the Qur'an is a created work. The Zaydis are Shi'ah, and believe that their Imam has authority passed on directly from the Prophet Muhammad through his daughter, Fatimah, and his son-in-law, 'Ali ibn 'Ali Talib. It will be remembered that 'Ali ibn 'Ali Talib was reputed to have been sent by the Prophet to the Yemen, and the country has always shown great loyalty to him and his family.

The Zaydi Imam was selected from among the Sayyid class, that is, from one of the descendants of the Prophet. He was eligible only if he conformed to fourteen qualifications, among them being courage, capacity to rule with justice and generosity, and ability to attract followers. Through the Imamate the establishment of a centralized authority for government over the tribes was possible. But whenever the Imamate became weak - or was brought down by such external causes as invasion - tribal anarchy usually followed. In addition to the other

qualities required of him, the Imam had to be a resolute warrior to deal with dissension and maintain his authority; it was further necessary for him to have an almost encyclopedic knowledge of the tribes and the families of the Yemen, with all the intricacies of their relationships.

The Sayyids, as members of the Prophet's house by birth, enjoyed enormous privileges and respect throughout the Zaydi Imamate. They were the aristocracy of the country, devoting themselves to scholarship, administration and legal affairs. Though therefore essentially urban dwellers, they frequently possessed rich lands outside the towns. From this group come a majority of the *ulema*, the religious fathers. Many of the Sayyids also engaged in trade.

Another leading group in the highland community are Qadis. The title, strictly speaking, means 'magistrate' or 'judge'. It is accorded to an educated man when he is deemed to have earned the respect of the community by his wisdom and activities, providing he comes from one of certain qualified families. It is believed that these families may have originated from the aristocracy of pre-Islamic Yemen. Many of the officials, judges and scholars of the highlands belong to this class.

The remainder of the social classes in Yemen are tribal in origin - except for the lowest class of all. This is true in both urban and rural societies. Occupations are divided into those that are 'honourable' and those that are deemed socially inferior.

The sheikhs of the tribes form an important group in the Yemen. They are elected from among the tribesmen and usually belong to one or two of the leading families of that tribe.

In the towns those people engaged in 'honourable' pursuits, like peasant craftsmen, would be termed *manasib*, that is, they are understood to have a 'tribal ancestry'. Often the word 'Arab' is used to designate them. They are engaged in all the leading branches of commerce and in all the most skilled of the handicrafts, their occupations ranging from goldsmiths and silversmiths through coppersmiths and blacksmiths to the makers of daggers, joiners, turners, stonemasons, bricklayers and porters. Able-bodied men of this class who were capable of bearing arms were traditionally compelled to do so if their town was attacked.

At a lower social level, regarded as below the honour of a tribesman, are activities undertaken by members of the *muzayyin* class. This class would include shoemakers, beltmakers, saddlers, tanners, brickmakers, barbers, bath attendants, butchers, cafe proprietors and market gardeners. It would be socially degrading for a child of the *manasib* class to marry into the *muzayyin*. They even live in separate quarters in some of the highland towns - there is also an observable tendency for this to occur in parts of the old city of San'a'. In common tribal law the killing of a *muzayyin* by a tribesman, or *mansub*, would be regarded as a discreditable act.

The lowest class of all are the *akhdan*, a numerically small group in San'a', mostly employed in former times as street cleaners. They were not allowed to take up the occupations of the other classes or carry arms or purchase houses or land.

The class to which a man belonged was traditionally indicated by his dress, in particular by two features of it, the dagger and the head-

dress. The Sayyid, Qadi, and other educated, respected men still wear on formal occasions a kind of hat made of a stiff, flat-topped cylindrical frame with a top finely worked in white thread around which is wound an embroidered cloth or a strip of white muslin. The dagger in their belt is slightly curved and has an ornate handle of silver filigree work housed in a silver or embroidered case; the belt is of woven silver or gold thread. They are frequently very neatly dressed in well-tailored, dark coats worn over white cotton robes.

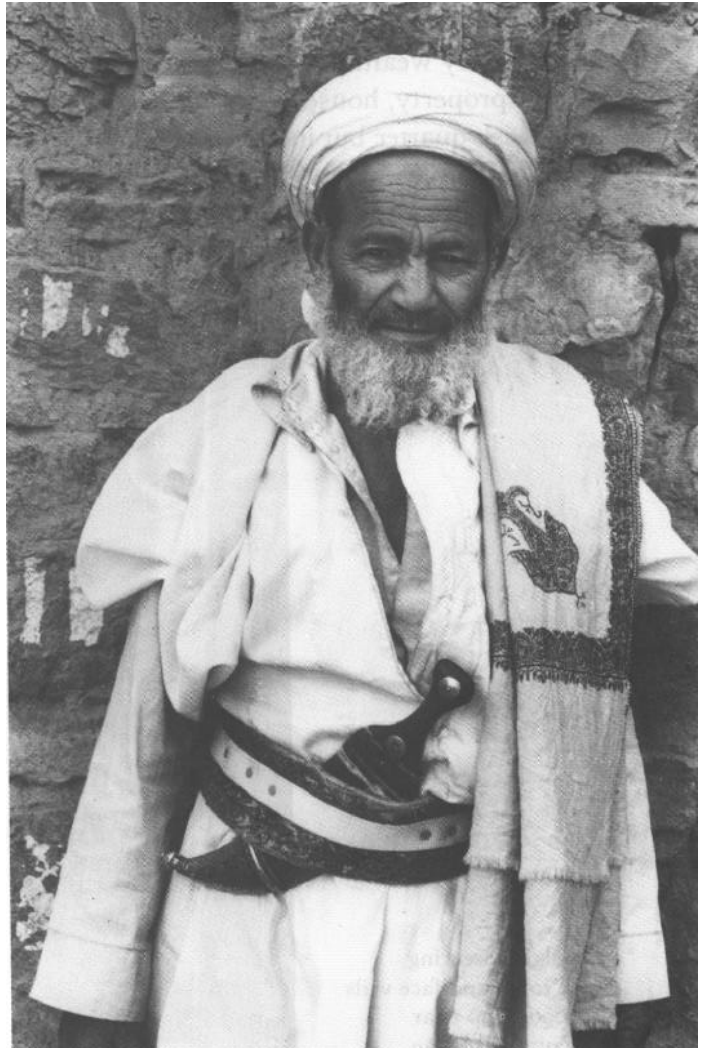
Until recent times the standard head-dress of a tribesman was a turban of cotton, dyed in indigo so that it shone like metal, wrapped around a small crocheted sweat cap. It was also worn by craftsmen in the market and by some of the lower classes. Today this kind of head-gear is more commonly replaced by shawls made in the Tihamah or in India. The dagger of the tribesmen and those San'a'nis who claim tribal origin is J-shaped with a bone or wooden handle housed in a leather sheath and worn on a leather or cloth belt. Tribesmen or craftsmen traditionally wear either a striped, wide-bodied and wide-sleeved, full-length garment or a shirt and *futah* a striped cloth wrapped around the waist.

By contrast, female dress revealed no specific marks of the status of a woman. Regional or economic differences might be recognizable, but a woman could easily wear the dress of another group without reprobation. In any case, because in public women were veiled, there was an all-pervading anonymity about female dress.

Jews in San'a' were mostly craftsmen; very few were traders. They worked side by side with

14

A Qadi wearing the traditional headdress and dagger (*janbiyya*), Qadis wear their *janbiyya* to the right side of the belt (cf. Plates 33 and 34).



Muslims who belonged to the same craft or trade, often sharing adjoining premises in the suq. There is no indication that any craft or trade was reserved exclusively for the Jews.

The Jews, who until the 1950s numbered about a fifth of the population of San'a', that is, at various times from 8,000 to 12,000, were on the whole a prosperous community. It has been estimated that between a quarter and a third of them were wealthy by San'a' standards, some of them very wealthy indeed. Many owned extensive property, houses and shops, not only in the Jewish quarter but in the rest of the city and outside. The Jews played an important role in Yemeni history and frequently provided financial support for the administration, wars and

development projects of the Imam. Owing their security to him, and lacking tribal affiliations, they formed, from his point of view, one of the groups in the community on whom he could most depend.

Like almost all Islamic towns, the administration of San'a' was divided up into a number of quarters or wards, each named after the main or largest mosque in each quarter (often there were two or three other mosques in a quarter). Perhaps because San'a' had been for at least 1,000 years a 'protected' town (hejira), the original function for which the quarter system was evolved (i.e. to protect tribesmen from attack by neighbours who belonged to traditionally hostile tribes) may have fallen away. Hence the

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Schoolgirls wearing
black robes and face veils
in a bookshop near
the Zumur mosque.

boundaries between quarters were not as important as they may have been in the days when quarters were separated by walls or open spaces. In San'a' it appears that the number of quarters, and hence their size and boundaries, have often changed quite arbitrarily throughout history.

In San'a' each quarter had a headman, the *'aqil*, who was responsible to the governor of the city for the maintenance of security, the collection of taxes and for settling any local disputes. Every craft also elected or nominated a sheikh who represented the interests of that craft, ensured fair prices and arbitrated in the case of a dispute between a member of the craft and one of his customers. These craft sheikhs elected the sheikh of the market, who was responsible for maintaining security at night by hiring watchmen and who acted as a spokesman for the merchants and craftsmen with the governor of the city. Under him, however, there was an official responsible for security at night, a sheikh *al-layal*, whose job was to supervise the watchmen. Since the second Ottoman Turkish occupation a municipal organization has been set up in San'a' which to some extent relieves these officials of the more irksome of their duties, and has accordingly somewhat reduced their status.

THE TRADITIONAL WAY OF LIFE

In San'a', mornings and evenings are the working periods; afternoons are spent relaxing in groups in the houses or shops, smoking *hookahs* (water-pipes) or chewing the stimulant leaf

16

Man returning from the *qat* market. His headdress is of the type worn by Sayyids and Qadis.



qat. If there are strangers present, the groups are segregated, the men sitting in one 'room' of the house and the women in another. Occasionally there is further separation between the young and the old people of both sexes.

In the streets, the men dress in stylish, colourful clothes, with daggers in their belts; they wear turbans or cylindrical hats and carry shawls across their shoulders. Variations in the styles and colours of the garments come and go just as they do in the Western world, but on a slower time scale. Until the present century, material and clothing were expensive. Most people reserved new clothing for ceremonial occasions, such as festive days and wedding

feasts, and kept garments for as long as possible, redyeing and patching them. Men normally cut their hair short, but remote tribesmen from the countryside sometimes wore no headgear and left their hair long. In cold weather a *kirk*, that is, a coat with a black lambskin lining, would be worn; if the owner was from the upper class, this would be covered with a smart coat of blue serge; if from a lower class, it would be left with the skin of the animal showing.

60

Yemeni men seemed to possess an innate colour sense. Bright colours were often worn in combination but almost never to poor effect. Aristocrats and scholars preferred white or pastel colours. Striped cloths were always popular. Tribesmen from the country wore, and still usually wear, simple undyed cottons or those in plain colours, or the old-fashioned indigo-dyed cloths.

Until a few years ago, women were veiled in all circumstances in the company of men other than those of the family. Not only the face, but if possible the feet and ankles too, had to be covered. Girls younger than the age of 12 and women past menopause were allowed to appear before strangers unveiled. The wearing of the veil had a particular advantage in San'a'; because the houses did not provide a fully separate zone for women, the veil allowed a woman to preserve her modesty before men who were not of the immediate family and yet be unhindered in her movements. It may be said here that veiling women in the company of men was regarded as a means of honouring the women and their modesty among at least the more thoughtful of the traditional society. Tribes-

women generally did not veil their faces but each wore instead a simple black shawl thrown over her head, which might be gathered across the lower face as a veil if she so desired it.

In the home, women normally wore a simple cotton dress with narrow sleeves which they dyed and redyed black or dark red until it was threadbare. On their heads they wore a minimum shawl which could double as a veil. But in the afternoons, women normally dressed to go to a party or to receive guests. For this they wore finer clothes, long dresses with woven silver or gold thread, lace stockings, brightly coloured or silver shoes, silk, velvet, Indian brocades, or even imported European silks. Quantities of rich silver jewellery were worn around the neck, ankles, wrists and possibly on the forehead. Yemeni silver-work was among the most famous in the Islamic world. But necklaces of amber and semi-precious stones were also worn. When a woman went out she wore over these a dark outer garment, usually black, a face cloth of local San'a'ni dyeing, with large circles in black, white and red, and over the whole was thrown an imported Indian glazed printed cotton in red, blue, green and orange. Until recently, both cotton and woollen cloth were woven in San'a', and the embroidery of cloth is still carried on there. The striped shawls made in San'a', with bands of white and silver and gold thread running through them, have been famous since early Islamic times, but their manufacture in the highlands is fast disappearing. Yemeni cloth is still manufactured in the lowlands and the Tihamah, but foreign cloth is increasingly imported for sale.

To this day some carpets are woven in the

countryside around San'a' from wool produced by the farmers and spun by the womenfolk. Striped patterns or plain black carpets are favoured. The carpets have no pile but are very thick kilims.

Greetings between men are often elaborate. There are said to be more than fifty kinds of greeting. They range from a simple clasp of the hand or a touch on the shoulder to repeated kissing of the back and palm of the hand, the wrist, the shoulder and even the knees as signs of respect or affection. Niebuhr reported in the eighteenth (twelfth) century that it was customary for the Imam to be greeted by a kiss placed on the back and palm of his hand, as well as the hem of his robe, and on one occasion the townspeople approached the Imam to kiss his knee.

Food typically consists of a large meal after the midday prayer, a very light meal in the evening, and the consumption of bread at breakfast time. A meal for a guest at lunch time (i.e. a full meal) begins with the eating of radishes and continues with the serving of *al-shafut*, broken-up pieces of flat bread soaked in buttermilk or sour skimmed milk and garnished with grated garlic, leeks, chilies and thyme. The next dish is often *bint al-sahn* meaning 'daughter of the bowl', which is made of alternate layers of thin cake soaked in ghee, honey and black cumin seeds, served in a hot stone dish and covered with melted butter and honey. The meal being half over, the diners more than half full, meat is then served, usually in the form of a broth (*merak*) followed by stewed or roasted meat together with pieces of okra, fried, boiled or roast potatoes, rice or beans. Finally, the

meal is concluded with jelly or fresh fruit, apples, apricots, peaches, pears, figs, pomegranates, melons, bananas and the grapes for which the countryside around San'a' is particularly famous.

Other meals might include porridges made from various grains, or dhals. There are nine kinds of bread, besides a large number of bread dishes and at least four kinds of cake.

Servants were practically unknown under the Imamate, even in the houses of the wealthy. The households were so large that the housework and cooking could be done by the housewife, her daughters and other relatives. Some slaves were once employed as a sign of prestige or to do menial tasks in the great houses, but these were few and reputedly treated as members of the family.

At celebrations there was music and dancing, although a number of the Imams issued injunctions against it. The musical instrument most favoured was the lute, or *'ud*, which the Yemenites claim originated there. It was usually played by a single singer to accompany his ballad, although groups of two or three *'ud* players singing together are common today. Dancing was usually performed to the music of side drums and a double flute, the *mizmar*. The high-pitched, buzzing sound of the *mizmar* was characteristic, the piper leading the drummer with a nod of the head whenever necessary. The method of dancing was that two men faced each other, or a group of men formed a circle, and used their daggers - which they waved above their head and dropped - to mark time, while they paced out an elaborate pattern of steps with their feet.

The architecture of the old city of Ṣan'a

*The heritage of your father is worth more
than years of study.*

Yemeni proverb

The opportunities for undertaking research in the Yemen, and particularly in San'a', after the end of the Civil War have nowhere been more significant than in architecture. Although architectural researchers are seriously handicapped by the lack of any archaeological study within or near the city, as well as by the absence of classification of most of the documentation, the immense wealth of surviving buildings in San'a' has made it possible to establish the main outline of building development for at least the last 300 years, and, in the case of mosques, for well over 1,000 years. It has proved possible, subsequently, to link this in its essentials with detailed accounts of the physical character of the city in the tenth (third) century, and with what little can be gleaned of pre-Islamic San'a', so that the essential continuity of architectural design can be asserted with some confidence for a period dating back to the beginning of Islam, and, on the evidence of the tower palace of Ghumdan and a few other fragments, to four centuries earlier.

As timber was in short supply, because trees were relatively rare and small, the traditional architecture of San'a' relied to only a limited

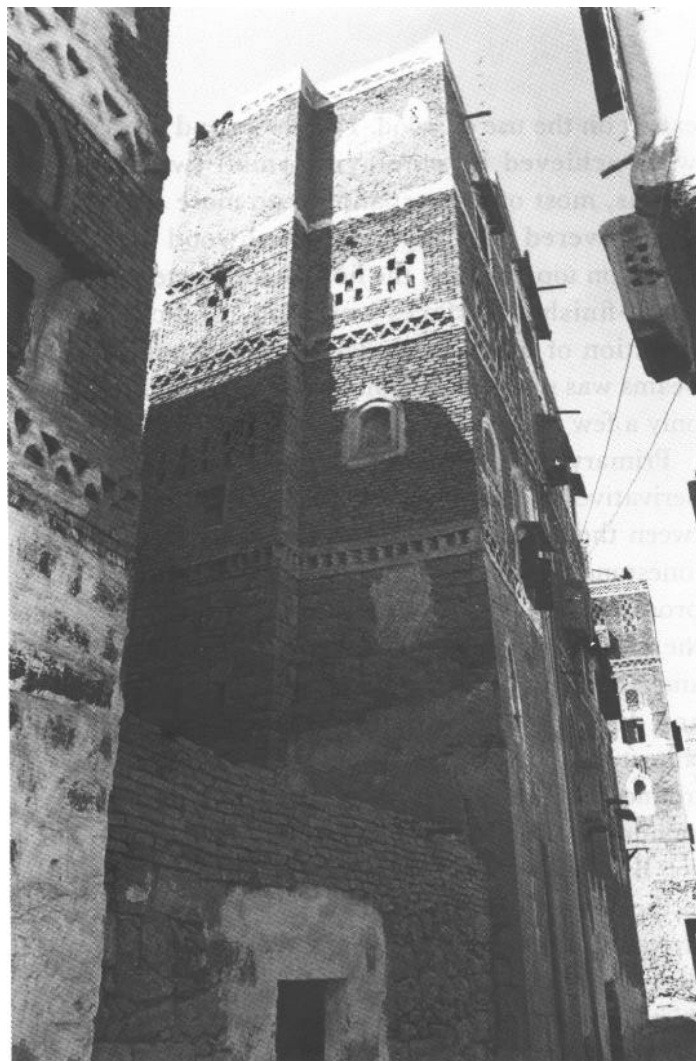
extent on the use of wood. Flat floors and roofs were achieved by employing small twisted beams, most of them spanning no more than 3 m, covered with layers of brushwood and earth, on top of which the horizontal plaster or earth-finished surfaces were laid. The construction of fine ceilings with larger wooden beams was so expensive that these are found in only a few mosques and palaces.

Primary building materials were stone and derivatives of clay from the loess-like plains between the mountains. Sometimes gypsum and limestone deposits occur, and from these were produced, by low-temperature firing in kilns, the splendid gypsum plaster (plaster of Paris) and lime whitewash for waterproofing. Vaults and domes were not part of the domestic architectural tradition and seem to have been introduced as a means of roofing larger spaces in monumental buildings, and possibly baths, under Byzantine and perhaps Persian influence, in the centuries preceding Islam. But after the arrival of Islam they went out of style again, and were only revived under the Rasulids in the thirteenth (seventh) century, and then only for tombs, mosques and public baths.

HOUSES

18

Bayt Wassa, seen from the west (see Fig. II)



The predominantly square tower houses impress the visitor with their height. Many houses are more than five storeys high, the largest commonly having seven, eight or even nine storeys. A view of the city from a distance, with many hundreds of these houses soaring above the city walls, makes an unforgettable impression.

The streets of the towns are generally narrow and flanked by towering houses with no sight of vegetation or water to relieve the eye, yet behind the houses and extending right up to them there are frequently large gardens. These are the waqf foundations which support the mosques; they are planted with vegetables and fruit which are sold to the inhabitants of the encircling houses, the surplus going to the market. Thus almost every house, even in San'a', has a view through its windows into extensive gardens. The cultivated areas frequently appear sunken, and indeed it was from these areas that earth was taken for the construction of the surrounding houses, but the effect is increased by the accretion of centuries of rebuilding along the streets, so that the building and street levels have risen several metres above the original ground level.

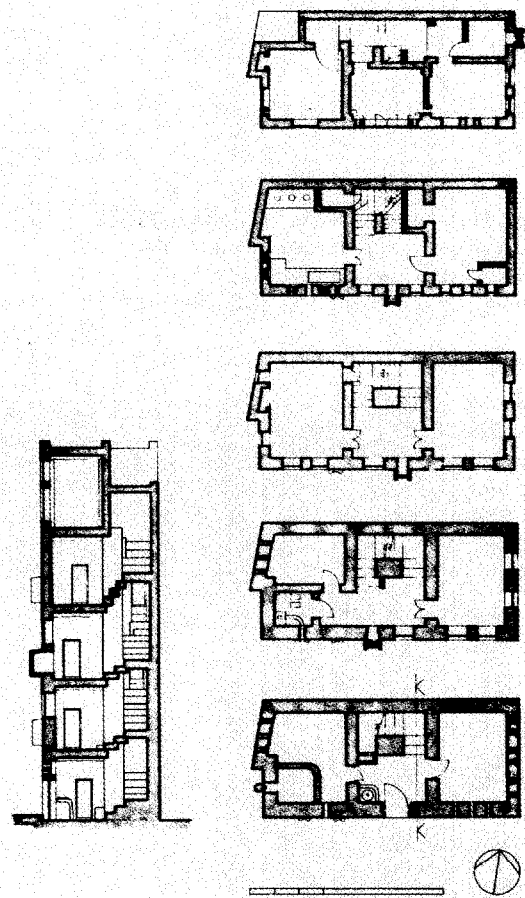
The houses are seldom joined together to make one architectural façade. Each house, even if wall to wall with another, appears to want to be looked at for itself and pays little attention to an exact alignment with its neighbours. Many of the largest houses are so packed that they do not have an entrance court, but a few stand in small gardens which are hidden from the street by high walls.

The houses are constructed of ashlar stonework up to approximately 6-10 m above street level, where exposed brickwork takes over. The stone walls are not solid but have a rubble-and-clay infill, faced on each side with squared stones tapering slightly as they penetrate the wall. The flat square bricks are made from the clay of the surrounding plains and average 16.5 cm square and 4 cm thick. Externally the lower levels are plain whitewashed or bare stone. They are entered through only one opening, a squat wooden door, usually in the middle of the southern side.

Yemeni houses are normally built for one nuclear family; old houses may have two or even three closely related families living in them; in a few cases houses are owned by a sheikh for use by members of a tribe, or are waqf foundations, in which case they may be subdivided.

The distribution of usable space is basically the same in all these tower houses. The ground floor serves for the accommodation of animals, ranging from cattle and beasts of burden to sheep and goats. From it a stair leads up to the first upper level, sometimes a mezzanine above only a small part of the ground floor. This first level may be used for the storage of grain and fruit. It sometimes contains the circular stone mills for grinding grain; alternatively these mills are placed on the ground floor, inside the entrance. Above these levels is the first domestic level, usually containing a family living-room in which business may be conducted and visitors initially received; at such times women retreat to the higher levels.

A carved door opens from the staircase at each upper level to give access to a generous



II
Bayt Wassa: plans and section.

19

Bayt Mutahar: the *diwan*, now also used as a bedroom, showing the introduction of a Western-style bed on the right. The upper windows are of alabaster.

lobby, around which the rooms are grouped, usually one main room, a store and a bathroom. Sometimes another tiny room is provided for the preparation of beverages and to house the charcoal brazier used for lighting the tobacco pipes; these activities may also take place in the lobby.

On the second living level is the *diwan*, a kind of large parlour kept locked except for family gatherings for feasts, weddings and funerals;



this room is also used as the place prepared for childbirth, with an elaborately arranged and decorated raised couch.

Above the *diwan* are similar? semi-private rooms and the kitchen, and at the highest level of the house the afternoon reception room, the *mafraj*, used most often by men. In the *mafraj* an assembly of relatives and friends smoke the traditional hookahs and chew *qat*, while engaged in conversation which is often phrased in elegant formal language or even in poetry.

The *mafraj* is built at a great height above the ground, and is customarily the most decorated room in the house; it has large windows on three sides providing magnificent views, which are at their best at sunset, when conversation tends to flag. The fourth direction, the north side, is kept closed to prevent the entry of cold winds.

Because the walls of the houses are of stone and thickly plastered, the extremes of heat and cold experienced from noon to midnight are rarely felt indoors. The thermal capacity of the walls introduces a heat lag which smooths out most of the temperature differences. There is no heating, even though the climate is quite cold in winter.

Permanent ventilation is provided in the staircases and lobbies by means of projecting masonry cooling boxes. These have shuttered doors which can be closed in cold or windy weather. Rooms are normally ventilated at a high level by tiny opening flaps set in the walls between the fanlights. In the rare event of high humidity after rain, the lower shutters can be opened to provide cross ventilation at body height.

The lighting levels are high, due to the large

areas of fanlight above the low-shuttered openings. In some cases the fashion for coloured glass tends to reduce the natural light, but in the older houses alabaster panels above the shuttered windows flood the interiors with a golden light.

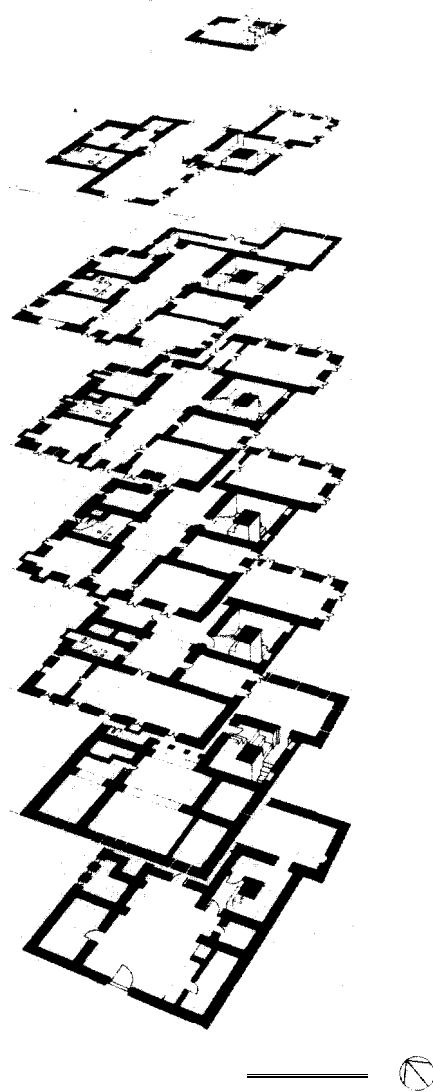
The following sections give a detailed description of these houses.

The ground floor

The stalls for animals on the ground floor usually take the form of enclosed rooms approached by hinged wooden doors and ventilated onto the street through small openings in the outside walls. Firewood for the house is stored in one of the larger animal stores or in the entrance lobby. The ground floor of the house also contains a closed room for nightsoil under a 'long-drop' lavatory. Here the nightsoil is stored and dried, then shovelled out through a low opening in the street wall and taken away to be used as fuel in the public baths. From the entrance hall a wide internal door opens onto the stone staircase, which winds upwards around three sides of a central zone pier and is enclosed throughout its height in walls. This is one of the reasons for the strength of Yemeni buildings: the staircase acts as a kind of hollow column. The entrance hall is lighted through a cluster of slits above the front door.

The entrance door is pivoted on stone pads at top and bottom and fits into a recess in the thickness of the outer wall. It is furnished internally with two sliding wooden bolts and a

III
Bayt al-Belayli: a perspective of the plans.



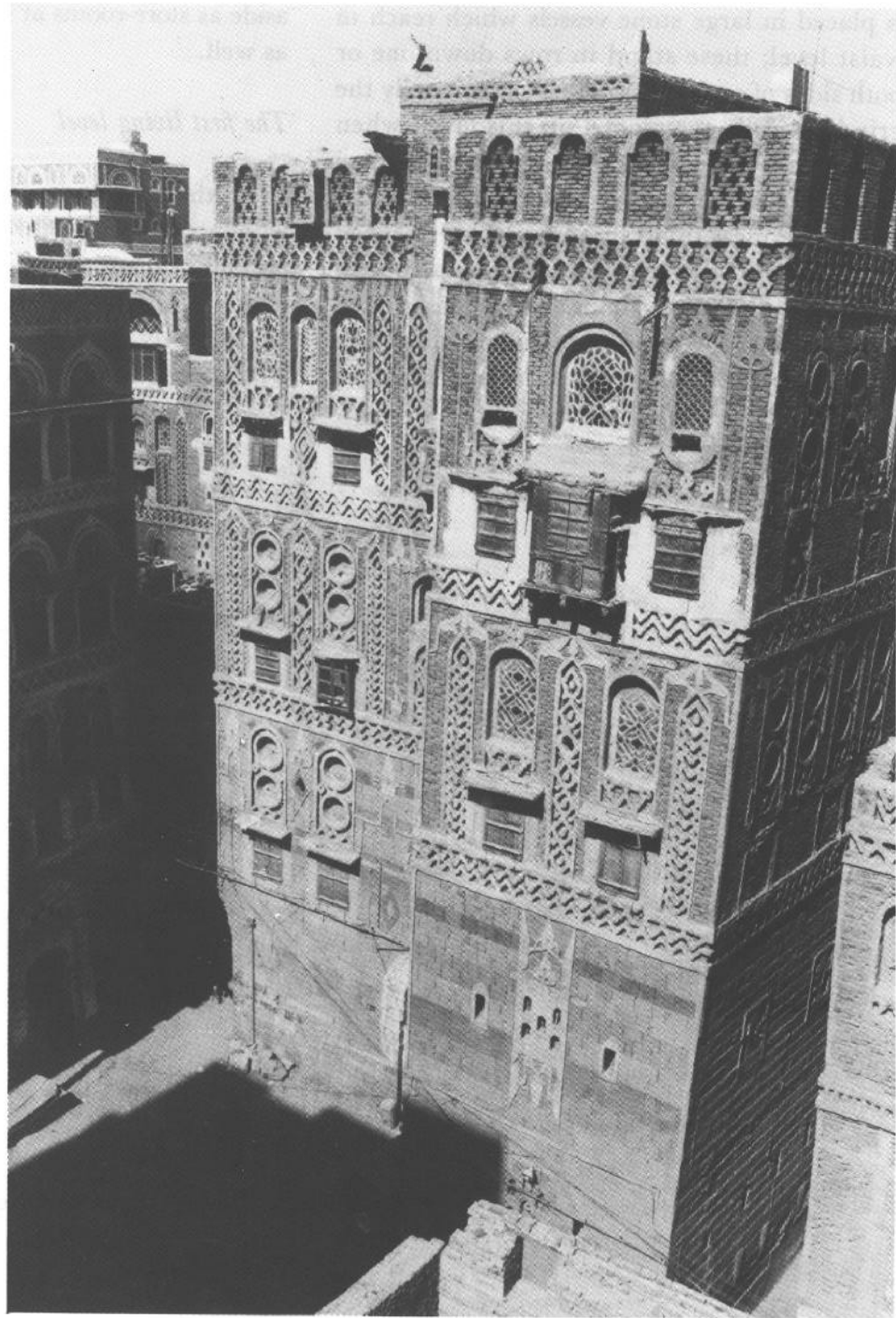
wooden lock. The lower bolt can as a rule be operated from outside by a large key, which must be turned four or five times to slide the bolt back through a series of notches cut in its underface. The upper bolt cannot be opened from outside, but it can be closed by pulling a cord passed through a hole in the door. This enables the inhabitants to secure the house completely against intruders; even with a key to the house the door cannot be opened. This second bolt can furthermore be opened from any level of the house, by pulling the cord which passes over a wooden pulley and then travels vertically through holes in the floors of the upper staircase lobbies. The cord is fastened to the end of the bolt, drawing it from its socket. It is customary for a visitor to shout from the street to the inhabitants above, who then open the door in this way. Alternatively, a special pattern of knocking, which is known only to those who live there and close friends, may be used.

The first upper level

This is often a mezzanine level, the entrance hall itself rising through two storeys. In this case, one or two large arches, built of exposed stone voissoirs, cross the entrance hall to support main internal walls on the upper floors. Commonly, the mezzanine level contains no living-rooms, though in some very old houses there is one. Large houses may have a guardroom on the mezzanine level which overlooks the entrance hall. This often has a private wardroom adjoining, as well as a lavatory.

Most of the mezzanine space is used for storing grain. The wheat, corn, millet or other grain

20
Façade of Bayt Sāri',
built some 150 years ago.
Some of the older circular
alabaster windows
have been replaced by
larger ones of coloured
glass set in a gypsum
tracery.

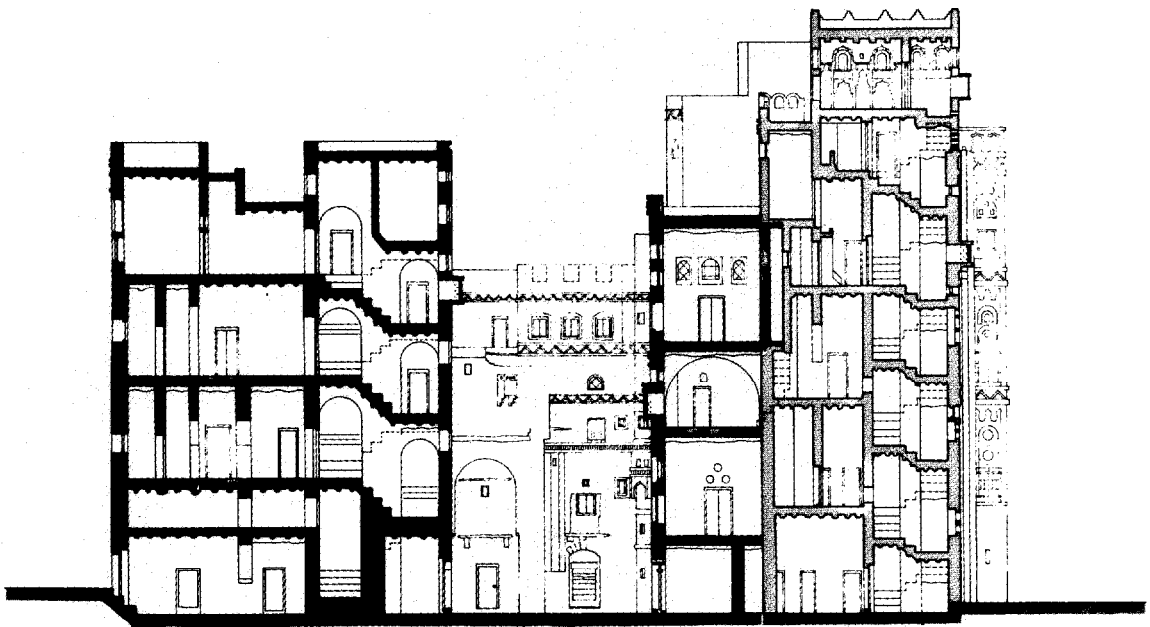


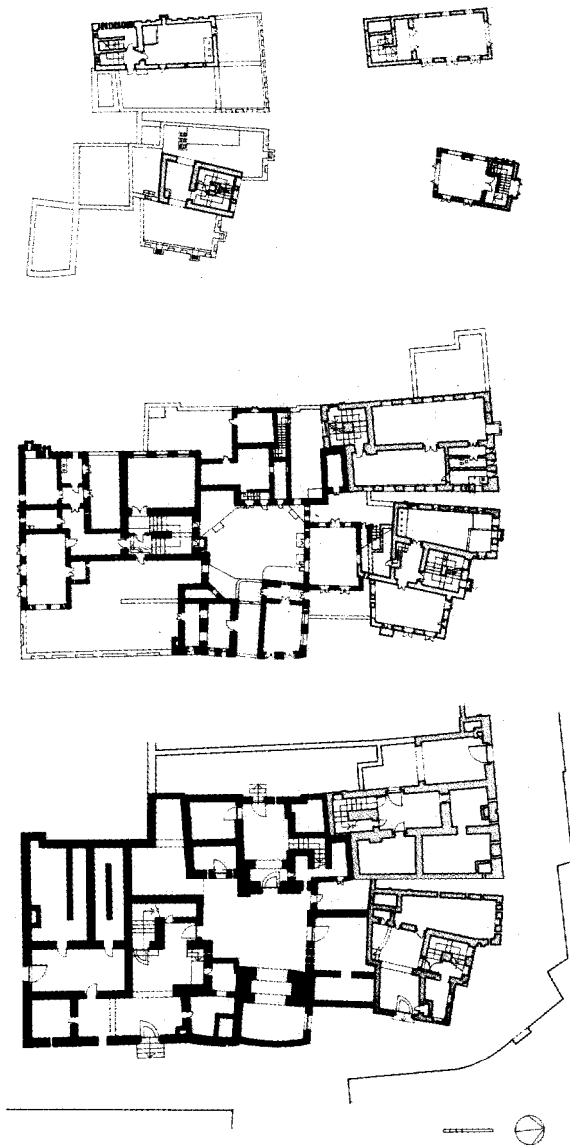
is placed in large stone vessels which reach to waist level; these stand in rows down one or both sides of each store-room. Occasionally the grinding mills are placed on this level; when there is not enough space below, animals may also be housed in some rooms on the first upper level. The mezzanine store-rooms are reached either from the main staircase or up special stairs from the ground floor. Large houses often have another level for store-rooms above the mezzanine level. Sometimes there are rooms set

aside as store-rooms at higher levels of the house as well.

The first living level

From the staircase one enters a large lobby off which open two or three rooms. The most important of these, entered through double doors, is the family living-room where strangers are customarily received socially or on business. The floors throughout are stone flagged.





IV
A cluster of houses in the Salah al-Din
quarter: plans and section.

The family living-room. Almost all the Yemeni rooms can be used alternately for eating, sitting or sleeping; the family living-room is typically arranged with the minimum of furniture. The floor space nearest the door is generally kept clear to allow shoes to be left just inside the room, and part or all of the remaining space is carpeted and lined around the walls with a continuous seat of kapok or wool-stuffed mattresses. Behind these mattresses, against the plaster wall surfaces, stand vertical cushions stuffed with straw, used as back-rests. Above these there are sometimes placed smaller cushions as headrests, often with fringed white antimacassars. There are usually hard cushions, stuffed with straw, used as armrests and arranged to denote separate seats. Strip carpets often cover the seat cushions.

The *windows* have low sills, approximately 45 cm high, to permit people to see outside from a sitting position. They are closed by shutters with separate, arched, semi-circular fanlights above the windows, of fixed translucent material to let light in to the room even when the shutters below are closed. This material is either thin alabaster sheeting (called *qamari*, derived from the Arabic for 'moon', approximately 1.5 cm thick) or stained glass set in gypsum sheets. During the present century, the practice has slowly gained ground in San'a' of introducing a pair of clear glazed sashes inside or outside the lower wooden shutters. This practice is not found in older, unaltered houses or in outlying areas.

On the walls of the room are high shelves made of hard gypsum plaster, on which articles can be placed when not needed. On the *ceiling*

both the area of the rough beams and the surfaces between are completely plastered and whitewashed.

One of the remarkable things about the old houses, noted by al-Hamdani in the ninth (third) century, is the cleanliness and freedom from odours of the *bathrooms*, which contain the lavatories. The lavatory consists of a stone platform 70 cm square with a square hole in the centre. The latter opens into a vertical shaft which drops down into a square stone receptacle underneath designed for collecting the solid waste. In front of the lavatory is a sloping section in the stone platform, which leads urine down to a channel in the stone floor. The channel takes the liquid through an opening in the outside wall, whence it runs down the face of a specially constructed and shaped vertical draining surface made of waterproof gypsum plaster. Frequently these vertical drains are elegantly shaped and decorated. As soon as it reaches the ground, the liquid disappears into an underground drainage sump, from which it is led either to an underground 'French' drain, for disposal into the soil, or to a cess-pit. A recent tendency, introduced within the last few years, has been to collect this liquid at a sump at the level of the lavatory and lead it down the face of the wall in a pipe.

Odours are completely eliminated from the lavatory in two ways. First, by ensuring that liquids are not allowed into the 'long-drop' shaft or the chamber beneath, the solid waste is allowed to dry very quickly (San'a" has a low humidity) and becomes odourless. Secondly, a pot or ladle stands on a stone cylinder near the lavatory; with the aid of this, the surfaces over

which urine has run are swilled down after every use of the lavatory. Later the dried night-soil is shovelled away and burnt as fuel in the public baths of each quarter, the ash serving to fertilize the market gardens around which the houses are grouped. Thus an ecological cycle exists remarkable for its simplicity, hygiene and economy.

The bathing facilities consist of a pair of square stones spaced approximately 12 cm apart, on which the user squats, and a cylindrical stone centrally in front of them which has a recessed top to receive the container of water. The container is usually an open-necked earthenware pot about 20 cm in diameter, without handles. Often a much larger earthenware vessel for water is placed in one corner of the bathroom, or in the lobby outside, from which the bather's supply can be replenished.

If the house has a well, it usually rises through the lower levels up to at least the lobby of the first living area. In many cases it rises further to the level of the kitchen above. In this way water may be drawn in the lobby area on each level, as well as in the entrance hall.

The well is usually a small square shaft, about 28 x 22 cm, built above a circular stone well in the ground, which extends approximately 30 m below ground level. There are wooden pulleys at the top level so that water can be drawn on the ground floor for the animals, on the living floors, and up to the kitchen. The well is cemented with a special water-proofing mortar made by mixing wood ash, animal hair and seeds of rushes into the lime plaster. A leather bucket: is used, drawn on rope made from vines or local fibres.

Larger houses have bathrooms which contain lavatories on more than one of the upper floors. They are usually superimposed, which means that a vertical waste shaft passes through the lower bathrooms. This is a plain stone-built box, plastered so that from the inside it appears to be part of the walling of the house. The waste liquid passes to a vertical draining surface on the outside of the house which is shared by all the bathrooms. In most houses these are on the cold, or north, side of the building. The walls are finished with hard, smooth, gypsum plaster which is easy to wash.

In the outer wall of each lobby there is usually a projecting window box (*shubbak*), built of open-work masonry above timber beams. Its floor is constructed of wooden slats or boards with several holes drilled in them; these holes permit the women of the house a view of the front door below without themselves being observed, while the projecting box catches the wind, to cool earthenware jars of water placed or hung on hooks inside it. There are usually one or more arched fanlights of alabaster or stained glass in the wall above to light the lobby. A neatly framed hole in a corner of the lobby floor allows the passage of the rope which is used to open the front-door bolt.

The second living level

The largest room on this level is the *diwan*, entered by a pair of double doors which are usually kept locked. In an average house the *diwan* would be 5-6 m long and 3-5 m wide; in larger houses it may be as much as 12 m long. Such big rooms are usually crossed with masonry

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Characteristic *diwan* in a very old house in San'a'.



arches to strengthen the structure. Generally, one end of the room is more important than the other, and is kept furnished with cushions, rugs and carpets. This is the end of the *diwan* used for childbirth and for laying out the dead. In the case of the family living-room - and the *diwan* when it is used for family gatherings and feasts - it is not uncommon for older people to gather at the more important end with the young at the opposite end. During feasts, or when the rooms are being used for entertaining, the furnishings of the room are often supplemented by the addition of large brass trays carrying hookahs, braziers and spittoons.

Occasionally the windows of these rooms are splendidly decorated, the shutters of the lower section having differing patterns carved on them with bosses and fittings of ornamental brass. Sometimes a latticed box is provided, projecting from the building so that when women open the shutters to look out they cannot be seen from the street. There are large sheets of alabaster in fixed areas above, or double plaster tracery, each panel different, filled with brightly coloured stained glass in the inner panels. Older houses have small circular areas of stained-glass tracery, usually two in each fanlight, fitting into spaces which apparently once held sheets of alabaster.

Important officials, or other men transacting business in their houses, sometimes do so in a lower room specially set aside for the purpose, or in the *diwan*.

Alternative second living level

In very high houses the *diwan* may be relegated to the third living level. In this case a suite of family living-rooms is often interposed on the second living level. This suite may be used privately by the dowager mother of the household, by a close male relative and his wife and children (son, father, etc.), or by the women of the household, as their living and entertaining space. Being self-contained, space in these apartments is at a premium, and they are characterized by one or two low store-rooms at a high level built over the bathrooms. These are used as wardrobes to store the women's or children's clothing and are approached up narrow flights of stairs made of hard gypsum plaster.

The third upper living level

This is usually the level on which the kitchen is placed, and may have other store-rooms and rooms used mainly by the women of the family. The kitchen is a smoke-blackened room containing a stone cooking stove on the northern wall. There is sometimes a stone-built oven next to the stove, and above the stove there is a chimney emerging on to the roof. The stove, more than 1 m deep and 1 m high, is composed of a row of three or four hollow, earthenware ovens in a stone bench, each tapering to a cooking opening at the top; a hole is left in the side of each oven at the bottom so that hot coals can be inserted or removed during the cooking process. The stone construction of the stove is packed with ash to provide insulation. In the kitchen there is also a raised washing surface which drains through the wall onto a vertical drain outside. Adjoining it there may be a stone bench for the cutting and preparation of food. A grinder made of stone may stand on the floor; it has to be used in a squatting position.

Surplus smoke from the stove finds its way out through the walls, which are pierced with a large number of holes arranged in patterned areas.

There is normally only one kitchen in a house, no matter how large the number of families in it, and this is shared by all the women. Food may be heated or reheated elsewhere using braziers. Reasons why the kitchen is normally on the upper floor include the seclusion of women, the need to serve refreshment up in the entertainment rooms as well as down in the *diwan*, and the desire to keep smoke and fumes

away from the windows of the living-rooms. The chimney is normally placed on the north side of the *mafraj*, which has no opening windows. In the few cases where the kitchen is placed lower down in the building (which is usually an indication that the building was once lower) a special well may be provided to allow the smoke to escape.

Sometimes the kitchen is on the roof of the main structure of the house, so that there are terraces adjoining it. The kitchen may even be entered from an open terrace or courtyard. The house normally continues upwards another floor or two to the *mafraj*. Generally the top of the building has a greatly reduced floor area, so that open terraces are provided for the practical use of the women. The laundry may be on such a terrace or under cover. It consists of a deep open reservoir for rainwater, which is collected from the roofs above and drains down into a plaster spill, and a hard plaster or stone floor surface on which the clothes are scrubbed. They are hung to dry over the parapets or on lines stretched across the terraces.

The upper entertaining rooms

In a large house the most important entertaining room is the *mafraj*, a high room with long low windows on at least three sides, used by the master of the house for entertaining in the afternoons. There may be other rooms for the same purpose. Often, one floor below the *mafraj*, there is a smaller reception room, with windows with a view on only two sides or even one. This is usually called a *manzar*, a name sometimes used for the highest entertaining room of

a smaller house. Since the house narrows as it rises above the kitchen level, this lower entertaining room often has a roof terrace outside it. Sometimes it is the prerogative of the women to use this room for entertaining when the men are not in the house, in which case the terrace is carefully screened with pierced masonry arcing.

Above the *mafraj*, there is, in a few cases, another level, comprising one small room, the *zihrah*. This is used by the owner of the house when he wishes to chew *qat* or smoke alone, or entertain a small number of friends. The room is seldom more than 2 m square, with a window on every side, so that it enjoys magnificent views. It is often constructed in the staircase walls.

The staircase usually continues up unbroken from the bottom to the top of the house, a solid construction of stone with a massive central stone pier acting as a kind of spine to strengthen the whole building. In some cases, though, the reduced size of the top two or three levels necessitates the inclusion of another staircase in a different position on the plan.

The *mafraj* is sometimes further elevated by placing it above an additional storey which contains a store-room for food and clothes, or a minor living-room.

The *mafraj* (the word comes from *faraja*: dispelling grief or anxiety) is usually some 6 m long by 4 m wide, with a lobby 4 m square continuing its volume at one end. The *mafraj* is a step higher than the lobby; it is separated from it by double doors. At the end of the lobby is a long window, closed by double folding shutters, which opens to almost the full width of the room. There is a large semi-circular fanlight

above, containing alabaster slabs, or else richly coloured stained glass set in gypsum-plaster tracery. Similarly wide view-windows are placed at the opposite end of the *mafraj* and in the middle of the south-facing long side. The remainder of the south-facing long side has smaller openings, with fanlights placed on either side of the main view-window fanlight. The opposite, northern, long wall usually has high fanlights with decorated plaster shelves beneath to hold ornaments and articles for use in the *mafraj*.

The shutters and doors are stained natural wood, except in the richest houses when they may be lacquered and decorated with paintings. The window shutters often have another smaller shutter within, with an ornamentally shaped top edge, designed to provide a silhouette against the light. Frequently, the elaborate plaster decoration includes passages of poetry and verses from the Qur'an. There are hooks for coats below the shelves, and a small cupboard with a finely decorated door.

The furnishings of the *mafraj* follow the traditional furnishings of all Yemeni living-rooms described above, but they are usually of luxurious materials. There is an expensive carpet in the centre of the floor space. A circular brass or silver tray stands on the floor near the entrance to the room and is filled with pipes, braziers, jugs for water, incense burners, and spittoons for use when chewing *qat*. There is sometimes a high tray on a pedestal for serving coffee. A low box which acts as a writing desk may be brought in. Candlesticks sometimes stand on the wall shelves or on the brass tray.

On the same floor as the *mafraj*, or on the floor

below, is a lavatory for people using the entertainment rooms. There is often a larger water-cooling box related to it projecting from the building, or even a room with pierced walls on the end of the building or a corner of it, in which earthenware jugs of water are placed for cooling.

Window boxes of aromatic flowering herbs are often provided for the *mafraj* and the entertainment rooms. There may also be a small garden of fragrant plants in pots on the roofs outside these rooms.

Alabaster plasterwork

Some houses preserve in their entrance halls, staircases and lobby walls a feature which is missing from those houses which have been extensively renovated in recent years. This is the decoration of the lower wall surface up to waist height with hard, honey-coloured plaster polished so that it shines like marble. In the lobby the plaster surface is moulded into patterns, each contained within a framed panel. Around the staircase walls a stepped band runs continuously, paralleling and reflecting the rhythm of the stairs. In many of these dado panels the *durah* plant is used as a theme. This type of plaster is made of a mixture of ground alabaster and gypsum. It gradually darkens with age until it is almost black, a characteristic shared by the alabaster panes in the upper windows. This may explain why this special plaster decoration has so often been stripped in houses in San'a' (similarly, alabaster window areas have often been replaced in recent years by sheets of opaque or clear glass).



23
Traditional alabaster
plaster dado decoration
in a house staircase.

Symmetry

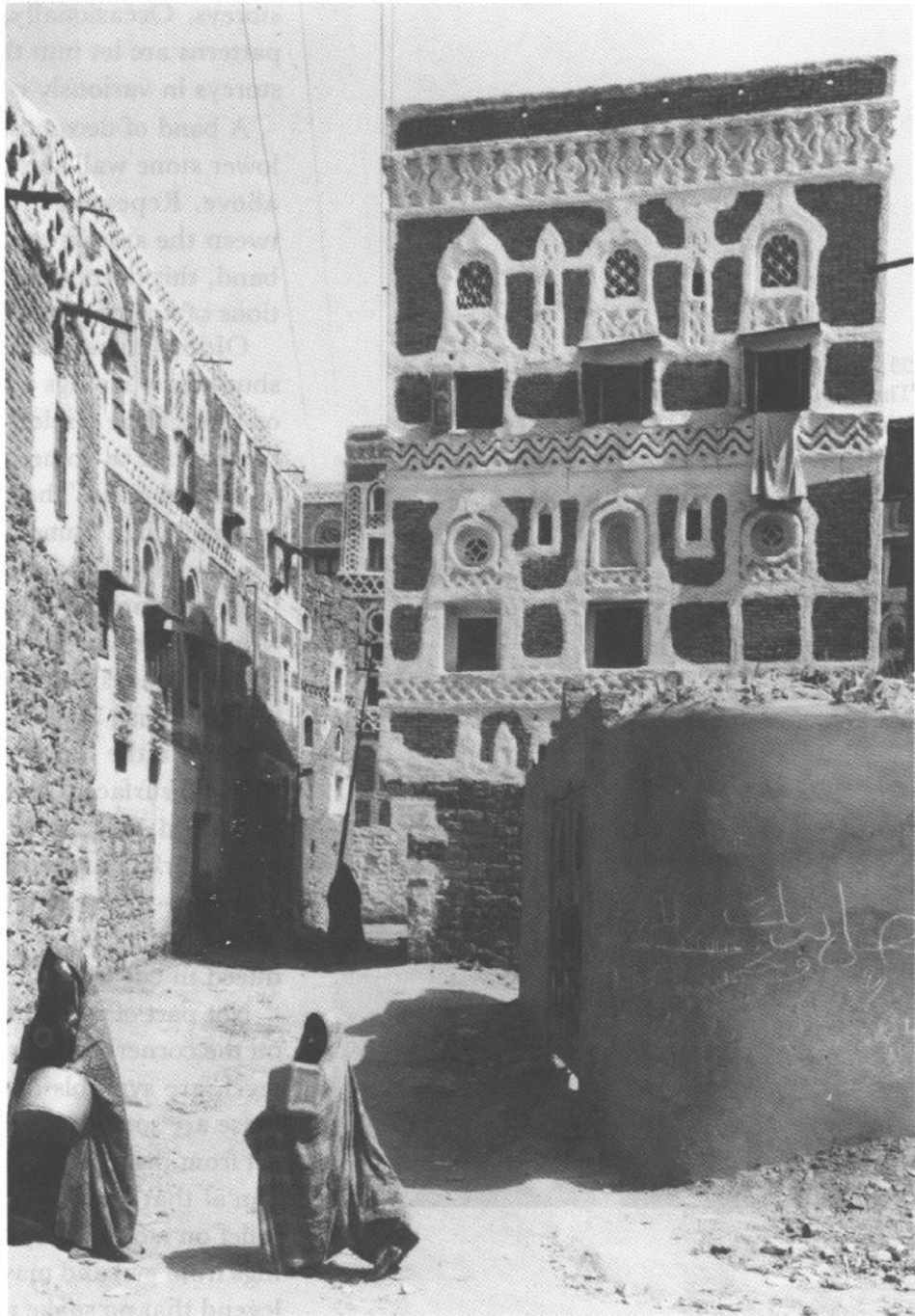
Symmetry, or at least symmetrical balance, was clearly felt to be desirable in the houses of San'a', as is evidenced by comparing the main facades. In some cases this desire produces an almost symmetrical plan. In other cases the plans are less symmetrical because the staircase is in one corner, but the main facade retains its balanced eurhythmy, with a central doorway or symmetrically placed lower windows.

San'a'ni architecture, even in small houses, thus has a strong ingredient of conventional formality. It is this that gives the quality of ordered repose to the exteriors, a characteristic that is as strongly felt in the interiors, with their plain, whitewashed, cubic or rectangular rooms punctuated with evenly spaced doors, square or circular windows and whitewashed shelves - rooms which in each house are approached up a plain staircase of short easy flights within a square plan.

External decoration

Usually there is ornament on the front door in the form of carving or fretwork, with a metal door knocker on a shaped wooden mount. Sometimes ornamental strips of wood or metal are added. Often there is a decorative frame around the door, executed in plaster with durah-plant shapes at the corners. In the oldest examples a frieze of triangular stones of alternating colour is introduced above the door. Alternating bands of different coloured stones are sometimes found ornamenting the lower

24
Types of fenestration.
Note the lower shuttered
openings and the fixed
fanlights above, made of
alabaster or stained glass
with gypsum tracery,
shaped as arched
openings, single or double
rondels.



25

The carving of a gypsum fanlight screen, one of the most skilled crafts in the Yemen.



storeys. Occasionally, abstract or emblematic patterns are let into the stonework of the lower storeys in variously coloured stones.

A band of decorative brickwork separates the lower stone wall surface from the brick surface above. Repeated in the bands higher up between the storeys and in the crowning cornice band, this decoration usually consists of variations of a zigzag motif.

Older houses have upper fanlights above shuttered openings which are made of one, two or more large circles originally filled with alabaster, but in some cases afterwards renewed in stained glass. The circles are often contained externally in a frame which resembles an arched window. The solid areas between the circles are then ornamented with motifs which are taken from those used in the ornamental bands. Empty spaces below the fanlights or between windows may be filled with areas of decoration which are the richest and most imaginative in the wall surface. Occasionally a lattice effect is produced, not unlike a pierced screen, while other surfaces resemble hanging necklaces or festoons - even though they follow straight, not curved, lines. These patterns are usually produced in cut-brick bas-relief.

Not part of any pattern, but sometimes found on the corners of houses about 7 m above street level, are symbols of snakes. In country areas these are sometimes executed in iron and project from the corners, but on the old buildings in San'a' that still retain them they are carved in relief on stone. They are said to protect buildings from evil and may be related to the ancient legend that no snake may cross the threshold of the city gates and survive.

Besides simple arches, trefoil arches and those with an arc of a circle rising out of a flat head are found, particularly as heads to blank panels. Pointed arches are seldom seen and then only in a few very old buildings.

The age of the tower houses

High houses seem to have existed in the Yemen in pre-Islamic times. A Himyaritic inscription in the Ta'izz Museum refers to the construction of a house with 'six floors and six ceilings'. A stone of unknown provenance shows a graffito of a house with nine storeys. The great San'a' palace of Ghumdan had at least seven high storeys, and its height awed all the historians. It will be remembered that it was described as a square building having a special room at the top 'with windows'.

The appearance of the pre-Islamic house in the Yemen almost certainly inspired the Axumite architectural style recorded in the great stelae of Axum, which are variously thought to date back to between the fourth and the sixth centuries A.D. These include a number of features typical of the San'a'ni houses described above. They have the same formal symmetry, with one great entrance door. There are no windows on the ground floor, but small windows clearly express the storage mezzanine above it. The lowest large windows, which indicate the first living floor, occur above that. The windows are made up in the same way as the windows in San'a', that is, they are wooden-shuttered openings shown below, and over each a fanlight with a single large sheet of material glazing it. The top floors are shown as the most

important levels; on the great stelae the two top floors (of the thirteen levels shown) have tracery screens in the fanlights. At Axum there are six surviving stelae on which these houses, from four to thirteen storeys, are represented. The construction technique represented shows bands of wood encircling the houses, of the type that still survive on many San'a'ni houses.

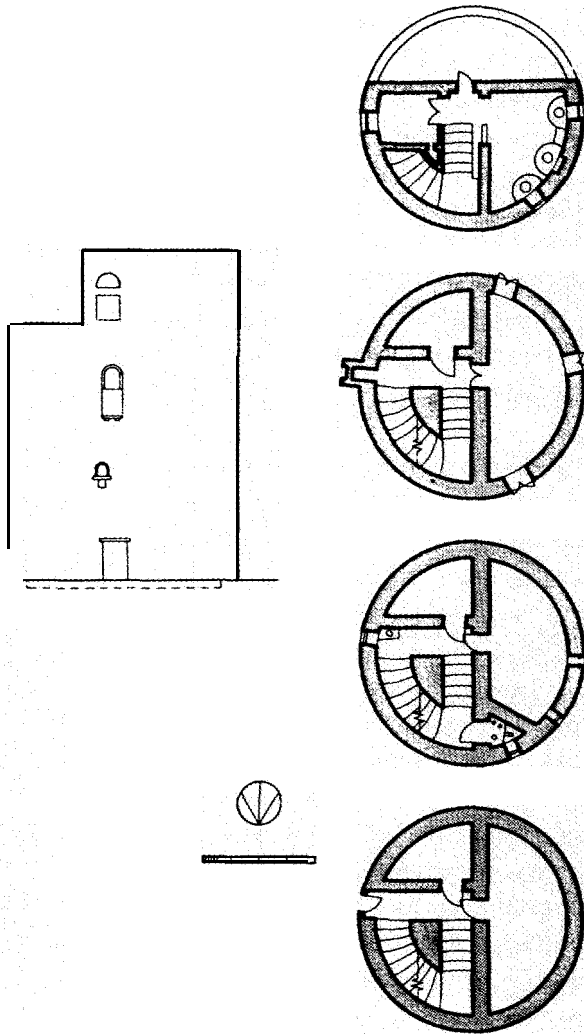
One constructional detail shown at Axum is no longer seen in the Yemen highlands, however. This is the use of lateral pieces of timber running through the thickness of the wall and projecting beyond its face, to form square projections of the door and window frames, and circular bosses along the wooden bands. But these techniques do survive in the coastal buildings of the Red Sea in the Yemen and Saudi Arabia, where rubble stone and clay are widely used in high buildings, as they were in Axum.

The first description of the houses of San'a' in Islamic times occurs in Ibn Rustah (c. 903-13 (290-300)): the 'fine houses' rise 'some above others', and are 'decorated with plaster, burnt brick and dressed stones'. Al-Hamdani (d. 943 (330)) includes several references to San'a'ni houses; one compares mud towers elsewhere to the towers of San'a' 'because of their height', another refers to the cleanliness of the sanitation. Al-Razi quotes him as speaking of 'the loftiness of structure' of the San'a'ni houses. Al-Razi says elsewhere that the houses were 'tall and imposing and many had high prices'. Other early references describe the use of alabaster in windows and the spaciousness and clean white interiors of the houses in San'a'.

The oldest surviving houses have frequently

V

A *nobah*: plans and elevation.



had their upper levels rebuilt. The thinner brick walls have decayed, or cracks lower down have got wider as they reached the top of the building. At various times, when San'a' was sacked by tribesmen, the *mafraj* storeys of the larger houses were plundered and sometimes burnt. It is clear that the lower levels of some of the houses are extremely old. Documentary evidence points to an age of up to 800 years for a few of them. Most of the houses, however, are not much older than 300 years, and the top-most storeys are usually less than 100 years old.

The origin of tower houses

It seems fairly certain, from surface remains, that in remote antiquity agriculture was of two types. It was carried on either in wadi beds, which were sometimes irrigated from dams built across their upper valleys, or in stone terraces built on the slopes of the mountains to retain the moisture in horizontal soil beds. Centres of habitation were seldom situated on valuable agricultural land, but were concentrated on outcrops on the valley floor, or on slopes and hill-sides that were too steep or rocky for agriculture. Isolated farmhouses, though they did occur, were rare. More commonly, clusters of buildings came together for mutual protection to form small villages. With building land near the farmlands restricted in area, and often steeply sloping, it is not surprising that the early houses had small ground floors, and extended vertically rather than horizontally.

The mountainous terrain afforded good shelter for the marauding tribes who at any moment might descend to pillage the villages and

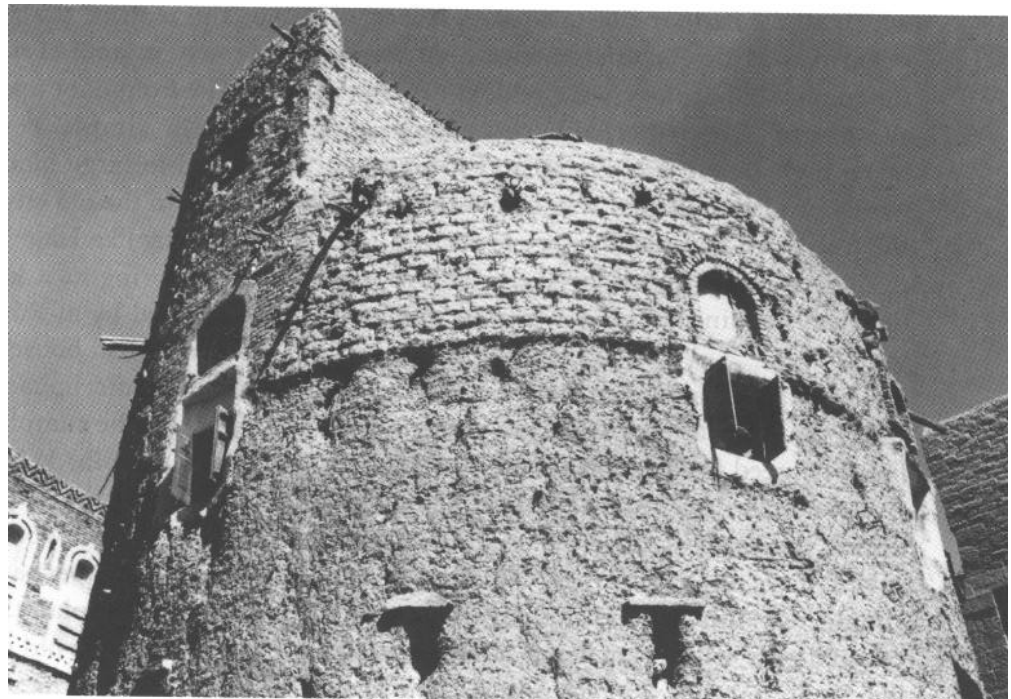
farms of the agricultural areas. So the need for defence was another factor leading to the form of the tower houses. Throughout the region, towers built of cyclopaean stonework seem to have been used for domestic purposes. Some northern villages still retain clusters of them too numerous to have been part of a fortification system. It seems likely that the modern square tower houses seen in farms, villages and cities are sophisticated descendants of such a prototype. An intermediate phase may be represented by the circular farmhouses, the nobah or nawbah, which continued to be built until recent times. A large farm would possess one such circular tower as its main refuge in time of attack, surrounded by a number of low rectangular buildings.

The San'a' house - an alternative type

Not all houses had their *mafraj* on the roof; some were at ground level with a reflecting pool outside. As this took up considerable space, very few of this type were built within the walls of the old city. Outside the old walls to the west are the villa areas, such as Bir al-'Azab, which were particularly popular during the Ottoman occupations. These areas contain larger houses and palaces that commonly have a *mafraj* of this type. Some of the richest have another on the roof as well.

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Although situated within the house, the lower *mafraj* is characteristically not entered from inside; instead there is a separate outside entrance to it past the reflecting pool. An open



26
Exterior of the upper
levels of a nobah.

arched balustrade of lime-washed plastered brickwork shields the *mafraj* pool from the surrounding garden, providing a sense of enclosure. It is overhung by trees planted just beyond the balustrade. A vine trellis crosses the pool and its central fountain, sometimes supported in the centre by columns rising through the water of the pool itself.

A large arcade forms a loggia which separates the pool from the *mafraj*. In some houses the top of the loggia acts as a screened terrace for the private use of the women of the house.

84

Jewish houses

An essential difference between the Jewish house and the Islamic house was that the former had as its focus a courtyard on the roof from which all the main rooms opened. A second peculiarity was the Jewish practice of arranging the rooms so that there were seldom two on the same level, the principal entertaining room being highest, the *diwan* next, and so on downwards until the kitchen was below the level of the courtyard and the lavatory lower still. This involved small flights of stairs before each doorway leading up or down from the courtyard.

The explanation given for these characteristics is that they are derived from a religious belief. The need for a courtyard was explained to Goitein thus: 'According to strict Jewish law, during the Feast of Tabernacles, celebrated for seven days in September/October, a man should not only take all his meals in a room covered only with branches of a tree or similar light material, but also sleep in it.' The court-

yard made possible this temporary construction, but 'in order that the light material covering the tabernacle should not be blown away by the winds', a screen wall called a *kuwwabah* had to be built around the courtyard. The screen wall was sometimes pierced with a projecting stone box for water jars, or by areas of gypsum tracery contained in arches.

The hierarchy of levels around the courtyard has also probably something to do with this religious belief. That is to say, since the courtyard served to house the tabernacle during a brief period each year, it became a sacred place at that time, and no room could be exactly on a level with it. In particular the lavatory and bathroom had to be below it, as they were in the synagogue. The extra height to which the entertaining room was raised was probably due to the feeling that it should conform to the Yemeni custom of having a fine view.

The front door openings of Jewish houses are usually simple rectangular constructions, framed in large blocks of stone, like the oldest houses in the old city. Jewish door knockers are frequently like Islamic ones, but there is also the use of a ring as a knocker, recalling the type mentioned by al-Razi.

The Jewish houses of al-Qa' are much lower than Islamic houses, presumably in accordance with the sumptuary regulations of Islamic South Arabia. While it is true that it is recorded that the houses were originally higher in al-Qa' and were reduced by edict of the Imam - and perhaps some were - they were also larger in plan than it was possible to be in the press of the old city for at least hundreds of years before. The advantage of the increased

size of the plan, of course, was that more living-rooms could be grouped around the courtyard. As this also increased the area available for store-rooms and stables underneath, the mezzanine could be eliminated. Thus the height of the house could be reduced from four levels to two, with a great increase in amenity. If a rich man could acquire a larger site, or join two houses together, as often seems to have happened, then he could continue to increase the accommodation without building upwards, something that could not easily be done in the Islamic house with its more rigid concept of grouping rooms around a single staircase instead of around large and flexible courtyards.

MOSQUES

Although the use of vaults and domes appears to have been known in the Yemen before Islam, the earliest mosques that can be dated do not have them, but are flat-roofed. A possible reason for this is an early Islamic insistence on simplicity and unpretentiousness. But an alternative explanation is the strength of the ancient indigenous tradition, reinforced by the influence of the Sassanian Persian audience hall, the *apadana*. The latter may explain the construction in Yemen of a number of high mosques with elaborately moulded and decorated ceilings carried on high slender columns.

The Great Mosque of San'a', according to tradition, was built at the instruction of the Prophet Muhammad himself. In the form in which it was rebuilt at the beginning of the eighth (second) century, it had arcades,

parallel to the wall, which carried the flat roof. It seems likely that these arcades date back to the earliest construction of the mosque and are derived from Byzantine influences in the Yemen at a time when the largest church in the Axumite Kingdom was erected at San'a'. Early Islamic historians say that Byzantine architects were involved in the design and construction of this church; a door in the Great Mosque with panels containing pre-Islamic inscriptions has arcades as part of its decoration, and possibly came from it.

Of the earliest Great Mosque, built at the order of the Prophet Muhammad, probably nothing remains except possibly some of the arcades and a few fragments of ornament now gathered with others in the high western ceiling. From the position of a natural rock which still survives, it seems likely that the western edge of the mosque has not changed from this earliest building. Its qiblah wall lay across the present courtyard, with the building probably encircling a smaller square courtyard. The southern limit of the mosque apparently coincided with the present southern wall. To the north of the *qiblah* wall, half under the present prayer hall and partly beyond it, was the large tomb of an early prophet, possibly Hanzalah ibn Safwan. It is true that some of the arcading may survive from this earliest mosque, reincorporated in the second mosque, but it is reported by one of the early historians that this mosque was a new structure, so it is more likely that the earliest surviving arcading is from al-Walid's mosque.

The rebuilding of the mosque by al-Walid (c. 705-15 (87-97)) probably accounts for the

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The Great Mosque: internal courtyard with a late Christian, or early Islamic, capital and shaft standing on an upturned Axumite Christian capital.



general external character of the Great Mosque as it stands today. Much of the stonework of the northern, western and southern sides may date from this time, as do many of the stones in the remainder of the walls. The Great Mosque is built in an ancient style of stepped stonework which is linked to the style of Abyssinian Axumite building.

The plan was greatly enlarged, and took the shape it has today, except possibly that it was later widened to the east. The pre-Islamic prophet's tomb to the north of the mosque was wholly or partially demolished to make way for the moving of the *qiblah* wall and the whole of the prayer hall further north, more than doubling the size of the courtyard. The general character of the arcading probably dates from this period, when capitals, shafts, bases, wooden decoration and possibly the door referred to above were removed from the ruins of the Axumite Christian cathedral further east. This Christian material was mixed indiscriminately with other pre-Islamic material of indigenous South Arabian style, taken from the great ruined palace of Ghumdan alongside, and from some Sabaean temples, and used to build up the columns under the brick arcading. There was a richly decorated *mihrab* to the mosque, which was afterwards stripped of its ornament by a zealous Qadi. The five toplights allowing light to fall onto the centre of the *qiblah* wall were probably added at this time, if they were not moved from the first mosque or a pre-Islamic building.

The mosque was subsequently rebuilt (or repaired?) on the order of the 'Abbasid Caliph in 753 (136), according to the inscription

preserved in the courtyard - though it is possible that other mosques are referred to. It may just record the erection of a single minaret, the eastern, standing when the Qarmatians came in 911 (299). However, this minaret could have originally been built during the construction of al-Walid's building, or during the next rebuilding phase.

In 878 (262) the mosque was damaged in a great flood and had to be extensively repaired, but it was not completely rebuilt, if we are to believe Ibn Rustah, who was told that the mosque building was 'ancient' in 903 (290). The close resemblance between the fragments in the western bays of the prayer hall and the ceiling of the Shibam-Kawkaban mosque, built at this time, suggest that the San'a' mosque was given a similar high, richly decorated ceiling, afterwards mostly destroyed and lowered.

While the colour on this ceiling was still fresh and bright, the mosque was allegedly deliberately flooded in 911 (299). The water was allowed to remain 'until the freshness of the decoration in the ceiling was lost'. This must have caused considerable damage to the structure, and may have directly resulted in the need, probably within a century, to lower the ceiling and replace it by one of a plainer design, preserving possibly only the four bays of the higher ceiling at the western end, into which the surviving wooden fragments were gathered.

The eastern wing was rebuilt, at least partially, by Queen 'Arwa ibn Ahmad in the eleventh (fifth) century; she added a magnificently carved and gilded ceiling to the new eastern wing, and a slightly less splendid one to the old western wing. Parts of the ceiling of the north-

ern prayer hall were repainted in the same style, with some calligraphy. It is possible that the second (western) minaret was added at this time, to match the first. Both minarets were 'restored' in the early years of the thirteenth (seventh) century. They do not seem to have been altered since. A new *mihrab* was made in 1266 (665), but was removed when the present *mihrab* was added in this century.

The domed building for *waqf* documents in the courtyard was built in 1603-07 (1012-16), and the courtyard paved. It is possible that a central building existed in the courtyard before this date, and not inconceivable that it originally had some other function, perhaps a fountain with a treasury above, of the type built by al-Walid in the mosques of Damascus and Hama. In 1936 (1355), Imam Yahya built a library over the southern hall of the Great Mosque and a new aisle on the northern side of it.

There are over 100 other, smaller mosques in San'a'. The early ones had merely a clearing in front of them and no proper courtyard; they were devoid of ablution places, the people performing their ritual ablutions in their own houses before going to the mosques for prayer. Following the plague of 1526 (933), the Imam took over the properties that had been left without owners and used the money collected from their sale to construct ablution places, and, where there was no room, other mosques on new sites. As a result, people abandoned some of the smaller mosques with no ablution places. They fell into ruin and were eventually lost without trace.

The oldest standing mosque is that of

88 Farwah ibn Musayk, who was one of the Companions of the Prophet. It must therefore have been built, if we are to believe the historians, in the seventh (first) century. It is difficult to say how much, if any, of that building remains now. Possibly some of the lower walls on the eastern side are original, or very early - they have the same stepped stonework as the Great Mosque. But it is known that this mosque was extensively repaired after it suffered major depredations in the wars at the beginning of the eleventh (fifth) century. Later in the sixteenth (tenth) century it was altered again and covered with pointed domes.

This history is typical of the continual rebuilding and alteration of many of the San'a' mosques. The *musalla* (place reserved for prayers), or Jabbanah, was laid out on the camp of the Abyssinians at the instructions of the Prophet Muhammad himself, according to the early historians. The wall in which the *mihrab* is placed and the remainder of the surrounding walls are probably those referred to as built in 1015 (407), although they were substantially extended during the present century. Unfortunately the central open area of the Jabbanah has recently been filled by a large modern mosque.

A number of early mosques of the unpretentious style described above survive in San'a' - that of al-Tawus is likely to incorporate the graves of one of the second-generation Companions, who died at Mecca in 724 (106).

Apart from these early mosques which were supported on columns, there are a number of mosques constructed with arcades, which are thought to date back to the ninth-tenth (third-fourth) centuries. These include the mosques of

Ibn al-Husayn and al-Shahidayn near the suq.

From the mid-thirteenth (seventh) century, which appears to have been a great age for mosque-building - and indeed a period of great prosperity for the Yemen as a whole - dates the construction of much loftier and grander mosques with high, wide, and beautifully proportioned pointed arcades. In San'a' they include the mosque of al-Madrasah and that of al-Filayhi. At this time a number of domed tomb buildings were built, many of them finely decorated; but mosques with large domes appeared only after the Ottoman conquest in the mid-fifteenth (tenth) century. The double-domed mosque of Janah, in the suq, was built around 1583 (991); and the mosque of al-Bakiriyyah was erected by the Ottoman governor Hasan Pasha in 1597 (1005). The latter is in the metropolitan style, very grand by San'a' standards, though small by those of Istanbul. The later, smaller-domed mosques of the Qubbat Talhah, 1619 (1029) and 1831 (1247), and the Qubbat al-Mahdi 'Abbas, 1750 (1164) continue the Ottoman tradition; although they are smaller in scale, they are extremely fine in design and in the quality of their decoration.

The mosque of al-Bakiriyyah was redecorated during the second Turkish occupation in splendid pastel colours, and furnished with a new raised *diwan*, for the use of the governor, and a fine minbar.

Mention should be made of the splendid quality of some of the carved wooden tombs. These are sometimes finely decorated in colour or polished. Outstanding examples survive in the tomb of al-Mutawakkil, 1726 (1139), and that of al-Mahdi 'Abbas, 1750 (1164).

MINARETS

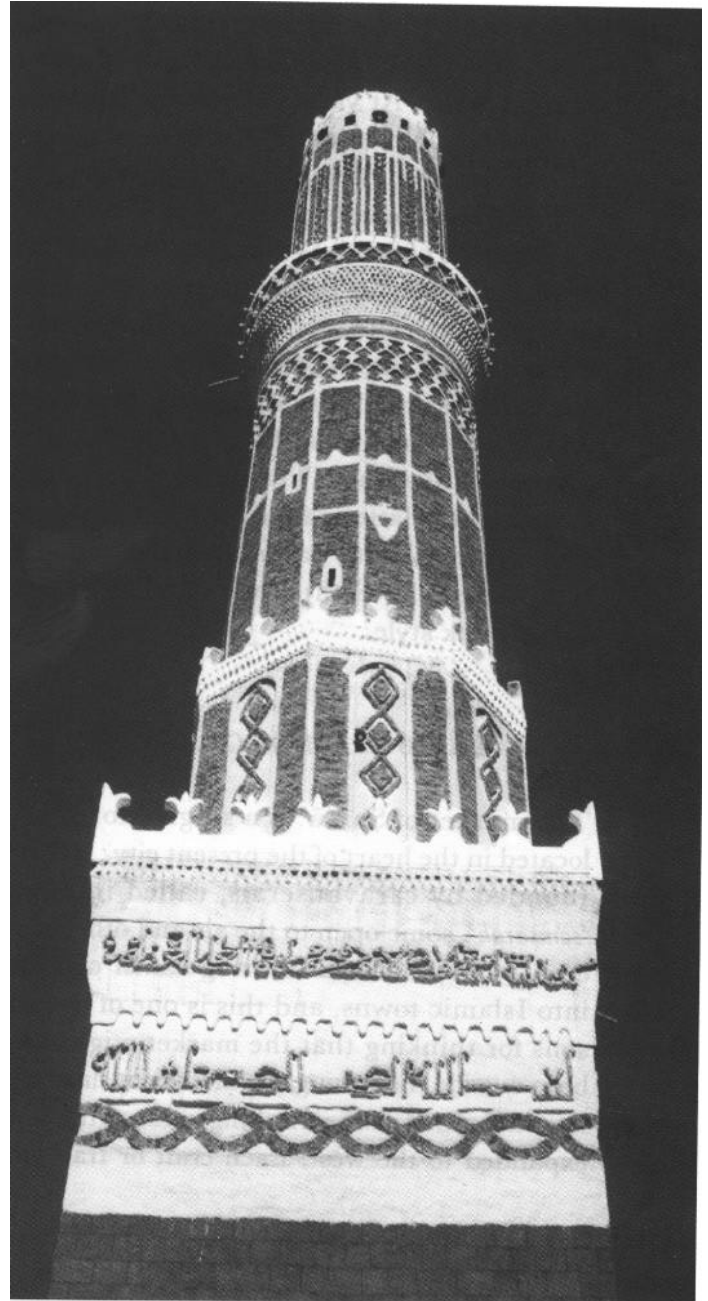
The first recorded minaret is that of the mosque of Farwah ibn Musayk. If the early historians are to be believed, Farwah watched the construction of the Jabbanah from this minaret, which would place it in the seventh (first) century. Historians next refer to a minaret on the Great Mosque which was standing when the Qarmatians arrived in 911 (299). As mentioned above, it is quite likely that it dated from the time of al-Walid's building, since he is known to have built minarets on the Friday Mosques at Medina and Damascus. It is indeed possible that there was more than one on the Great Mosque at this time (it is certainly true that there were two minarets by at least the twelfth (sixth) century).

The mosque of Ibn al-Husayn was called in the early times the 'mosque of the minaret', though it is difficult to know what the form or height of this minaret might have been. There is evidence that at least some of the Zaydi theologians were opposed to minarets on the grounds that they made mosques resemble churches. They advocated that minarets should not be raised above the roof level of the mosques. That is to say, that the call to prayer could be made from the roof-top and possibly a small shelter against the sun provided there for the muezzin. A number of the small mosques of San'a' still have roof shelters of this type, with no minaret.

But in the case of the larger mosques, this Zaydi prejudice against the minaret does not seem to have persisted beyond the fifteenth (ninth) century.

28

Minaret of Musa mosque.
Made of baked brick decorated
with gypsum, and standing on a
square base, it is a typical
example of a San'a' minaret.



In the early sixteenth (tenth) century the first of the patterned, baked-brick minarets, later to be repeated on many mosques in San'a', was built - that of al-Madrasah. The shaft of the minaret is cylindrical with bas-relief decoration in diamond shapes, but it rises in three stages from a square base through a polygonal stage, and is crowned by a circular balcony beneath a pointed dome. At various times the brick decoration, which is in relief, has been picked out with whitewash to make a stronger pattern. Many other minarets of this type, like those of the mosques of Salah al-Din and al-Bakiriyah, were built later in the sixteenth (tenth) century. But the construction of similar minarets has continued into modern times.

Two other minarets should be mentioned: that of the mosque of al-Filayhi and that of the mosque of al-Abhar. The former has a fluted dome and the latter a fluted shaft; it is possible that they are slightly earlier than the beginning of the sixteenth (tenth) century and predate the baked-brick style.

THE BUILDINGS OF THE SuQ

The market of San'a' is a single-storey area located in the heart of the present city. It is surrounded by caravanserais, called in San'a' '*samsarah*', some open to the air and others covered. It was unusual to bring camel caravans into Islamic towns, and this is one of the reasons for thinking that the market might have been outside the town gates in ancient times and later absorbed as the dwelling areas of the town expanded to the west. Each craft or trade has

its own area in the suq, often its own street, and there is evidence in many cases that it has occupied it for centuries.

The great *samsarah* buildings which surround the suq belong to a curiously South Arabian type. Each of them has large stables for animals on the lower levels, surrounded on two or three storeys by lower store-rooms, to which goods are carried up staircases. High columns rise through these lower mezzanine levels to support the main roof, which is pierced with openings to allow shafts of natural light to reach the stables.

Above the roof, there used to be what were essentially hotel complexes, rooms around courtyards in which the caravan owner and his drovers could stay. They were apparently fairly comfortable establishments; there was sometimes a pool in one of the courtyards, and very commodious bathrooms equipped with hot-water boilers. The vertical arrangement of stables, store-rooms and living spaces follows the same pattern as that in the Yemeni houses; it seems likely that this is an ancient type of building which has existed continuously up to the present day. The upper levels of these caravanserais have not been used for the accommodation of visitors since the end of the Civil War, but another traditional type of hotel or inn was in use until about 1980. This was a double-level building, the lower level having coffee, smoking and dining rooms, and the upper level private rooms which were let to visitors.

The stalls in the market were small and raised on stone or brick plinths to the height of a metre above street level. Each always contained a counter and a fretted wooden cupboard in

30

Bayt al-Balayli: the mafrāj, looking at the view to the west across the lobby through the entrance doors of the room.



31

A nūbah: the dīwān.



32

Bayt al-Balayli: the mafrāj (see Fig. III).

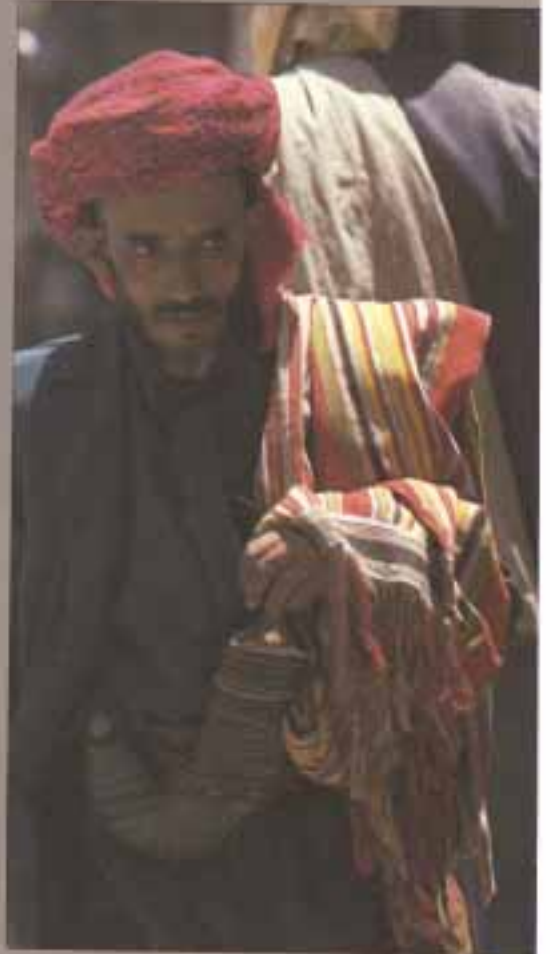
33

*Close-up of a
dagger (janbiyya).*



34

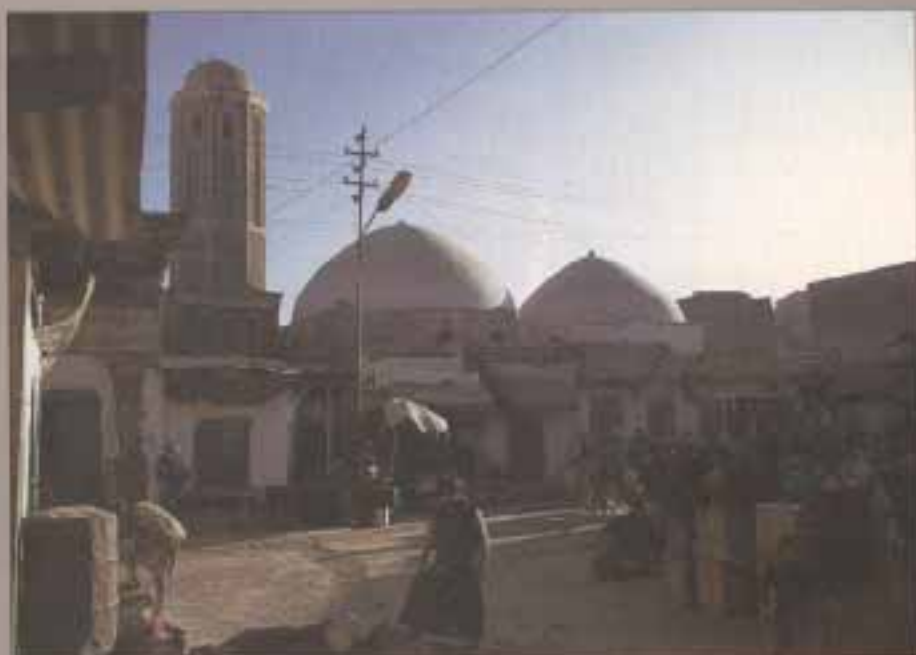
Traditional men's tribal dress.



35

*Women dressed for the street,
wearing the traditional outer
garment (sitarab), originally
imported from India, and the face
panel (maghrabiya), which is dyed
in 'Sari' (see also Plate 21).*

36
*The Süq al-Milh
in the early morning,
with the domes of an
Ottoman mosque
behind it.*



34



37
*The süq: the open
space in which old ar-
abick donkeys are fed
at the expense of the
merchants.*

which a hookah was placed so that it could be smoked without knocking it over. Where it was necessary, the walls of the store were lined with shelves and there were chests of drawers for goods and money. In stalls like these a number of trades were also carried on, such as wood-turning, the manufacture of hookahs, shoes, daggers, silver and gold jewellery, and so on.

The camel market, which was entered through the northern gate, provided access to the suq for large camel loads and today also for vehicular traffic - although movement is almost blocked by a mosque in the middle of the *maydan*. During the monsoon rains the camel market is rendered impassable for some hours as an old watercourse finds its way to the north across it.

In a medieval Islamic suq such as this, the mills that grind sesame seed and salt are an important ingredient. There are about forty of these mills around the San'a'ni suq. Another important element consists of the buildings owned by the *awqaf* built from bequests, in which the poor, students and the old and sick live. There are a number of these rooms over the shops in the suq, around the edges of the market, as well as many adjoining the mosques.

There are few gaols. Wrongdoers are generally punished in public by being made to wear shackles or chains. One story is typical: a small boy was accused of stealing from a shop, so he spent the afternoons after school displaying his chains in front of the shop to embarrass the shopkeeper.

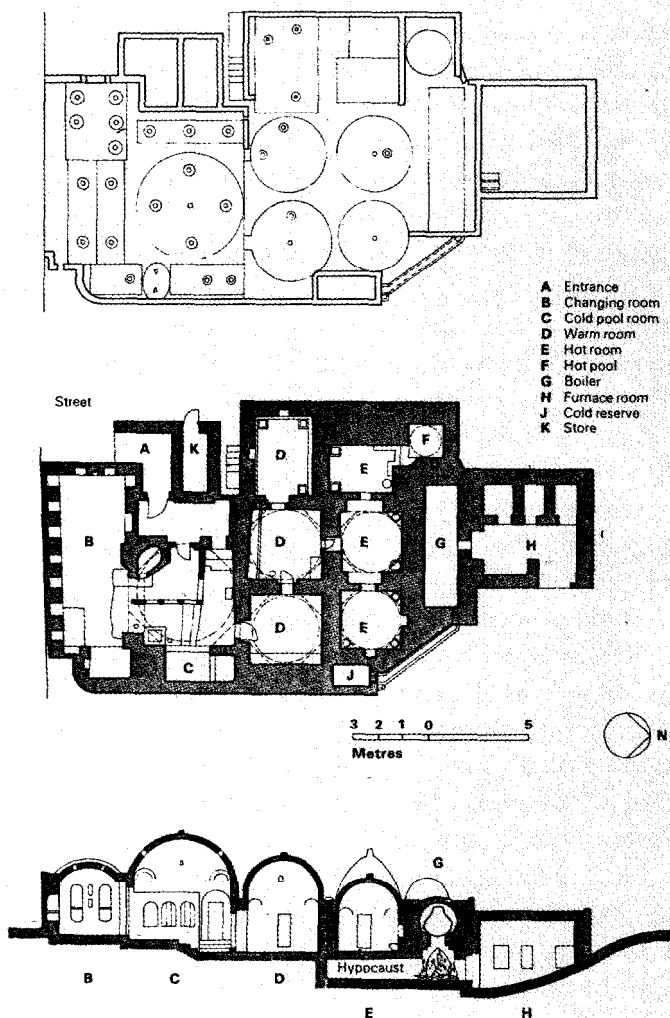
WELLS AND WELL-RAMPS

A characteristic feature of the old city are the enormous structures which housed the well-ramps. These were ramps which made it easier for animals or men to draw water because they were moving downhill as they pulled on the weight of the buckets. When the buckets were empty they climbed to the top of the ramp and began their descent once more. At the top of the well, the well-master tipped the buckets into a cistern opposite the ramp and from there the water could be drawn as needed to feed animals and to irrigate the land. The animals most usually used for the well-ramps were camels, and at an early stage the Yemenites developed the habit of shading them from the sun by constructing a roof over the ramp. Although this presumably rendered the animals much more efficient, the practice of roofing in the well-ramps was only observed in the urban areas. As the water table has dropped in the last 100 years these well-ramps have had to be extended, and many of them now terminate underground and are over 30 m long.

Above a number of the well-ramps other structures have been erected, for example in Qubbat Talhah, where students' rooms belonging to the mosque have been constructed. In the old city there are usually one or two of these well-ramps associated with each of the market gardens and with the major mosques.

An alternative method of bringing water into the city was practised until the Civil War. This was the use of underground channels, called *ghayls* or *qanats*. The *ghayl* has to be ventilated every 100 m or so; the stone-lined circular

VI
 Hammam Shukr: plans and section.



ventilation holes also serve for the cleaning out of silt from the water channel, so that the ventilation hole can eventually be seen from a distance because of the large mound of earth around it.

Six of these ancient *ghayls* have been identified coming into San'a' from the north and south, but more are known from ancient texts. In times of war it was common to seal them up to prevent secret entry into the city, and since the Civil War they have not yet been brought back into use.

PUBLIC BATHS

The baths are a very fine element in the old city. Although there are many of them - seventeen were functioning in 1980 - there seems to be no connection between the number of baths and the number of quarters or wards. Indeed it would be difficult to establish such a direct connection, for the use of the baths alternates between the sexes - men on some days and women on others. It seems that people simply went to the nearest bath which was open to their sex on the day they chose to bathe. There was no obligatory connection between the local bath and the people who lived in the houses near by.

Some Yemeni scholars believe that the public baths existed in the Yemen before Islam. The oldest that can be identified have a form close to that of a provincial Roman bath. They are roofed with domes and vaults, they are usually focused around a large, domed, central room containing a wide, central, cold-water pool with fountains, and the rooms which make up the hot

area of the bath are heated by means of hypocausts and flues in the vertical walls. A characteristic feature of the plan of the Yemeni baths is that the temperate and hot zones comprise six rooms - a central room and two side rooms in each zone.

The hot rooms are underground, because it is rather cold at night and in winter there are short periods when it is cold during the day; this design, with the bath sunk into the ground, avoids the need for insulation, and makes water circulation easier. The domes are built of a specially fired baked brick; glass inserts are let into them to allow light to filter down into the bath-rooms below.

Apart from the great luxury of being able to have a hot bath in an often chilly climate, the public bath is a pleasant place for talking to friends and relaxing.

The baths are open for eighteen hours a day, from 4 a.m. until 10 p.m. The fires to heat them normally burn dung cakes made from the nightsoil from the neighbouring houses, or from dried skins and bones from the slaughter yards. A deep well and reservoirs behind and above the baths ensure that there is a sufficient supply of water, which is circulated from the hot boiler or the cold reservoir through a system of pipes so that it is available to be drawn directly in the hot and temperate rooms.

On entering the bath, the bather takes off his shoes and leaves them with the bath-keeper, who puts them in a special recess in the wall. He is shown a vacant place in the changing room where he takes off his garments - always preserving his modesty under a cloth wrap, or *futah* - and places them either on a high shelf or

in one of the many niches in the walls. Finally he takes his valuables and deposits them with the bath-keeper. Before leaving the changing room area it is normal for him to wash his feet, standing on the stone steps which lead down to the drained stone floor around the cold pool; using a dipper, he takes the water from a small reservoir specially provided for the purpose. He then proceeds straight through the temperate rooms to the central hot room, where the attendant douses him several times with very hot water to begin his bath. Bringing another leather bucket of water, the attendant swills down an area of the heated floor in the central hot room or one of the side rooms so that the bather can sit or lie on it. Here he remains for ten minutes or so to induce sweating. To accelerate the process, he may perform some exercises, periodically calling for the attendant to douse him again with hot water.

After he feels that he has stayed long enough in this heat-charged atmosphere, the bather moves out to the temperate rooms, where he is seated next to a stone basin by an attendant; he either rubs the top layer of dead skin off himself with a rough woollen glove, or has a member of his family or an attendant do it for him (women and children use pumice stone instead of a glove). This stage is followed by a head-to-foot soaping, again performed either by the bather himself, by one of his family or by an attendant. It is a mark of great friendship if one man directs another, not of his family, to help him in this way.

The soaping complete, the attendant from the hot room brings in several buckets of hot water which are poured over the bather. He then

proceeds to one of the unlit side rooms of the hot area of the bath; here he may remove the cloth wrapped around his loins without any loss of modesty and complete the washing process. That done, he receives a further dousing with hot water from the attendant and may then return to the cold room. Some bathers go back to the hot room and complete the cycle of sweating and rubbing a second or a third time.

Upon returning to the cold room, the bather stands on one of the steps leading up to the changing-floor and is doused for the last time with a large dipper of hot water brought from the hot rooms, the water running back into the drain in the cold-pool room. His towel and a second cloth are brought to him; the towel is wrapped around his shoulders and the second cloth around his waist. He then proceeds to remove the wet waist cloth from beneath the second cloth, and leaves it with the attendant to be wrung out, while he returns to his place in the changing room to dry himself. There he sits or squats, talking to the other bathers and the bath-keeper, taking coffee or tea or, if it is time for prayer, praying. For the latter purpose there is usually a *mihrab* in the wall of the changing room to indicate the direction of Mecca. Eventually the bather begins to feel cool and then he dresses in preparation for his departure. He pays the bath-keeper whatever is required of his status (the rich pay many times more than the poor). Wrapping his towel around his head to keep from catching cold, he goes to the outer entrance of the bath where he may sit for a few moments on a seat in the outer lobby, provided for the purpose, before venturing into the street.

Baths can be hired by the hour, and this is

usually done by rich or even moderately well-to-do men in preparation for a wedding festivity, or by a group of friends before a festival.

TRADITIONAL BUILDING CONSTRUCTION

In old San'a', the characteristic building materials were stone, baked brick and wood, with plaster and decoration of gypsum. In the Jewish quarter and some parts of the old city mud was used.

The foundations of a San'a' tower house normally lie a metre or so below ground level; they are constructed of igneous quarry stone, split black basalt boulders, or wadi-bed stones. At the base, the foundations project slightly on either side of the wall above, the additional thickness averaging about 20 cm. The stepped foundation generally extends upwards 60-80 cm. Above the foundation walls, the lower courses of the wall are built of hard black quarry stone, each course being 20-25 cm high. This part of the wall sometimes has a hard mortar of lime and earth from 50 cm below to 150 cm above ground to prevent salts and damp rising in the stonework. Rubble stonework is used above that for the lower storeys of the buildings in rougher work, for store houses or rear walls; this is usually coursed. In better work, however, the rubble is retained only for the core of the wall, the external and internal faces being constructed of squared ashlar stone. Each stone is tapered behind the face of the wall, so that it can be fitted with fine joints (less than 1 mm is common). The strength of the wall therefore

depends on the ability of the mortar used in the core to hold it all together; a good clayey soil is quite adequate, but careless builders who choose the wrong soil may produce a weak building. In mosques, tombs and finer houses, a mortar of gypsum or even lime was sometimes used.

The preferred stone for ashlar facing is a blue-grey pumice-like basalt? or tufa, which is pale buff in colour. Fine-grained limestone is popular to produce variety, ranging from white to red or green. Cheaper facing stones are cut from coarse white limestone.

The process of building the wall is first to shape the square facing stones, determining the size of each by the span of a man's hand (20 cm approx.), and then to lay a course of the finely dressed outer facing stones, each propped on a gypsum fillet (which shows as a thin white joint between the facing stones when the wall is finished). Then the corresponding inner course of stones is laid, these more roughly dressed, but still tapered into the wall. Finally, the 3-10 cm gap between the stones is filled up with a mixture of good clayey-soil mortar and crushed-stone aggregate to make the core of the wall. The next course can then be laid, and so on. Such a stone wall is at least 45 cm thick, approximately a *dhira'*, the building unit, which is generally 47.5 cm. The rough inner stonework facing is usually plastered over.

To the outside faces of the external wall are tied the crosswalls, by which means the plan area is divided into easily roofed sections approximately 3 m wide. The system is one of the two devices by which the stability of the structure is assured, the other being the strength of

the staircase pier, usually built throughout its height in stonework. Both the external corners and the staircase pier are built using gypsum mortar for extra strength.

The inner faces of the external walls support the floor, roof beams and lintels. The building of the external and internal faces of stonework is carried out by two entirely different trades, then a third trade builds the central earth-and-rubble core of the wall.

Crosswalls are built of rough rubble or unbaked brick. They may be interrupted by large arches or door openings without their essential strengthening function being impaired.

Brickwork begins above the stonework, which in houses usually ceases between 3 and 10 m above ground level. Brickwork, being lighter than stonework, is more suitable for upper walls; bricks are easier to carry up staircases, and more flexible in permitting large openings.

Baked bricks (*yayur*, pronounced 'yagur') average 16.5 cm square and 4 cm thick, but vary considerably. Older bricks are as much as 8 cm thick and up to 20 cm square. They used to be made from a local clayey soil found on the north-east side of the city, a short distance beyond the walls. After being shaped in a box and dried in rows in the sun, they were stacked in one of a number of low brick kilns and burnt for two days using dung or skin and bones as fuel. Today bricks are usually brought in from other towns.

Mortar for brickwork is normally clay mortar, with a little gypsum added, but this is changed to a pure gypsum mortar every five or six courses, over large openings and in areas of stress, such as the corners. On the outside face,

where it is particularly exposed to the weather, lime mortar is sometimes used for the outer joints, but this is not very widespread.

Upper walls are generally two bricks thick (i.e. 36 cm or more), lower levels two and a half or three bricks thick. The topmost storey and parapets are sometimes only one brick in thickness, with extra reinforcements provided by piers.

Wooden bands run around many of the houses, especially those with lower storeys built in stone or brick. They are carefully joined at the corners so that they form a continuous girdle preventing the walls from bulging outwards; they naturally also take up stresses due to unequal settlement or earthquake shocks; a further advantage in their use is that they allow sections of the stone wall below them to be renewed with less danger of the wall above them cracking. There are usually two of these bands above and below the lowest large windows, acting as sill and lintel, and sometimes another running through the stonework below. They are often whitewashed for weather protection, and therefore not immediately recognizable as wood. Although other woods are used, a favourite for this purpose is apricot wood, which becomes stronger when damp and thus resists decay.

Unbaked brick (*libin*) is sun-dried and contains straw and chaff for greater strength. It varies from the common size of baked bricks up to the massive size used in farmhouses of approximately 44 X 22 X 11 cm; even larger sizes are sometimes seen. Mouldings are usually executed in common-sized bricks, either lightly baked or hard-baked.

Openings are bridged, using arches of the

same materials, or flat arches of small bricks resting on a row of thin timber beams. The mortar used is a clay, sand and straw mixture, sometimes with animal dung added; it is left to 'mature' for several days (fermentation produces chemicals which give it strength).

Unbaked brick walls are frequently used on cheaper work above stone plinths or lower walls. Occasionally the highest, thinnest sections of a house built mainly of unbaked brick will be executed in baked brick.

Coursed clay is used for lower walls in rougher work in San'a'. It is laid in courses 50-70 cm high, the bottom of each course slightly overhanging the one below and then tapering gently to become thinner at the top, creating a visual separation between the courses which is frequently accentuated by weathering. The clay is taken from a borrow pit near the site. It is mixed with sand, straw and chaff, water is added, and then it is beaten or trodden underfoot. It is left to mature for two days, during which time chemicals from the straw and chaff mix with the clay to produce a stronger and more water-resistant material.

The clayey-earth mixture is passed from the ground to the workmen on the walls by shaping it into balls which can easily be thrown. The builder catches them and lets them drop into position on the wall, then pummels them into shape so that they make a homogeneous mass 40-50 cm wide. There is no shuttering.

Each course is completed and left to dry for from two days to a fortnight before the next course is begun. Openings are bridged with stone slabs, or with rough timber reinforcing built into the thickness of the clay courses.

The foundation of these earth walls is of coursed rubble and usually extends above ground to a height of between 30 and 90 cm. Often a layer of gravel or a course of bricks is introduced on top of the stones, before the first earth layer.

The bulk of all plasters used in San'a' are derived from gypsum; lime plaster is relatively little used, as lime is expensive, and is reserved for conditions requiring a good deal of waterproofing or protection from the weather.

Gypsum plaster is usually reserved for internal decoration, for making plaster shelves, small flights of stairs to upper store-rooms, and for constructing pierced screens and tracery windows.

There are two special lime plasters for permanent, weather-resistant high-quality finishes: *khudr* and *qadad*, the former is the cheaper and less durable of the two. *Khudr* is a general waterproof plaster, floor or roof finish, or mortar. It is used for joining the stones in the floors of bathrooms and lavatories in houses and elsewhere, also for the stone pavings of mosques and public buildings. It is made by crushing together dry lime and ashes with a hard stone, and afterwards mixing this powder with water and sand to form a mortar. *Qadad* is used for both waterproof dados and other surfaces on walls, for lining water cisterns and drains? and for roofs on mosques and on other important and expensive buildings. The manufacture of *qadad* is an extremely skilled and prolonged operation. Grit is obtained from pumice stones called *hishash*, which can be ground very fine; three measures of it are mixed with two of the lime. Water is added, and the mixture is

crushed together by pounding with a black stone; it is then left to ferment for a week. When the mature mixture is ready, a layer of it is applied by beating it into place with a black stone for a whole day. Not surprisingly, this is described as being 'very laborious' work. On the second day the same procedure is followed again, but for a little less time. On the third day, by which time it is beginning to dry, the beating is repeated. Usually it is dry after the third day, after which a second layer can be applied and treated in the same way for a day and a half. Finally, when that is dry, a wash of plain lime is applied and polished with a piece of pumice; the same finishing process is then repeated three times more, at weekly intervals.

The earth/straw plaster applied to the surfaces of earth walls differs little in composition from the earth/clay mixture used for constructing adobe walls, except that the proportion of earth is reduced in favour of more grit and chaff. Cheaper burned brickwork walls are often protected externally with this earth coating, and it is also a common finishing material for the outside of houses in smaller towns and on farms. It is not usual to paint the earth coating, which retains a good natural appearance and colour, except possibly around important windows, which may be whitened with lime to give them a frame. Sometimes the earth coating is entirely repainted with a wash made from animal dung and straw, which hardens the surface and gives it an excellent appearance.

Upper floors are made by laying tree trunks and branches stripped of their bark as beams placed about 60-100 cm apart across the space between the walls. Thick bundles of small sticks

are placed on top so that they span across them; the resulting platform is then covered with a thick layer of earth, finished with stone slabs to create the floor surface.

Roofs have the same construction as floors, but the best work is finished in hard lime plaster for waterproofing purposes, instead of stone. Alternatively, a thin layer of fine clay can be applied, which becomes waterproof when wet; this is smoothed and beaten into place after each rain. An older technique was to use a layer of grit and lime. The waterproofing material is sometimes obtained from old houses which are being demolished, or the fine clay can be imported from an area north of San'a'.

For stability, the thickness of the walls of the San'a' house decreases gradually as the building rises in height. Nevertheless, the thickness of the walls at their base seldom exceeds 70 cm, and the audacity of the architects in building houses which are often more than 25 m high remains surprising. Although collapses have been

known, they were rare before the days of the high water table and were usually limited to the outer wall nearest the street. This seems to support the belief of the old builders that the real strength of the house lies in the staircase, the massive central stone pier joined to its outer walls by stone-paved steps on wooden beams, constituting a braced structure usually more than 4 x 5 m in size which serves to stabilize the remainder of the house. This strength is supplemented by the system of carefully dividing the building with crosswalls into sections, each approximately 3 m wide.

Given the relative fragility of the building, the importance of preserving its geometry becomes paramount: walls must remain plumb, and arches evenly loaded. Hence the extreme concern with which movements of buildings are viewed in the old city; such movements out of the vertical have become common as a result of the water leakages into the ground which have occurred in the last few years.

Protecting and conserving the cultural heritage of the old city

*A little that lasts is better than a great deal
that is ended.*

Yemeni proverb

The old city of San'a' possesses a uniqueness in Yemen and in the world which can only be compared to the special quality of Venice; that is, its value lies not so much in the merit of the individual buildings, important though they may be, as in the unforgettable impression made by the whole - an entire city of splendid buildings combining to create an urban effect of extraordinary fascination and beauty.

But the old city is even more than that, for it is amazingly untouched by change: mosques, baths, suqs, caravanserais, houses, market gardens, all as they used to be hundreds of years ago; a living, functioning city out of the Islamic middle ages, the people a pageant in themselves with their varied, colourful clothes and traditional manners. It is the coherence and harmony of this ensemble, more than the buildings taken by themselves, that give old San'a' its exceptional quality.

DANGERS THREATENING THE OLD WALLED CITY

To what extent is it possible to protect and preserve all this for posterity? There is strong

evidence that the people of Yemen would like to do so, but the pressures against it are enormous.

The first of these pressures is the speed of modernization. Yemen was effectively closed to technical advances or contact with the outside world under the Imams. During the Civil War the country was too distracted for much change to occur. Peace and the establishment of foreign embassies, international aid organizations, banks and commercial enterprises in the early 1970s therefore quickly produced a physical impact of enormous magnitude on both the people and the country. It also happened to coincide with the emigration of hundreds of thousands of workers into the neighbouring rich oil states who, returning with their wages, drastically changed the purchasing power of their families and of the whole country. Migration into the big cities from the countryside began for the first time, and San'a' was one of the principal magnets.

As already mentioned, the population of San'a' had grown from about 55,000 in 1970 to 250,000 by 1982. This means that to the 100.8-hectare area of the old city (including al-Qa'), which contained approximately 50,000

inhabitants, was added the area outside the walls of 1,250 hectares, accommodating a further 200,000 people. The old city has thus shrunk from being the dominant physical and social area of the city to a position of relative inferiority, occupying only a tiny fraction of the city confines, and housing only one-fifth of the population.

This change was paralleled by a shift in the main shopping area, banking and government facilities out of the old city, mainly to the west and north-west. Education, recreational, entertainment and health facilities have also almost all moved away to the area outside the walls.

There is thus a very real danger of the old city's dying. Today, it is only the traditional role of the suq as a market for the sale and supply of produce and commodities for the large agricultural hinterland that keeps the old city alive - that and the decision of a number of San'a'nis to maintain their tower houses within the old city, in spite of the inconvenience involved.

But more and more of the old families are building new houses and moving to the new outlying districts. Their reasons for making the move are the unsanitary and unwholesome condition of the streets, the lack of services and the relative inaccessibility of their houses for vehicles. Other important factors are the attractions of nearby educational facilities and medical services, and the possibility of a different, more modern, life-style.

There has been a move away from the tight-knit restrictions of traditional custom since the end of the Imamate, and a new value is being attached to life within a nuclear family in preference to an extended one. This has meant that

young men and women are no longer content to live as married couples within the shadow and authority of their parents, but prefer to move into new, smaller homes. They have been able to do this only by leaving the large tower houses of the old city and moving into new areas. With the old tall houses thus semi-deserted, the parents have either closed up large parts of them, or decided to move away themselves and allow them to be divided up for tenancy among poor relatives or new immigrants.

These social changes are fundamental. Not merely do they pose a threat to the survival of the old city as a society, but they are encouraging the intrusion into the old city of new buildings which are executed in alien 'modern' materials and in styles that are catastrophic in their visual effects upon the existing street scene.

At the same time, the maintenance of many of the old buildings, whether religious, publicly owned or private, is being almost wholly neglected. Attention is naturally focused on the areas of modern development, and there is a general feeling that the walled city is a phenomenon of the past, even though it would be unwise politically and patriotically for this idea to be admitted.

The list of dangers and problems that are afflicting the old city on a purely physical level is formidable. One of the most visible and most serious is the extent to which dampness is rising to unprecedented levels in the walls of the buildings. The reason this is happening is that about ten years ago piped water was made available throughout the whole of the old city, but until now no drainage facilities existed for taking that water out of the city again. So for a

decade vastly increased amounts of water (and most of the old houses now have washing machines for clothes) have been pouring into the ground and accumulating there. To make matters worse, the original water-supply pipes were of poor quality, laid close to, or even on, the surface of the ground, so that they have easily been damaged. The resulting escaping water, combined with the vast quantities used in the houses, has undermined the foundations, and water has risen by capillary action to quite high levels in the walls of the buildings. If, as often happens, the water is also polluted by human and animal waste, the acids thus formed can readily attack the materials of the walls. Attempting to deal with the water and the resulting dampness is a major problem for the old city; the cost of improving the infrastructure and rectifying the damage that has already been caused is likely to represent something like 25-33 per cent of the total cost of any conservation programme.

The first step is a thorough review of the whole system of water distribution, with the aim of testing each part of the system immediately and replacing defective pipes wherever necessary. The authorities are beginning the work of installing a sewerage and drainage system in the old city, which has to be of the highest standards of materials and workmanship, so that the risk of leakage is reduced to an absolute minimum.

Impassable streets

In wet weather the streets are often impassable because of mud and flowing water, conditions

which are exacerbated by vehicular traffic. The paving of at least the main streets with small stone blocks is a matter of high priority. Once this is done, a system of stormwater drains will have to be introduced into the city to remove the large volume of water that can accumulate in the streets during the monsoon rains, in order to prevent it soaking down into the foundations of the buildings.

Traffic

The congestion of the streets by parked vehicles makes passage by pedestrians and motorcars well-nigh impossible in many areas. This is cited as one of the main reasons for the abandonment of the walled city by the old families. Vehicular circulation and parking, and their effect on the old city, have to be carefully studied in the context of the expanded city of San'a" as a whole.

A particular danger that has to be avoided is the cutting through of a main road across the old city from north to south; this has already been proposed above a covered-over sa'ilah (dry riverbed) where the flood waters run. Its effect would be catastrophic, irrevocably dividing the traditional way of life of the people of the old city into two weaker, fragmented zones, and inevitably attracting high commercial buildings on either side of it. From the viewpoint of conservation it would introduce alien features of such a scale and impact that the conservation of the western half of the old city - and therefore ultimately of the whole - would become meaningless.

Litter

The conditions of the streets are generally appalling. Garbage and rotting litter, sometimes mixed with animal and human dung, combine to produce the most unhygienic and unpleasant atmosphere imaginable. Not only is this a potential hazard for the sudden spread of epidemics, but it has a major effect on the inhabitants. Many are persuaded to abandon the old city simply for the sake of their children's health, while many of those remaining are discouraged by the environment from repainting or doing repair work to maintain the appearance of their houses. A satisfactory system of waste collection and disposal and of street cleaning is an urgent necessity.

Unsightly wiring and aeriels

Electricity and telephone wires are draped across the buildings in the old city, or suspended from ugly, leaning poles at street corners. The number of wires is proliferating all the time, and a rash of television aeriels has broken out against the sky. All this is disfiguring the character of the buildings. The only feasible solution, if the traditional visual character of the city is to be retained, is to install all this wiring underground and to provide a communal television aerial connected by cable throughout the whole walled city area.

Maintenance

The lack of maintenance has already been mentioned, and yet it cannot be too strongly

stressed that this is one of the serious dangers threatening the old city. Buildings which were built in the traditional way were meant to be maintained every year. It was accepted that after the rains repainting and replastering would be necessary to repair any damage done by the water. If this is no longer carried out every year, deterioration is extraordinarily rapid. Yet maintenance is not being undertaken, not merely because the owners are careless, but also for a number of other reasons: primarily a shortage of builders. A new generation of builders has grown up who are not aware of the need for constant maintenance, and many of the building materials needed to repair the traditional buildings are not easily available. The shortage of traditional craftsmen has been caused by two factors: first, emigration to work in the oil states and, secondly, the temptation for skilled workers to move into modernized building industries where they can earn higher wages. In addition, building workers who were trained in other areas and do not have any experience or understanding of the traditional techniques of old San'a' have come into the building industry there.

Traditional building materials needed for repairs include such materials as lime, gypsum, alabaster and special plasters. Some of these are either unobtainable or are prohibitively expensive owing to the cost of raw materials and labour - or both. It is therefore essential, if maintenance of these buildings is to be revived, that measures be taken to encourage traditional building skills and crafts, and also to ensure that supplies of traditional building materials are maintained by the government.

A related danger is that the old buildings may be repaired using the wrong materials. One of the great hazards is cement, which, if used incorrectly, can cause more damage than it prevents. It cracks easily and can therefore let in water, and it also contains free excess salts which can interact with the surrounding building materials to destroy or discolour them. Traditional techniques for repairing such things as roofs, cracked walls or settled foundations need to be revived, for they are in the long run more economical and yield less unsightly results in the old buildings than the best modern techniques.

Public amenities

The lack of public amenities is a serious defect in the old city. Not merely do more schools have to be constructed, but playing spaces have to be found in or near the old city for games and sports. Health clinics need to be built where they can be easily reached. Finally, public lavatories have to be provided for the suq and other public areas.

Ugly modernization

In the public interest, control must be exercised over new building in the old city. Certain principles need to be established, such as the strict observance of a blanket height limit throughout the old city and restraint on façade changes, on the addition of extra storeys without permission, and on the introduction of buildings made with new materials or having novel elevational characteristics.

THE INTERNATIONAL CAMPAIGN FOR SAFEGUARDING AND CONSERVING THE OLD CITY

The campaign hopes to attract the participation of many organizations and countries to assist the people and Government of the Yemen Arab Republic to undertake the difficult and ambitious task of preserving and safeguarding the old city of San'a'. It is intended that this should be done by using an integrated, multi-disciplinary approach, through careful urban and regional design of the relationship between the new parts of the city and the old, by rehabilitation, by conservation, by the encouragement and revival of crafts and trades, and by the sponsorship of cultural activities.

In many of these fields international aid is needed to supplement those resources lacking in the country itself. Expertise, fellowships, and equipment as well as voluntary financial contributions are urgently needed from all sources if the campaign is to have any hope of success.

The campaign will take as one of its targets the growth of a sense of participation of the people of the city of San'a' and of the Yemen Arab Republic in the spirit of a national cultural identity symbolized by San'a'. At the same time, it will help to generate an awareness at the international level of the historical and cultural significance of San'a', and thus ultimately encourage more understanding and appreciation between differing cultures. As part of the campaign, brochures, books, cinema and television films are being prepared to disseminate knowledge about San'a', its history, its culture, and its heritage of sites and buildings. No method is

to be spared which might contribute to the campaign: articles in magazines, programmes on international radio and television, the publication of tourist books and serious research works on the subject, the preparation and sale of postcards, special postage stamps and posters.

A strategy for conservation

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The government has established a special committee of the Cabinet to assist the international campaign. It is hoped, as aid funds become available, to set up an office for the preservation and conservation of the old city of San'a'. This will be headed by a director-general, a distinguished Yemenite, aided by an administrative staff and an executive technical organization. The latter will be composed of executive technical officers, specialized technical consultants and laboratory and research staff. For practical reasons it will probably be necessary to utilize the services of internationally trained and experienced personnel for some of these tasks.

Priorities for immediate action will be established quickly, and resources directed at these targets first. Among them, the solving of the infrastructure problems of the old walled city will take an important place.

A policy for action

Because the value of San'a' lies in its exceptional quality as an ensemble and not in the merit of individual buildings, important though these may be, it would be dangerous to focus too

much attention in the conservation programme on any one section of the city, or on the significance of a few monuments at the expense of the whole. Part of the uniqueness of the city is that it is still alive - a breathing medieval city bustling with activities that have been essential to its survival for more than 1,000 years. It has to be kept as a single living organism, one which cannot be dissected so that certain parts are protected and preserved while others are allowed to change. The policy of conservation is therefore designed to have three main goals:

First, the preservation of as much of the physical context and as many of the monuments of the old medieval city as possible, in order to convey its unique character together with its sense of age and history.

Second, ensuring the preservation and rehabilitation of the traditional way of life of the medieval city as much as possible for those who desire it, while recognizing the importance of carrying the burden of history without stifling urban life, so that the population is encouraged to change and upgrade its way of life as it wishes.

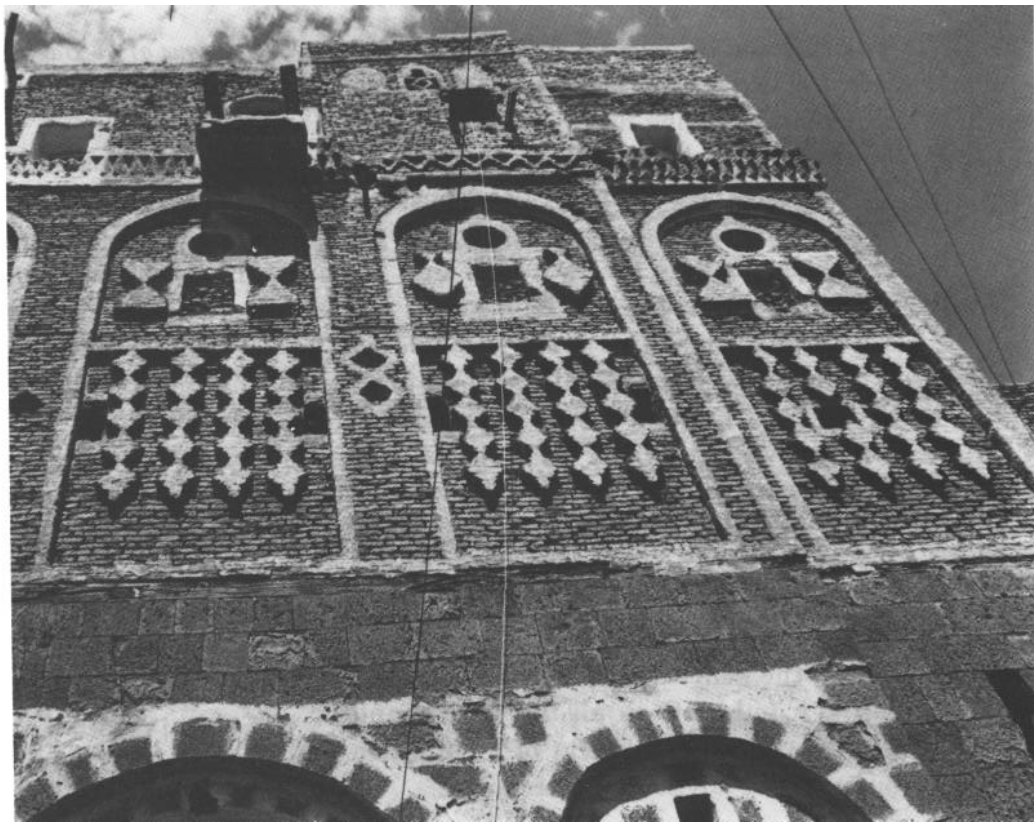
Third, achieving a very simple method of implementation for every aspect of the preservation and conservation of the old city.

There clearly exist today two cities in San'a', the old and the new, with widely differing physical and social patterns. The old city preserves a way of life, firmly rooted in its physical form, which is immediately recognizable to the great majority of Yemenites who visit San'a' from the rest of the country and who themselves come from such an environment. The old markets act as the primary exchange centre for

a large agricultural region, as well as serving the traditional needs of a large part of the whole urban population. (Most inhabitants of the new areas of the city are said to visit the market in the old city at least once a week.) Many of the remaining inhabitants of the old city are craftsmen or are engaged in some other traditional occupation. The new city serves to house the bulk of the newly arrived immigrants, as well as an emerging Western-oriented middle class. The inhabitants of the old city visit the smart Western-style shopping streets of the new areas not less than twice a week.

While it is possible to argue the validity of an urban framework which accepts and caters for both the traditional and the innovative, it is important to recognize and attempt to understand the strains and stresses of such a two-fold system. This is nowhere more true than at the physical points of connection between the two systems; careful thought needs to be given to these connections wherever, and in whatever form, they occur.

Above all, it is important that the old city should never be considered in isolation; its problems and the solutions proposed for them



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Samsarat al-Majjah
looking up at the brick
bas-relief of the façade.

should always be considered in the context of the city as a whole.

Some specific detailed aims are as follows:

1. To retain the traditional street pattern.
2. To retain as far as possible the traditional method of use of the street: i.e. mixed circulation of vehicles, animals and pedestrians.
3. To retain the gardens (singular: *bustan*) as functioning market gardens (singular: *miqshamah*) supplying vegetables to the houses and markets, and to prohibit building on them.
4. To create a strictly controlled buffer zone outside the old walls.
5. To protect and conserve, meticulously, selected national historic treasures within the old walls, including historic sites and monuments.
6. To prevent the erection of new constructions or additions above the general height of the highest houses in each local area.
7. To control the excessive use of materials and colours on the buildings which would be out of character with the traditional appearance of buildings in the old city.
8. To preserve the diversity of life and crafts in the old city, by the protection of activities which are of small scale and cannot always survive in new developments with higher rents.
9. To use every means to obtain the co-operation of the general public in the old city, through publicity in all the media, and through the establishment of information bureaux and advisory services.

SOME TYPICAL EXAMPLES OF THE ARCHITECTURAL CONSERVATION NECESSARY IN THE OLD CITY

The Great Mosque

(see Plates 2, 4, 6 and 27)

A detailed account of the history and importance of the Great Mosque is given on pages 85-7. Although it was last repaired in 1974, this building merits conservation work of the most thorough kind on the roofs, minarets, ceiling decorations and antiquities.

Estimated cost (approx.) \$200,000

The mosque of al-Bakiriyyah

(see Plates 9 and 10)

This mosque was built by an Ottoman governor, who named it after one of his friends who was killed at San'a' and is buried in one corner of the mosque. Built and decorated in typical sixteenth- (tenth-)century Ottoman style in 1597 (1005), it was extensively redecorated during the second Turkish occupation after 1872 (1289).

Conservation will involve repairs of the minaret, of all the roofs and walls, where they are cracked, the removal of whitewash from the gilded and coloured decoration, and its general restoration.

Estimated cost (approx.) \$70,000

The Hammam al-Maydan
(formerly *al-Bakiriyyah*)
(see Plate 7)

This great public bath, with a domed changing room 13 m high internally, was built by the same Ottoman governor as a waqf property for the new mosque. It has fine rooms throughout, now somewhat altered and reduced in quality, but it is still used.

It needs general conservation work, repair of the roofs of the domes, replastering internally and the removal of later accretions, so that it can be effectively restored to its original state as it was at the beginning of the seventeenth (eleventh) century, consistent with its use today.

Estimated cost (approx.) \$30,000

Baytal-Belayli
in the vicinity of the *Suq al-Milh*

(see Plates 30 and 32 and Fig. III)

This is one of the finest surviving houses in San'a', though it is in a neglected state. It has been owned by the government since 1962 and is now let out as apartments. The bulk of the building was erected in the early seventeenth (eleventh) century. The top floors were redecorated, or possibly completely rebuilt, in 1904 (1322).

The *mafraj*, the *manzar* and the *zihrah* are all of quite exceptional quality, as are the woodwork, gypsum screen work and stained glass throughout the building.

The house needs general conservation work to restore it to its former beauty.

Estimated cost (approx.) \$30,000

Bayt Fay ' and Bayt Bertowah
in the *Harat Salah al-Din*
(see Fig. IV)

These two adjoining houses are those shown in the bottom left and top right of Fig. IV. The lower levels of the former are claimed to date back to the late fourteenth (eighth) century (the owner was treasurer of the Zaydi Imam Salah al-Din), and the whole of the latter to 1509 (896). They are certainly two of the oldest houses remaining in the city. Bayt Bertowah has been owned by the government since 1962 and is let out as apartments. They are in varying stages of decay.

Extensive repair, reconstruction and conservation work is urgently needed if these historic houses are to be preserved for posterity.

Estimated cost (approx.) \$100,000

The Samsarat al-Majjah
(see Plates 6 and 39)

This caravanserai, reconstructed in its present form in the seventeenth (eleventh) century, is typical of those discussed on page 90. Although the stables are no longer used for housing animals, the lower levels of the building are still in use as warehouses. Above the roof, however, the rooms for lodgings and bathrooms have fallen into disuse, and have lost their doors.

The building needs general conservation, and adaptive re-use of the upper floors, possibly as a youth hostel or students' lodgings.

Estimated cost (approx.) \$30,000

THE CULTURAL TRADITIONS
OF THE OLD CITY

Many of the crafts, trades, pursuits and cultural activities of the people of the old city of San'a' need encouragement, training programmes and financial subsidies:

Crafts: woodcarving, wood turning, forging, carving of pierced gypsum fanlights, weaving, etc.

Trades: traditional building skills, in particular specialized ones like *qadad* plaster laying.

Pursuits: traditional medicine.

Clothing and jewellery: traditional embroidery of various kinds, gold- and silver-working.

Food: traditional cooking, particularly of old recipes which are in danger of being lost.

Poetry and folklore: the collection of San'a'ni sayings, epigrams, proverbs and poetry, both ancient and modern.

Music and dance: traditional aspects relating to the old city up to the present day.

A new museum of pre-historic, pre-Islamic and Islamic cultures is already being planned on a site within the old city on the southern side, to the west of the Sa'ilah.

PLAN OF ACTION AND
PRELIMINARY ESTIMATES FOR
THE PRESERVATION AND
CONSERVATION OF THE OLD CITY

Emergency measures

1. Immediate repairs to roofs to prevent rain damage to the most important buildings.
2. Introducing measuring devices into build-

ings which are cracking in order to study the extent of failure.

3. Shoring and stabilizing buildings which are collapsing.
4. Holding action to prevent the construction of new buildings in the old city or the execution of major external alterations to old buildings.
5. Holding action to prevent damage to *miqshamahs* and *bustans*.
6. Establishment of an advisory service for the inhabitants of the old city in construction-and-repair techniques, improvements and upgrading. To be located in Dar al-Jadid within the old city. Staffing by Yemenites and foreign volunteers. Furniture and equipping by Yemeni Government and international agencies.
7. Demonstration, restoration and improvement projects (Dar al-Jadid and two others in different parts of the old city).

Phase I: priority work (first year of action with international funds)

1. Testing and replacement of all water pipes likely to form leaks in the water-supply system of the old city. To be executed as part of the sewerage-laying scheme in some areas.
2. Establishment of the organization for safeguarding and conserving the old city. To include an administrator and a technical director whose salaries would be paid from the fund-raising campaign; also to include a number of technical advisers, both Yemeni and foreign, the attendance of the

latter to be funded from international funds or by bilateral aid.

3. Restoration of eight or ten key monuments (including two or three houses) as visual evidence of the commencement of the conservation campaign.
4. Repair, cleaning and rehabilitation of the public baths, both inside and outside.
5. Detailed investigation of certain aspects of the conservation programme, if investigation of these has not already been completed before the commencement of the implementation of the international campaign:
 - (a) the upgrading of the hygiene and servicing of solid-waste disposal systems in traditional bathrooms, together with the possible introduction of alternative 'dry' systems of solid-waste disposal;
 - (b) the provision of amenities for vehicular circulation and the parking of vehicles, of vehicular services to the old city, and the detailed design of the system (it is of the utmost importance that this should be considered in relation to the city as a whole);
 - (c) demographic and socio-morphological studies of the old city, including employment and incomes analysis, length of occupation and previous occupation records back ten years (in course of execution by the Central Planning Office, 1982-85);
 - (d) the effects of social and economic change on the old city, together with studies of the positive or negative

effects of the international campaign on the citizens, in conjunction with (c) above.

6. Detailed structural survey and analysis of all dangerous houses and other buildings, recommending either:
 - (a) temporary abandonment and shoring;
 - (b) method of repair and strengthening, if possible;
 - (c) demolition, if it is not possible to repair them; in this case the doors and windows of old facades and any other recoverable parts of the best houses would be taken out before demolition and stored, ready for rebuilding into other reconstructed houses (to be done, if necessary, by Yemeni and foreign volunteer teams under the direction of conservation architects).
7. Investigation of the means of providing incentives, financial and otherwise, to encourage building owners and the inhabitants of the city to maintain the buildings. Investigation of action to be taken against absentee landlords, clarity of land tenure, the possibility of long-term leases for tenants, etc.
8. Investigation of methods of upgrading the building technology and facilitating maintenance.
9. Establishment of mechanisms for the revival and training of all the traditional building crafts and skills needed for the efficient repair and maintenance of the old buildings.
10. Programme evaluation and revision of the subsequent plan of action.

Subsequent phases (four subsequent years)

1. Replacement of all above-ground electric wiring with underground cables, together with similar action (where necessary) for telephone wires and the provision of an underground cable connected to a communal television aerial.
2. Rebuilding and repairing of the old walls of the city.
3. Upgrading of the hygiene and servicing of the solid-waste disposal system for those parts of the old city which still utilize it, as proposed in Phase 1.5(a) above.
4. Provision of amenities for vehicular circulation and the parking of vehicles to service the old city, with the design of the system, on the basis of the studies proposed in Phase 1.5(b) above, taking account of the provision of paved roads and kerbs, emergency services, fire, ambulance, maintenance of public facilities, etc.
5. Investigation of means of transferring some properties in the old city owned by various government ministries to the control and care of the conservation authority, possibly by exchange.
6. Conservation of all monuments and publicly owned building in the old city. Rough estimates of the cost of conserving the buildings are divided here into two parts. It is envisaged that all government-owned properties, including houses, will be repaired and conserved using government funds, or grants, aid, or loans made available to the government from international sources. Private properties, on the other

hand, whether large commercial buildings or houses, will be repaired at the expense of the private owners, but with subsidies to provide incentives and low-interest loans made available from a special bank set up for the purpose, possibly with some of its funding internationally raised.

The only exception to the above division is that nearly a third of the privately owned houses are estimated to be neglected for reasons of poverty - the incentives and the wherewithal for repairs no longer being available to their owners. This part of the private building sector is therefore assumed to need more than subsidization, and in these cases it has been assumed that the burden of conservation of the whole of their structures, of the exteriors and the roofs would have to be borne by the conserving authority, maintenance once they are repaired returning to the hands of the private owners.

7. Development of incentives for the conservation, repair and maintenance of privately owned buildings in the old city (continuation of Phase 1.7).
8. Improvement of educational and training facilities related to all the traditional crafts and trades in the old city.
9. Improvement of public amenities for the old city, schools, playgrounds, sports-fields, clinics, markets, fire-fighting facilities, etc.
10. Co-ordination of studies of the city, particularly archaeological studies, with the other activities of the campaign.
11. Presentation of aspects of the city's life and history to the public. Presentation of the

<p>most significant archaeological sites, monuments, representative old houses traditionally furnished, etc.</p> <p>12. Continuous re-evaluation of the programme and revision of the plan of action.</p> <p><i>Preliminary estimates</i></p> <p><i>Modernization of the infrastructure:</i></p> <table border="0"> <tr> <td></td> <td style="text-align: right;">US\$</td> <td></td> <td></td> </tr> <tr> <td>1. Upgrading of water</td> <td style="text-align: right;">3,000,000</td> <td></td> <td></td> </tr> <tr> <td>2. Upgrading of electricity</td> <td style="text-align: right;">10,600,000</td> <td></td> <td></td> </tr> <tr> <td>3. Upgrading of sewerage</td> <td style="text-align: right;">4,400,000</td> <td></td> <td></td> </tr> <tr> <td>4. Introducing stormwater drainage (including walling and paving the Sa'ilah)</td> <td style="text-align: right;">4,000,000</td> <td></td> <td></td> </tr> <tr> <td>5. Paving of streets</td> <td style="text-align: right;">30,000,000</td> <td></td> <td></td> </tr> <tr> <td>6. Communal television aerial (underground cable)</td> <td style="text-align: right;">10,000,000</td> <td></td> <td></td> </tr> <tr> <td>7. Upgrading of solid-waste system</td> <td style="text-align: right;"><u>250,000</u></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;"><u>62,250,000</u></td> <td></td> <td></td> </tr> </table> <p><i>Transport and circulation:</i></p> <table border="0"> <tr> <td>1. Provision of car parking</td> <td style="text-align: right;">100,000,000</td> <td></td> <td></td> </tr> <tr> <td>2. Special service vehicles</td> <td style="text-align: right;">2,000,000</td> <td></td> <td></td> </tr> <tr> <td>3. Road improvements and controls</td> <td style="text-align: right;"><u>2,000,000</u></td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">104,000,000</td> <td></td> <td></td> </tr> </table>		US\$			1. Upgrading of water	3,000,000			2. Upgrading of electricity	10,600,000			3. Upgrading of sewerage	4,400,000			4. Introducing stormwater drainage (including walling and paving the Sa'ilah)	4,000,000			5. Paving of streets	30,000,000			6. Communal television aerial (underground cable)	10,000,000			7. Upgrading of solid-waste system	<u>250,000</u>				<u>62,250,000</u>			1. Provision of car parking	100,000,000			2. Special service vehicles	2,000,000			3. Road improvements and controls	<u>2,000,000</u>				104,000,000			<p><i>Buildings:</i></p> <p>Repair: assuming repair of one-third of 6,000 houses has to be paid by government = 2,000 houses</p> <p>Of these:</p> <p>50 per cent = 1,000 (at 50,000 rials) = 50,000,000 rials</p> <p>25 per cent = 500 (at 100,000 rials) = 50,000,000 rials</p> <p>25 per cent = 500 (at 30,000 rials) = 15,000,000 rials</p> <table border="0" style="margin-left: 20px;"> <tr> <td></td> <td style="text-align: right;">11 ,000,000</td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">11 ,000,000</td> <td style="text-align: right;"><u>117</u></td> </tr> <tr> <td></td> <td style="text-align: right;"><u>3,500,000</u></td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;"><u>25,500,000</u></td> <td></td> </tr> </table> <p><i>Improvement:</i></p> <p>Assuming two-thirds of 6,000 houses have to be improved from government loans: = 4,000 x 25,000 rials = 100,000,000 rials (to be arranged as repayable loans from international aid bodies and excluded from total estimate)</p> <table border="0" style="margin-left: 20px;"> <tr> <td></td> <td style="text-align: right;">23,000,000</td> </tr> </table>		11 ,000,000			11 ,000,000	<u>117</u>		<u>3,500,000</u>			<u>25,500,000</u>			23,000,000	<p>US\$</p>
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<i>Conservation of public buildings:</i>	US\$	<i>Experts:</i>	us \$
Great Mosque	200,000	Average of twenty expert	
Average of other mosques =		months per year plus ten	
\$ 30,000 x 30	900,000	fares annually for five years	1 ,000,000
Presentation of buildings			
to the public	500,000	<i>Officers of Conservation of San'a' Campaign:</i>	
Well-ramps, public baths		Fifteen permanent staff for	
and other public buildings	1,500,000	five years	7,500,000
Walls of city	4,000,000	Remainder of staffing from	
	<u>7,100,000</u>	international aid and	
		Yemeni Government	
		(amount not included in	
		total estimate)	
		TOTAL ESTIMATE (approx)	<u>210,050,000</u>
<i>Encouragement of craftsmen and tourism:</i>			
from international aid funds			
and UNDP	+ 500,000		
<i>Development of property laws:</i>			
from government funds			
<i>Socio-cultural activities and leisure:</i>			
from government funds and			
international aid	+ 1 ,000,000		
<i>Material:</i>			
1. Equipment of offices,			
workshops, drawing offices			
from Unesco permanent			
funds, Yemeni Government			
and international aid	+ 500,000		
2. Conservation laboratory			
from international aid	200,000		
3. Rolling stock from			
international aid,			
Yemeni Government	+ 500,000		
	<u>1,200,000</u>		

Note: This estimate includes the cost of every item judged necessary for the conservation of the old city; where there is doubt, it represents the maximum needed; each item is only an approximation, and is expected to be drastically reduced as the work proceeds and exact estimating becomes possible. It is hoped that much of the expenditure would come from funds allocated by the government, or might be granted as aid in kind from interested bodies, governments or international organizations.

Chronology

- C. 5000 **B.C.**
First village settlements yet identified in Yemeni highlands
- C. 1200 **B.C.**
First urban settlements yet identified on edge of eastern deserts
- C. 700 **B.C.**
Construction of Ma'rib dam (?)
- C. 700 B.C.**
Construction of Sirwah temples (?)
- C. 500 **B.C.**
Beginning of period of great prosperity for Saba', with construction of many fine monuments
- C. 115-109 B.C.**
Emergence of state of Himyar as a rival to Saba'. Probable conquest of state of Ma'in by Saba', and rise of 'greater Sabaeen state'
- By first century **B.C.**
San'a'' becomes centre of inland trade route
- C. 100-200 A.D.**
San'a'' a royal city, joint capital of Sabaeen federation
- c. 210-50 **A.D.**
Construction of great palace of Ghumdan in San'a''
- After 300 **A.D.**
Himyarite domination of South Arabia leads to use of Zafar as alternative royal residence
- 119
- 342 **A.D.**
Embassy of Byzantine Emperor Constantine to Yemen
- c. 520 **A.D.**
Massacre of Christians of Najran by Dhu Nuwas, Himyarite ruler of Yemen
- 525 **A.D.**
Aryat, general of Abyssinian army, defeats Dhu Nuwas and assumes government of Yemen in the name of Axumite Emperor
- 537 **A.D.**
Abrahah assumes government of Yemen
- 570 **A.D.**
War of the Elephant against Mecca (Qur'an, Sura 15)
- C. 575 **A.D.**
Persians conquer Yemen at request of Himyarite princes
- c. 628 **A.D.**
Yemen converted to Islam during the lifetime of the Prophet
- c. 847 **A.D.** (232 **A.H.**)
Bani Yu'fir, first independent Yemeni Muslim dynasty, rules from San'a''

- 1004 **A.D. (399 A.H.)**
End of period of Yu'firid rule from San'a'
- C. 1047 **A.D. (437 A.H.)**
Conquest of San'a' by Sulayhids of Zabid
- 1173 **A.D. (569 A.H.)**
Invasion of Yemen by Ayyubid brothers of Salah al-Din
- c. 1189 **A.D. (585 A.H.)**
Ayyubids reside permanently in San'a', using it as their northern capital
- 1323-24 **A.D. (723 A.H.)**
After a long period of alternating governments, the Zaydi Imams finally establish themselves as rulers in San'a'
- 1515 **A.D. (920 A.H.)**
Mameluke Egyptians obtain San'a' for two years after surrender of governor
- 1517 **A.D. (922 A.H.)**
Zaydi Imams resume government
- 1547 **A.D. (954 A.H.)**
Ottoman Turks conquer San'a' and put 1,200 people to the sword
- 1623 **A.D. (1029 A.H.)**
Zaydi Imams drive out Ottoman Turks and begin long period of rule from San'a'
- 1849 **A.D. (1265 A.H.)**
Weakened Zaydi Imamate agrees to become vassal state of Turkish Empire
- 1872 **A.D. (1289 A.H.)**
Turks initiate second occupation of Yemen, ruling from San'a'
- 1918 **A.D. (1336 A.H.)**
Ottoman Turks retire, leaving Zaydi Imams once more rulers of Yemen
- 1948 **A.D. (1367 A.H.)**
Assassination of Imam Yahya. Accession of Imam Ahmad. Sack of city of San'a'. Capital thenceforth transferred to Ta'izz
- 1962 **A.D. (1382 A.H.)**
26 September Revolution against Imam Badr, who had recently ascended the throne on the death of his father, Ahmad. Civil war between Royalists and Republicans then follows
- 1968 **A.D. (1389 A.H.)**
End of Civil War. Establishment of civilian government of the Yemen Arab Republic

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Illustrations”

Front cover: *Detail of the facade of the minaret al-Madrasah.*

Back cover: *High houses and minarets in the centre of San'a'.*

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