Until the 1970s the built environment of North Yemen conveyed a general image of homogeneity, consolidated through centuries of isolation. There were episodic partial occupations of envoys from the centers of Islamic rule, but the area was never controlled by any of the Western powers that dominated, politically or economically, the surrounding countries. The Republican Revolution of 1962, however, introduced many changes in a short period. This report examines a few aspects of the changes that took place in the built environment between 1970 and 1990. These years have local political significance and may be seen as milestones in the progression of the culture of North Yemen toward exposure to the world beyond long-established natural and political limits: 1970 was the year of the “Reconciliation” between the intervenients of the Civil War that followed the Revolution; and 1990 was the year of the “Unification” of North Yemen and South Yemen. The report attempts to describe some changes in the forms of buildings during this period and their contribution to the transformation of regional vocabularies. It also looks at a few aspects of the country’s urbanization, understood not only in terms of physical expansion, but also as the diffusion to rural situations of values and attitudes from central areas.

Yemen is the name given since antiquity to the southwestern corner of the Arabian Peninsula where the chains of mountains running between the desert of the Rub’ al Khali (Empty Quarter) and the Red and Arabian Seas meet and rise to more than 3,700 meters.
Fringe areas of this region are now included within the political boundaries of Saudi Arabia and Oman, but its bulk, approximately 490,000 sq. km., comprises the Republic of Yemen, formed in 1990 through the unification of the Yemen Arab Republic (also known as “North Yemen”) and the People’s Democratic Republic of Yemen (or “South Yemen”). The Republic of Yemen’s capital is Sana’a; its main port is Aden (fig. 1).

Broadly speaking, present-day Yemen incorporates three major natural regions: the coastal strip, the mountains, and the desert fringe. Steffen has presented a convenient classification of natural regions in the country based on the orientation and characteristics of its three main mountain escarpments: the western escarpment slopes toward the Red Sea, the eastern toward the desert, and the southern toward the Indian Ocean. These mountain features condition climate and form specific drainage systems. The natural region defined by each is further subdivided, according to altitude and a climatic progression from hot and humid to temperate and dry, into lowlands (sea level to 500-1,000 m.), midlands (lowlands to 1,500-1,700 m.), and highlands (midlands to 3,760 m.). The central spine of the highlands is marked by a series of alluvium-filled valleys where some of the most important mountain towns, including the capital, Sana’a, are located. Of the country’s other important areas, the western (and part of the southern) lowlands — the coastal strip — are known as the Tihama; the eastern midland and lowlands, encompassing part of the desert, comprise a region commonly known as Al Mashriq, or the Eastern Plateau; and the southern midlands, mostly located in what was formerly South Yemen, form another distinct region, the Hadhramawt.

Physiographic characteristics may explain many building differences, but other factors, such as social organization and territorial delimitation, have also contributed to the regional distribution of building techniques and styles. In particular, tribal affiliation has been important, its influence increasing as one progresses from the coast to the highlands and Eastern Plateau. In interior regions, the tribe has served as the core of social organization since pre-Islamic times.

For more than a millennium before the arrival of Islam, Yemen’s culture was based on control of the incense road. Impressive remains are still being uncovered of towns, temples, and irrigation works, of which the best known today may be the Marib Dam (500 BC to 500 AD). However, after the arrival of Islam, Yemen became a mosaic of states with shifting borders, controlled in turn or simultaneously by local dynasties, the mountain tribes, or envoys of the dominant Islamic power. Such states often comprised territories which began at the coast, progressed inland, and stopped where they could no longer win over the highland tribes. This partly explains differences between the culture of the coastal areas and the southern mountain slopes, whose populations came to profess the Sha’fi school of Sunnism, and the culture of the northern highland tribes, who came under the influence of the Zaydi Shiites.

Thus, the isolation of North Yemen until recently can largely be explained by two factors: the rugged nature of its mountainous core, and its inhabitation by close-knit tribal units with a high degree of autonomy who were able to rally under a general leader — the Zaydi Imam — in the face of strong common enemies. The latter trait was particularly evident in response to the Turkish invasions in the sixteenth and nineteenth centuries. Resistance to the Turks united different factions in common cause, and ultimately proved the motivating force allowing the Zaydi Imam to consolidate its rule over the country, making Yemen the first independent state of modern Arabia — a fact which, however, did not lead to any appreciable opening of the area to the outside world.

Paradoxically, the autocratic and isolationist rule of the Imam relied on a military force whose officers, trained abroad, became exposed to ideological principles established in Egypt in the 1950s under Nasser. Thus, in 1962 the “Republic Revolution,” led by a group of army officers, brought an end to the Imamate, whose autonomous rule had prevailed for a millennium over some part or another of Yemen. The officers found support both among segments of the population eager for modernization and among conservatives who disagreed with the Imam’s intention to continue rule through dynastic line instead of through the Zaydi principle of elections. A civil war followed which lasted until the end of the decade, pitting adepts of the Imamate against the government of the new “Yemen Arab Republic” — the former backed by Saudi Arabia, the latter by Egypt. At the

same time, the British, who had held Aden and its hinterland for more than a century, were faced in the South with the struggle for independence of what became, in 1970, the “People’s Democratic Republic of Yemen.”

The changes brought about by the Republican Revolution in North Yemen have, since the early 1970s, clouded the image offered by the country’s traditional built environment. At that time, buildings appeared to express a collective identity that often led expatriates to use statements like “all Yemenis are architects” when summing up local culture. Implicit in such a view was an association of tradition with harmony in the relationship between dwellers and environment, involving the direct relation of body with matter, and reflecting on social and individual values.

In the ebullient twenty years that followed the Revolution, however, signs of idiomatic differentiation began to appear in the built environment which foretold an increasing social and spatial heterogeneity — notwithstanding the prevalence of local formal models, however subject to new interpretations and however cladding structures from exotic origins. The question today is whether and how the inspirational value of traditional construction and the intellectual concern for historical continuity can contribute to a representation of global identity in the lineage of the built environment for which the country became known.

AGRICULTURAL TERRITORY

Although not unique to Yemen, terraced agriculture has long been one of the country’s most characteristic traits, particularly on the western and southern slopes of its highlands. However, the last quarter of a century has witnessed the decay of the terrace structures for a number of reasons, among which are a preference for tracts of land which support mechanized agriculture, the impact of low-priced imported foodstuffs, the tearing of terrace tissue to expand the country’s road network, and a shortage of manpower for maintenance due to emigration and the progressive rejection of the hardship involved (FIG. 2).

The rehabilitation of the terraces, a costly task and a much-debated question in 1990, has been considered a government responsibility, both to prevent the erosion of mountainsides and the disastrous flooding of valleys below and to maintain the terraces’ emblematic value (Yemen without terraces, for many, is unimaginable). However, in the years since 1970 terrace maintenance has, for all practical purposes, been left to local initiative. Thus, the situation has remained much as before the Revolution, but without the level of necessity and collective responsibility once required by a society reliant on terrace agriculture for self-sufficiency.

Water collection and distribution methods, one of the achievements of Yemen’s antiquity, were by 1970 reduced to simple forms of spate irrigation along wadis and the collection of runoff water by open-air cisterns (ma’jil). The variety and formal quality of ma’jil are an important part of Yemen’s identifying patrimony, but the use of mechanical methods to extract water from deep aquifers has largely rendered them obsolete. Ma’jil today often serve as dumps, with garbage floating in filthy water (FIG. 3).

It has now been recognized that “neglect of terrace maintenance, excessive ground water extraction and consequent salinization” are key factors behind the trend toward desertification in the country, considered almost irreversible by the end


of the 1980s. Other side-effects of development, such as organic and chemical pollution and the generation of waste, have become major concerns in a society which traditionally produced no waste in quantity or nature other than that which could be immediately recycled.

DWELLING TYPOLOGIES AND SETTLEMENT PATTERNS

Generally speaking, building and dwelling options in the country can be grouped according to its broad natural regions. Except in the desert, where, according to the traditions of Arabian desert dwellers, shelter was traditionally provided by tents, regional specificities developed to include particular typologies, materials, and formal treatments (Fig. 4).7

The most elementary level of shelter was represented in the mountains by caves and ledges adapted for use by individuals and even small communities. Some of these were still occupied twenty years ago, and showed a preoccupation with the formal treatment of the interior. However, the clearest expression of entirely manmade basic shelter was the saqif (literally, “roof”). These one-room, earth-covered, stone structures, mainly used by shepherds, were either quadrangular, roofed by stone slabs on monolithic beams and arches, or round, roofed in the manner of a false dome by increasingly smaller rings of stones.8 The quadrangular form, in particular, represents something of a constructive model for Yemen, its flat roof having been adopted for use in structures from simple houses to large mosques.

In the mountains the identification of house types depended more on structural complexity and consequent spatial organization than on the material out of which they were built. The most primitive forms were always made of stone, but earth and stone were used for all the three major types: single-story; two-story with an external stair (with living quarters located above ancillary spaces); and multistory with an internal stair, a form commonly known as the “tower house.” The latter were the most widespread form of dwelling structure in the mountains. They were present from the smallest rural cluster to the largest town, and they have provided the publicized version of the “traditional Yemeni house.”

Within a tower house, space was organized on levels along a continuous interior stair, from ancillary spaces on the ground floor, through reception rooms and household storage at the intermediate levels, to private quarters above. Roofs were fully accessible and used as terraces, often equipped with a kitchen, a bathroom, or a reception room called the mafraj or mandhar (Fig. 5).9 One variation of the tower house consisted of rooms around a courtyard on the top floor, with light wells offering illumination to the floors below. This form may have been derived from a form existing since pre-Islamic times, which

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**FIGURE 4.** Schematic map of house typologies in pre-Revolution North Yemen.

**FIGURE 5.** Schematic plans of a characteristic rural house in Haraz, western highlands (1976).
was transmitted by local Jews (the last Himyarite rulers had converted to Judaism), whose houses in Sana’a resembled scaled-down versions of this model.¹⁵

In the Tihama three major house types developed: reed houses, brick houses, and Red Sea houses. Both reed houses (made of various types of thatch, with round or quadrangular plans and conical or pitched roofs) and brick houses (made of baked-earth blocks, with quadrangular plans and flat roofs) were basically organized as compounds of single-story, single-room constructions around a courtyard. Yet, while their functional organization was similar, they were differentiated in terms of structure and decoration both by material and by kinship to dwelling forms in Africa and India, respectively. Red Sea houses, of which a few ruined examples still existed in 1990 in Moccha, Hodeida and Al Luhhayia, represent a distinct typological enclave.¹¹ They were part of a family of structures existing on both shores of the Red Sea from Ethiopia to Sudan and Saudi Arabia, characterized by, among other things, the variety and quality of woodwork in their wall openings. Red Sea houses were generally two or three stories high, with an internal stair and a spatial organization close to that of multistory mountain houses.

Settlement formation and siting follow a few basic patterns. Along the coast, besides fishing villages and harbor towns, settlements developed along the trade paths of the mid-plain. In the midlands and throughout the Eastern Plateau, farming villages and hamlets concentrated near wadi basins. In the highlands there was a characteristic preference for settlement locations on peaks and rock outcrops. This has been explained in a number of ways: by the need for defense and visual control of the territory; by the necessity to reserve all land fit for farming; and by such subjective reasons as a taste for disengaged views (FIG. 6). The exterior boundary of highland settlements was usually well defined. In smaller settlements the protective and delimiting role of natural features such as rock outcrops might be complemented by construction of a solid outer ring of houses, whose lower, windowless, floors were used for animals and storage and served the same function as a rampart. By contrast, upper-floor living quarters in such houses had sufficient windows and could be used as lookout positions (FIG. 7). On flat ground, watch towers at some distance from the settlement would serve an additional protective purpose, but larger settlements relied on free-standing walls for confinement and defense.

The houses of community leaders might serve as elementary citadels, where community foodstuffs could be stored, and where in times of war villagers might seek refuge. Yet, although they may have been identifiable by their location or relative size, such houses did not usually present exceptional external signs of distinction.

Even the smallest settlement had a mosque, if in no other form than as a small structure adjoining the headman’s house. Mosques inside a settlement were frequently paired with mosques outside its boundaries. A congressional mosque meant a settlement of a certain importance; in large towns neighborhoods normally had their own mosques.

The association of places of prayer with sources of water has been a pervasive part of the mountain scene. Elementary forms, consisting of a paved area with a raised stone marking the direction of Mecca, could be found adjoining ma’jil. The small mosques dotting the countryside also often displayed large ablution pools, whose size may be explained more by the need for irrigation water than for ablation.

Markets provided regular intersettlement contact.¹⁶ They received physical expression either as open spaces where tents and awnings could periodically be set up, or as clusters of simple stalls made of stone or mud (in the mountains), or of reed (in the Tihama). These would normally be deserted except for one day a week, although occasionally they might have a small permanent population of caretakers with no tribal status. Such marketplaces could appear as nodes within a trade network established outside and at a distance from the settlements they served. Or they might appear as an integral part of the space within the walls of a town. In the latter case, the structure of market areas might take the form of an itinerary, beginning at one of the town’s main gates where an open space would be informally defined as the location of a periodic market, proceeding into the settlement by means of a market-stall-lined street, and culminating at the town’s great mosque, where the associa-


FIGURE 7. Dhu Aula'ain (Dhamar), 1976 (destroyed by the 1982 earthquake).
tion of great mosque and market would define the town core.

Places of polity were not necessarily located in this core, and by themselves they defined no special instance of public space. Nevertheless, the ruler’s quarters were often sited near the marketplace, this being the natural place for mass concentrations and for public acts, including the carrying out of punishment.

The coming together of places for prayer, trade, and the exercise of leadership may functionally characterize an urban space. But the peculiar urban atmosphere of Yemen’s mountain settlements, independent of their size, owed much to the homogeneous texture of streets lined by tall buildings, whose treatment always revealed attention exterior appearance. The relationship between buildings and their environment resulted in a formal mimetic component which is particularly suggestive in the highland skylines of tower-house clusters and rocky peaks. It is also possible to see a mimetic component in the relation between the spatial organization of houses and the uses of land in the surrounding environment.

Both can be understood as vertical structures of ascending horizontal layers with corresponding functions. Thus, spaces to grow food — wadis, terraces — correspond to spaces to store it on the lower floors of the house. Spaces for transient populations on the mid-slopes — markets and road-side mosques — correlate with reception rooms for general guests (diwan) on the floor above. Higher up, access is restricted for outsiders to the spaces of the village or hamlet, just as access is restricted for outsiders to family rooms on the upper floors of the house. Finally, at the highest point of the settlement, the shaykhi quarters find a correspondence with the mafraj, the isolated top room of the house, the realm of the eldest man where only selected guests are received.

TRADITIONAL MATERIALS AND STYLES

Traditional materials and building techniques were related to the natural regions described above. Thus, thatch construction only existed in the Tihama, while stone construction (hajjar) prevailed over the central massif, alternating with construction in raw-earth blocks (libn). Raw-earth-block construction appeared wherever the material was available, but the best examples may be found on the peninsulas from north of Sana’a to the southeast of the country. Another type of raw-earth construction — by layers, known as zabur — was characteristic of the north and the northeast. Use of baked bricks (’ajur) appeared in the Tihama and in the major towns of the highlands: Sana’a, Dhamar, Rada’a, and, to a lesser extent, Ta’iz. Floors and roofs were made everywhere according to the same principle: joists or tree trunks were disposed at regular intervals, covered across with branches and a thick layer of sifted earth. In the interior, walls were subsurfaced in mud and rendered with lime or gypsum plaster, while roofs might be left with the earth exposed or waterproofed with lime plaster. Stone shafts and slabs might be used in the most primitive constructions instead of wood joists and branches.

Regional distinctions were affirmed through the choice of wall finishes, decorative options, and the treatment of openings. With the exception of brick houses in the Tihama which might have had their front elevations entirely plastered and carved, the decoration of brick and stone walls consisted basically of variations on diamond and zigzag reliefs. Otherwise, external decoration only appeared in two major forms: whitewashed geometric designs on stone walls in the western mountains, and bands of red and yellow ochre paint around the openings and roof lines of the zabur buildings of the Eastern Plateau.

Interiors, however, which were generally rendered in lime or gypsum plaster, could be considerably embellished with carvings, especially around windows and fanlights. Alabaster, the original material for fanlights, had largely been replaced even before the Revolution through much of the country by takhrim — a combination of stucco tracery and colored glass panels that afforded the opportunity for a great variety of designs. Rooms also characteristically featured niches, built-in cupboards, and plaster shelves which were usually also the object of decoration.

NEW PROFESSIONS

At the end of Civil War the master mason (’usta) still served as both designer and builder of three-dimensional space.
His qualifications were guaranteed by a long process of apprenticeship and his subsequent acceptance into a professional league. For him, design of space was not predetermined by conventional drawings, but was developed in the act of building. Repetition of basic functional models was common and followed established stereotypes. The 'usta might also have served as contractor (muqqawal) within the restricted practices of the time.

Since the 1970s, however, new building-related professions have emerged, and by 1990 the role of the master mason had considerably changed. For example, the 'usta could not always meet the organizational challenges of new materials and programmatic demands. Consequently, many were relegated to working as concrete masons in buildings produced by contracting firms, affirming their skill and personality only in the final stages of construction, when finishes were carried out in stone or brick.

Contractors (muqqawal), on the contrary, represented in 1990 a well-developed category. Their work depended on economic profit derived from the act of building, regardless of the intrinsic quality of the design or the origin of the project. Ideally, this would require the assembly of industrial components and basic prototypes with a minimum of formal variation and with quality demands set by the market.

The other group presently involved in construction are design professionals (muhandis), either civil engineers or architects. They were originally associated with roles in public administration and family enterprises, working occasionally with contracting firms for large-scale ventures. Their necessity was first justified by the calculations required for concrete structures, and later by the bureaucratic procedures of building permits. It is, however, in their work that a deliberate search for new models or interpretations of the traditional heritage can be recognized, however filtered by drawing-board discipline.

**NEW TYPOLOGIES**

Concrete-frame and concrete-block construction first entered the towns of Yemen through the influence of the Egyptians who came during the Civil War. With these new materials came two new dwelling types: the three- to four-story apartment building with shops on the ground floor, which first appeared in the main towns, but which was later adapted, with different textural treatments, to roadside development; and the single-story villa sited in the middle of a walled yard, which became favored by the new urban elite, and which has also appeared in impoverished versions in fringe areas around the country’s main towns.

Of the two forms, villas have offered the most fertile ground for the introduction of exotic plans, volumes and textures. But the first villas actually offered a fairly standard spatial organization, not much different from that of an apartment, with a reception zone separated by a door from the central hall or corridor onto which family rooms opened. In villas, a stair to the roof did offer the potential of expansion, and by 1990 many villas in Sana’a had expanded upward and assumed the bulk of pre-Revolution suburban houses. These had been set in the middle of orchards, and which offered two or three stories, with living quarters on the ground floor (FIG.11).

In rural mountain areas, expansion in height also followed an initial proliferation of single-story structures. The main difference between these and earlier mountain houses, once they have grown to the volumes of their predecessors, has been functional: the ground floor is now used as living quarters, not for storage or quartering of animals.

Meanwhile, in the Tihama new houses have tended to adopt the volumes of the traditional brick houses, with baked-clay brick being substituted for concrete block. Such struc-
tures have infiltrated former zones of homogeneous reed construction. Variations of the provincial mountain type just described have also appeared in the foothills, built mostly in concrete block with characteristic painted decoration.

MATERIALS AND FORMAL COMPONENTS

In the early 1970s the poor quality of reinforced-concrete construction in the country initially worried both national leaders and foreign advisors. They recommended a reversion to construction in local materials, inspired by local forms, as exemplified by public buildings erected at the time. However, the scarcity and spiraling cost of timber eventually gave the pretext for the generalized adoption of concrete for floor and roof slabs and for window and door lintels. This occasionally allowed for the translation of traditional wooden features into elements of a new formal idiom. The combination of concrete frames with infill stone walls has now become generalized, especially in the main towns.

The countrywide acceptance of stone, now the predominant material for infill wall construction, may have in part been due to its identification with permanence and status. In corporate and institutional buildings the trend soon emerged to explore the possibilities of stone, following formal conventions more or less related to the “established tradition,” or to models current in the Middle East. “International Architecture” was scantily, although emblematically, represented. Religious buildings did for a time reveal the conventions of the country subsidizing their construction, causing concrete domes to become features of large new mosques. But by 1990 stone walls, and especially stone or brick minarets, were regarded as more in keeping with the formal standards of the local past, notwithstanding the acceptance of a wider range of textural variations.

In the north a standard of stone architecture had been set at the time of the last Imams, especially in Sana’a, and its effects were still being felt in 1990. It was characterized by a smooth finish and hairline joints, with a preference for black lava stone in quoins, friezes, and around openings. After the Revolution a northward migration of southern masons brought coarser but faster and more showy techniques to the north’s main towns. This contributed to the formation of composite styles, in which unusual cuts and treatment of joints were further enriched by the variety of colored stone available. Black basalt, white sandstone, and gray, green, orange, yellow, brown and pink lavas increased the possibilities for inlaid designs, juxtaposed courses, or random patterns of different colors on the same wall. Mechanically cut stone further facilitated this process, so that some new buildings became saturated with different techniques (Fig. 12).

Machine-cut stone appeared around 1984 in the major towns and contributed to a revolution in construction methods and in the appearance of buildings. Thus, infill walls for concrete frames could now be made in concrete blocks instead of solid stone, with the whole covered with stone facing to maintain the “stone building” look (Fig. 13). Decoration now borrowed both from traditional stonework and from themes that used to be specific to brick decoration. The effect was often closer to marquetry than to the woven patterns traditional

FIGURE 12. Concrete frame and stone facing in construction, Sana’a, 1990.
stone or brick reliefs brought to mind. Stylization of the traditional vocabulary also tended to simplify the designs, both as a method of production and as an expression of taste, sometimes leading to the invention of new forms. And, with the new prevalence of machine-cut stone, hand-hewing (which in the main towns had for a time been considered too rustic) returned as a symbol of good workmanship affordable only by the rich. Thus, by 1990 it had become a sign of distinction to hand-finish the visible face of machine-cut blocks.

Of all techniques, earth construction was the most affected by the arrival of new materials, procedures and fashions. Although by 1990 construction in zabur was still common in the northern and northeastern highlands, the result was often debased by the concurrent appearance of concrete and stone. The cost of zabur construction, if entrusted to a professional builder, was now as high or higher than that of construction in stone. The effect was even more severe on construction with earth blocks, libn. This has now been replaced by concrete blocks in all but the most remote areas, although in more costly buildings it has been replaced by stone and baked brick. Baked brick from traditional kilns has also returned to a limited extent in its traditional areas — alone and in combination with stone or concrete and often associated with a certain revivalist taste (fig.14). And the use of industrialized brick was beginning to appear by 1990.

Changes in the building idiom were also well expressed by modifications in the proportions, dimensions and rhythms of wall openings. Windows became larger and more uniform, giving a more regular disposition to elevations. It was also part of the exuberance of some new buildings to display a variety of windows, glass surfaces, and plaster screens. However, lately, the treatment of openings has manifested a more deliberate concern with sober composition.

Colored glass and stucco tracery fanlights (takhrim) have also contributed much to the role played by windows in the appearance of new buildings. The simplicity of this technique and the low cost and availability of the raw materials, together with the possibility for easy embellishment, have caused takhrim to become an expanding business, appearing to many as an exemplary adaptation of a traditional technique. A great diversity of shapes has been created to satisfy new decorative needs, with attempts at naturalistic representation, usually characteristic of provincial situations, being added to conventional patterns. Yet, at the end of the 1980s, possibly because of the fascination with new technology, the fashion had arisen of using aluminum for the tracery (fig.15). The area of Ibb, in the southern highlands, is particularly representative of this trend, but Sana’a, reputedly a city with a more conservative taste, had already acquired its share of examples by 1990.

The carpentry of windows and doors, which left a few remarkable examples,12 was in decadence well before the Civil War, especially because of the 1948 exodus of Jewish craftsmen to Israel. Instead, by the 1970s painted metal doors were appearing all over the country, offering a fertile new ground for individual creations. Mechanized carpentry was then almost exclusively applied to new types of window frames. Throughout the 1980s aluminum frames were becoming common, at the same time that imported wood doors were becoming a sign of wealth. A traditional carpentry center was created in 1990 as part of the rehabilitation of Sana’a’s Old Town.
In terms of interiors, the greatest differences have concerned the proportion of rooms (which have tended to become wider and less elongated), and in the passage from exposed-joist to flat ceilings. Thinner interior walls have also meant the suppression of niches and built-in cupboards. Rendering in cement and paint has to a certain extent replaced gypsum plastering; the older technique is still used in better-quality buildings, but only after adopting modern standards of surface regularity and smoothness. And, although carvings are still fashionable, they are now costly to produce and tend to be intricate in an effort to affirm the owner’s status.

By 1990 new trends in the various areas of the country were not sufficiently well defined to allow definitive statements about the development of new regional styles, but some formal conventions had become clear enough to place a building in its regional context. The exploitation of new materials and forms has widely expanded the possibilities of personalizing a building. This has meant, at a certain point, the assemblage of a variety of shapes and textures, with a conspicuous tendency to value polished, even glossy surfaces. Alternatively, as if in a reaction to this tendency, distinction has come to be associated with sobriety, quality being evinced by features requiring particular skill or cost of execution.

In the countryside, whimsical contributions of personal intervention have become important. Quite often marks of distinction have been introduced by the mason or by the owner. Most commonly these include the name of the builder or owner, or the date of construction. But they might also include the usual post-Revolution imagery (weapons, cars, planes) and simple calligraphic inscriptions. The use of color has also become a common feature in the decoration of buildings, both as the formal exploits rendered over metal doors and concrete surfaces and as the combinations of different stone inlays. Some new formal patterns have appeared, with a rules of design and execution, but in most cases decoration is the result of personalized attempts at a new figurative imagery. Thus, unaffected signs of distinction have come to punctuate the rural building scene, using the available materials and skill and unconcerned with formal stereotypes (Fig.16).

**DECONFINEMENT AND URBANIZATION**

The 1962 Civil War dramatically proved that strategies for the defense of settlements based on impregnability by land were futile in the face of air raids. The progressive control by the Republican government over the local conflicts which had once justified confinement of settlements within secure sites and walls also meant that safe living was possible without such protective measures. Development of the country’s road network in proximity to small settlements also carried the expan-

![Figure 14. (Left) New building in traditional baked-brick style, Al Rhawdha, 1990](image14)

**FIGURE 14. (LEFT) New building in traditional baked-brick style, Al Rhawdha, 1990**

**FIGURE 15. (ABOVE) Colored stone and aluminum frames and tracery, Ibb, 1990.**
The problem that afflicts Yemeni towns are similar to those experienced in other developing countries. Characteristic impacts from the post-Revolution period have included great increases in cost of land, number of motor vehicles, water consumption, and generation of refuse (with the concomitant problem of its disposal). As the result of a general movement of population from countryside to town, in Sana’a, for example, the resident population increased tenfold between 1962 and 1990, and land coverage increased 25 times. Such problems have also taken a toll on the more vulnerable fabric of rural settlements.

PLANNING

Following the Revolution, physical planning was initiated by the Ministry of Public Works with the assistance of Egyptian advisors. The first document approaching a contemporary city plan was the “Egyptian Plan” for the country’s three largest towns. This still provided the basis used in Sana’a by surveyors in 1973. In 1970 a formal Physical Planning division at the Ministry of Public Works became operational with the assistance of the United Nations Development Program, having the responsibility to prepare, first of all, a Master Plan for Sana’a and development plans for various provincial capitals. But, given the conditions of the time, the planning process for several years was largely based on securing a ringroad system and creating subdivision plans in the form of neighborhood units that could be provided with essential services and connected to a collector-street system. Such a basis for land development was still being applied in 1990 (FIG.17).

By 1990 the basic planning documents for Yemen’s largest towns were still the master plans commissioned in 1978 from a foreign consulting firm. In Sana’a these envisioned sectoral development extending from the densely built-up core, with each sector equipped with a central commercial zone and government offices designed according to a recognizable Western “plaza” model. Peripheral sites were designated for institutional use, industry, refuse disposal, and restricted development; historical-protection districts were established in the Old City and the former Jewish quarter of Al Qa’a. The charge of implementing these plans fell to the Main Cities Planning Department of the Ministry of Municipalities and Housing, and there were reportedly many difficulties in the enforcement process.

FIGURE 16. Popular imagery painted on new concrete block wall shop (1990), Dahi, Tihama.

FIGURE 17. General plan of Dhamar, 1990. The shaded area corresponds to the area occupied by the town in 1973. (Source: Main Cities Planning Office, Ministry of the Municipalities and Housing, Sana’a.)
The next step in countrywide municipal planning was the creation in 1981 of a “Secondary City Section,” concentrating on the preparation of master plans for secondary cities.24 The aim of this program was local development through decentralization and the training of local planning officers. Municipal engagement with the development process also increased during this period to include such additional responsibilities as laying down street and infrastructural networks, collection and disposal of refuse, and administration of new building-permit requirements.

In the traditional model, streets spaces had not seemed to be the object of much special concern; their aesthetic quality was generally the result of the combined effect of buildings that fronted on them. In a small community maintenance and care of public areas would be undertaken as needed in a shared manner, and in the larger towns a skeletal municipal administration took care of basic aspects of public sanitation. The process appeared efficacious within a traditional context, but proved vulnerable to the impact of post-Revolution development. Nevertheless, as the most convulsive aspects of new construction settled down, pleasant results of new urban design notions could be seen in the expanded areas of both the capital and the provincial towns (FIG.18).

Part of the work of new municipal governments was aimed at beautifying public spaces. These efforts have ranged from such activities as sidewalk tree-planting and the creation of town parks to the ornamentation of streets for a variety of public activities. Street sculptures, seen at their best in the capital, where they first appeared during the 1980s, reflect various tendencies, from free-form, Western-originated monumental place-markers to enlarged stone versions of objects in common use, such as the janbiya, which echoes the cast-concrete coffee pots seen in road roundabouts of Gulf states. Examples of such public artwork in Yemen place a strong emphasis on the display of skill in fashioning stone (FIG.19).

BUILDING PERMITS

At the end of the Civil War all that was needed to build a house was possession of land and compliance with a few basic rules concerned more with local sociability than with centralized land control. The first step toward centralized land control was the institution of a building permit procedure within urban areas in 1968. At the time the granting of a permit was concentrated at the Planning Division of the Head Office (later Ministry) of the Municipalities, and both the procedure and the enforcement of it were rather loose, mostly a question
of obtaining the signatures of various bureaucrats on a sheet of ruled paper—a process which normally took a week at most. No building plans were required, and no special rules or regulations existed concerning the design of buildings.

Later on, building permits became obtainable only at municipal offices, and the procedure became more rigorous, with building plans mandatory for all projects except smaller buildings on minor streets. The tendency, however, has been to generalize the requirement for a project. This was particularly true after the earthquakes of 1982. Small municipalities have not rigorously enforced the permit requirement, especially when traditional construction procedures were followed in which a master mason also served as designer.

STANDARDIZED HOUSING

The first public housing programs in the country appeared in the early 1970s. Based on plans prepared by a U.N. expert at the Ministry of Public Works, they included schemes for several thousand units at Hodeida and in Sana’a which were to optimize floor-area ratios and be built in raw-earth blocks. However, these projects were either never built or were built only in a highly distorted manner, and in the years that followed governmental housing never amounted to much within the overall scope of housing construction. A few peripheral projects were designed, adopting fairly conventional notions of the single-family detached unit or of apartment buildings. A greater priority for government expenditure has been to provide utilities to the spontaneous development growing at the urban fringes.

There was, however, one significant event of mass housing, which was originated as the result of the 1982 earthquake in Dhamar province. The extent of the loss following this disaster justified intervention by various foreign-aid donors, which led, ultimately, to the construction of 15,000 housing units by contractors, all with minimal areas (36-48 sq.m.) and the same elementary design. These units were built using cement blocks and the simplest types of windows and doors, and they were sited according to rudimentary grids on flat ground, often at quite a distance from the original settlement (FIG. 20).

Supported by their sheikhs, villagers responded both by refusing to live in these units and by initiating their own developments, often on the slopes between destroyed settlements and the new government-built houses (which were left empty or given over to nonresidential uses). In the proximity of the larger population centers, such as Dhamar and Dhawran, where the cost of housing was more critical and where tribal ties were more tenuous, need did lead people to adapt what was available. In these instances, the standard model was often modified through the addition of walls to enclose several units for a single family, or by the infilling of street space with ancillary constructions.

On the positive side, earthquake relief funds paid for more-or-less extensive repairs to some 27,000 damaged structures. Humanitarian agencies also provided professional training to local masons on earthquake-resistant techniques.

REFLECTIONS

The image of wholeness given by the building traditions of Yemen always incorporated sedimented ingredients from other cultures with which the country had contact. Yet assimilations were generally only textural: since pre-Islamic times, the options for built structure in Yemen remained based on bearing walls with monolithic shafts or tree trunks to span the spaces between. The technology of arches was only mastered in Yemen to a limited extent, while vaults were fairly rare and domes were only built by local masons to cover the small spans, for example, of mosque bath stalls. Large domes were considered the responsibility of specialized craft workers under foreign supervision.

The underlying character of Yemen’s traditional built environment is structural. Its originality lies mainly in the way deceptively simple techniques of wall building, at the service of such elementary needs as human shelter, resulted in volumes with the scale of a grandiose landscape. Concrete is, on the other hand, a technique of voids rather than volumes. In this way, the introduction of concrete structures after the Revolution has represented a change more radical than the mere substitution of materials.

Concrete structures respond to the preference in the country for construction in height, which the last 25 years has confirmed. Yet, if mud or stone buildings five or more stories high once represented a distinct structural achievement, this claim cannot be made for the same heights in concrete. The crucial question may now concern whether techniques of concrete construction will attain equivalent levels of audacity.

Pre- and post-Revolution attitudes may be presented in the form of dichotomies, as, for example, rough/polished, dull/glossy, monochrome/polychrome, and stereotyped/personalized. These represent milestones in the progression toward individualization of the house, with distinguishing marks made possible by the access to new products and technologies. By contrast, the tendency toward uniformity in dwelling construction has been represented by government or private efforts, in which inhabitants
are grouped into categories expressed in terms of project cost and tenant income. Overall, the twenty years spanned by this study have appeared to illustrate a tendency to evolve from a built environment that betrayed no class distinction to one in which status is demonstrated through architecture.

The urban/rural polarity has also undergone a change of contours. In this regard, urbanization can be seen not only to result from the physical displacements of country to town, but also from the dissemination of urban values and methods to the country. This is now possible in less time than that needed to solve the infrastructural problems created. Part of the process of urbanization is now the proliferation of intermediaries, whose number multiplies as building becomes increasingly governed by paperwork within a complex bureaucracy.

It is not possible to predict at this point the degree to which changes underway in the culture of Yemen will allow a continuity with the country’s building traditions. By 1990, conservation and adaptive reuse were part of an effort to retain the inspirational value of traditional structures. At the same time, “cultural tourism” had gained weight in the country’s economy, contributing to the maintenance of outward appearances. Conservation and rehabilitation campaigns lay stress on the importance of creating the conditions that will keep the populations in their historical quarters; but concessions must also be made to repay the financial effort involved. In consequence, situations may occur with names like “suqification,” the term used in the early 1990s to describe the transformation of the ground floors of Old Town Sana’a buildings into shops catering to tourists. The word implies the subversion of the traditional system of neighborhood codes, which may undermine the way of life that once formed the very spaces meant to be preserved.

Concern has also been voiced as to whether the skill to build traditional structures will be lost once the education of master builders ceases to be authenticated by a rigorous process of apprenticeship and strict admission into a professional league. Schools of building crafts have today been prescribed as part of rehabilitation efforts, but their materialization was, in 1990, at almost utopian levels. The fact remains that traditional structural solutions, in spite of their virtues, have not been able to compete economically with industrialized methods. Thus, by 1990 the use of traditional materials for structures had tended to become limited to rich urban or remote rural populations. The continuity of tradition is recognized in formal affectations, but different types of building initiatives — entrepreneurial, architect-designed and “popular” — are developing identities of their own.

At the same time, there may be reason now to speak of the emergence of a new type of “vernacular” architecture, one represented by manifestations marginal to mainstream building which reproduce structural options in continuity with pre-Revolutionary days, or which develop decorative treatments of a more personalized nature.

REFERENCE NOTES


6. I chose to call “traditional” the values and methods which were in common currency in North Yemen before the Republican Revolution, whether they prevailed or not after this event.


8. Besides “wood cutting, increased erosion, decreased soil productivity due to over-exploitation and reduction of organic matter.”

9. Ibid.


12. Ibid.

These differences as well as the use of the ground floor as shops instead of stables may characterize rural and urban situations but are also associated, to a certain extent, with regional particularities.


19. The first concrete building dates from 1965 and was built in Ta’iz.


22. The 1971 Master Plan for Sana’a rested on five major objectives: 1) basic housing for all households in which at least one member worked; 2) basic utilities and facilities for every neighborhood; 3) control of city growth to allow the progressive provision of utilities, facilities and job providers at minimum cost and maximum efficiency; 4) preservation of the city’s cultural heritage and adoption of a modern construction program adapting to Yemen’s cultural features; 5) systematic tapping of the manpower resources offered by traditional building craftsmen. A. Bertaud, “Master Plan for Sana’a Valley,” unotc Internal Report, 1971, 1973.

23. Louis Berger/Kampsax.

24. The 1.5 – 2 million people that made up the urban population of North Yemen in 1986 were roughly distributed into three parts. One-third was in the capital, another third in the cities of more than fifty thousand (Ta’iz, Hodeida, Dhamar and Ibb), and the remainder in seventy or so minor or secondary towns with populations of between 2,000 and 15,000 people. A. Saqqaf, ed., Urban Development in the Yemen Arab Republic, A.N. Almadhagi, trans. (Sana’a: Ministry of Municipalities and Housing, 1989). During the 1980s land-use plans were produced for approximately a quarter of the secondary cities. H.P. Reinders, "Land Use Planning for Secondary Cities: Final Report," German Volunteer Service, Sana’a, April/July 1986.


26. OxFAM, Concern, and Save the Children Fund.

All illustrations are by author unless otherwise noted.