

Regional Exchange and Knowledge Transfer through Building Practices: The Work of PACE in Yemen, 1968-2016

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In international geopolitical terms, the two decades following World War II, were marked by the unfolding escalation of the Cold War, and the decolonisation of Asia and Africa. Post-colonial Yemen, located between Asia and Africa, with a long sea border touching the Red Sea, Arabian Sea and the Gulf of Aden, was the site where ideological power games—royalist vs. republican, capitalist vs, communist, Arab nationalist vs. nationalist—confronted and competed with each other from the late 1950s to the late 1970s.

In the early 16th century, the Ottoman Empire, feeling threatened by the arrival of the Portuguese in the Indian Ocean and the Red Sea, decided to occupy Yemen. The Ottomans had two interests in Yemen: the protection of the holy Islamic cities of Mecca and Medina; and the safeguarding of the route to India for spice and textile trade. The Portuguese presence endangered both these interests. Accordingly, between the years 1539 and 1547, the Ottomans sent 80,000 Egyptian soldiers to Yemen. Hadım Suleiman Pasha, the Ottoman governor of Egypt received orders to command a fleet of ninety ships to conquer Yemen.¹

Post-independence from the Ottomans in 1918, North Yemen became a Mutawakillite Kingdom under Imam Yahya bin Muhammad. A descendent of Imam Muhammad bin Yahya who had led the resistance against the Ottoman occupation from 1890-1904, Imam Yahya was assassinated in 1948 and succeeded by his son Imam Ahmad. Imam Ahmad forged ties with the Soviet Union, China, and the Egyptian Republic as a strategic anti-imperialist stance in the hopes of liberating the South of Yemen from British rule and recovering the Aden Protectorate as part of Greater Yemen.² In 1958, Imam Ahmad joined the United Arab Republic (Egypt and Syria) to form The United Arab States (UAS) - a short-lived confederation of North Yemen, Egypt and Syria that lasted until 1961.³

Meanwhile, in the bustling port of Aden in the south, encouraged by the rhetoric of President Gamal Abdel Nasser of Egypt against British colonial rule in the Middle East, pressure for the British to leave began to grow.⁴ In the North, Imam Ahmad eventually turned against Egypt, which after his death in 1962, supported a republican coup against his son and successor, the last in this lineage of imams. That same year, a civil war broke out between the two newly formed states of North and South Yemen. Supported by Saudi Arabia, the North Yemeni royalist forces fought against the republican, Arab-nationalist, communist forces backed by Egypt in the South. As Dr. Charles Schmitz, an expert on Yemen explains: “What ensued was a civil war that was a proxy war between Saudi Arabia and Egypt, which was really a proxy war between the United States and the Soviet Union.”⁵ It is against this backdrop of instability and conflicting ideological positions, that the office of Pan Arab Consulting Engineers (PACE) began working in Yemen, beginning in 1968 with their first project in Hodeida and Sanaa.⁶

PACE itself as an engineering practice had only recently established itself that very same year by Hamid Shuaib, in partnership with Sabah al Rayes

and Charles Haddad. Shuaib was a Kuwait-born British-educated architect and town planner with experience in the UK. Al-Rayes was a Kuwaiti born, American-educated civil engineer, while Haddad was of Palestinian descent and had migrated to Kuwait in 1956 through an internship program between the American University in Beirut (AUB) and the Kuwait Municipality.⁷ The new established General Board for the South and the Arabian Gulf (GBSAG), created to institutionalize aid to neighboring countries, commissioned the office’s first project in Yemen and the office’s subsequent projects thereafter.

At the time, the Gulf States had just undergone a decade of dramatic transformations. With the flow of oil revenues, the decade was marked by the construction of an infrastructure, which in a post-colonial context attempted to inscribe national sovereignty and nation-building through modernisation projects. While the other Gulf States flourished and grew, Yemen lagged behind, with its small oil production outputs and its entanglement in a civil war that drained its resources.⁸

Kuwait, on the other hand, had undergone the most rapid and radical changes of the Gulf States. Kuwait’s discovery and export of oil came earlier than its neighbours in 1946. The exports and influx of revenues almost coincided with the Palestinian dispersion of 1948. As a result of the dispersion, Kuwait rapidly gained a new class of experts, labourers, teachers and civil servants that helped create the bureaucratic underpinnings of its new state.⁹ With independence in 1961, the new state focused on the modern project, with all that this entailed in terms of institution building.¹⁰

By the mid-1960s, Kuwait had met the majority of its requirements for internal development in terms of construction of schools, hospitals and other institutions.¹¹ The 1960s also marked a time of many political movements in the region, including Arab nationalism, with the British still heavily involved in the commercial and political sphere.¹² Wanting to improve education in the other Gulf states in order to both ensure regional stability, and bolster education, regional development became the new target for the Kuwaiti government.¹³

7 Engineer Sami Abdel Baqi, a Lebanese engineer who migrated to Kuwait in the 1950s, institutionalised the internship exchange program between the municipality and the American University in Beirut (AUB). Sheikh Fahed Al-Salem was then the director of the Municipality of Kuwait and was a strong supporter of Lebanon. Through his multiple contributions to designing roads, bridges, and industrial establishments, Abdel Baqi was eventually promoted to the role of inspector general. As inspector general, Abdel Baqi played an influential role in the development and planning of the city but also through initiation programs such as the internship exchange with AUB. In the case of Charles Haddad therefore, the Palestinian diaspora can be contextualised within a framework of decisions that were in line with politics of Arab nationalism and the importing of experts to Kuwait at the time. Bissell, Richard E. “Soviet Use of Proxies in the Third World: The Case of Yemen”, *Soviet Studies*, Vol. 30, No. 1 (Jan.,1978): 87-106.

8 Davidson, Christopher M..“Higher Education in the Gulf States: From Traditional to Modern,” in *The New Post-Oil Arab Gulf: Managing People and Wealth*, edited by Nabil Sultan, David Weir and Zeinab Karake-Shalhoub. London: Saqi Books, 2011.

9 Ibid. Ansari, Shahid Jamal. *Political Modernization in the Gulf*. New Delhi: Northern Book Centre, 1998: 188-190.

10 Ibid.

11 Ibid.

12 Ibid.

13 The British were interested in Yemen and Aden as a port from the early 17th century. For more context: “The British, who had first visited the area in Imam Qassim’s days, (1608), had, throughout the 18th century, established trading posts on the coast along with the Dutch, and by the last quarter of the 18th century were in firm control of the coffee trade. After the arrival of Napoleon in Egypt and his victory over the Mamluk sultans, the British occupied the Perim island in the Bab Al Mandab and installed themselves in Aden, at the invitation of its sultan to prevent the French reaching the Indian Ocean. Treaties of friendship and commerce were thereafter made with the sultan of Aden for the following 40 years. The Zaydi imam also supported the British in Mocha, where they were permitted to build a hospital. In 1839 the British, pressured by the need to install a steamship coaling station and unable to negotiate to this effect with the sultan, took over Aden and began their political control of the area.” From Fernando Varand’s thesis that discusses built space in Yemen from the earliest phases of the process of building and dwelling in an agricultural territory to the increasingly complex expressions of settling and developing urban structures, before and after Yemen’s Republican Revolution of 1962. Varanda, Fernando. “Tradition and Change in the Built Space of Yemen.” PhD Dissertation., University of Durham, Durham, UK, 1994.

1 J. Richard Blackburn, “The Collapse of Ottoman Authority in Yemen, 968/1560-976/1568,” *Die Welt des Islams*, New Series, Vol. 19, Issue 1/4 (1979): 119-176.

2 Dresch, Paul. *A History of Modern Yemen*. Cambridge: Cambridge University Press, 2000: 87-113.

3 Schulze, Reinhard. *A Modern History of the Islamic World*. New York: New York University Press, 2002: 136-137.

4 Ibid.

5 Qtd in Tim Alamenciak, “A brief history of Yemen,” https://www.thestar.com/news/world/2012/05/12/a_brief_history_of_yemen.html, (May 12, 2012).

6 As provided from PACE archives.

Another possibility, likely in conjunction to the aforementioned political position, was economic: since Kuwait at the time, had neither a robust agricultural nor industrial sector, the country found itself desiring investment opportunities abroad. Even with plans to develop domestic industrialisation, allowing it to optimise the use of available energy sources, the relatively small size of the internal market necessitated the development of a “regional economic framework” that could be lucrative for investments and trade.¹⁴ Finally, another possible motivating force for the Kuwaiti urge to share building practices with Yemen was a sentiment of social solidarity and a desire to use modernist building practices to strengthen and support ties with a less fortunate Arab state, in essence echoing the sentiments of Arab Nationalism.

Institutionalised structures for aid directed the distribution of assistance programmes to lesser-developed regional partners. Three bodies existed with the purpose of distributing aid as well as investments, namely, the Kuwait Fund for Arab Economic Development (KFAED); the Gulf Permanent Assistance Committee (GUPAC); and the General Board for the South and the Arabian Gulf (GBSAG). Formed under the auspices of the Kuwaiti Ministry of Foreign Affairs, the GBSAG was an important instrument of foreign policy through its aid programs.¹⁵ The GBSAG focused primarily on housing, health and education, financing the construction, staffing, supplies, and equipment of schools and clinics in Yemen, Bahrain and the emirate of Dubai.¹⁶

The programmatic functions of these new buildings imbued them with a performativity as markers of a desired modernity and progress with greater aims to transform society. Accordingly, starting in 1968, the GBSAG began commissioning PACE with housing, education and health projects in Yemen. It is important to note in this context that the GBSAG commissioned the projects to PACE as civil and structural engineering consultants rather than as architects—though PACE certainly performed this role as well. The transition in the region away from traditional building, where builder was also designer, meant there was a lack of education about the role of the architect and the value that hiring an architect could bring in terms of design innovation. Though the situation has improved considerably since, this problem persists to this day.

In terms of the urban context in which PACE began to operate, Yemen was still at the crossroads of modernising. The first electricity bills had only appeared in Sana’a in 1960 and there were virtually no vehicular roads within the cities, and no regional road network to connect urban centres. The first such road to be constructed was the Sana’a-Hodeida road, built by the Chinese, and inaugurated in 1961. In 1963, two additional electricity generators were installed in Sana’a and by 1963 the city of Taiz had piped water. Since Yemen was lacking in local expertise at the time in terms of trained architects and planners, much of the construction and planning relied primarily on Egyptian consultants, United Nations Development Programme (UNDP) experts and other foreign aid agents due to respective political entanglements.¹⁷

14 el Mallakh, Ragaie. “Kuwait’s Economic Development and her Foreign Aid Programmes,” *World Today*, Vol. 22, Issue. 1, (London, 1966): 13.
15 Niblock, Tim. “The Prospects for Integration in the Arab Gulf” in *Social and Economic Development in the Arab Gulf (RLE Economy of Middle East)*, edited by Tim Niblock, London: Routledge, 2015.
16 Ibid.
17 Evin, Ahmet. “The Yemen Arab Republic: Economic Development and Architectural Change” in *Development and Urban Metamorphosis: Volume 1: Yemen at the Cross-Roads*, edited by Ahmet Evin, Singapore: Concept Media/Aga Khan Award for Architecture, 1983: 11.

According to Fernando Varanda, an expert on Yemen’s traditional architecture and its transition to modernisation:

[...] the Egyptians were the agents for the widespread introduction of among other things, radios, cars and reinforced concrete construction - particularly in the Hodeida/ Taiz/ Sana’a triangle. In other spheres, they contributed to the organisation of the government into ministries and prepared the first physical planning layouts and public works projects.¹⁸ In 1966 the Central Planning Organization was created as a national planning agency and in 1970, the University of Sana’a was officially inaugurated, 1973 saw the opening of the Russian built cement factory in Bajil and the beginning of the construction of Sana’a International Airport.¹⁹

Yemen already had a unique and rich heritage of buildings, urban centres and civil construction, which had survived with almost no change over centuries. The vernacular building traditions responded to geographic, ecological, political and defence considerations, using locally sourced materials. The settlement patterns of Yemeni towns/urban centres were typical of traditional Islamic cities: “a tightly knit fabric composed of markets (*souq*), caravanserais, mosques, shops, warehouses, and residential quarters.”²⁰ Mosques contained within them the *kuttab* as the religious and only educational training facility, and medical treatment was sought through natural healers who had their own practices, likely operating from their own homes or storefronts. Housing in urban centres was clustered based on family patterns, both nuclear and extended.²¹

The characteristic urban house in Yemen was tall and with a square plan. A standard feature of the tower house was its height, with houses ranging in height from three to nine storeys high - around 20 to 50 m high with many houses overlooking communal gardens and orchards.²² In the most basic form, the house, even those that were one storey and constructed of mud, was divided into rooms for living, keeping animals and storage. Openings were from the roof and not through windows and there were no sanitary installations within the house. As for the more urban tower house typology, bathing and toilet facilities and kitchens were included in the house, with more space given for living quarters of the family and also for the receiving of guests. Circulation and services typically faced north, whereas the best rooms faced south in the highlands region. The reverse orientation was found in hotter regions such as the Tihama region, which was probably due to maximisation of passive cooling and heating. Room uses also changed seasonally, accommodating different functions according to the weather and their propitious positioning. The typical tower house was articulated with hierarchies of privacy ascending upwards. This ascending privacy also aligned well with defense and protection intentions with the farthest rooms from the ground being the most secure. Rooms opened straight onto other rooms with circulation occurring via stairs but no corridors and lower levels were typically dedicated to storage with no windows.²³ In some homes, there were connecting passages

18 Varanda, 21-22.
19 Ibid.
20 Ibid,16.
21 Al Sabahi, Hatim. “A Comparative Analysis of the vernacular Housing Cluster of Yemen. Sana’a and Shibam Hadhramawt A Case Study,” in: *Journal of Science and Technology*, Vol.10, Issue 2, 2005: 5
22 Ibid.
23 Aga Khan Program for Islamic Architecture, “The Yemen Arab Republic: Economic Development and Architectural Change”, in: *Development and Urban Metamorphosis*, Volume 2: Background Papers, ed. Ahmet Evin, Singapore: Concept Media/Aga Khan Award for Architecture, 1984: 18-20.

between houses on the upper floor, built-in for defensive purposes. These passages also allowed women to move freely between houses without having to descend in the public sphere of the street.²⁴ They provided additional shading for the street below and the top floors had terraces to allow people to sleep in the open air in the summer months.²⁵

Three factors affected the façade design of vernacular houses: the first one was the variation in the style of the openings, with different forms, typically arched, as well as their placement in different locations, making the facades more dynamic. The second, was their decorative ornamentation, while the third was the choice of building materials, with the lower part of the facades usually built of stone, which had the advantage of thermal insulation, while in the higher parts, bricks were more commonly used. Depending on geology, climate, and availability of materials, the other commonly used vernacular construction material was mud bricks.²⁶

The transition from vernacular construction to modern buildings was abrupt. After years of isolation, Yemen opened up to the world in 1962 after the September revolution in that same year.²⁷ Foreign consultants and planners arriving to the scene in the 1960s, considered the vernacular city cores to be slums that needed to be cleared to make way for modern grids. These grids would have wide roads that accommodated vehicular traffic and modern housing that extended beyond the centre onto the agricultural extents of the city in the north and the south to house the growing population of the city.²⁸ Rural-urban migration was increasing steadily during this period due to economic growth in cities, as was the need for proper housing to accommodate the influx. In 1962, the city of Sanaa had 55,000 people occupying 300 hectares but a mere fifteen years later, the population had tripled and was spread over nine times that area.²⁹ Moreover, concrete and other imported materials were introduced to the city. Concrete optimised speed, as its production was industrial compared to the more labour-intensive stone and mud construction methods. By the mid-1980s, an annual budget of \$55 million was expended annually solely on the importing of concrete.

In this setting, PACE's approach in the context of Yemen had the power of dogma: framed in universal terms it reflected a particular approach and aesthetic forms. Beyond the formal ambitions of their work, their buildings imparted an assertive message of modernity through their programmatic roles as places of secular higher education, western medicine and multi-family urban housing. The first buildings designed by PACE in 1968 were located

24 Damluji, Salma Samar, ""Architectural Terms of Upper Yafi in Yemen", Vol. 26, *Papers from the twenty-ninth meeting of the Seminar for Arabian Studies*, Cambridge, 1996: 23-30.

25 Al Sabahi, 21.

26 Sultan, Basel. "Modern /Traditional Buildings in Yemen and Sustainability", Conference Paper from *Symposium on Yemeni Architecture And Challenges Of The Era*, University of Aden, Volume: 1, Aden: 2008.

27 AlKawkabani, Nadia. *New Directions in Modern Architecture of Sanaa 1962-1990*, PhD dissertation, Cairo University, Cairo, Egypt, 2000: 48.

28 As per Varanda, in the early 1970s, the UN expert in charge of the Sana'a Plan, faced with the imminent explosion of development within the city, proposed a scheme of land control whereby farming would be maintained as the city's main green open space. This approach was in line with the example of the Old City and the traditional principles of settlement on sterile land, with good land saved for farming. The administration rejected it, probably due to pressure for high density development on central area land and being pre-disposed to accept the more conventional urban model of extensive subdivision serviced by a tight street network. Later master-plans for the city of Sana'a, including the 1978 Luis Berger plan and 1998 Cuban-Yemeni plan, tried to focus on pedestrian uses, and integration of historic preservation. See Varanda, 204.

29 Ibid, 198.

30 Typical highland urban context (above) and house (below). Courtesy of Fernando Varanda, "Art of Building in Yemen", The MIT Press, 1982.



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in Hodeida and Taiz and were of a total built up area of 3600m². As with all PACE projects in Yemen, the GBSAG was the commissioner and the project was intended to address the aforementioned new housing needs and provide a model for new housing construction. It consisted of two residential buildings that were three storeys each, with three apartments per floor and a ground level dedicated to a commercial frontage on the street. The project also included two mosques. In some ways, this project, along with other early residential buildings that were built at the time by Egyptian and other foreign consultants, foreshadowed a typical pattern for housing types in Yemen, as Varanda describes in his thesis:

Sana'a typifies the co-existence of a variety of new typological concepts. Generally, development is heralded by single-story commercial frontages along major arterial as much as in local streets. Upper floors may be added later, displaying various degrees of aesthetic treatment ranging from complete indifference to determined formal expression. In contrast, the 'villa' neighbourhoods are characterized by a regular layout of streets, wide enough for the expected traffic, lined by the high yard walls surrounding one or two-story houses.³¹

In the Hodeida-Taiz project, balconies were introduced to the units, an element that was not traditional in Yemen at the time. On the exterior, the buildings articulated a horizontal expression in contrast to the vertical vernacular. Reinforced concrete frameworks allowed this horizontal expression with its longer spans. Original spans in traditional buildings were much smaller because local timber from acacias came in irregular shapes giving a maximum span of 3.5 metres. In the traditional type, programs were therefore spread over multiple levels in vertical units. Here, the buildings were elongated and the horizontality was emphasised, through the exposure of the concrete floor slabs on the facades as horizontal ribbons that wrap around each floor. There was no ornamentation on the exterior and the windows were rectangular in contrast to the typical arched typology that had been characteristic of the architecture of Sana'a until then. Corridors were also introduced within the unit as a means of accessing different rooms. This again lies in contrast to the vernacular distribution, where rooms were accessed through other rooms and stairs in a layered hierarchy of privacy. Overall, the Hodeida-Taiz residential building, was modernist in its references and articulation—both through its horizontal massing enabled through the use of reinforced concrete, and its introduction of balconies and rectilinear windows in the façade, as well as corridors for circulation within the units.

Later buildings by PACE diverged in varying degrees from a pure modernism in an attempt to respond to climatic needs and accommodate a regional vocabulary while still maintaining a modernist functional approach. At the time, PACE was already collaborating on projects in Kuwait with the likes of Rifat Chadirji, the father of modernist architecture in Iraq. Chadirji was concerned with developing a language of regional modernism that was in touch with the times in terms of technologies of construction, using modern materials and programmatic organisations, but which still maintained regional elements that responded to the particularities of the climate, projecting an image of modernity with a local brand. It is important to also note, that at this time, a majority of the architects working in the PACE office on the Yemen projects, were Iraqi-trained, including Akram Ogaily and Saib Yousif. Chadirji was teaching at the University in Baghdad and was already setting an agenda of regionalist modernism through his pedagogy, publishing, and building.

31 Ibid, 195.

One such building by PACE that departs from pure modernism is the Hostel for the Students of the Ministry of Education in Aden. Commissioned by the GBSAG in 1973, the building was completed three years later in 1976. The project accommodated 200 students with a clubhouse, library and restaurant. It is a three-storey mixed use building spread over a large plot with a total built up area of 3200m². In some ways, the hostel bears a resemblance to the Hodeida-Taiz residential buildings. A horizontal expression was utilised again and emphasised in the massing, as well as in exposure of the floor plates in the façade as a horizontal ribbon. However, the difference here is an experimentation with bringing the vernacular recessed arched window type to the units and the elimination of the more unfamiliar balconies. The ground floor, which instead of working as commercial frontage, was instead occupied by the public programmes of the hostel.

Another demonstration of the divergence from pure modernism is the Religious Institute, commissioned and built in Taiz over the same timeframe as the hostel, from 1973-76. Located on a sloped site, the complex included lecture halls, a library, fourteen classrooms, a prayer space and administrative offices. Domes were used to contrast the prayer space and library to the more cubic expression of the classroom and administrative office spaces. The classrooms were sited on the upper level of the site, with shaded outdoor circulation corridors allowing access to the classrooms, and the domed prayer space was more grounded on the lower level – which could be read as a metaphor for the ascent entailed in the acquisition of knowledge.

Influences from Chadirji who along with his office, Iraq Consult (IQC), had just collaborated with PACE on the Al-Hassawi Residential Complexes in Kuwait and the Jahra Complex from 1968-73, can clearly be discerned in both the overall plan and elevation design of the Religious Institute. In the Al-Hassawi Residential Complex, PACE and Chadirji employed linear arches that spanned several storeys, resulting in narrow vertical articulations for the facades. Chadirji attributed his use of arches in both the Al-Hassawi Complex and an office building in Abu Dhabi to vernacular precedents he had seen in North Yemen, the Al-Aqsa Mosque in Jerusalem, as well as the Safa mosque in Isfahan. Shaded external circulation arcades utilized arches to access public programming on the ground floor.

Here too, in the Religious Institute, PACE followed the same language of arches and meticulously organised small openings that they had just worked on in Kuwait. This can be seen most clearly in the elevation of the classroom building. The arches provide a layer of shading and protection from glare, as Chadirji explains in an interview: “In Iraq, we have a very fine dust in the atmosphere that creates a strong glare. So I blocked my buildings from the glare by walls and by having the light come in indirectly by double reflection.”³² Just like Iraq, Kuwait and Yemen, too, suffered from the same glare problem. The recessed arches in the classroom building therefore acted as a screen of sorts to diffuse the impact of this glare.

Like the mixed-use complex of the Al-Hassawi Residential complex, with its commercial arcade along Beirut Street in Kuwait, the intermediate semi-private communal spaces in between the classrooms and the other program-

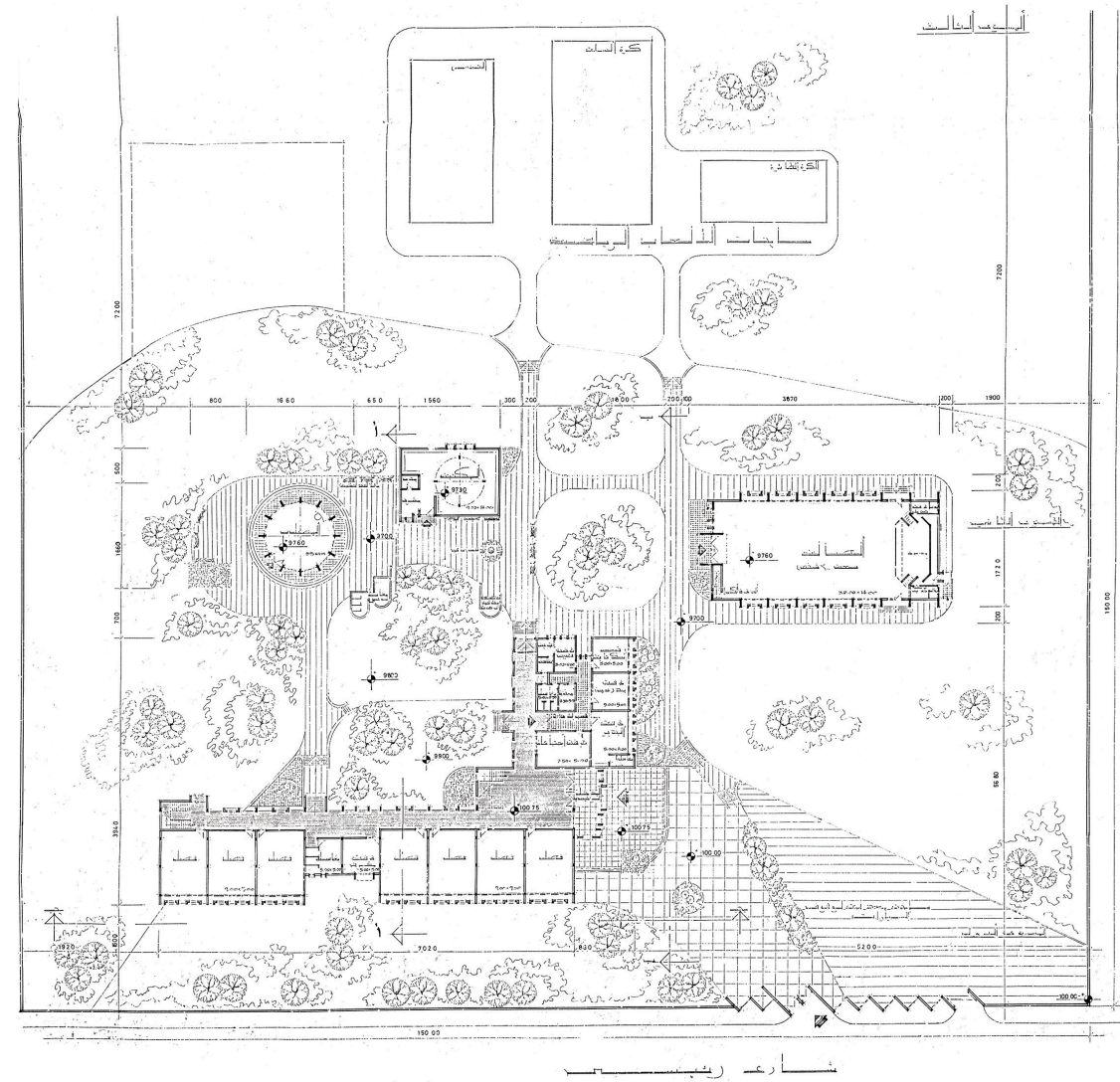
32 Huge Lindgren interview with Rifat Chadirji, “The Way We Live Now: 5-18-03: Questions for Rifat Chadirji; When Saddam’s the Client,” <https://www.nytimes.com/2003/05/18/magazine/way-we-live-now-5-18-03-questions-for-rifat-chadirji-when-saddam-s-client.html>, (May 18th, 2003).



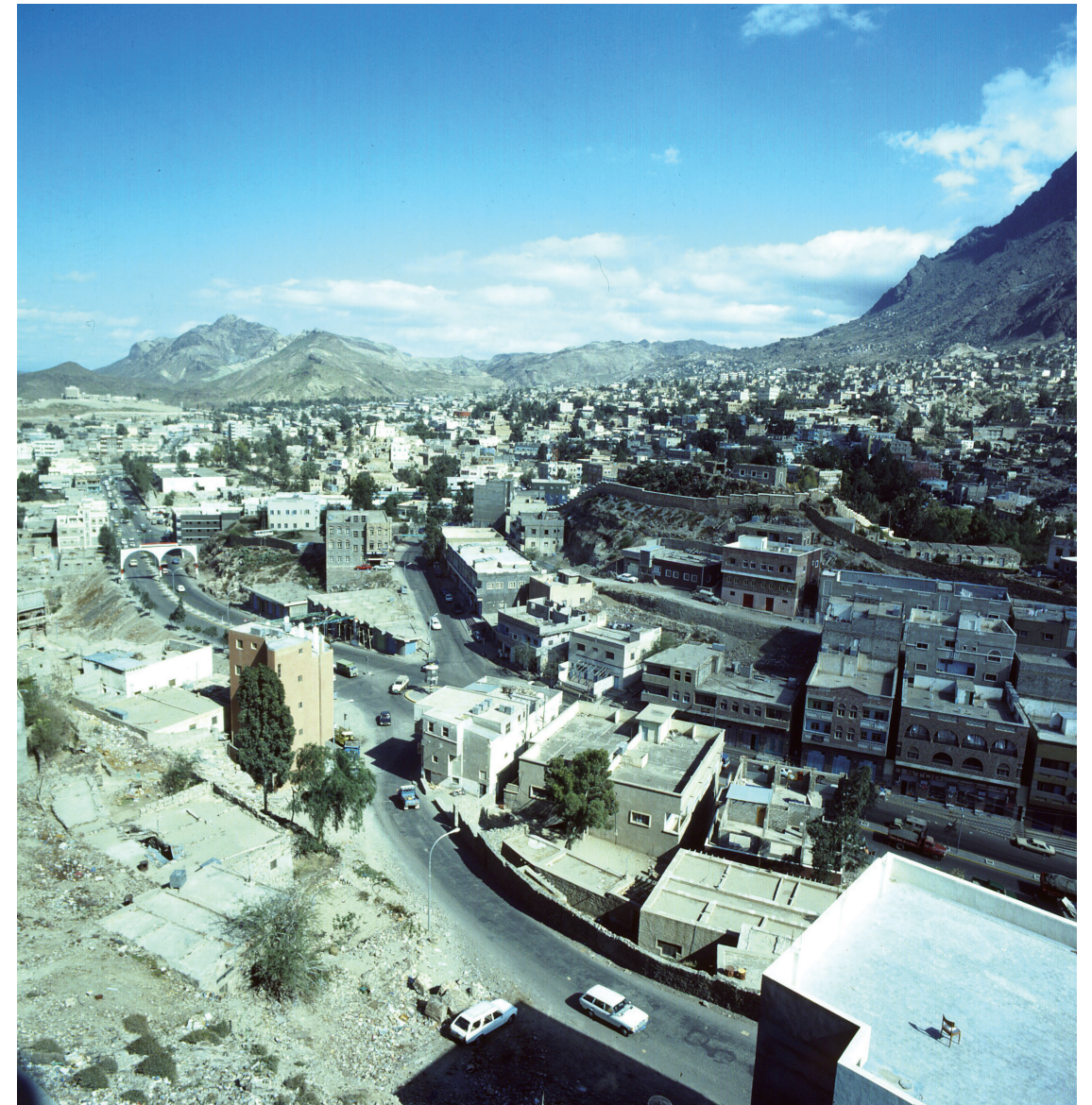
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73156 Master Plan for the Religious Institute, Taz, Yemen.

74196 College of Law in Sana'a University, Sana'a, Yemen, undated photograph.

matic functions in the Religious Institute's - mosque, offices and library were intended to encourage cross circulation and promote social activity across the campus. Chadirji's dictum on developing a modern regional architecture can be read elsewhere in PACE projects in Yemen: "I set out to learn from traditional architecture and to achieve a synthesis between traditional forms and inevitable advent of modern technology. My aim was to create an architecture which at once acknowledges the place in which it is built, yet which sacrifices nothing to modern technical capability."³³

As PACE continued working across Yemen between 1971-75, the office attempted to develop prototypical designs for clinics, hospitals and schools with rational organisational logic that could be repeated across the country, with minor modifications to suit particular sites.

Some of these works are a continuation of themes developed in the Religious Institute with arches and local stone facades, in reference to a regional vocabulary, while the organisation of the plans in the interiors continued to reflect a European modernism. It is important to note that the typology of a secular school, university, and Western medicine clinic and hospital, were nonetheless new typologies in Yemen at the time and had no precedent in terms of plan and organisation. The buildings PACE designed consisted of simpler grid and concrete frame expressions, where both inside and outside matched a more modern approach, such as their work on the clinics in Aden completed in 1975. The use of arches and arcades is particularly evident in the school buildings but also in the buildings PACE designed for the University of Sana'a from mid 1970s to early 1980s, including the College of Medicine and the College of Law, as well as the University Library, Science Laboratory and the Lecture Halls.

In the College of Medicine, the building complex included its own teaching and research laboratories, lecture halls, a library and a café. Oriented on a diagonal axis, the complex acts as a cluster with a diamond-like formation in the site plan, with the apex of the diamond marking the entrance to the complex on the main avenue. The building was located on the apex, facing the main avenue, and was designed with a domed roof to denote hierarchy. The rest of the buildings were organised around an interior courtyard, with external arcaded corridors serving as the main paths for circulation. These shaded arcades were consistent with the earlier Hostel, College of Medicine and the school buildings. The site for the College of Medicine is sloped with a 20m difference from northeast to southwest and the design was intended to maximise this attribute through the creation of an interesting sequence of levels. As for the two-storey library building, designed also for the University of Sana'a, it consisted of a main reading hall, stacks, seminar rooms, a rare books and manuscripts section, and offices. The building attempted to reflect traditional Yemeni architecture using stone with modern techniques. It, too, had arched, deeply recessed fenestration to control the sunlight. Though there are windows, the skylights in the reading rooms were the main way to bring light here, and skylights were also used to highlight spaces such as the main stair at the entrance.

33 Ibid.

PACE continued its work in Yemen up to 2016 with the design of the embassy of Kuwait and the ambassador's residence in Sana'a. This time however, the project was a commission from the Ministry of Foreign Affairs in Kuwait (MOFA). Covering a plot size of 13,212 square metres, the building complex encompassed four main zones: the Embassy Building, Consulate Building, Diwan Building and the Ambassador's Residence. The project was designed with the intention of incorporating traditional elements from Kuwaiti vernacular architecture. This expression is particularly evident in the facades with the wooden doors and the use of a sequence of multiple courtyards to create a spatial progression on the site. There are no arches or domed buildings but there are, like their past projects in Yemen, external shaded arcades for circulation on the periphery of the courtyards. The fenestrations are also deeply embedded to provide shading.

The work of PACE in Yemen provides us today with a rich source for investigating the connections between regional politics and architecture. PACE's location in Kuwait, a cosmopolitan hub that was already absorbing both regional architectural and cultural talents and ideas, meant that the office itself was a conduit of new architectural ideas, where a specific regional vocabulary that responds to local needs was being developed. At that moment in history, both Kuwait and PACE represented intense exchanges of architectural expertise and practices. PACE's collaboration with the GBSAG coincided with a pivotal historical moment in the region as most countries in the Gulf were shifting from post-colonial independence to radical modernisation and state building. Yemen's instability and precarious economy, meant that the modernisation efforts—with the new building programs which that entailed, such as the construction of schools, clinics, hospitals and universities—were often initiated and implemented with the help of development aid organisations.

Since the expertise required to carry out these projects in Yemen was almost entirely lacking locally, development aid agencies operating in Yemen, such as the GBSAG, hired foreign architects. What is interesting and unique in the case of GBSAG, unlike the UNDP and other aid agencies operating in Yemen at the time, is that it was a regional fund coming from Kuwait. The architects they hired therefore, rather than being Western, and completely removed from the context, were from the region, represented in the office of PACE, which designed and implemented tens of large-scale projects in Yemen from the late 1960s onward.

Since the work of PACE in Yemen was largely a product of a collaboration with the GBSAG, financed by a regional development aid agency, their work cannot be isolated and understood without unpacking the intricate web of geo-political conditions, economic mechanisms and socio-cultural considerations that affected the architectural expression. The agenda of Kuwait in the region at the time, strongly influenced its development policy-making, which defined how and why aid was provided, and to which countries. Accordingly in the late 1960s, the GBSAG elected Yemen, along with Bahrain and the Emirate of Dubai, to be the recipients of charity in the form of institution building. As discussed earlier in the essay, perhaps the choice of Yemen for aid was strategic for political and economic considerations, but it is also equally

possible that it was driven by a charitable disposition to support a regional neighbour that was struggling to develop economically. Whatever the reasons, working within this framework of aid meant that PACE was but one of a group of agencies who were part of the process of translating specific ideologies of modernism and modernity into the built environment. PACE in Yemen, was therefore a cog in a bigger wheel of government officials, policy makers, project supervisors and local builders.

The inception of the GBSAG coincided with decolonisation and sentiments of Arab nationalism, which had given birth to a momentum of hope in the region. This came hand in hand with an enthusiastic belief in modernity and progress embodied in a particular image of industry, technology, and new social relations. In architectural terms, this involved certain techniques of representation and formal strategies that acted as responses to the technologically enabled transformation of modes of production. It also necessitated the building of new institutions that would guide the processes of social transformation. The introduction of modern technology affected the use of materials and their manufacturing process. As Chadirji argues, this meant that the role of the local master builders in the region became subordinate to the role of the academically trained newcomers—whether it was international consultants or internationally-trained Arab engineers such as the founders of PACE who had become well-versed in these new technologies. Accordingly, the skills of traditional masters deteriorated, and the vernacular form and type faded with time.³⁴

which were routinely incorporated into projects due to economic necessities, and likely pressures from the funding agencies to maintain a certain level of efficacy in expenditure and time, resulted in a loss in a place such as Yemen with its rich vernacular heritage and material vocabulary. Although PACE did attempt to incorporate the use of local materials such as stones in their designs, the overall construction frame was typically concrete and steel, and the traditional plaster, *joss* for example, which does not erode stones over time the way cement does, was rarely used. *Qadad*, a stone-based insulation material used in roofs and bathrooms, which is much stronger than modern equivalents was also not utilized as often in PACE's buildings and the majority of the new buildings erected post 1960. These old stones and insulation techniques were better calibrated to the sharp diurnal shifts in temperature in Yemen's desert climate.³⁵

Nevertheless, the intentions of the architects from PACE to create a broader geographical category of Arab Modernism which retained features of the vernacular, but still responded to the specific cultural and environmental context, is evident in some of the Yemen projects such as the Hostel, the Religious Institute and the University buildings. An ambition to integrate local vocabulary, whether through the use of local materials such as stone or through the use of vernacular arched recessed openings, were amongst the common tools they used to express these ambitions.

When looking through the lens of development aid in Yemen, and the work of PACE there, we witness an extreme form of architectural globalisation. The buildings are marked with the complexity of a transitional period where questions of identity, nation building and regional cooperation were still very prevalent and not yet entirely formed. Development aid offered a platform to test and develop a varied range of practices and ideas on a massive scale and to transfer that experience to other contexts. This is evident in the exchange of ideas from the Yemeni vernacular, back to Kuwait, through Iraqi architects working in PACE and then translated back from Kuwait to projects in Yemen, Bahrain, and Sudan that PACE was involved in. The work of PACE in Yemen therefore serves as evidence of the multitudinous, overlapping, yet discontinuous processes and ideas as they were exchanged and tested in the built environment, supported through the funding of regional aid agencies.

The work of PACE in Yemen was assertive in its formal, programmatic and technical messages of modernity. Through the programmatic roles as places of secular higher education, western medicine and mass urban housing, the buildings imparted a modern voice that attempted to ameliorate standards of living through modern building typologies. Assimilating and blending the utilitarian and the modern both in materiality and form, with some regional symbolic aesthetic references such as arches and recessed openings, the work of PACE in Yemen can be celebrated for representing multilateral cooperation between countries and regional collaboration within an office that brought together a wide mix of talents and ideas.

34 Chadirji, Rifat. "Architectural Education in Iraq", in *Architectural Education in the Islamic World*, edited by Ahmet Evin, Singapore: Concept Media/Aga Khan Award for Architecture, 1986.

35 Worth, Robert F. "Yemen Finds Dreamland of Architecture," November 15, 2009. <http://www.nytimes.com/2009/11/16/world/middleeast/16yemen.html>.