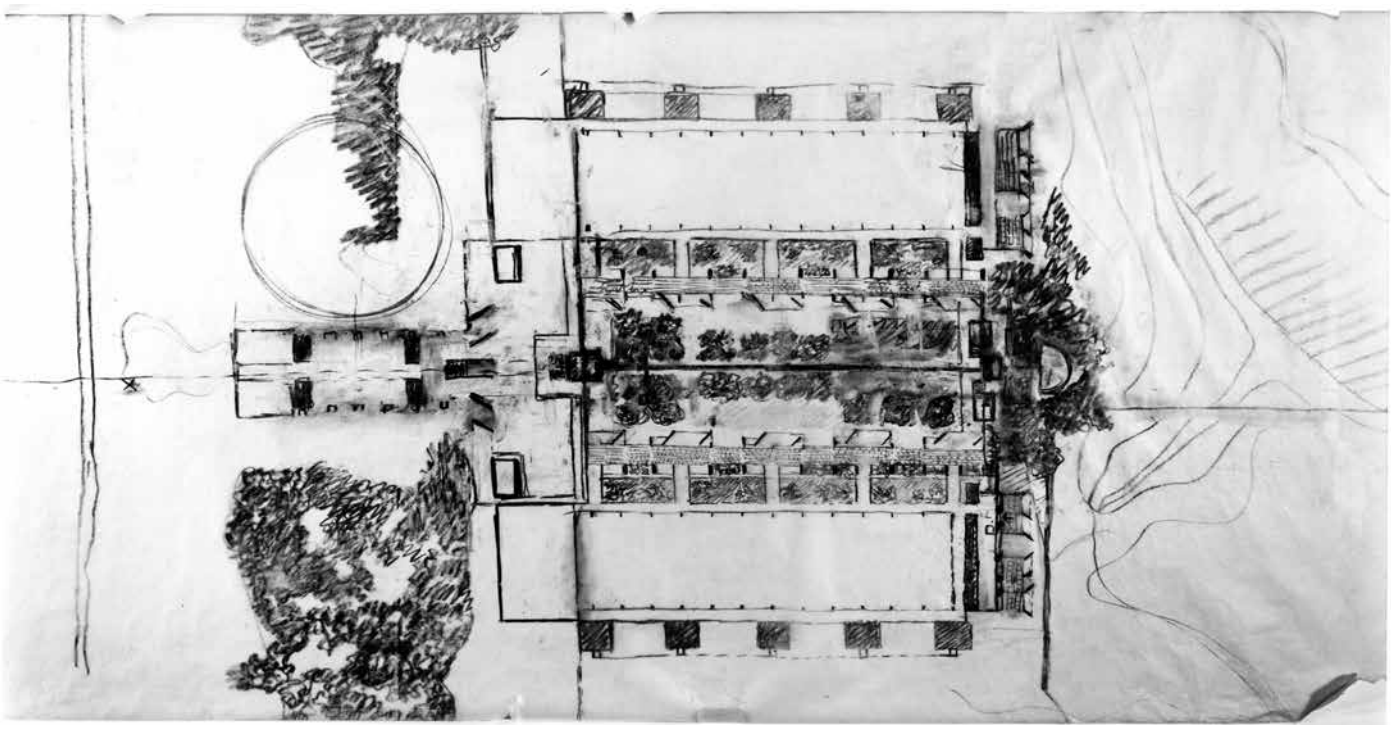
arq (2024), **28.2**, 130–149. © The Author(s), 2025. Published by Cambridge University Press.
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1

1 **Louis I. Kahn, preliminary study for the Salk Institute court and surrounding landscape. Vegetation flanks the rill, with trees arranged in two bosks on both sides of a central allée.**

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In this paper Modern and Ancient (Greek) buildings and texts are adduced to describe the practical and representational meanings of one of architecture's essential forms, the platform.

Platforms: standing between sky and soil

Antonios Thodis and David Leatherbarrow

A 'façade to the sky' is the way Louis I. Kahn and Luis Barragan understood the court-plaza-garden at the Salk Institute. We use a doubly hyphenated term to describe the well-known platform because all three types played important roles in Kahn's thinking, throughout the several phases of design and construction. The triplet-typology also indicates the polysemy of platforms more generally, regardless of whether they are modern or ancient, as we shall show. Not only will boundaries between types be crossed in what we have to say, also typical separations between different kinds of performance, and modes of cultural sense. In all cases, however, the building's most basic horizontal will be seen as a place where individuals and groups take their stand between the work's sky and soil, an architectural element that both seams together and spaces apart regions above and below that have equally ungraspable depth.

Salk Institute's plaza as a fifth façade

Barragan's famous report on his conversation with Kahn at the Salk Institute construction site can be recalled to introduce the key topics this study will address:

> *Lou was thinking and stated a very important thing, that the [plaza] surface is a façade that rises to the sky and unites the two as if everything else had been hollowed out. It must have an expression.*[1]

Although he had been invited to La Jolla to design gardens within and around the ensemble of buildings, Barragan's first impression of the place was of a *plaza*, one that incidentally brought to mind paintings by Giorgio de Chirico. Kahn, however, had been designing configurations of trees, lawns, water courses, and pools, which is to say, *gardens [1]*.

Anticipating the realisation of anyone who goes there, both architects knew that the ambient landscape would both enclose and infiltrate anything inserted into it, for the surroundings included a very big sky and an edgeless tangle of shrub-lined valleys and rill-cut plateaus, with the ocean down below and in the distance accomplishing their conjunction and forming their perceptible limit. Whatever topographical form one calls the project's central platform – court, plaza, or garden – the really challenging problem is to understand how it was also seen by the designers as a *façade*, for façades normally face one frontally, standing up not lying down. Here is Barragan's recollection: 'I proposed a plaza, whose pavement would be treated as a fifth façade.'[2]

Although it is perhaps the most famous space of its kind in late modern architecture and still studied avidly, the configuration of the Salk Institute's central space seems simple enough, basically an un-roofed outdoor room, orthogonal in its layout and oriented along the east-west axis. Yet, it was delimited very differently in its two principal directions. Under the path of the sun, which is to say from east to west, contrasting landscapes formed rather indefinite edges, one extending westward from the outdoor room towards the ocean and the other eastward into the orange and eucalyptus groves. The other two sides, on the north and south, were, by contrast, unambiguously defined by the walls, rhythms, and spaces between the stacked studies, stairs, and open courts, creating a pattern of bright surfaces and dark shadows in insistently regular alternation. The result of the four 'sides' together was thus an unusually open room, walled and not, but clearly ordered and edged nonetheless. To that orthogonal and open-ended arrangement was added (or imagined) a fifth element, a *façade* that was also, oddly, a floor, facing not forward but upward, while covering or hiding who-knows-what below.

Barragan wanted this earthen elevation 'paved'. Initially, the story goes, Kahn bypassed the matter of its physical make-up, and addressed instead its spatial meaning or perceptible outcome: it would 'resolve' the wall-façades, he said, with a pattern of regulating lines. Here is his explanation:

> *I know what I'll do. Let's think that we must consider the canals for drainage that will go to the end to a fountain that it has over there.*

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2 Central drainage canal, 'River of Life', of the travertine plaza, Salk Institute of Biological Studies.

> *That pattern of the canals is what must resolve the facades, that it must make sense and be beautiful at the same time.*[3]

The *sense* that this pattern would make would be practical (drainage), and its beauty would be perceptual (resolution). But, again, he had in mind a rather distinct form of perception, not face-to-face, the way the first four 'sides' of the plaza were to be seen (the walls and the prospects), but an omni-directional apprehension of ambient form, a beauty all-around and below.

As Barragan suggested, the next step involved conceptualising the platform's materiality. The site's soil was not so much suppressed in Kahn's thinking but substituted, not *cultivated* as a garden but *constructed* as a plaza. Barragan reported that when Kahn thought about looking for the right material, Mexico seemed a good source: '[H]e wanted a lilac stone … He could buy that material [in Mexico], but [the problem was] it would take them a year or two to make it. It was impossible.'[4] No drawings or notes suggest that Kahn ever imagined the plaza's material contributing to the 'resolution' of the space. It seems as if colour was not all that Kahn had been thinking about, for at that point he had already solved the problem of draining the plaza: 'Very small channels but very well-defined, that would collect the rainwater and would bring it to a fountain that was just as you went down *[…]* Even though the fountain had been designed without needing the channels.'[5] At this point the fifth element seems to have become a little more complicated, a 'façade' that was not a wall – for it lay flat on its back – nor only a deck, on which Kahn, Barragan, and the rest of us could stand, but also something like a roof, because its task was to direct and shed rainwater. Even more difficult to think through is the idea that it was a *façade-wall-roof* that was also meant to be perceived as a geometric pattern, which is to say as much a *form* as a material element: 'Then he [Kahn] thought, *the pattern of those channels is what is important, the material.*'[6] It is a strange thought. Somehow, the difference between surface

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and substance did not trouble Kahn, a geometric pattern seemed to imply a material, as if inscribed lines were essentially shadows that resulted from the light of the plaza disappearing into cuts made in a material that would last, stone. The result: resolution of the court-plaza-garden-façade-wall-roof thanks to wet black lithic lines and angles *[2]*.

There was to be a corresponding experience of environmental qualities. On Kahn's account, the *fifth façade* would sustain the 'many moods of the sky and atmosphere *[…]* never static, full of the never-ending anticipation of the rising and setting of the sun.'[7] With the word 'moods' we understand him to indicate a number of environmental/emotional phenomena: disposition, temperament, and temperature, as well as expression. In all cases, change was also to be apparent, diurnal, and seasonal sequences of course, but also the expressions that would result from varied vantages, which is to say prospects seen along the central or a side axis, or, after a few steps to one side or the other. A changed mood might appear at one angle, and then again at another when a view was cast upward, downward, or outward, giving rise to still other impressions. As with actors on a stage, these moods were understood to be both expressive and performative, for the plaza-façade was also a catchment or contributing area that received, directed, and discharged rainfall, as we have seen.

Carving out the platform's expression

Two kinds of cuts in the platform stone played their parts in the patterning and functioning, a main central canal and secondary tributaries. All were wet-black 'lines of water', forming in concert an 'architecture of water',[8] that conveyed the accumulation towards the side-to-side pool at the ocean-facing edge, from which the overflow fell into a second smaller and similarly symmetrical basin positioned between the landings of the paired stairways,[9] but sided by boxed plantings up at the plaza level that framed the final phase of the descent to a lower deck basin *[3]*. Although at the start, up on the dry deck, all appears to be flat, the surfaces and the channels themselves were, of course, slightly sloped, the gradient of which was sufficient to direct the accumulated rainfall towards the horizon, visibly, audibly, and artificially repeating in its slow descent the natural cycles of flow that had from time immemorial been gathered and channelled in the wider landscape, before dropping into the ocean, its destination as well as source.

Can one say, then, that when considering the material make-up and geometry of the plaza Kahn intended to imitate natural patterns, the web of channels through the land, towards the beach and ocean beyond? If so, was the imitation representational? Is there an iconographic dimension of this *fifth façade's* geometry? Might the descent that it put on show have alluded to 'a return to the source of all creativity', or 'of scientific knowledge'?[10] With these questions or suggestions before us we immediately feel the need to proceed cautiously, for Kahn emphatically argued against mimicking nature.

Among the many, many accounts of the central platform and its three-level drop, few have considered at any length his sense of the relationships between the platform and the surrounding plateaus.[11] Far from being uniformly flat, the land that extends from the western edge of the Institute had for ages been furrowed with natural channels and gullies by the rainwater that had gathered from flanking slopes. At the plateau's edge, between the gullies, the accumulation lost its footing and fell precipitously, though non-orthogonally, onto the beach and from there, less dramatically, onto the shore's slight slope into the ocean. The role played by the vertical cuts into the face (façade?) of the land are vividly and beautifully



3 **Cascading fountain as seen from the lower west court.**

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portrayed in Kahn's survey sketches, and later drawings, particularly an elevation of the second design (1960–2), from the ocean towards a nearly skyless outcropping of his buildings *[4]*.[12] From the start and throughout the project the levels and relief of the substrate were on his mind.

Obviously, the rockface façade we see in this beachfront sketch is not a pattern of perpendiculars (like those that marked the Institute's *fifth façade*), but shadow-cast *resolution* occurs there just the same, in channelling all that the sky cares to give back to the ocean, the rain's source, we have said, and receptacle. It would seem, then, that one way to understand the court-plaza-garden-façade's architecture of water is to see it as an earthwork that operated the ways its surroundings did, wet-black cuts channelling movements and cycles of sunshine, shadow, and rain from above to below. The object of imitation in this case would be a process or operation, not their outcome. Accordingly, the accent would not be placed on representation but participation, which is to say a project taking part in the play of natural elements, their movements and metamorphoses, by structuring them.

Let us look a little more closely at his injunction against imitation. It is two-part. First, there is an unwillingness to imitate the work of nature, second, a refusal to work in the manner of the landscape architect. With respect imitating nature, he advised:

> *The architect becomes an advocate of nature and makes everything in the deepest respect for nature. He does this not by imitating nature at all, and not allowing himself to think that he is a designer – he imitates how, let us say, the bird plants the tree. But he must plant the tree as a man, a choosing, conscious individual.*[13]

His final point in this definition of the architect's basic task suggests that the last thing one would want to see on the plaza is a face furrowed like the cliff he drew. With respect to (not) following the pattern set by the landscape architect, he insisted that:

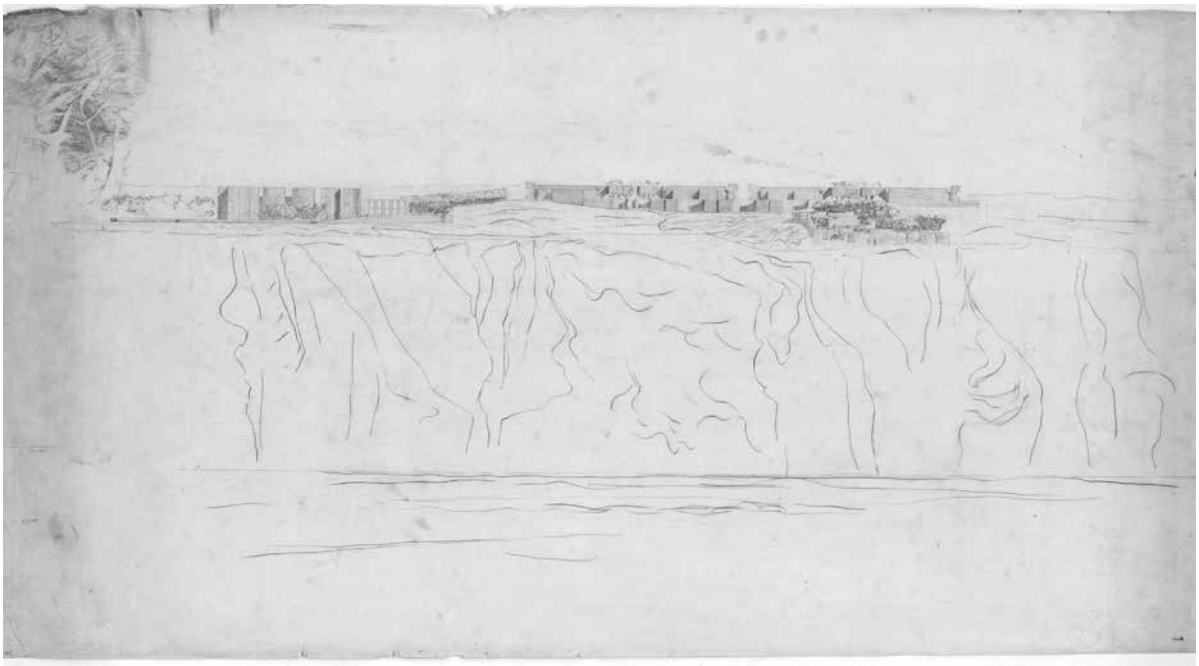
> *The architect* […] *does not mimic the landscape architect, he looks at land from his point of view. He is in that sense a land architect, [and] as a land architect must also be a building architect.*[14]

An architecture of water is what the building architect makes out of the site's soil and sky. But not only that. We have seen that there was from the very start not only a concern for pattern (the shadow-casting cuts) but also for colour, the lilac stone Kahn initially sought in Mexico. Similar sensibilities are suggested in his initial survey drawings, where he noted the colour of the terrain, well before anyone got started with construction.[15]

Seasonal and daily colour at Salk Institute

Colour can be characterised as qualified light, another of Kahn's great themes, light that is alternately apparent and absent 'All material in nature, the mountains and the streams and the air and we, are made of light which has been spent, and this crumpled mass called material casts a shadow, and the shadow belongs to Light. So Light is really the source of all beginnings.'[16] Here we touch on the last of the Salk Institute platform's qualities we will address. In this case, too, a brief departure from La Jolla will be helpful, not to Mexico, but farther afield.

4 **Sketch of the West Elevation with the Meeting Place, Laboratories, and Living Place on the plateau, above the Pacific, and under a low sky.**



4

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5 View looking west across the south flank of one study tower.

6 Louis I. Kahn, 1951 pastel drawing of the interior of the Parthenon.



6

'Greek architecture', Kahn explained, 'taught me that the column is where light is not, and the space between is where light is. It is a matter of no-light, light, no-light, light. A column and a column brings light between them. To make a column which grows out of the wall and which makes its own rhythm of no-light, light, no-light, light: that is the marvel of the artist.'[17] On this account, light reveals itself on the surfaces and in the spaces between the temple's columns (intercolumniation). Sunlight produces sharp shadows where the temple's columns connect with their platform and epistyle. At the Salk Institute this can be seen where the pier-columns flank and separate the plaza's platform from the lower and upper two floors *[5]*.

While sketching Greek temples and other historic sites, Kahn also learned how significantly seasonality affects the perception of a building, yielding changing and dynamic appearances, based on the month of the year and hour of the day, and by the sun's position and the clouds' presence, if

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7 **Salk Institute plaza at sunset with lilac-purple hues.**

8 **Salk Institute plaza at sunset with orange hues during spring equinox.**

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rain is falling, mist rising, and so on. The sequence of thoughts goes something like this: room→light →nature→seasons→times→moods→meanings. Of course, his thought was not as linear as this sequence might suggest, still less was it causal; the sequence is no more than a chain of implications: 'A room is not a room without natural light. Natural light gives the time of the day and the mood of the seasons to enter.'[18] Further, 'We are born of light. The seasons are felt through light. We only know the world as it is evoked by light.'[19] The desire to respond to the 'moods' of the sky and atmosphere in his buildings was beautifully highlighted by Kahn's daughter, Sue Ann Kahn:

> *In pastels that are among the most sublime examples of his drawing, my father portrayed the vivid colours of light and shadow, illuminating the historic spaces of Italy and the ancient sites of Greece and Egypt* […] *Trained from early years to be an artist, my father was intrigued all his life by the colour of daylight and its complementary hues. In speaking of his inspirations for the pastels, he excitedly recalled, 'One time when I was in Paestum, I was in a magenta sunset and the magenta sunset cast a green shadow that was as green as green could be. The green was so green that I had to feel that there wasn't paint; and on the shadow of my hands was also green* […] *it really wasn't just an ordinary green. It was ink green. And that cast a shadow on the stones which were a golden colour and this green cast itself a purple shadow, because it had so much light in the green. So within iridescent stone there was a shadow caused by the green shadow on the stone itself, and that really set me off because I thought I could independently paint all of these things.' As much as concrete, brick, or travertine, my father used the changing light of the day and the seasons as building blocks of architecture.*[20]

Consider, for example, a few of his well-known pastel sketches: the Parthenon *[6]*, and the Temple of Apollo at Corinth. Of course, the geometry is significant, particularly the level lines of the platforms; but no less so is the material make-up of the façades (vertical and horizontal), rendered vividly in colour. Can we see in the pastel sketch of the Parthenon the combination of oranges, pinks, and blues that he later hoped would qualify the Salk Institute's earthbound elevation, the *lilac colour*, which he explained as 'pink and blue?' *[7]*.[21] Still further, might the design of the *fifth façade* have indicated his desire to harmonise the platform with the sunset sky, so often vivid in this location *[8]*? Lilac stone would have rendered the sky's gift permanent. Because travertine was used, the appearance of the lilac colour is occasional. For any visitor today, the Salk Institute's pavement stages the sky's colour spectrum.[22] Perhaps the orange hues are the most spectacular, but there are also the blue. Let us look again at his early rendering of the Greek temple's *stylobate*. One should not think that the blue that appears on the deck is there by accident, nor is it the hue of the stone, as another day's colour demonstrates. One of the platform's many tasks is to reflect the colour and qualities of the sky above. In admittedly overly dramatic photos, the mirroring of the sky and buildings on the Salk Institute's pavement's plaza on rainy days shows the same correspondence – as above, so below.

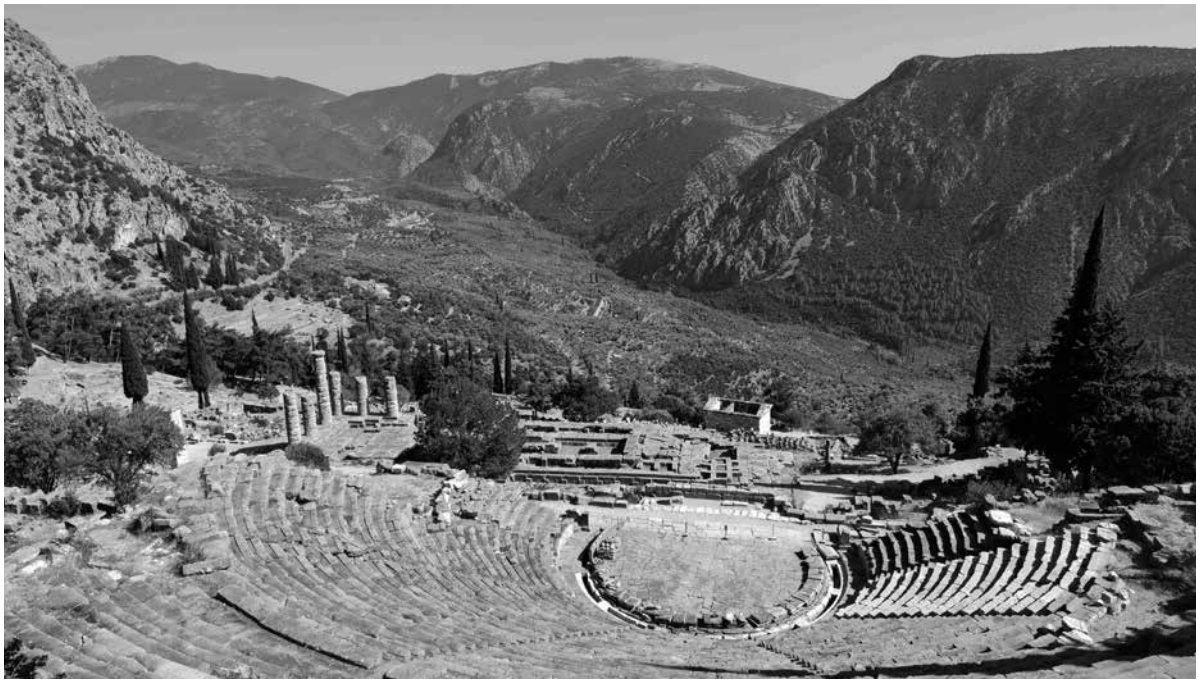
But at this juncture, let us briefly step away from Kahn's design and ask if his comments and interpretation can be generalised? Is the platform in each of the above ancient Greek cases a *fifth façade*? If so, in what sense? Geometry joining construction and context? Furrows and sky-tears, wet-black or sun-coloured?

Mediating between what is below and above in Greek antiquity

Examples of ancient Greek architecture that use paved and orthogonal platforms, temples for example, merit attention, but also those that are unpaved and circular in shape, designed and built for either religious or prosaic uses. Most of the time, ancient sources suggest, they remained empty, in anticipation of events that would articulate various ways of being between the soil and the sky, cultural patterns, and institutions. A good example is the circular *orchestra [9]* and related to it the threshing floor *[10]*. The circularly dancing *chorus [11]* that periodically performed at the *orchestra* and at the threshing floor in agricultural festivals reenacted the circular dance of deities and that of other archetypal figures who were in myth perceived as personified stars. The dances of mortals were patterned on the circular star dance in the firmament. Correspondingly – below as above – the rhythmic beating of the ground with the feet invoked (awoke?) earth/Gaia/Demeter, the underground forces of regeneration. Also pertinent are the *hippodrome*-chariot racetracks, with their orthogonal layout and semicircular ends *[12]*. On the *hippodrome's* flat surface, the chariot race and its two turns emulated the daily course of chariot-driving deities like Apollo-Helios, Selene (Moon), Nyx (Night), Day and Auge (Dawn) as they followed in turns their daily and annual tracks in the sky. Furthermore, the platforms of the temple, the *orchestra,* and the *hippodrome* accompanied one another within the *temenos* platform, waiting for orderly pacing in procession, or for individuals and groups to stand still or wander, variously reenacting exemplary movements, in celebration or competition (which was also celebratory).

In the ancient period, the platform's mediation between what is below and above, included and excluded, was not only encountered at the scale of the building, but also at that of objects, such as altars *[13]*. Upon an altar's flat surface the gifts of earth were separated, elevated, and exposed to the open sky. The blood of the sacrificial victim was spilled and fell downwards – sometimes channelled in blood – not shadow-filled cuts – while the smoke of the burned fat and bones ascended upwards.

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9 **Orchestra at the sanctuary of Apollo at Delphi.**

10 **Circular threshing floor in Santorini, Greece.**

11 **Circular dance, terracotta figurines, Archaeological Museum of Ancient Corinth.**

12 **'*Amphora (storage jar): Chariot Race* (Circle of Leagros), 1933–54', Harvard Art Museums collections online, 10 November 2024 <https://hvrd.art/o/288110>.**

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13 Remains of the altar opposite the entrance of the temple of Apollo, Sanctuary of Apollo at Delphi.

14 Attic pyxis with lid (Ident. No.: F 2519 – Staatliche Museen zu Berlin.)

Horizontal forms we see as equivalent to the platform also appeared at the scale of handheld objects, such as the flat and circular lid of the *pyxis* on which sky gods and goddesses were often depicted in their ever-circling galloping, as they brought with them daylight, starlight, and darkness *[14]*. A methodological premise is required for interpreting these examples as equivalent articulations of our topic; namely, that they give shape, substance, and measure to equivalent experiences of seaming together and spacing apart regions of the world, through one or another cultural practice that was perforce social: worship, combat, dramatic performance, and so on.

But let us pause again. Instead of illustrating the platform's amplitude of articulations by adding still more examples at different scales and built for different purposes, let us look still more closely at a number of Greek temples and try to discover in just one type other dimensions of meaning in this topic's spatial, performative, and cultural senses. As we do so, we will keep Kahn's designs and ideas close by, retracing some of his steps, particularly the passages about light and dark, dry and wet, but also those of the Swiss-French architect with whom he also had an ongoing conversation.

Kahn's 'teachers': the Greek temple and its platform

Despite the chronological and cultural differences between the Greek temple and the Salk Institute, their respective platforms have thematic correspondences. Of course, both seam together and space apart soil and sky, but that is only the most obvious similarity. The proper term for a Greek temple's podium or base is *crepidoma*. Although common usage implies a single element, in point of fact it is typically multilevel. In Doric temples it has three parts. More levels make up Ionic designs, forming steps. In the Doric cases the 'risers' are often prohibitively high for anything like easy ascent. The *crepidoma's* upper part, the *stylobate*, serves as the base on which the temple's columns stand, the deck whose surface Kahn rendered as alternately shadowed and chromatic. Its association with the columns is apparent in the Greek names, *styloi* (columns) and *stylobate* (platform), the latter is literally the level on which columns stand or walk – as we might. More solid is what plays its part beneath the *crepidoma*, the foundation or *euthynteria*, which is rarely visible, but not for that reason unimportant. And obviously, beneath

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15 Le Corbusier's sketch of the Parthenon's stylobate.

16 View from the top of the Acropolis towards the west from the Vravronio at the west of the Parthenon. Philopappou hill at the left, Piraeus at the centre and partial views of the Temple of Athena Nike and the Propylaea at the right.

the foundation could be rock, though more generally the unlimited and dark but fertile mass of the earth, which was for the Greeks both material and metaphorical, as we will see.

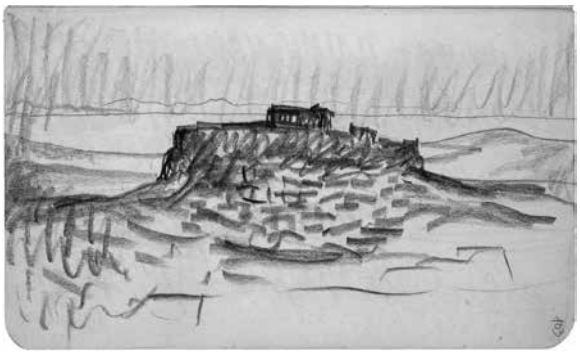
Triply stacked and stepped in the Doric temple, the *crepidoma* keeps itself comparatively dry during and after heavy rains. Its elevation also separates it from whatever may accumulate outside its limits. The stance is, thus, somewhat contradictory, for it stands apart from the soil while being anchored to it, having perfected whatever flat hardness the pre-existing site possessed. The coupling of separation and connection comes into vivid focus at its edges. They are obviously *its own* edges, but they often bear resemblance to similarly stable lines in the distance, coupling near and far horizons, rather like the relationships between Kahn's deck and the surrounding terrain, particularly the ocean's far limit. The second perimeter we will consider below is the limit of the *temenos*, the precinct within which the platform sits and the temple stands. The third more distant horizon is the line where the sky meets the earth. Together, these three horizons (of the work, its precinct, and the wider world) suggest another triple structuring, not of levels but distances: the outer edge of the *stylobate*, the inner edge of the *temenos*, and the remote edge, where the level of visible land comes to its end.

Kahn's comments about light – the rhythm of light alternating with no-light – hint at more than the origin of the column (arising, he said, out of the darkness where light is not), they also indicate the coordination of the three distances we have observed. From within the *peristasis*, the surrounding environment is framed by the columns, as they stand in-between the horizontal *stylobate* (below) and *epistyle* (above). From close by and outside the temple, the straight edges of the orthogonal and stepped platform, together with the equidistant arrangement of the columns, direct



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one's view towards the distant horizon. At the Parthenon in Athens, for example, these lines bring into focus the contours of city's outwardly defining mountain-scape *[15, 16]*. This prospect focused Le Corbusier's attention and gave rise to his approximately political analogue for separation and involvement: the Parthenon was, he said, a 'sovereign cube' *[17]*. Presumably, the *areopagus*, *agora*, and wider terrain were the elements of the topographical constituency it governed. The *crepidoma*, edged as sharply as his blunt pencil would allow, targeted the mountain.

Kahn, we have seen, was no less attentive to the distances: the edge of the plaza, the pools, and the horizon. At the Temple of Poseidon at Sounion the steps together with the *peristasis* once again bring attention to the Saronic Gulf, its coastline, and islands *[18, 19]*, and, at the south and southeast, the endless horizon of the Aegean Sea. Nowadays, upon entering the Salk Institute's plaza from the east, having passed through an orange grove, the plaza and its central canal, along with its rhythmically arranged flanking 'columns', culminate at its western horizontal edge. Here, as in the Greek cases, the edge acts as an 'artificial horizon', which brings to attention the unending western horizon where the sky and the Pacific Ocean meet. Eventually, once one has arrived at the plaza's limit, the remote horizon replaces the local.

The *stylobate's* elevation above the surrounding soil via a stepped base contributes to the semiotic sense of the *temenos'* sacrality. In the simplest rendering, with word origins in mind, both temples and *temenoi* are spaces *cut off from* or *out of* their surroundings. In religious thought, the same is true for sacred spaces, cut into or out of prosaic conditions. Sites or religious practices in the archaic context were grounds-enclosures-areas demarcated or defined by built elements, such as the upright *horoi* stones, or the *peribolos* with *propylon [16]*. The elevated *stylobate* can be understood as contributing to the semiotic stratification of the already wider sacred ground-space-area of the *temenos*. But the sense of such a place was not limited to what could be seen, what



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17 **Le Corbusier, sketch of the Acropolis from as seen from afar, Parthenon, 'a sovereign cube'.**

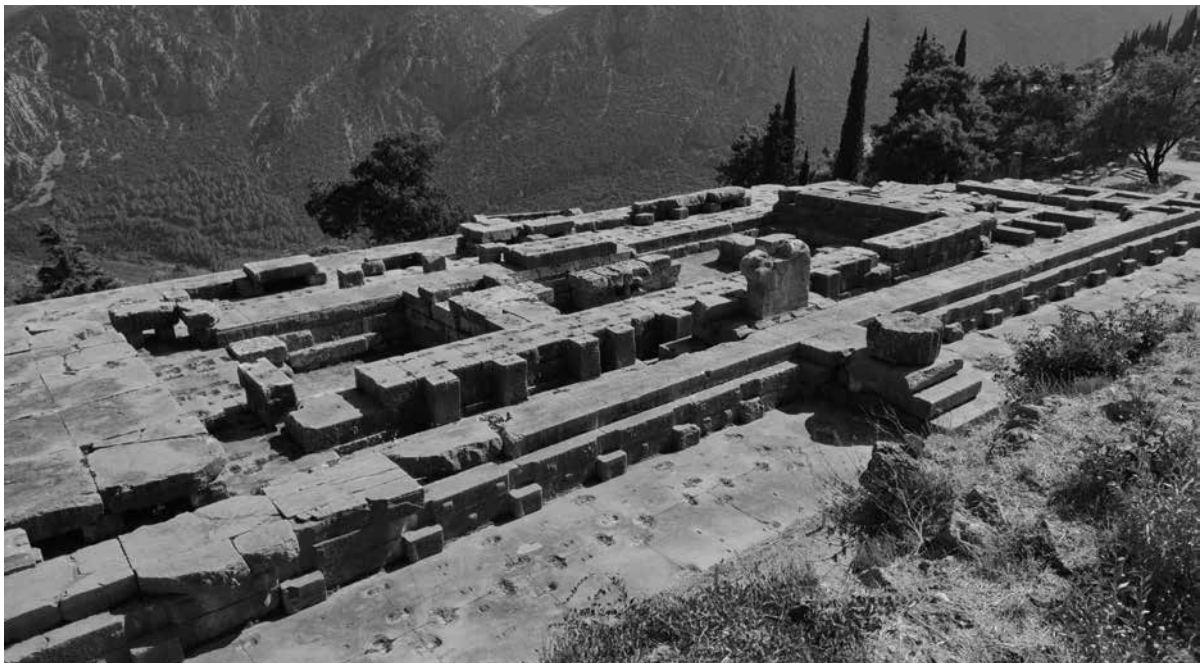
18 **Temple of Poseidon at Sounion, Attica, from the northwest.**

19 **Temple of Poseidon at Sounion, Attica, from the east.**



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20 Temple of Apollo at Delphi, crepidoma, stylobate, and sunken room-chamber at the western part of the temple's central nave.

21 Temple of Zeus at ancient Nemea, sunken floor – crypt – at the adyton at the far back of the temple's interior accessed via narrow steps.

appeared in the light of day, for what was unseen and darkly implied was no less important.

Let us return again to the Salk Institute's site. Earlier, with rainwater runoff in mind, we suggested that Kahn's platform could be understood as a roof, improbable as that description might initially seem. The association becomes less doubtful when Greek examples are considered. The *crepidoma* and its *stylobate* often covered subterranean rooms or opened downward into sunken enclosures or chambers, despite the dark silence and sense of no way out (other than cycling back) they convey. In these cases, the sub-surface space accommodated and expressed the worship of chthonic deities and potencies. Seen from a distance (during worship in the *temenos*) the platform's upper side stood for its underside, symbolically representing the powers at play within the soil, which is to say underground potencies or propensities.

At the fourth century temple of Apollo at Delphi, for example, below the western part of the central deck was a sunken chamber where the Pythia sat on her tripod, possibly next to the *omphalos*, where she would pronounce Apollo's prophesies, enigmatic though they often were *[20]*. The pavement of this sunken part of the *cella* was earth. A similarly sunken crypt, accessible through narrow steps at the temple's *adyton* cut into the *stylobate* can be found at the back end of the fourth-century temple of Zeus at ancient Nemea *[21]*. Such a site section has the following levels: sky blue above the temple roof and columns that stand on the *crepidoma* and its *stylobate* which, in turn, roof sub-surface spaces that shelter beneath them wet-black earth. This middle position of an up- and down-ward facing deck is also evident in the circular form of the tholos-*thymele* of Asclepios at his *temenos* at Epidauros. In this case the *crepidoma* and its *stylobate* cover and connect (through a round well) to the labyrinthine abode-tomb of the hero/god, also circular in plan and subterranean.[23] *Thymele's* combination of a double circular structure, below and above ground, has been interpreted by Karl Kerényi as a map of unified earth and sky. This reading accords with our initial suggestion that platforms may be understood as *fifth façades*.[24] The stepped *crepidoma* and its *stylobate* can thus be perceived as elements that stand for the elevated earth/ground, which covers the underground and its chthonic potencies.[25]

Although the Salk Institute's plaza does not organise a wider consecrated site of ritual and worship, it, too, clearly plays an important semiotic role in the domain of the research complex, coupling soil and sky. The Institute was intended by its founder Jonas Salk to provide creative inspiration both to scientists and artists alike. Unable to prevent himself from invoking sacred

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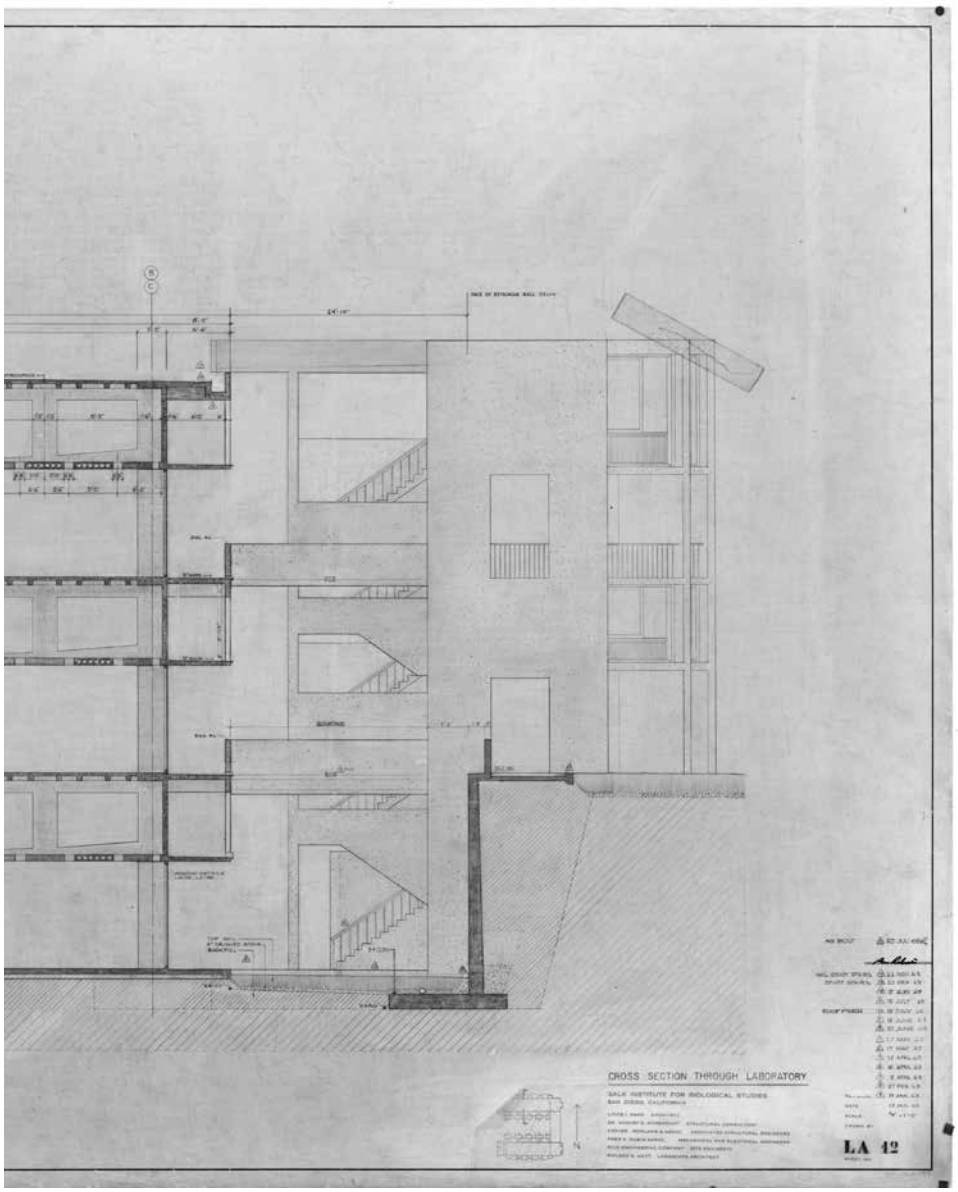


22

spaces, the Institute's former president Rusty Gage gives it 'a global reputation, as "a cathedral to science, an homage to art".'[26] Whatever one's views of that ranking, the cathedral image would be apt if one imagined its nave or choir covering a crypt. The site's cross-section bears witness to the intimate and complementary relation of the subsoil, 'vertical depth belonging to the earth', ground, plaza-deck, and the sky *[22, 23]*.[27]

As noted earlier, the Greek temple and its platform were among Kahn's 'teachers'. One of his 'classes' seems to have been meteorology, for Greek architecture provided lessons on the importance of the sky's seasonal-diurnal alterations in the perception of the building's appearance: high or low sun, day or night, and their moods, a dynamism or set of 'occasions', καιρός, that was captured and held most securely by the elements and edges of the *crepidoma* and *stylobate [24]*.

The exposed southern, eastern, and western stepped *crepidoma* produces striking contrasts of light and shadow during a sunny day (obviously the existence of the roof allowed the light/shadow



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22 **Salk Institute for Biological Studies, passage between labs and study cells.**

23 **Salk Institute for Biological Studies, cropped drawing of section through northern labs and plaza, 19 January 1963.**

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effect to appear at specific hours of the day). We have already quoted Kahn on this point above: 'Greek architecture taught me that the column is where light is not, and the space between is where light is. It is a matter of no-light, light, no-light, light. A column and a column brings light between them.'[28] Among the temple's striking and noticeable elements are not only the alternating lighted and deep-shadowed surfaces on the *stylobate*, but also those on the steps themselves, on the columns' flutes, along with the diagonal shadows produced by the capitals' meeting with the *epistyle*. These light/shadow effects have been captured in the sketches and drawings of both Kahn and Le Corbusier *[6, 15]*. The significance of the deep diagonal shadows is also emphatically noted in Kahn's drawings in other ancient monuments where beams meet the wall, such as the Egyptian temple of Khons *[25]*.



24

Although a unique case among the Greek temples, but not in the history of architecture, the platform and columns of the classical temple of Apollo Epikourios at Bassae were aligned to the sun's annual movement. The temple's design, including its *stylobate-adyton* pavement is tied to the annual movement of Apollo as Helios-Sun, which is informed by the belief in the god's seasonal travel to and return from the blissful land of the mythical Hyperboreans.[29] The design of the north-south oriented temple in correspondence with the movement of the sun is confirmed by a solar phenomenon related to its *adyton's* eastern opening and its irregular pavement. Frederick Cooper has proposed that the purpose of the east opening was to funnel the sun rays into the *adyton* at dawn on a particular day to light the *adyton*'s southwest corner. In-situ observations and the solar analysis of the temple confirm the thesis. Light streams through the *adyton*'s opening at a summer sunrise; in fact, a double ray, one that lights the centre of the south *adyton* wall, while the other marks the southwest corner *[26, 27]*.[30] Nancy Kelly has argued that the positioning of the east opening of the classical temple and its solar effect is: 'not an original innovation by the Classical architect but a faithful reproduction of a physical feature of the Archaic temple in order to accommodate the beam of sunlight.'[31] Quite apart from the important question of lineage, the double beams are plainly products of the



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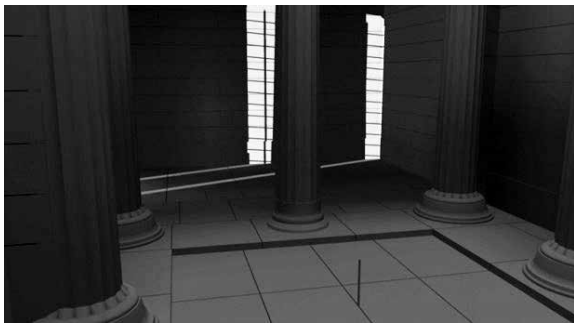
24 **Crepidoma of Temple of Zeus at Ancient Nemea.**

25 **Temple of Khons, Karnak, Egypt, pastel drawing, Louis Kahn, 1951.**

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26 Areas of light on the adyton wall of the Temple of Apollo Epikourios at Bassae through the east opening at sunrise Cooper 1968, pl. 40, fig. 3.



27 Light entering the adyton of the Temple of Apollo Epikourios at Bassae, summer solstice sunrise.

peristasis' columns in combination with the eastern opening. The temple's platform graphs the sun's movement.[32]

The Salk Institute's play of shadows is similarly varied and striking. As noted earlier, the deep cutouts of the plaza's flanking buildings, at plaza-ground and second floor level, together with the rhythmically distributed pier-columns, perpendicular and angled, produce noticeably alternating light and dark surfaces on sunny days *[28]*. The alternation was no doubt intentional. Kahn's writings and lectures speak of the coupling of natural light and shadow in his buildings, as we have seen. And this not as an outcome of a narrowminded utilitarianism/functionalism, or formalism. Instead, the play of sun and shadow was invested with deep philosophical and poetic underpinnings, including what have been called metaphysical inquiries.[33] The source of natural light, the sun, naturally, then, has a unique position in his design philosophy and in his thinking about mankind's making-creating activity: 'Man makes something; the sun is inspired.'[34] Today at the Salk Institute the sun is put to additional uses, not really perceptually apparent, but significant nonetheless.[35] The alternation between light and dark resonates with the shift from dry to wet. We have seen that the *crepidoma* and its *stylobate* raise a dry platform out of the moist soil, though they, too, are to be periodically 'refreshed', which is to say wetted with springwater and rainwater, gifts of the gods.

The labours of the *crepidoma* did not escape the attention of ancient writers. Euripides, in *Ion*, explains that the hero's duties, as servant to Apollo and his temple at Delphi, included making it pure, which is to say cleansing and sweeping the temple's pavement with laurel boughs. The laurel is summoned by Ion as follows:

> *Haste, thou verdant new-sprung bough,*
> *Haste, thy early office know;*
> *Branch of beauteous laurel come,*
> *Sweep Apollo's sacred dome,*
> *Cropp'd this temple's base beneath,*
> *Where the immortal gardens breathe,*
> *And eternal dews that round*
> *Water the delicious ground,*
> *Bathe the myrtle's tresses fair.*
> *Lightly thus, with constant care,*
> *The pavement of the god I sweep,*
> *When over the Parnassian steep*
> *Flames the bright sun's mounting ray;*
> *This my task each rising day!*[36]

The newly grown laurel, whose origin is traced to mythical-immortal gardens, and through whose myrtle foliage an ever-flowing stream of water passes, cleanses the altar, the flat ground that surrounds the temple, and the temple's platform, which is to say *refreshes* them. The idea of refreshment is also found in Ion's other duty, which involves wetting or moistening the ground around the temple with dew, which is to say with drops of moisture brought in vases from the sacred Castalian spring, as if another rain.[37]

The periodical wetting-refreshing of the temple's surrounding ground and platform is coupled by that of the gods who are inseparable from the natural elements in the ancient Greek understanding of the universe as *kosmos*. The sky-sent rainwater is attributed to Zeus, whom the faithful call upon to pour rain onto the earth and all that lives and dies on it. Not so gentle are his other activities, he is also the one who sends thunder and lightning our way, no less examples of his meteorological/weather-making power.[38]

Rainwater wets the ground and, in some cases, also the exposed *crepidoma* at the sides of the temple through the streams of water pouring from the predominantly lion-headed waterspouts of the roof's *sima*. If the deck is a *fifth façade*, these drops can also be seen as its tears.[39] At hypaethral temples these effects are accompanied by the direct fall of rain on the interior exposed part of the *stylobate* or unpaved courtyard. This is a practical solution to the need of shedding the water off the temple's roof, but at the same time celebrating the heaven-sent gift. Regularly spaced lion mouths are typically intertwined with images of vegetal fecundity and vigour, spirally voluted plants with acanthus leaves and anthemia antefixes most commonly *[29]*. Like the *crepidoma*, the *sima* couples phenomena that are above and below, but at the upper level there is also displacement: plants have been uprooted and

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relocated, and animals elevated. Key for us, though, is the regularity of the spout spacing, no less repetitive than the intercolumniation below, forming an equivalent to or anticipation of Kahn's 'architecture of water'. The means of problem solving were thus put on show and used to reinforce the understanding that all the building's parts had roles to play in the cooperative workings of the natural and cultural (religious) worlds – *resolution*, as he called it. Rain was sent by the sky-god Zeus to reinvigorate the earth-body of the mother-goddess Gaia, or Olympian Demeter. By doing so, he/it moisturised and refreshed the earth, which in turn nourished the emergence and growth of plants, trees, crops, and other living things.

We have seen that water is variously and repeatedly put on show at the Salk Institute, in the crevice-like canals, lake-like pools, cascade-like fountains, and so on. But once again, complementing the seen was unseen usage. Water, utilised for cutting-edge scientific research, is distributed at will through a highly advanced network of pipes and electric machinery. The laboratory buildings' interstitial pipe-space is considered a seminal example of Kahn's 'servant/served' space, but also as a zone of extraordinary performance.[40] It is a true marvel of human ingenuity and technical precision. Water, of course, is also used for more mundane, everyday practical reasons and must be taken away from the buildings' rooftops and the plaza, the latter built on a high foundation, which demanded significant earthworks, as seen in photographs of the site during its construction process.

On the plaza, rainwater gathered from the smaller drainage canals first pours into a central channel, the so-called River of Life, which in turn feeds a cascading stepped fountain-waterfall *[3]*, which emulates the cascading rainfall periodically gathered from the canyons' rill-channels, gullies, and ravines, that direct its eventual fall and return to the beach and ocean, just beyond the Institute and its plaza *[4]*. The 'River of Life' represents the 'constant trickle of discovery spilling into the great body of knowledge, symbolized by the Pacific Ocean',[41] says the Salk News correspondent, and perhaps, as was intimated above, also representing creativity returning to its source.

While a façade, typically vertical, articulates the relationships between the interior and exterior, mediating the two, the platform as a *fifth façade* mediates what is below, on, and above ground. As Kahn and Barragan noted, the plaza at the Salk Institute rises to the sky, uniting itself with it. Below, at its sides are the caverns in which research operations affirm or deny upper-level speculations. Likewise, the temple's *crepidoma*, standing between soil and sky, accentuates diurnal and seasonal phenomena and cycles, the sun's rays, shadow casting, and rainfall, elements whose interplay



28 **Salk Institute for Biological Studies, shadows on the platform, the façades, and behind the study towers.**

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29 **Marble sima of the Classical Temple of Apollo at Delphi, lion-headed waterspouts intertwined with a band of spirally voluted plants and anthemia antefixes, Archaeological Museum of Delphi.**

bring soil and sky into union. Of course, the Salk Institute's plaza is neither an *orchestra* in the ancient Greek sense of the word, nor a threshing floor. What *drama* there might be in the modern case would be rather more reified – suffering and rejoicing in the exchange of arguments and ideas. Similarly, any equivalent to the seasonal singing and stomping on threshing floor would be in the separation of the wheat and chaff of thought through dialogue, perforce embodied in the affirmative or indifferent intonations of the voice, gestures of acceptance or refusal and so on. Any argument for equivalence in type-form requires a plausible account of equivalent experiences, those that endow the modern with content comparable to that of the ancient examples. Earlier we stressed *performance* rather than appearance in interpretations of similarity. Here we accent the term's dramatic potential.

An empty platform full of potential

Kahn's *fifth façade* is, thus, not an indifferent or casual surface. Its a-typical articulation and relationships to the surrounding natural setting and built elements qualify it for occupation on special occasions. Of course, everyday casual walking occurs there, also leisurely occupation – but there's always a sense that they are somewhat intrusive. Nor does the horizontal face merely 'solve' a practical problem. Being empty most of the time, waiting to be filled at special moments of the year, it has been prepared to reveal aspects of the latent richness of the site and the highest aspirations of its human occupants.

What is true for the Salk Institute's platform may provide keys for the characteristics of this topic of design more generally. We have seen that platform labour involves seaming together and spacing apart phenomena that are above and below its visible surface, sky and soil. Materials matter in the make-up of platforms, as they modulate the surrounding terrain, with as much contrast as similarities. They are harder, flatter, and dryer, prepared to receive all that the sky cares to give, sunlight and shadow, wind and rain, heat and cold, as well as the patterns of life and human movement they accommodate and represent. All this work unfolds within limits. Yet, the boundaries that platforms establish have parallels in the wider terrain. Platform space both defines and distances itself. Yet, thus cleared, platforms do not mind waiting for events to occur within their limits, scripted or unscripted; in fact, their patient readiness is recognised culturally as a sign of their unstinting generosity.

The Salk Institute and the Greek temple may be greatly distant in time and space, but not so in spirit and sensitivity, particularly how their respective platforms, their *fifth façades*, engage the natural world, how they bring to attention the local ground and the distant horizon, or, more basically, how they stand between sky and soil, staging their interaction as the full context of human institutions, life, and creativity.

Notes

1. Louis I. Kahn and Richard Saul Wurman, *What Will Be Has Always Been: The Words of Louis I. Kahn* (New York, NY: Rizzoli, 1986), p. 269.
2. Marc Treib, 'To End a Continent: The Courtyard of the Salk Institute', *Journal of the Society of Architectural Historians*, 65:3 (2006), 402–27 (p. 414, note 43). In an alternate recollection, reported in 'Form and Design', Barragan is to have said: 'If you make this a plaza, you will gain a façade-a fifth façade.'
3. Kahn and Wurman, *What Will Be Has Always Been*, p. 269, emphasis added.
4. Ibid.
5. Ibid.
6. Ibid.
7. Treib, 'To End a Continent', p. 422 (note 70: Kahn Collection, AAUP,

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Louis Kahn to Jonas Salk, 19 December 1966).

8. See Mary Huntington Hull, 'Gift from the Sea', San Diego (February 1962), p. 41. We thank Daniel Friedman for this reference.
9. The slab of the second 'pool' from which water is discharged has an inscription with Roman lettering: 'ELINOR von OPEL', in (principal authors) Peter Inskip, Stephen Gee, Liz Sargent, Conservation Management Plan, Salk Institute for Biological Studies, La Jolla, California, October 2016 [redacted May 2017], p. 257 [accessed 1 February 2023]. Elinor von Opel (1908–2001) was a member of the German von Opel family of automobile industrialists and the greatest sponsor of the institute <https://www.welt.de/print-welt/article421384/Ein-Mann.html> [accessed 1 February 2023].
10. 'Salk has a global reputation as a cathedral to science, an homage to art', says Salk President Rusty Cage. 'The Institute's founder, Jonas Salk, understood that art and science come from the same creative source. It was his intention that his Institute become a place where scientists and artists could both find inspiration, and we're honored that Louis Vuitton found inspiration here.' and further, 'The "River of Life" water feature cutting through the courtyard represents the constant trickle of discovery spilling into the great body of knowledge, symbolized by the Pacific Ocean.' Salk News, 'Salk Institute Hosts Louis Vuitton Fashion Show: A First for the Institute, the May 12 Event was Held at Sunset on the Iconic Campus', 13 May 2022 <https://www.salk.edu/news-release/salk-institute-hosts-louis-vuitton-fashion-show/> [accessed 1 February 2023].
11. For an indication of the then current state of thinking, see: Jørn Utzon, 'Platforms and Plateaus: Ideas of A Danish Architect', *Zodiac*, 10 (1962), 112–40 (pp. 114–17).
12. David Leatherbarrow, 'The Beginning of the Beginning: Louis I. Kahn's Site's Sketches at the Salk Institute', in Michael Merrill, *Louis Kahn: The Importance of a Drawing* (Zurich: Lars Müller Publishers, 2021), pp. 66–77.
13. In John Lobell, *Between Silence and Light: Spirit in the Architecture of Louis I Kahn* (Boulder, CO: Shambhala, 1979), p. 38.
14. In Ibid., p. 38, and Merrill, *Louis Kahn*, p. 174.
15. Leatherbarrow, in Merrill, *Louis Kahn*.
16. Louis I. Kahn, Lecture, 1973, in Lobell, *Between Silence and Light*, p. 5.
17. Merrill, *Louis Kahn*, p. 79. This thought was also stated in one of the texts often cited in studies dedicated to Greek temples, Vincent Scully, *The Earth, Temple, and the Gods Greek Sacred Architecture* (New York, NY: Frederick A. Praeger, 1962), p. 65. 'Paestum marks the great event in architecture when the walls first parted and columns became.' Scully refers to Kahn as 'sensitive modern architect, not an art historian'. Of course, the two were professors at Yale.
18. 'The Room', Kahn 1971 charcoal sketch, Louis I. Kahn Collection, University of Pennsylvania.
19. Louis Kahn, 1968, quote accompanying Kahn's pastel sketches of the Greek temple in Sue Ann Kahn, 'The Colour of Light, The Treasury of Shadows', in Merrill, *Louis Kahn*, pp. 78–87 (p. 83).
20. Sue Ann Kahn, 'The Colour of Light, The Treasury of Shadows', in Merrill, *Louis Kahn*, pp. 78-87 (p. 78)., citing Louis Kahn, conversation with Jan Hochstim (1972), in Jan Hochstim, *The Paintings and the Sketches of Louis I. Kahn* (New York, NY: Rizzoli, 1991), p. 28.
21. Kahn and Wurman, *What Will Be Has Always Been*, p. 269.
22. Daniel Friedman developed the exceedingly insightful metaphor of the plaza as a 'solar stage'. See: Daniel Shay Friedman, 'The Sun on Trial: Kahn's Gnostic Garden at Salk' (PhD dissertation, University of Pennsylvania, 1999).
23. For the site as the 'tomb of Asklepios', see: G. Roux, *L'architecture de l'Argolide aux IVe et IIIe siecles avant J.-C.* (Paris, 1961), pp. 190–4.
24. 'Like the snake itself, a rotunda with a labyrinthine substructure had chthonic implications. But no more solely chthonic than the snake of Asklepios, which often dwells in trees, and particularly the snake which according to legend climbed a palm tree in the sanctuary of Apollo at Antium, so showing its Apollonian nature. The superstructure was more or less a copy of the heavenly cosmos. The religious meaning of the labyrinth, which leads down into the depths but only in order to combine "below" and "above" into a unity, is revealed also at Epidauros.' Karl Kerényi, *Asklepios: Archetypal Image of the Physician's Existence* (New York, NY: Pantheon Books, 1959), p. 105.
25. On the primacy of the representational aspect of the *crepidoma* as an elevated ground instead of its practical use, see: Joseph Rykwert, *The Dancing Column: On Order in Architecture* (Cambridge, MA: MIT Press, 1996), pp. 172–3.
26. See note 10.
27. 'Just as often as he laid out wide horizons he cut them apart, in order to show their support, bottomless – unmarked and unexplored – though it was. He "grounded" the horizon in brutally exposed earth, unarticulated but capable of sheltering the secrets of its formation and suggesting possible spaces of inhabitation, alongside the sage and in the shadows, if one chose to step downward. The site's vertical depth belonged to the earth but was also – one imagines he would have said – unmeasurable. When the two directions were combined, the broad levels granted the valleys their precipitous fall, unknown depth, and unreasonable stability. Likewise, the earthy ground supported its radical alternative, sun-dried decks, broad enough for a wide-eyed ramble, but implacably silent *[…]* Probably the best way to show this is with a partial section: inhabitable spaces between subsoil and sky, in portrait format.' Leatherbarrow, in Merrill, *Louis Kahn*, pp. 66–77 (p. 76).
28. See note 17.
29. Antonios Thodis, 'On the Corinthian Column at the Temple of Apollo Epikourios at Bassae', Harvard University, Classical Continuum, Harvard's online publication venue sponsored by the New Alexandria Foundation, 20 March 2023 <https://continuum.fas.harvard.edu/antonios-thodis-on-the-corinthian-column-at-the-temple-of-apollo-epikourios-at-bassae/>.
30. Frederick A. Cooper, 'The Temple of Apollo at Bassae: New Observations on Its Plan and Orientation', *American Journal of Archaeology*, 72:2 (April 1968), 103–11.
31. Nancy Kelly, 'The Archaic Temple of Apollo at Bassai: Correspondences to the Classical Temple', *Hesperia: The Journal of the American School of Classical Studies at Athens*, 64:2 (April to June 1995, The American School of Classical Studies at Athens), pp. 227–77 (p. 243). As noted by Kelly: 'There were also adjustments in the intercolumniations of the surrounding peristyle to permit this effect' (p. 243).
32. '*[…]* the sun's rays in the adyton at the summer sunrise are part of an annual choreography, that can be observed by following the

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movement of the sun's rays at the sunrise hours through the year. The morning sunlight due to the changing position of the sun throughout the year relative to the east traverses the interior floor of the temple and its southern and western walls. At summer solstice two beams of light hit, one the centre of the adyton's southern wall and the other its southwest corner, then as one beam it hits the west wall of the adyton on the equinoxes when the sun rises directly at the east. Finally, again as one beam it hits the Corinthian column towards the main cella in the winter solstice, when the sun rises to the southern-most position of east.' Thodis, 'On the Corinthian Column', p. 42.

33. See notes 16, 19.
34. Louis Kahn, conversation with Peter Blake, 20 July 1971, Merrill, *Louis Kahn*, pp. 78–87 (p. 86). Incidentally, from 2012 onwards, the sun's movement provides electrical energy for the Institute by 'harvesting' sunlight with solar panels on top of the building's roofs.
35. The aim was 'to improve overall energy efficiency, sustainability, and cost savings'. Salk News, 'Salk Institute named SDG&E 2012 Energy Champion', 11 May 2012 [accessed 1 February 2023]; Conservation Management Plan October 2016 [redacted May 2017], p. 50 [accessed 1 February 2023].
36. Euripides Ion 112–125, Euripides, *The Complete Greek Drama*, ed. by Whitney J. Oates and Eugene O'Neill Jr in two volumes. 1. Ion, trans. by Robert Potter (New York, NY: Random House, 1938).
37. 7 Euripides Ion 100–160.
38. For a cult site of Zeus as meteorological/weather god, which involves rituals related to the invocation of rain, see: Lycaean Zeus on Mt Lykaion in Arcadia Pausanias [8.38.4]; Simon Hornblower and Antony Spawforth, *The Oxford Companion to Classical Civilization* (Oxford and New York, NY: Oxford University Press, 1998), p. 786, s.v. Zeus; Walter Burkert, *Greek Religion* (Cambridge, MA: Harvard University Press, 1985), pp. 120, 126, 266.
39. Here we invoke a helpful image from John Ruskin's account of geological 'faults' and 'substances in solution', giving rise to 'crystal sorrows', as explained in John Ruskin, *Ethics of the Dust* (London: Smith, Elder, and Co., 1865), chapter 9.
40. Kiel Moe, 'Extraordinary Performances at the Salk Institute for Biological Studies', *Journal of Architectural Education*, 61:4 (2008), 17–24 (pp. 19–20).
41. See note 10.

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Competing interests

The authors declare none.

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