Practice as 'Theory': Amorn Srivongse's Labour-Intensive Precast Construction

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Abstract

Unlike spoken and written theories, the 'theory' explored in this paper is drawn essentially from 'practice'. It focuses on the theoretical groundwork developed empirically within the construction process, which is not always verbally articulated. The paper drew on philosophical and historical discussions concerning 'theory in practice' to investigate the construction of Amorn Srivongse's Faculty of Engineering, Prince of Songkla University. In particular, it reckons with how the processes of precast construction fabricated onsite might be understood as an embedded theoretical action. The finding is that the ways in which Srivongse's precast concrete system was developed—experimental, labour-intensive, craft-based and treating the process of construction as integral to the process of design—indicated that construction was more than simply a medium through which the architect's ideas were expressed. Out of his calculated employment of precast construction could potentially emerge a certain implicit, non-articulated intellectuality, which is no less a 'theory' than verbally articulated statements. In opening up possibilities for thinking about practice as 'theory', Srivongse's self-invented precast concrete is exemplary in critiquing the conventional thinking about architecture as theory guiding practice.

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FIGURE 1: A unit of roof concrete dome repurposed for a lotus pond basin. Source: Pinai Sirikiatikul.

Introduction

In one of my several visits to a former office of Thai architect Amorn Srivongse (1928–2012) to conduct archival research about his work, his son, who has inhabited his father's office after his death, pointed me to a lotus pond basin buried under the terrace ground. He explained that the basin unit is similar to a module of concrete dome his father designed for covering the structure of the Faculty of Engineering at Prince of Songkla University (PSU)—the country's largest steel frame ever built up to the 1960s. Coming as a surprise to find out that the roof component had been repurposed by turning it upside down to contain artificial pond water, I was curious to know more about its significance (Figure 1).

In searching the archives to find out more about the project, while drawings and construction records provide helpful information about the design and schedules of building works, little is known about how the roof component was made. Although technical specifications provided a valid account of the project's technical requirements in general, they have nothing much to say about the production of this component. Neither the material used nor methods of construction have been satisfactorily described. Not until visiting the built work itself did I realise the potential for further investigation.

FIGURE 2: The undersides of the concrete domes, while painted, still allows the shuttering marks of *lamphaen* to be partially visible, giving a humanistic touch to the precast components. Source: Pinai Sirikiatikul.

Seen from below, the roof dome's undersides left fair-faced show a striking feature of woven patterns. All the roof domes have the same size. However, the unique patterns left so evidently on every single roof dome, rendering each one distinct from the others, indicate some craft employed in the making rather than production in a factory or fabrication on an assembly line. Interviews with engineer Pibul Chinawat, who happened to visit the building site when the roof components were fabricated, reveal fascinating details. What appears on the roof domes' underside surfaces were shuttering-marked finishes of a local bamboo mat called *lamphaen*, used to facilitate the casting process. Built in 1967 in a remote location in Hat Yai, Songkla and finished in 1971, one year before Esso Headquarter in Bangkok—the fully developed prefabricated building designed by the Swiss firm Intraren Architectural Design—the Faculty of Engineering, PSU has largely passed architects by. To the best of my knowledge, the precast system employed at the Faculty of Engineering was the first time in Thailand that anyone had deliberately set concrete, generally regarded as a modern material at that time, within the context of older ways of building. For this reason alone, it is worth a look (Figure 2).

Throughout his life, Srivongse never published his thoughts about his work. Nor was he ever trained as an architect in any architectural school.

However, this is not to say that his work lacks a theory. His self-invented precast system, which combined the technical confidence of local building tradition with a keenness of mind unexpected in mass production, revealed that he had a calculated strategy for executing the work. He was just not interested to disclose this publicly. Yet can something produced solely through 'practice', without spoken or written entity, also be called a 'theory'? How can one talk about practice as having a theoretical proposition?

Just by asking these questions, we now face a paradox. If anything in 'practice' can be described as 'theory', it would seem to contradict the accepted nature of architectural theory. Theoretical discussion amongst architects is primarily concerned with design; theories derived from architects' intentions usually touch more on the design process than on the construction. Whatever thoughts architects put into the construction process have usually been characterised by practical terms. As a labour-intensive activity of bringing materials and labour into conjunction in the making of architecture, construction is commonly thought of as a domain that involves practical exertion rather than a purely intellectual one. This condition, of being a domain involving a great deal of practicality, leads to the common understanding of construction as being defined by an absence of theory. What could these technical and labouring processes possibly have in common with the work of the mind? How can we talk about this contradiction?

Practice as 'Theory'

In considering this issue in a more theoretically defined manner, some philosophers and historians have put forward arguments on how 'practice' could be thought to constitute 'theory'. The book generally regarded as the starting point for a 'theory of practice' is *The Concept of Mind*, published in 1949 by the British philosopher Gilbert Ryle. In his book, Ryle called into question the convention of a "local geography of knowledge" in human life. He argued that previous philosophers had made a mistake in postulating an invisible existent called "mind" as something situated "in" a body, governed by mechanical laws. Challenging the mythical secret about the mind—"that theorizing is the primary activity of minds and that theorizing is intrinsically a private activity, silent, or internal operation", he argued that such a "place" of the mind, lying "inside our heads", is merely metaphorical.[1] For Ryle, the "mind" does not exist in that abstract, internal-operative form, and therefore the intellectualists' assumption that intelligent practice can be predicated on its mental source is unfounded.

Ryle's criticism of the mythical bifurcation of "mental causes" and their "physical effects" is clear. His counter-argument is based on the fact that

no abstract knowledge, however well-described, can account entirely for an intelligent performance. "Knowing how to apply maxims cannot be reduced to, or derived from, the acceptance of those or any other maxims."[2] Ryle aimed to show that

> there are many activities which directly display qualities of mind, yet are neither themselves intellectual operations nor yet effects of intellectual operations. Intelligent practice is not a step-child of theory. On the contrary theorizing is one practice amongst others and is itself intelligently or stupidly conducted.[3]

In this regard, Ryle shifted attention away from preconception as a starting point of intelligent action and paid attention instead to the procedure of that action, through which "skill, habits, liabilities and bents" are intelligently performed. Ryle's proposition that the action is not preceded but accompanied by an intellectual performance opens possibilities of theorising, which essentially emerge in practice.

Concerning theories, Ryle distinguishes between "having a theory" and "building a theory". Having theories, he stated, is being "in a position to tell a theory"; building theories, on the other hand, involves those processes of exertions and observations, which constitute a theory, and without which the theory would not have been built.[4] While those who have theories can deliver theoretical lessons through spoken or written words, the act of building-theory is not necessarily created in literary or verbal form, nor is it necessarily intelligible. However, this does not mean that its activity, purely physical and unaccompanied by any colloquy though it may be, does not entail thought and thinking. For Ryle, it is essential not to keep the mental and the physical as separate entities but to treat the "mind" as operational performance: the mental and the physical are parallel in operation.

Ryle's idea that the mind is operational performance has had a parallel in the philosophy of phenomenology through the proposition that ideas cannot be separated from things. This proposition provides insight into how work like construction might be thought to have embedded in it a theoretical dimension. By its nature, construction is an activity that produces permanent things by making, labouring, assembling—literally, according to John Ruskin, turning what was otherwise inert and unstable into something of use and permanent.[5] Once "thought", "labour", "materials" and "means of building" are poured into the production process, they become embedded in the tangible form of architecture, which offers the possibilities of tracing each component's origin. A building reveals what it was made of, by whom or by

what means its material substances were produced and put together. The use of materials, the constructive manner in which they are used, and the articulation of materials in architectural forms are the tangible signs of the work's processes. Just as its physical manifestation makes visible the production process, so too the work of architecture, in turn, produces and preserves traces of its past. It bears a recollection of an "active historical process" through which it was built, and which remains in its being. This durability gives architectural works the capacity to preserve the intentions of the persons who made them.[6]

Construction may customarily be seen as practical and not purely theoretical because it is a labour-intensive activity. However, there is an intellectual quality that lies deep within it that can neither be found outside its territory nor substituted by any other kind of work. Nor can it be removed from the work of architecture unless the construction is destroyed. It is this unique feature of architecture—in that its conception cannot be examined independently of its substance—that provided Martin Heidegger with the grounds on which to criticise a Platonic view that things could be formed in the mind before their existences. As he put it, "The truth that discloses itself in the work can never be proved or derived from what went before. What went before is refuted in its exclusive reality by the work."[7]

This brief survey of traditions of 'theory in practice' draws attention to the fact that philosophers have done a better job of reconciling the split between 'theory' and 'practice' than has architecture. What philosophers like Ryle and Heidegger make obvious appears to have been obstinately resisted or ignored in the world of architecture. The fact that the traditions of 'theory in practice' have largely been passed by within architecture cannot be dismissed as occurring out of mere ignorance. For good reasons, architects and engineers have established their occupations as distinct from others in the building trades precisely upon the grounds, however illusory, of a theory-practice divide that has allowed them to think about architecture in terms that are independent of the production of building. It has for so long been a convention for architects to regard this division, in which they first conceive the design for a building, then hand over that design to be executed by tradesmen, as fundamental to their thinking about architecture that to suggest that 'intelligent practice' is not an application of any previously existing theory, but is a 'theory' in its own right, would seem to threaten their own occupation, by making it appear theoretically insufficient. This conventional division of architecture into two categories—theory and practice—is so rooted in architectural discipline as to make it difficult for architects to think of 'theory' and 'practice' as integral.

There appear to be some historians of architecture and of technology who have put forward arguments that are useful for thinking about 'practice' as a sort of 'theory'. One such is Andrew Saint's "sound building" argument. In *The Image of the Architect*, published in 1983, Saint suggested two kinds of theories: one is based on artistic discourse; another lies in "practice". Then he pointed out that architects use the first type of theories as self-justification, but it is the second that determine what they are. Architects' self-images, Saint stated, are constituted as much by abstract theories as by their practice. Saint's suggestion is that we should shift attention away from what architects said or what they thought of themselves and look instead at what they did to understand architects' "truer" proposition.[8]

Another line of argument in considering the practice as a theory comes from David Edgerton's insight into technology. In *The Shock of the Old*, Edgerton pointed out that it is an unfortunate myth of modern culture that we are made to believe (by the promoters of new technologies) that new technologies are always better than older ones. Observing the ways in which old technologies have continued to be used since 1900, particularly in cases where new technologies failed to produce a better result (which is frequently the case), Edgerton proposed that new technologies do not always replace older ones. More particularly, older technologies still occupy a larger share of the world's technological resources than so-called 'new' technologies. As he wrote,

> many things we think of as old remained in practical use for longer than our future-oriented accounts of technological history allow. Our industrial, scientific and technological museums testify to the long life of many machines, and yet, at the same time, many deny the significance of this point for our thinking about technology.[9]

For Edgerton, many technologies we think of as new have been around us for longer than we usually acknowledge. The new inventions of technology have often been less important than the survival of seemingly old technologies that have always played a significant role in society.

Edgerton drew his evidence from various social practices, ranging from transport to contraceptive pills and refrigerators to machine guns. Although he has less to say on construction, his general argument has implications for construction no less than the other practices. While building construction is constantly developing, 'primitive' ways of buildings, like mud and rammed earth construction, are far from disappearing but are still in active use nowadays in many parts of the world. Styles of architecture may change

from time to time, yet construction does not always alter in their footsteps. The most avant-garde design is often not built out of the latest construction method; indeed it is common for architects to adapt older ways of buildings in their most futuristic designs. This persistence of old technologies in the changing world of architecture is most evident and consistent with Edgerton's remark about technologies: "the seemingly old was much more important than we sometimes care to recognise".[10] In this respect, his argument is potentially helpful in thinking about the inertia nature of construction, which tends to retain older ways of building rather than dismissing them. Is there a theory that goes with the technological assimilation of new technology into an existing building tradition? If so, where does that theory lie? No building in Thailand demonstrates this sort of theory better than the building practice of the Faculty of Engineering, PSU, designed by Amorn Srivongse, as made evident in his system of onsite precast concrete.

The Faculty of Engineering, Prince of Songkla University[11]

Located at the south-western corner of PSU reservoir, the Faculty of Engineering stands unmistakably like a piece of engineering. It is supported on twisted concrete columns positioned 10 m by 10 m apart. Sitting on the columns is the roof structure of a double-layer space frame, made entirely of steel tubes. On top of the space frame, valley gutters, designed into an equal-armed cross-component and made of precast processes, are installed as an integral part of the roof structure. These valley gutters are then joined together to achieve the roof structure's structural continuity, creating grids of valley gutters upon which precast concrete dome components rest. As each of the supporting columns, together with the space frame and concrete gutters, supports 16 concrete domes, overall, the entire edifice consists of 3,650 units. The requirement for faculty facilities of 31,800 sq m, which covers the entire site of 150 m in width by 150 m in length under the single roof, coupled with the demand for rapid completion, led the architect to develop the rapid form of construction: onsite precast concrete for the roof components. Although the modular design of the building components seems ideally suited to prefabrication, this is not a case of prefabrication. Indeed, thinking of it in terms of the prefabrication system, there are more contrasts than similarities.

As part of the national plan for expanding education at the university level to major provincial towns, PSU was the third university established outside Bangkok, following Chiang Mai University in the north and Khonkhen University in the north-east. Situated on the sloping terrain of Nang Hong

FIGURE 3: Faculty of Engineering, Prince of Songkla University, designed by Amorn Srivongse and built between 1967 and 1971. Source: Pinai Sirikiatikul.

Hill, the site of PSU at Hat Yai, Songkla, though considered to be 'a real centre of Southern Thailand', had relatively limited access to advanced building technology. Nor did it adopt any available precast concrete system; a precast concrete system was not widely used in Thailand until 1973 when the National Housing Authority adopted precast concrete to provide affordable housing for the low-income. In any case, using a patented system at Hat Yai would have been inappropriate on account of its remote site. Unlike a typical application of prefabricated building, which aims at standardisation and quality products with a minimum of labour, the precast system at the Faculty of Engineering, PSU was carried out through craft process—not by specially trained workers, but by cheap, daily-hire unskilled workers. Indeed, it was through labour-intensive, craft-based operation and with limited access to local means that Srivongse took full advantages of the site and labour conditions (Figure 3).

Srivongse's creative acts lay in the building process no less than the design process for all his actions. The thinking behind the design and construction is both significant to understand his creative use of the precast system. The correspondences between his structural engineer, Rachot Kanjanavanit, and a site worker further indicate that the architect gave instructions on how the roof component should be made. However, the general contractors approached these instructions with hesitation. When the engineer dropped by for a site visit, they begged the engineer for an alternative, but the engineer immediately replied that they should adhere closely to the architect's instruction. We can only guess as to the exact instructions the architect gave and why

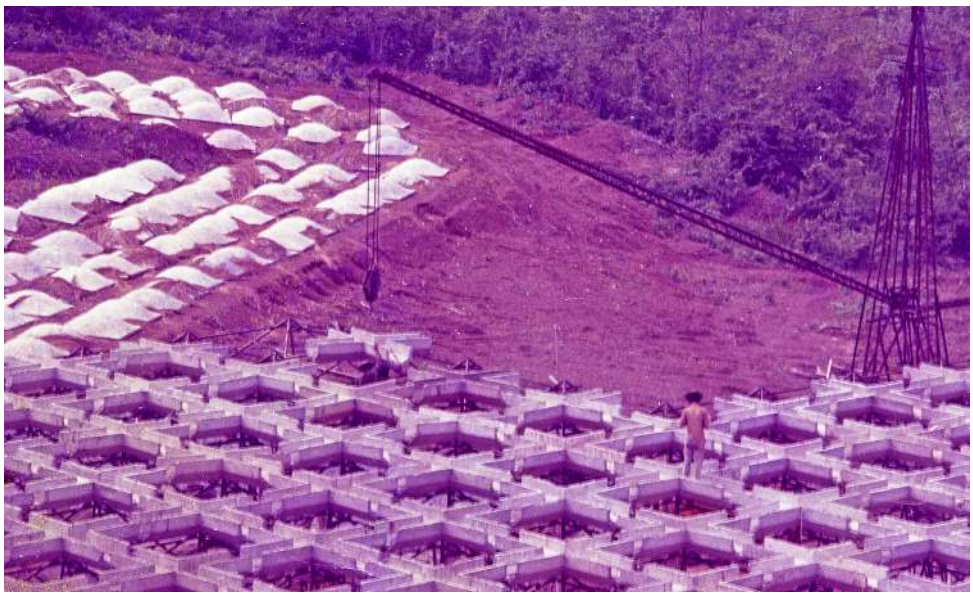

FIGURE 4: The photograph under construction illustrates particularly well how the precast elements were being made and assembled onsite. Source: Prince of Songkla University archives.

the contractors were hesitant to follow them, as the evidence has dried up at this stage. This lack of evidence from the architect's verbal description and representation forces us to deduce instead from the construction procedures and the built outcome.

Srivongse aligned himself with progressive, modernist architecture in terms of architectural style, but in building terms, he was practical enough to invent his casting method for all the precast concrete elements, apparently made onsite using earthen formwork. While the price paid for using earthen formwork is a considerable amount of site work, with suitable fill material readily available at the site, earth form not only proves cheaper than a complicated formwork as the haulage work is reduced to a minimum, it also ensures greater contour accuracy, necessary for making the roof components. A module of concrete domes is designed into 40 cm in height with a square base of 2.5 m by 2.5 m. With this size, they can be cast and their quality be controlled by human hands. Not only was this technique suited to local conditions, but it also offered an opportunity for adding human elements to the finished result (Figure 4).

To prepare the mound, workers formed the earth in a desirable shape, then used hand tools to compact it for moulding. However, the earth mould suffered from the drawback of adhesion between the mould and the concrete cast upon it. Thus, before pouring, the mould was treated with the bamboo

mat to facilitate the casting processes. By treating the earth mound with the mat before pouring, a 2 or 3 cm-thick layer of wet concrete could be poured onto the adequately prepared mould and carefully tamped with a hand tool without exposing concrete to the soil underneath. Not only did the bamboo mat act supremely well as a release agent to prevent the adhesion of freshly placed concrete to the earth mould, but the pores within it, as a result of the weaving technique, helped to stiffen wet concrete by draining its excess water. Moreover, traces of this woven texture for the concrete dome, removed after the concrete was settled, are left visible. Rather than covering the underside surfaces of the domes with plaster to achieve smooth surfaces, the architect chose to apply only a thin layer of white paint to the surface, allowing the casting component to carry the direct imprint of its own making. The texture left on the underside surfaces of the concrete dome is especially appealing, making visible both the human labour and the process through which the work was created.

Thus labour-saving cannot be claimed as the reason for its creation, though the modular system adopted for its overall design contributed to building economy and efficiency. At the Faculty of Engineering, PSU, the history of precast concrete is, in fact, the history of labour-intensive construction. The architectural value should be judged by its success at manufacturing the unprecedented amount of repeated sections with limited local means, with craft skills and without recourse to industrialised modes of production. Srivongse's onsite precast system is better understood in terms of an evocation of older ways of building that allowed architecture to be both progressive while at the same time connecting with an earlier tradition. What was being carried out at the Faculty of Engineering is the belief that construction is an active mechanism whose flexible nature can absorb progressive enthusiasm and desire for handicrafts within a historical perspective.

What makes the construction of the Faculty of Engineering so fascinating is the divergent approach from prefabrication of Western European countries, which can be said to be the equivalent of a practical theory, in Saint's second sense of the term, whereas the co-existence between new technology and existing building tradition reinforces Edgerton's argument about the persistence of old technologies (Figure 5).

Conclusion

The evidence of the precast concrete at the Faculty of Engineering, PSU, where drawings and building documents were subsidiary to the act of construction, should warn us against expecting an architect's account to reveal

FIGURE 5: Prime Minister Field Marshall Thanom Kittikachon and Amorn Srivongse during the building visit in 1971. Source: Amorn Srivongse Archives.

all there is to a work of architecture. While the architect's explanations and drawings express intentionality, the built work, on the other hand, speaks on its own terms and indeed contains both things that were intended and things that were not. This should warn one not to expect the account of the design stage to explain everything about a piece of architecture. Prefabrication, as an architectural ideal, may be a desirable image thought by the architect when designing. However, when it comes to construction, a built work gains something over the architect's imagination since it is a consequence of all actions that have gone through all the processes involved, from the design stage to the process of execution. A careful examination of the work itself and the condition under which the work was created makes it possible for us to see the act of 'building' as something that can carry 'thought' and is therefore capable of bearing theoretical propositions. Rather than a passive given, construction is ultimately an active agent—a 'thought-embedded-action' process—serving as much as 'a mode of knowing' as a mode of building. In a similar fashion to Ryle's concept of mind, construction can be seen as an internal mechanism of the larger architectural whole, through which it constitutes the work's 'substance'.

In opening up the possibility of thinking about building practice as a theory, I take Srivongse's self-invented precast concrete to critique the conventional thinking about architecture as theory guiding practice, in general, and prefabrication, in particular. Rather than treating construction as a less-than-adequate bearer of ideas, my intention was to avoid the tendency to isolate the theoretical dimension of the work from the process and consider construction itself an embedded theoretical action to disclose its implicit intellectual dimensions. Only by dealing with these processes, in which practical exigency and material relations of the work are immanent, will we get closer to understanding building practice as a constituent of architecture.

BIOGRAPHY

Pinai Sirikiatikul is an Assistant Professor at the Faculty of Architecture, Silpakorn University, Bangkok, Thailand. He completed his PhD, entitled "Constructional 'Theory' in Britain, 1870s–1930s", in 2012 at University College London. His current research focuses on construction history in Thailand from the late 18th to the 20th centuries. His recent book *Unpacking the Archives: Amorn Srivongse* released in 2020 explores the architectural works of the lesser-known, self-taught architect, Amorn Srivongse.

NOTES

1 Gilbert Ryle, *The Concept of Mind* (Middlesex, England: Penguin Books, 2000), p. 28.
2 Ibid., p. 32.
3 Ibid., p. 27.
4 Ibid., p. 270.
5 John Ruskin, *The Seven Lamps of Architecture* (New York: John Wiley & Son, 1865), Chapter on "The Lamp of Life".
6 For a useful philosophical discussion on the 'durability' of works, see Hannah Arendt, *The Human Condition* (Chicago; London: University of Chicago Press, 1998), p. 137.
7 Martin Heidegger, "The Origin of the Work of Art", in *Poetry, Language, Thought* (New York; Toronto: Harper & Row; Fitzhenry & Whiteside Limited, 1975), p. 75.
8 Andrew Saint, *The Image of the Architect* (New Haven and London: Yale University Press, 1983), pp. 161–76.
9 David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (London: Profile, 2008), p. 29.
10 Ibid., p. 51.
11 See the detailed discussion about this project in Pinai Sirikiatikul, "Onsite precast concrete: A critical approach to concrete at the Faculty of Engineering, Prince of Songkla University, Thailand", in *Building Knowledge, Constructing Histories*, ed. Ine Wouters, Stephanie Van de Voorde, Inge Bertels et al. (London: Taylor & Francis Group, 2018), pp. 1229–35; Pinai Sirikiatikul, *Unpacking the Archives: Amorn Srivongse* (Bangkok: The Association of Siamese Architects under Royal Patronage, 2020), pp. 77–105, https://asa.or.th/handbook/unpacking-the-archives-amorn-srivongse/ [accessed 26 June 2021].

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