THE LARGE-SCALE GHOST

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The two-stage Nordic competition for the design of the new university in Trondheim was declared on December 5, 1968, after several years of preparation both on the local and the national level.[1] The organizer, and the future client, SBED—the state agency for the construction and management of public buildings—issued a four-page invitation: Design a university complex with capacity for 37,000 students and employees, fitted in the 700,000-square-metre structure on 1,500,000 square metres of former agricultural fields at Dragvoll, just outside the city of Trondheim. The assignment also required second, a more detailed design of the first stage, consisting of 40,000 square metres.[2]

This competition was an indirect consequence of the overarching societal transformations in the first two decades following World War Two in Norway. The modernization processes had initiated numerous large-scale state interventions, from mass-housing projects on the outskirts of the cities to the implementation of new infrastructure. The postwar baby-boom generation was growing up and headed for institutions of higher education. The idea of higher education itself was being transformed from education for the elite into education for the masses.[3] The conjunction of these factors, along with the demands by the rising national industrial complex for a highly qualified working class,[4] caused an educational explosion. In 1950 there were 7,500 students in Norway, 10,000 in 1960, and 30,000 in 1970.[5] In 1968 the Norwegian parliament decided two new universities should be created, one in Trondheim, and one in Tromsø. A new educational infrastructure was about to emerge.

By the deadline of June 2, 1969, twenty-four proposals had been submitted. The competition jury consisted of nine members, four of whom were practising architects: Sverre Fehn, Birger Lambertz-Nilssen, Rolf Ramm Østgaard, and Knud Holscher.[6] The team selected six proposals to enter the second stage: five Danish teams and one Swedish. None of the Norwegian teams came through. Why the Norwegian architects did not qualify for the second round is open to speculation; after all, this was one of the largest and most important competitions happening in Norway at the time.

On February 5, 1970, the jury announced the winner: proposal number 22183, by the Danish architect Henning Larsen.

The jury characterized it "as a functional city-like structure capable of absorbing the future's unpredictable demands. The design of the first stage would easily fit within the whole structure without binding future development."[7] The winning proposal was a three-level-block structure based on a 100 x 100 metre city grid. The architect framed it as a product of "qualitative and quantitative site analysis that optimized the issues of sloping topography, marshy soil conditions, and the view of the fjord."[8] This analysis yielded a three-dimensional zone—a spatial system whose capacity was based on how university buildings could be arranged within it, according to both the environmental constraints of density, circulation, and light conditions and the performative constraints of interaction, flexibility, and expansion.

Perhaps the most compelling part of this proposal was the implementation of streets. The architect's statement was clear: "the in-between spaces—the streets—are articulated through a charged flow of information about seminars, parties, lectures, all kinds of activities—a market for communication in terms of large banners, posters, light shows, newspapers and slogans."[9] The jury was exhilarated by such rhetoric—the street was to yield a rich and differentiated city milieu.

Was this project a foreshadowing of something else? To answer this question it is necessary to go beyond the classifications through which this project has usually been characterized, and consequently reduced to—it is more than just one of the examples of structuralist architecture in Norway.[10] Instead of tracing it back it into an "ism," I will rather project it forward and approach it as a project through which a different type of architecture emerges in Norway: an architecture of large-scale projects that goes beyond the format of a singular building. The following essay will unfold the kinds of imaginaries that lay behind this project and how these imaginaries were translated into the physical structure, all this with an aim to question whether there was a line of thought emerging as architects began to encounter large-scale building assignments.

The deadlock

Immediately after the competition results were announced, SBED commissioned Henning Larsen to produce a book that would comprehensively describe the project.[11] The book's cover image was the bird's-eye perspective of an intersection of two streets within the future university complex, showing people and street signs, and activity in the adjacent building blocks. The first image in the book was a collage—Larsen's version of the Mies van der Rohe's collage for the preliminary design of the Illinois Convention Hall from 1954. This image was followed by the chapter "Forud for prosjektet," in which Larsen discusses the idea of a university. He writes about the emerging socio-cultural context of the 1960s and its influence on the organizational setup of the university, as explicated through two scenarios—the university as either a concentrated struc-

Henning Larsen's winning proposal: the city-like structure (1970). All images: Henning Larsen Tegnestue.

ture or a dispersed one. He sees both as a consequence of a "pluralist differentiation of the sciences."[12] These processes, the architect further argued, gave rise to numerous new autonomous entities (faculties and institutes), which were dependent on special research infrastructure and facilities. The problem with this development, Larsen says, was that universities were also mutating into large and chaotic structures. The idea of communication was a way out of this organizational deadlock: communication from the perspective of the emerging electronic technologies, on one side, and on the other, communication as both an optimized movement pattern within the building complex and a framework of social encounters.

Larsen explains how the concepts of communication and information dissemination evolved "from the primitive society into the idealized future."[13] Within this narrative, communication was characterized as being tightly interwoven with sociocultural practices. Learning processes in primitive cultures were built into the social relations. Through face-to-face contact, a child would acquire knowledge from adults, while adults gained knowledge from others nearby. In more differentiated societies, learning processes had evolved from face-to-face contact into one person confronting many different sources. The result is the institutionalized way of learning—the emergence of schools and consequently, universities, where the medium of the book had expanded teaching capacity.

Larsen enhanced his evolutional narrative with a discussion on different types of university buildings: old, yet updated modernized buildings; modern yet generic structures capable of adjusting to the immediate needs; and short-term structures which could be dismantled and taken away. The process of learning happens, Larsen suggests, in one more place: The space created by electronic communication made it possible to engage in learning anywhere, independent of the physical location. The university was no longer synonymous with built structures, no matter how flexible these might be. Instead, new means of communication now possessed a higher capacity to absorb the changing conditions in society than any building strategy could ever do.[14] The architect goes so far as to suggest educational TV channels as viable means of education. It was the electronic communication that was to solve the problems of agglomeration around universities.

In the architect's view the new technology would turn the future university into just one of many nodes within the global network of knowledge exchange. One can clearly hear the echoes of Marshal McLuhan: "The vision about the world university is not about large building complexes . . . Rather, the world university is understood as a global, overall easily accessible network of knowledge."[15]

The university as a static physical depot for the storage of knowledge was under scrutiny. The issue of knowledge dissemination was central and would consequently be approached through the idea of university as a place of social interaction. A university would be redefined, from a physical place of learning, a static institution with a formalized hierarchy of professor–student, into a place of dynamic social encounters within which the knowledge would be disseminated. Within this

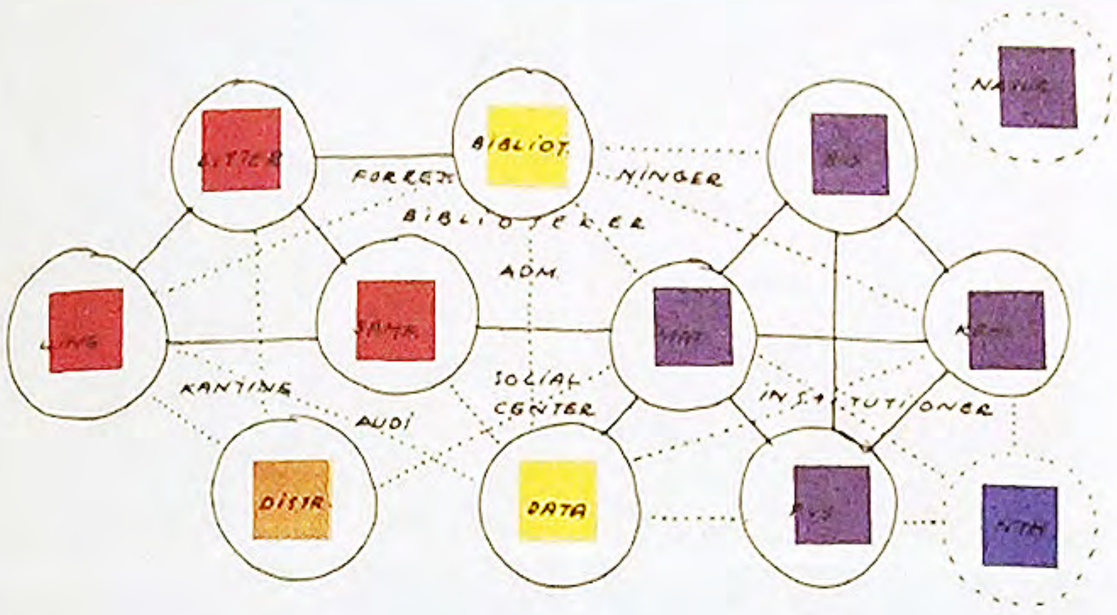
conceptual transformation the idea of social space (corridors, cantinas, plazas) would be expanded across the whole of the university, including spaces of learning (reading rooms, lecture halls, laboratories). The conceptualization of "the university as a framework for the real social life"[16] was seen as an agent for renewing the idea of university. Larsen's edited version of Mies's 1954 collage was intended to depict precisely that particular ideological attitude: the large-scale glassed-in-roof box was an idea, an image, capable of representing a socio-spatial framework within which the new university would unfold.

The city

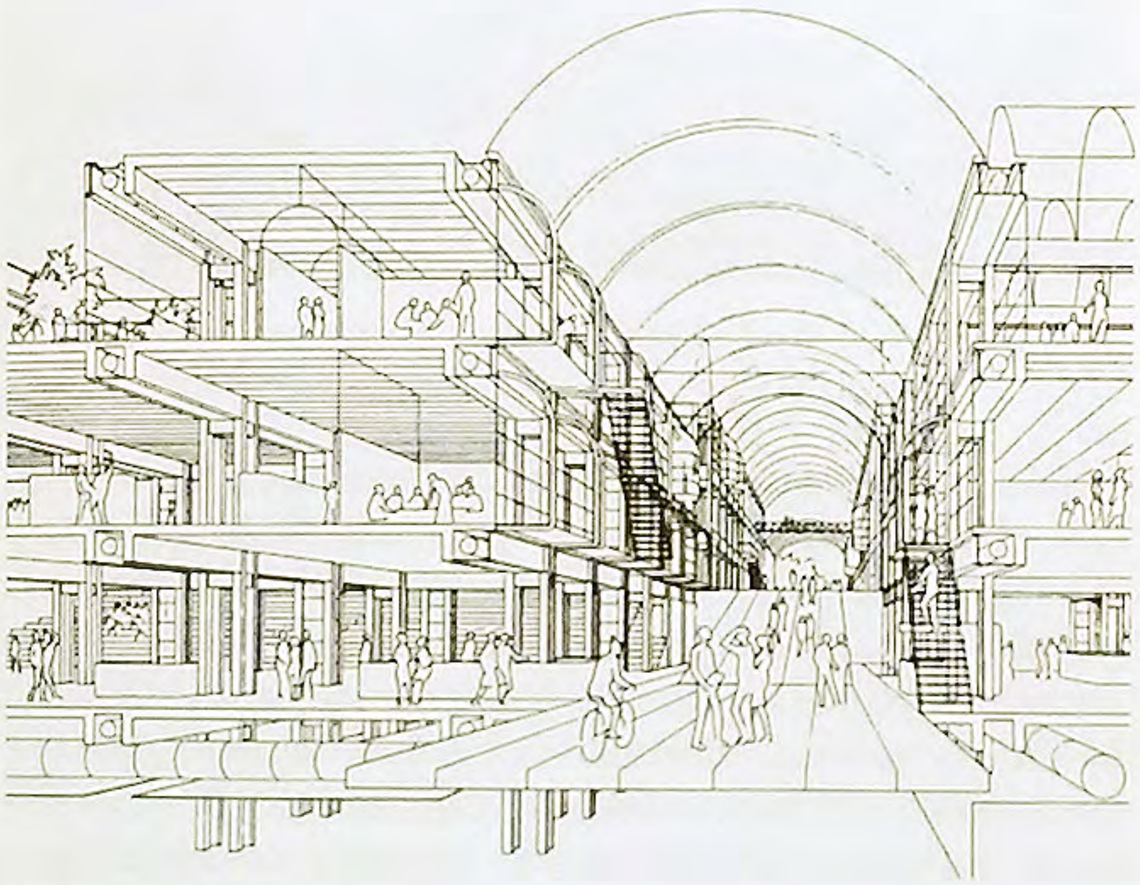
The idea of the large-scale box was a recurring "ghost" within the architecture culture of the time. In October of 1967, one year before the Dragvoll competition, SBED had issued a national competition for the new architecture school building in Trondheim.[17] The jury, with Arne Korsmo and Henning Larsen on board, chose the project by architecture students Knut Eirik Dahl, Eilert Ellefsen, Johannes Gunnarshaug, and Kari Stokland and the architect Per Kartvedt. The project, strongly inspired by Cedric Price's Fun Palace,[18] was based on the idea of the large-scale open box, defined by the two longitudinal wing structures housing workshop halls, photo rooms, administration, and staff offices. The central open space, below the glass roof, was to be given to the students—their future studio area. The young team encountered resistance from the old academic staff at the architecture school, and the project was eventually cancelled, for two main two reasons: the lack of professionalism by the young architects, and the loss of the project's main supporter, the architecture professor Arne Korsmo, who died in 1968.[19] The young team had already gone on several study trips with its clients, the SBED representatives, in England and the Netherlands, to explore the large community halls,[20] undoubtedly enlightening and indoctrinating the SBED bureaucrats (some of whom would later reappear in the university project).

The architecture school and the new university shared a common ideological attitude—the social space was central. Nevertheless, how this sociality became translated into physical structure differed. The school was organized around the idea of one singular open space within a big box, while the university was organized around the idea of the covered streets. The notion of sociality, as explicated in the revised collage of Mies, was translated into an architectural manifestation, a city streetscape, as shown on the book's cover: the bird's-eye perspective of an intersection of two streets along with the unfolding social activity. The street defined by the adjacent volumes and their inherent programs was seen as an attempt to simulate the city—the idea of the city was synonymous with the idea of the collective social experience. Larsen takes this analogy further with three particular diagrams, showing the city of Oxford, the street layout of the Dragvoll University project, and Trondheim's Midtbyen. All three are in the same scale, being inscribed in a five-minute pedestrian circle. The size of the building blocks within the new university was comparable to the size of the blocks *found* in the two referenced cities, both in terms of the scale of the horizontal grid and the number of floors, varying from two to three. Additionally, Larsen uses an aerial photo of the centre of Oxford to show the spatial variation created by the curving streets and their adjacent city blocks. The spatial variation in the case of Oxford was the

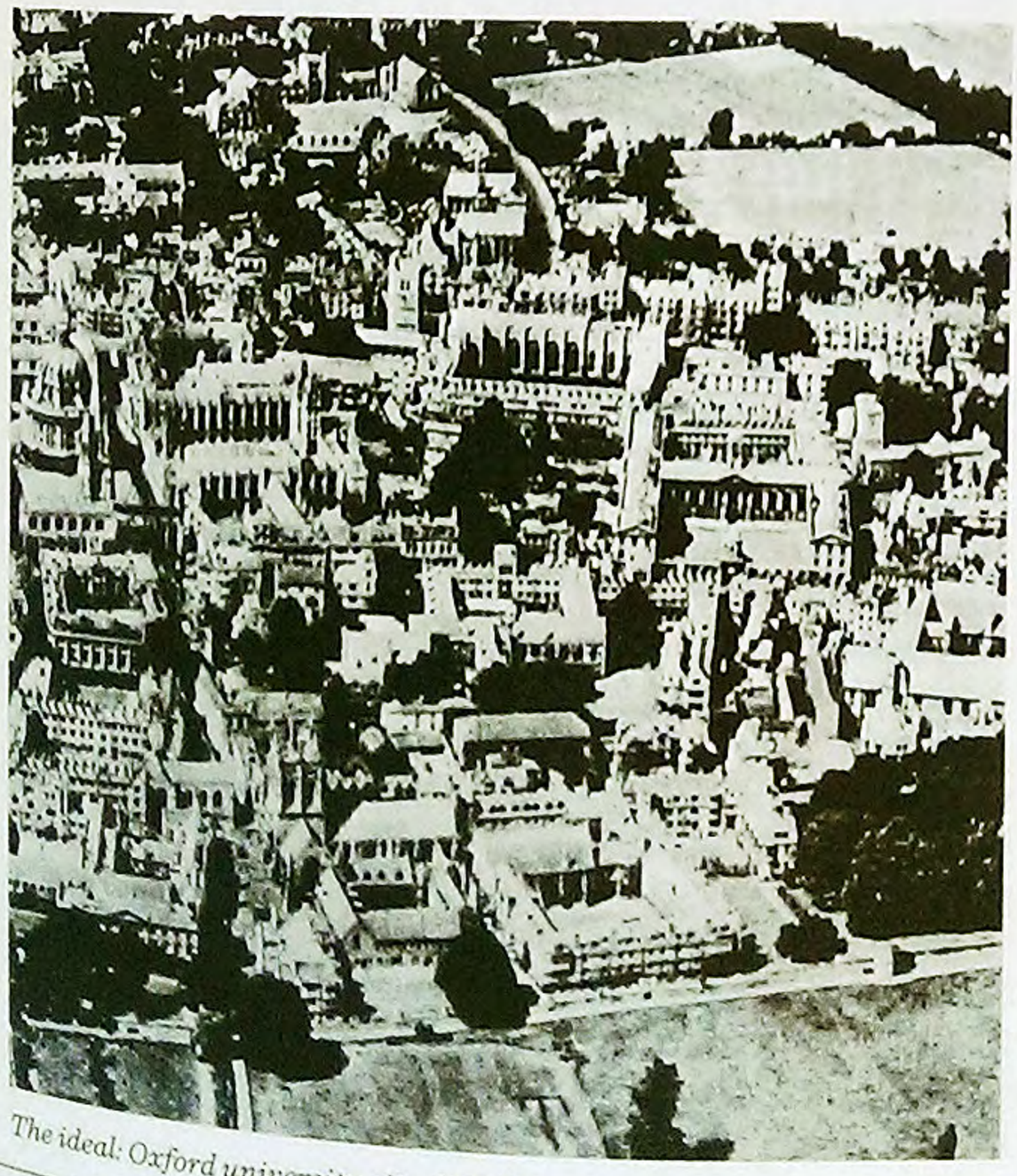
Contextualizing university: Oxford–Dragvoll–Trondheim (1970)



University as a network (1970).



The street and the block (1970).



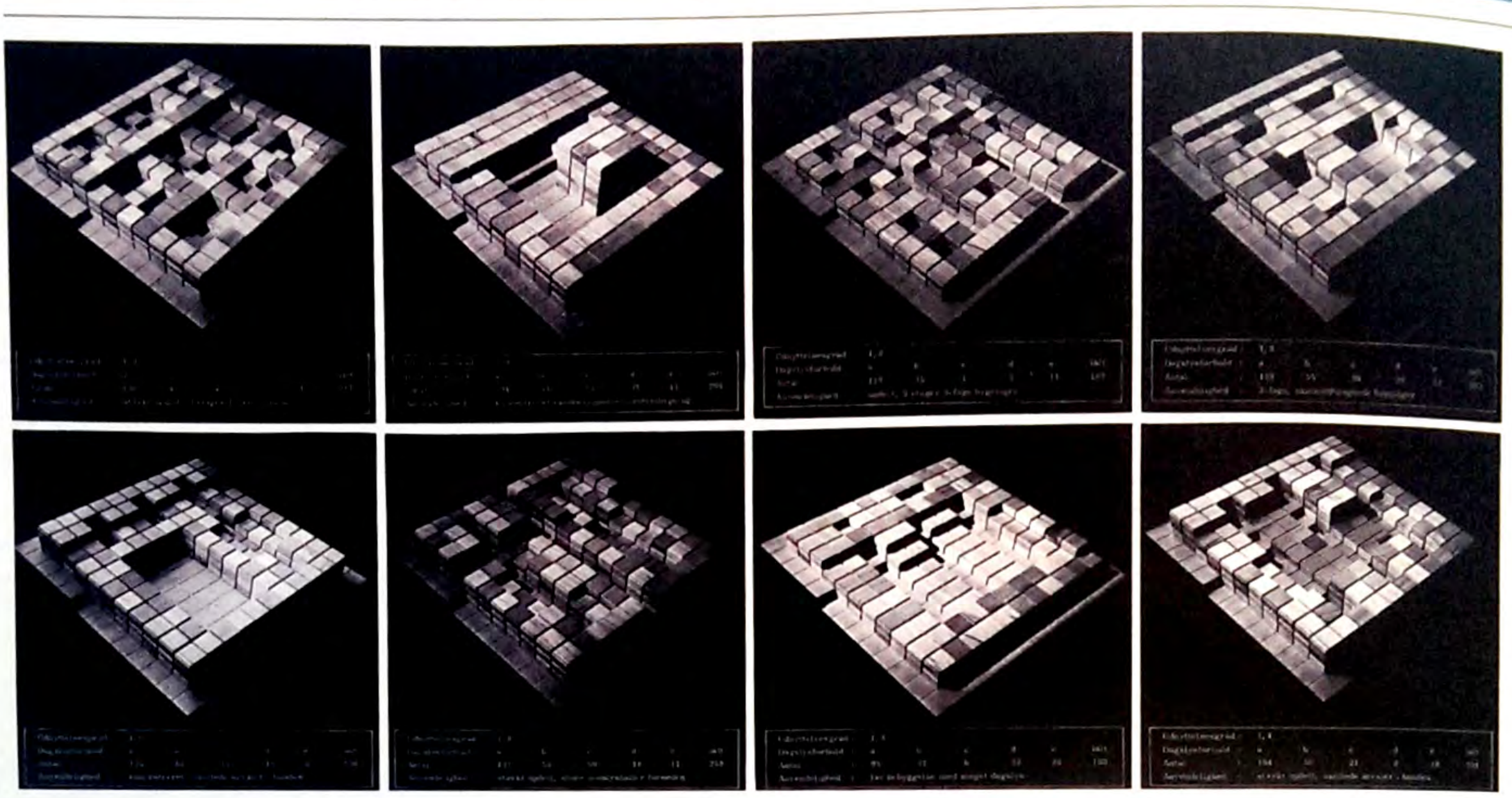
The ideal: Oxford university city (1970).

result of historical layering (Oxford as a city of monuments), as explained by the architect, whereas the spatial variation at Dragvoll was a result of the topographical conditions. The site contained cliffs, small hills, and a creek, so the grid structure of the future university city is adjusted into three main building agglomerations.

Another aspect within this discussion is how the city analogy related itself to the organization and distribution of different programs within the new university. This issue will be discussed through one specific drawing: the organizational diagram showing the particular position of the different university departments and their in-between relationships. Some were direct (indicated by solid lines) and some were more indirect (indicated by dotted lines). The result was a patchwork of relationships within which the architect also introduced other university functions, such as a student centre, libraries, shops, cantina, auditoria, and administration offices. The university would become a decentralized programmatic network consisting of several nodes—institutions and facilities—with the capability to programmatically complement each other. In the same way as the university would be a part of a larger global knowledge network, it would also be conceptualized as a network itself—a network within a network. The grid was an architectural counterpart to the idea of the university as a network. Through the idea of grid and its inherent horizontality, the architect intended to introduce a university for a democratized welfare society. The grid, having no centre, would be capable of de-monumentalizing the university, transforming it from an educational institution for the chosen few to an institution for the masses. In this particular case, the architect's intentions would be in accord with the intentions of the state and its modernization project.

The street

As explained earlier, Larsen's conception was that social space would be everywhere since the practice of learning was embedded within social practice. This was very much in accordance with the tendencies visible in the new universities of the late 1960s. The institutional-architectural notion of community was molded to fit inside communication. The movement thus encouraged within the one-building complex entailed the spontaneous rather than the institutional-formal[21]—an idea that would be revived in the 1990s with the design of the corporate headquarter.[22] In Larsen's project the glassed-in street was the formal answer to this development. What was the economic and structural rationale behind the glassed-in streets, beyond their ideological origin—how translatable were they into the real world of economics and building codes? The glassed-in streets had a significant presence in the project since their total length was several kilometres. The logic of the glassed-in street was that the streets would rationalize the space demand. It would render obsolete the corridors within each of the blocks, while at same time achieving a continuous flow of movement. The auditoriums would have a direct entrance from the street, along with the other functions on the ground floor. The second and third floors would have their own circulation routes that would be vertically connected with the ground-floor streetscape. The glass roof would function as a climatic screen that would protect the streets from rain, snow, and wind. The architect suggested that snow on the glass roofs could effec-



The potential of the block (1970). Henning Larsen Tegnestue.

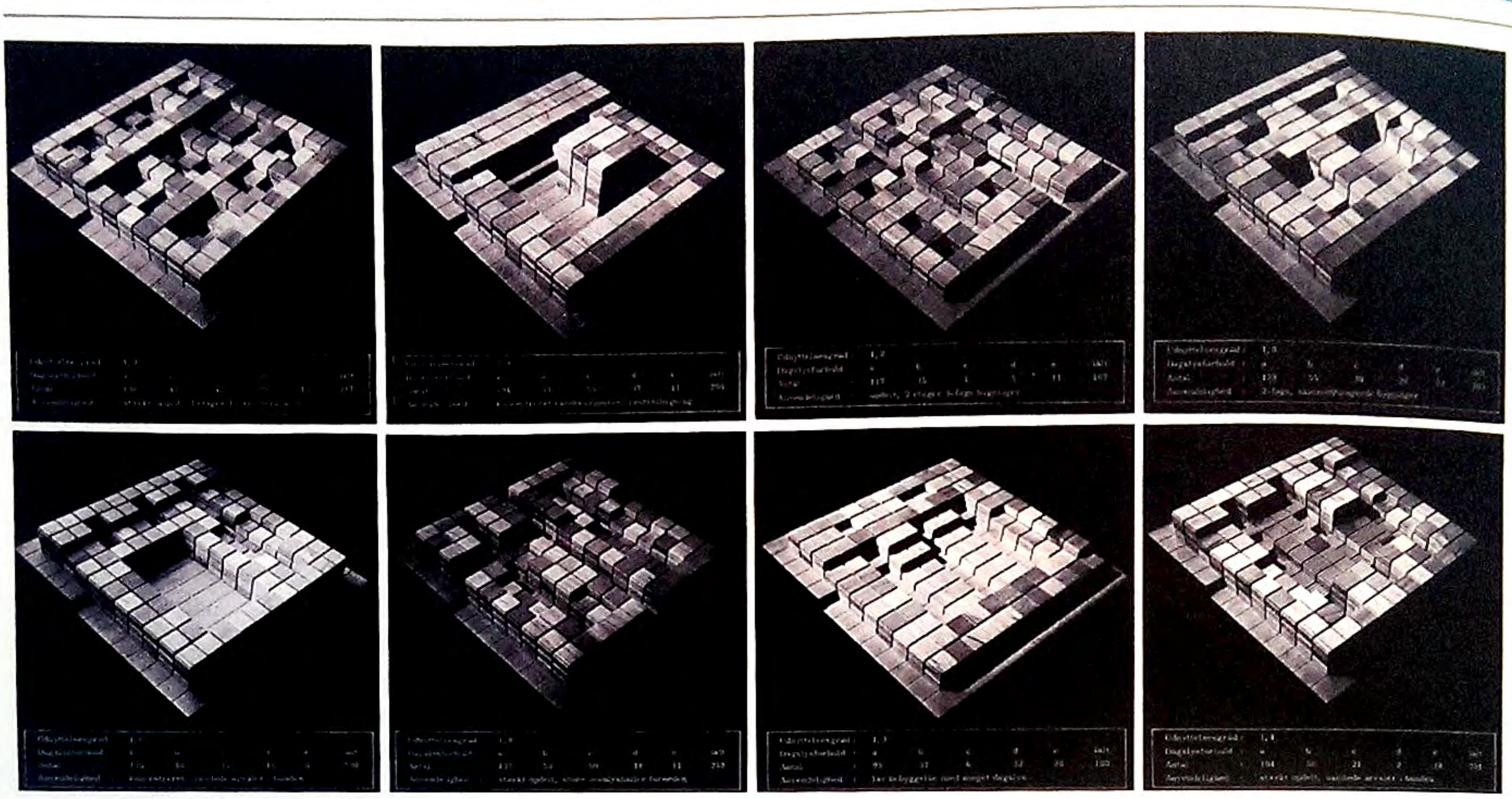
tively be removed as it was usually done at modern airports—by lightweight snow vacuum cleaners. Another aspect that could help rationalize the argument was that of energy savings. The energy transmitted from the exterior walls of adjacent volumes would warm the glassed-in street spaces. These spaces would not be heated by any additional heating infrastructure. However, the architect argued, there was an additional heating possibility: The exiting warm ventilation could be re-directed back into the glassed-in streets. In case of overheating, the glassed-in streets could be ventilated through openings on the glass roof, to be taken into the account in the design of the roof structure. Due to the benefits of the heat transmission between the glassed-in streets and the adjacent volumes, the thickness of the walls in between these two zones would also be somewhat reduced, thereby the construction cost would be lowered.

Perhaps the most problematic aspect to be solved was that of fire safety. The glassed-in street was a type of space unknown to both Norwegian and international contexts. There were some equivalent precedents from the nineteenth century, but none were built according to modern fire regulations. Larsen's design of the street—8.4 metres wide, continuous, and with windows on adjacent walls—did not conform with current fire regulations. With the enthusiasm of local Trondheim bureaucrats, a breakthrough was reached. The city fire commissioner, an engineer named Kai Nielsen, suggested that Larsen's glassed-in street was not an indoor space, subject to fire safety codes stipulating that no windows face the street and that the space itself be divided into several fire-proofed zones, but rather a covered outdoor space.[23] By defining it as a covered outdoor space, the glassed-in street would be exempt from fire code regulations, which did not take a position on issues of outdoor space as long as the distance between the adjacent volumes (or fire zones) was a minimum of eight metres. Additionally, the glassed-in street had to be ventilated, so the roof had to have sections that could open in case of fire to allow smoke to escape. The commissioner had to present the case in front of the state building authorities in Oslo, and subsequently received their approval. This simple juridical formulation would have immense importance for this particular project and for future large-scale projects in Norway. It is important to note that such juridical creativeness did not exist in Sweden and Denmark.[24] The glassed-in street became a reality through which the format of a singular building would forever be changed; buildings could finally become endless in their physical extent.

The block

The building structure was conceptualized around a three-dimensional system whose basis module had the dimensions of 8.4 x 8.4 x 4.2 metres. The module was to be multiplied and joined in a city block configuration having the maximum envelope of 11 x 11 x 3 modules (approximately 100 x 100 x 12 metres). Such an envelope was tailored both to absorb the demands of the vehicular traffic on the underground level as well as to offer multiple spatial dispositions for different programmatic scenarios on the upper floors.

To illustrate the potentials that such a city block, with its modular layout, might have, the architect presented a series of eight configurations. These were placed in the same topographic context, where the block's backside (an area of four modular rows along one of the block sides) was to be 4.2 metres higher—the block was to absorb the sloping terrain, equivalent to the height of one floor. The discussion parameters addressed density, daylight conditions, and usability. In terms of daylight conditions, the architect identified five different possibilities: 1) areas with side lighting with an angle of inclination less than 27 degrees, for general working spaces, such as offices, and communication space; 2) areas with side lighting with an angle of inclination between 27 and 45 degrees, for more labor-intensive working spaces, such as laboratories, and communication space; 3) areas with side lighting with an



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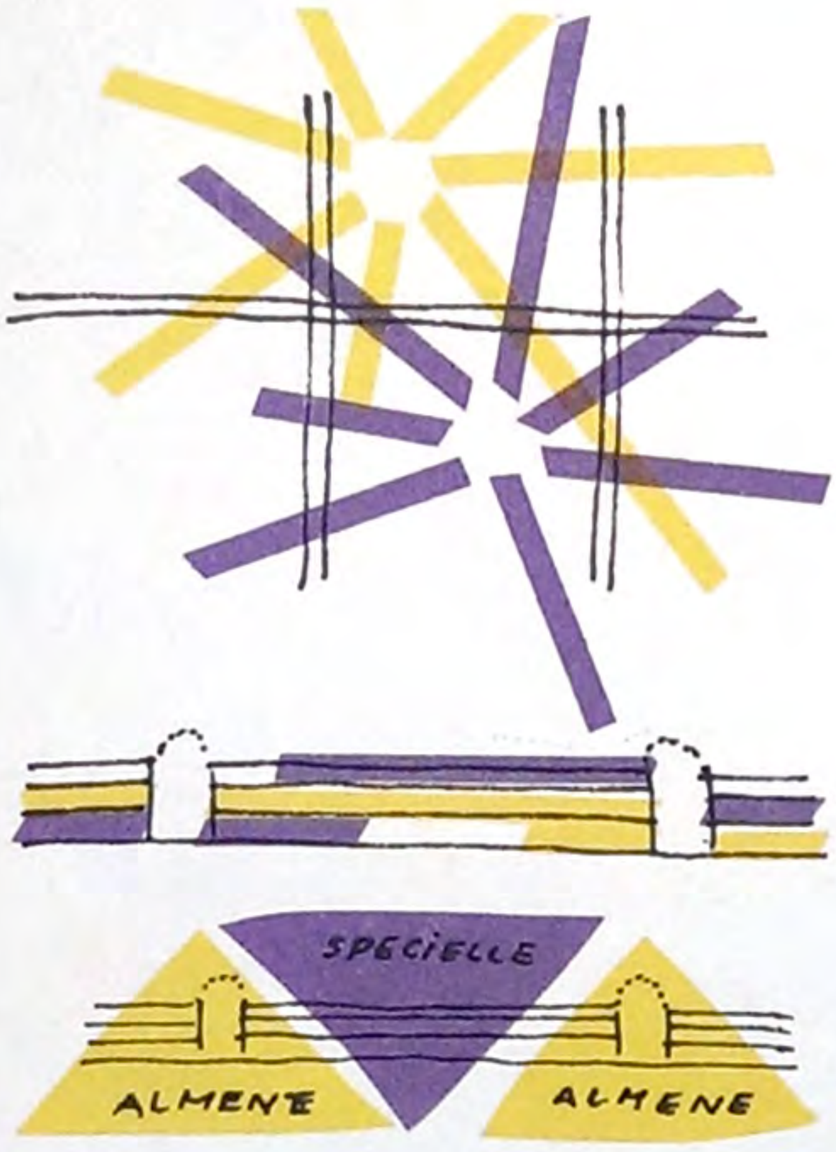
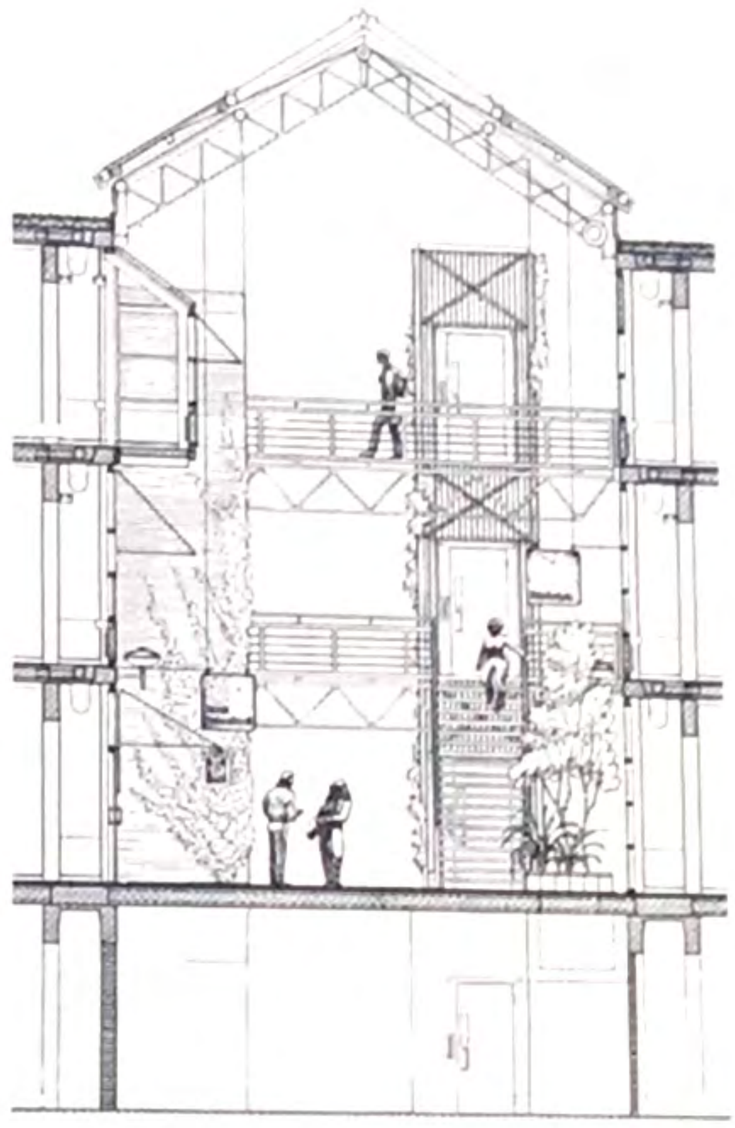


Programmatic layering within the block(s) (1970).



The street as a buildable reality (1970).

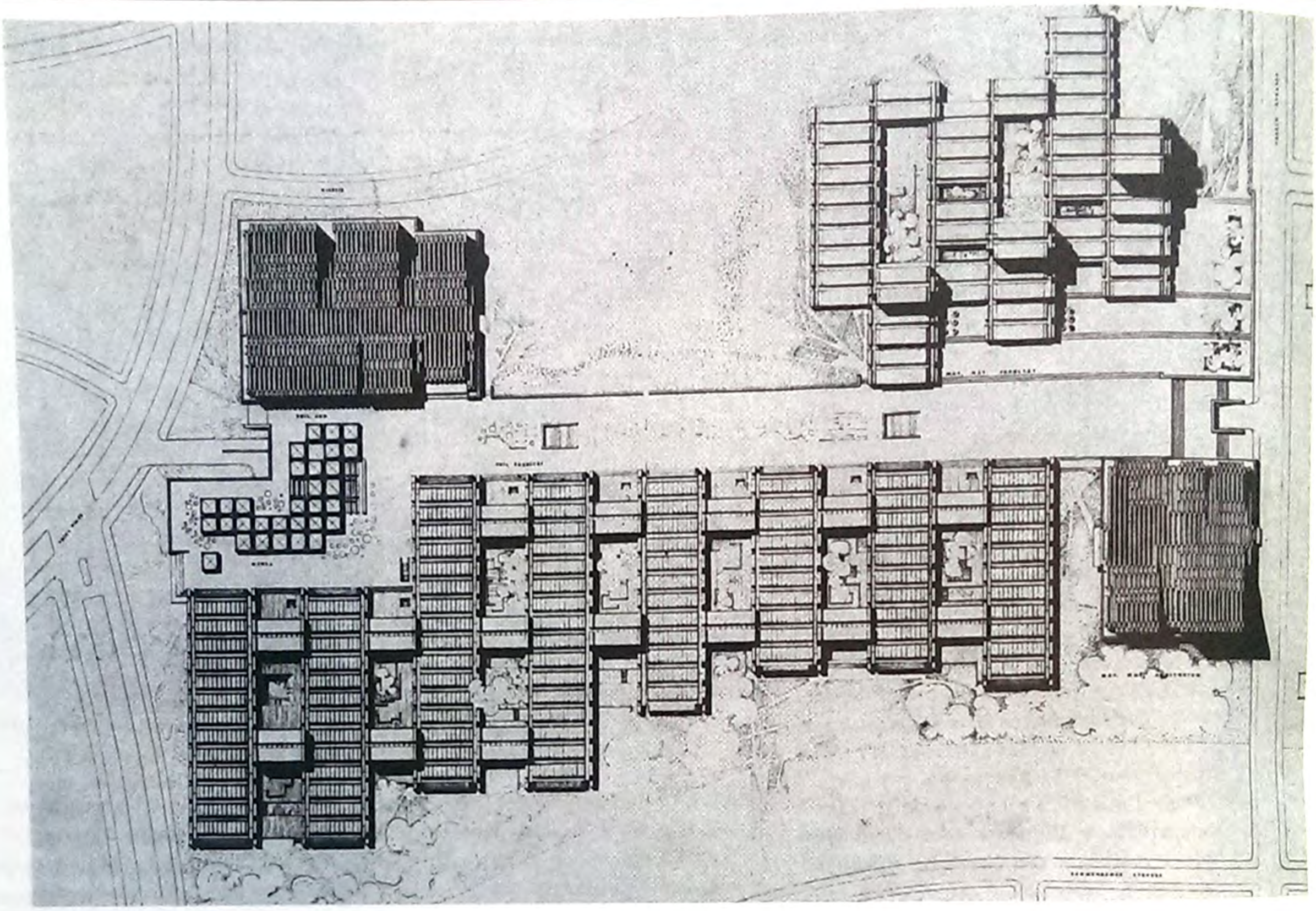
angle of inclination greater than 45 degrees, for communication space; 4) no daylight; and 5) overhead lighting from the roof. The issue of usability was not defined as quantitatively as in the case of daylight conditions. The architect arbitrarily suggested that the block could absorb both small offices and spaces with large open halls such as reading rooms and laboratories. The eight selected block configurations were indexed in accordance to these criteria (of density, usability, and lighting), almost as if they were a scientific finding: FAR[25] of 1.3 to FAR of 2.0; 188 modular units to 290; low uniform organization to highly divided and randomized; all using all five light conditions. The approach showed the endless combinations possible. What was missing was a more critical attitude towards the economy of space; for example, the relationship between usable space area and the communication space and how it could influence the block configuration. In the architect's view a desired block setup could be found through a cybernetic model following those predefined criteria. A computer program would analyse different configurations and then suggest the most relevant ones. The architect had scripted an open system, which could absorb any future possibility.

In one instance, the architect took a position in terms of a certain programmatic specificity within the block—in its vertical layering. In his view the project could specially treat those programs that demanded their functions be organized in an open and flexible structure, in which was embedded a maximum of possibilities for growth and the introduction of new ones. The three-dimensional structure was to be capable of creating contact interfaces between education and research so that the encounter between students, teachers, and researchers would be expanded. This layering had resulted in a general to specific division of spaces that were projected sectionally onto the university structure. The general spaces—those to be used by everyone at the university, such as auditoriums and reading rooms—were to be placed on the lower levels within the structure and organized according to the criteria of centrality, accessibility, and openness. The specific spaces—those be used by specific groups, such as the research laboratories and study cells—were to be placed on the upper levels and organized according to the criteria of decentralization, closeness, and quietness.

Predictably enough, the block setup opened up numerous possibilities, all of which were to be compartmentalized through the format of a lot of one hundred square metres. This format was capable of absorbing both different futures and different speeds at which these futures might arrive. The expansion scenarios were to be sequenced through the number of developing blocks. In that sense the project inhibited the fourth dimension of time, through which the idea of the university development as a single large-scale building was deconstructed into a university as a building complex—*building* being both a noun and a gerund. If the glassed-in street had opened up the possibility of a building that could be endless, the format of the block would sequence this endlessness into buildable entities.

The future

During the 1960s new technology and new social practices had a strong impact on the way architecture was conceptualized.[26] Henning Larsen's project was conceived amidst these ideological changes. This project did not denounce architecture itself. Rather, Larsen tried to construct narratives through which architecture would be revived: through the city analogy and its translation into a system of streets and blocks. Such an approach was different from Larsen's earlier university projects, the winning proposal in Stockholm University competition in 1961 and the second-prize proposal for the Berlin Free University in 1963. The Stockholm project was one large (monumental) building organized around a central plateau, while the Berlin project used an outdoor central strip as an organizer of the university, undoubtedly moving in the direction of a *build-*



Berlin Free University project (1963).

ing complex. The level of monumentality was clearly decreasing, and would meet its climax in Trondheim's *building* complex conceptualized around the idea of the city-like system of blocks and streets.[27] What is interesting is that two aspects within this narrative, that of social space and that of the emerging time dimension, are two "ghosts" that have haunted large-scale projects ever since. They were the consequences of architecture culture's counter-attack on the changing socio-political context, and later became part of the clichés embedded within the privately driven, large-scale speculation projects of the 1980s. In that respect, Larsen's Trondheim project foreshadowed the new architecture that would start emerging within Norwegian cities, an architecture that would escape suburbia and Dragvoll-like contexts and establish itself within the city. The paradox is that the city was used as an analogy to propagate the idea of the large-scale projects, but as time passed the city would become a victim—or beneficiary—of this analogy: The large-scale projects, and their inherent city analogy, would initiate the re-invention of the city itself. The city of the city . . .

1 These preparation processes are described in several municipal documents: "Sak B nr. 157/1968 Regulering av tomt for universitetet i Trondheim" in *Trondheim bystyres forhandlinger år 1968*, B, saker nr. 1-329/1968 (Trondheim: Adresseavisens boktrykkeri, 1969), 249; "Sak B nr. 65/1973 Reguleringsplan for universitetsområdet på Dragvoll—Stokkan" in *Trondheim bystyres forhandlinger, år 1968*, B, saker nr. 1-206/1973 (Trondheim: Adresseavisens boktrykkeri, 1973), 131.

2 The university plans set before the Norwegian national parliament in 1966-67 (they were approved in March of 1968) dealt exclusively with the first building stage. Still, the competition program and consequently the jury itself would embrace the scenario within which the university would be visualized as a total project.

3 Agnete Vabø and Per Olaf Amodt, "Kvalitets reformen og universitetene som masseutdanningsinsititusjon" in *Skriftseire 2/2005* (Oslo: NIFU STEP Norsk institutt for studier av forskning og utdanning, 2005), 13.

4 Berge Furre, *Norsk Historie 1914–2000* (Oslo: Det Norske Samlaget, 2000), 200.

5 Agnete Vabø and Per Olaf Amodt, "Kvalitetsreformen og universitetene som masseutdanningsinsititusjon," 17. In the same period, the student mass in Great Britain doubled, from 100,000 to 220,000 students. Tony Birks and Michael Holford, *Building the New University* (Newton Abbot: David & Charles, 1972), 9.

6 Sverre Fehn, Birger Lambertz-Nilssen, and Rolf Ramm Østgaard were Norwegian architects appointed by the Norwegian Association of Architects, while Knud Holscher was a Danish architect appointed by the Nordic architecture associations.

7 Henning Larsen Tegnestue, *Universitetet i Trondheim – konkurranceprojektet 1969–1970* (Copenhagen: Henning Larsen Tegnestue, 1970), 2.

8 Ibid., 15.

9 Ibid., 15.

10 Karl Otto Ellefsen, "Strukturalismen" in *Arkitekturteoriernas historia*, ed. Claes Caldenby and Erik Nygaard (Stockholm: Forskningsrådet för