al detailing, wood is likely to retain its position, for synthetic substitutes have failed to take its place. Synthetic chemical processes result in the loss of some of the qualities of wood that are most important in human and psychological terms. Therefore wood will probably retain its value as a rich, deeply human material whose resources are not yet even near to being exhausted.

THE HUMANIZING OF ARCHITECTURE

It was one of Aalto's strengths that he never allowed theories to leash his creativity, but instead let his intuitive creative work correct his theories. By 1940 he was ready to reject expressly the ideology of "non-synthetic" architecture and "limited analysis" for a new line of thought, continuing to interpret the concepts of art and culture from a modern, holistic perspective, but allowing sufficient latitude for individual creativity and the subconscious resources of the human psyche.

(Originally published in English in the *The Technology Review*, Nov. 1940):

Architecture is a synthetic phenomenon covering practically all fields of human activity. An object in the architectural field may be functional from one point of view and disfunctional from another. During the past decade, Modern architecture has been functional chiefly from the technical point of view, with its emphasis mainly on the economic side of the building activity. Such emphasis is desirable, of course, for production of good shelters for the human being has been a very expensive process as compared with the fulfillment of some other human needs. Indeed, if architecture is to have a larger human value, the first step is to organize its economic side. But, since architecture covers the entire field of human life, real functional architecture must be functional mainly from the human point of view. If we look deeper into the processes of human life, we shall discover that technique is only an aid, not a definite and independent phenomenon therein. Technical functionalism cannot create definite architecture.

If there were a way to develop architecture step by step, beginning with the economic and technical aspect and later covering the other more complicated human functions, then the purely technical functionalism would be acceptable; but no such possibility exists. Architecture not only covers all fields of human activity; it must even be developed in all these fields at the same time. If not, we shall have only one-sided, superficial results.

The term "rationalism" appears in connection with Modern architecture about as often as does "functionalism." Modern architecture has been rationalized mainly from the technical point of view, in the same way as the technical functions have been emphasized. Although the purely rational period of Modern architecture has created constructions where rationalized technique has been exaggerated and the human functions have not been emphasized enough, this is not a reason to fight rationalization in architecture. It is not the rationalization itself which was wrong in the first and now past period of Modern architecture. The fault lies in the fact that the rationalization has not gone deep enough.

The present phase of Modern architecture is doubtless a new one, with the special aim of solving problems in the humanitarian and psychological fields. This new period, however, is not in contradiction to the first period of technical rationalization. Rather, it is to be understood as an enlargement of rational methods to encompass related fields.

During the past decades architecture has often been compared with science, and there have been efforts to make its methods more scientific, even efforts to make it a pure science. But architecture

is not a science. It is still the same great synthetic process of combining thousands of definite human functions, and remains *architecture*. Its purpose is still to bring the material world into harmony with human life. To make architecture more human means better architecture, and it means a functionalism much larger than the merely technical one. This goal can be accomplished only by architectural methods—by the creation and combination of different technical things in such a way that they will provide for the human being the most harmonious life.

Architectural methods sometimes resemble scientific ones, and a process of research, such as science employs, can be adopted also in architecture. Architectural research can be more and more methodical, but the substance of it can never be solely analytical. Always there will be more of instinct and art in architectural research.

Scientists very often use exaggerated forms in analyses in order to obtain clearer, more visible results—bacteria are stained, and so on. The same methods can be adopted in architecture, also. I have had personal experience with hospital buildings where I was able to discover that especial physical and psychological reactions by patients provided good pointers for ordinary housing. If we proceed from technical functionalism, we shall discover that a great many things in our present architecture are disfunctional from the point of view of psychology or a combination of psychology and physiology. To examine how human beings react to forms and construction, it is useful to use for experimentation especially sensitive persons, such as patients in a sanatorium.

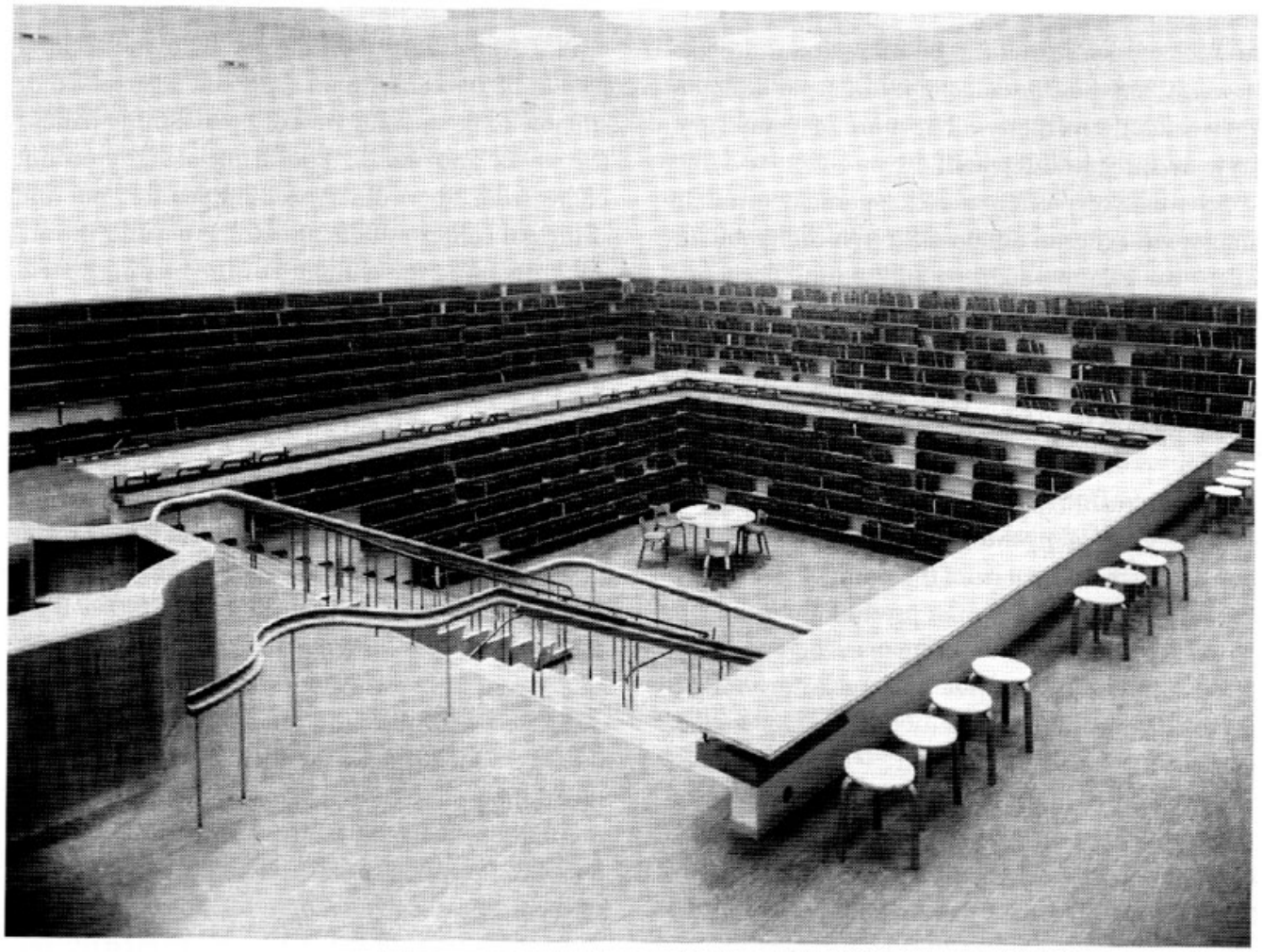
Experiments of this kind were performed in connection with the Paimio Tuberculosis Sanatorium building in Finland and were carried on mainly in two special fields: (1) the relation between the single human being and his living room; (2) the protection of the single human being against large groups of people and the pressure from collectivity. Study of the relation between the individual and his quarters involved the use of experimental rooms and covered the questions of room form, colors, natural and artificial light, heating system, noise, and so on. This first experiment dealt with a person in the weakest possible condition, a bed patient. One of the special results discovered was the necessity for changing the colors in the room. In many other ways, the experiment showed, the room must be different from the ordinary room. This difference can be explained thus: The ordinary room is a room for a vertical person: a patient's room is a room for a horizontal human being, and colors, lighting, heating, and so on must be designed with that in mind.

Practically, this fact means that the ceiling should be darker, with an especially selected color suitable to be the only view of the reclining patient for weeks and weeks. The artificial light cannot come from an ordinary ceiling fixture, but the principal center of light should be beyond the angle of vision of the patient. For the heating system in the experimental room, ceiling radiators were used but in a way which threw the heat mainly at the foot of the bed so that the head of the patient was outside the direct heat rays. The location of the windows and doors likewise took into account the patient's position. To avoid noise, one wall in the room was sound absorbing, and wash basins (each patient in the two-patient rooms had his own) were especially designed so that the flow of water from the faucet hit the porcelain basin always at a very small angle and worked noiselessly.

These are only a few illustrations from an experimental room at the sanatorium, and they are here mentioned merely as examples of architectural methods, which always are in a combination of technical, physical, and psychological phenomena, never any one of them alone. Technical functionalism is correct only if enlarged to cover even the psychophysical field. That is the only way to humanize architecture.

A picture of a typical patients' room at the sanatorium accompanies this article. Two other examples—from the Viipuri Municipal Library—show similar problems. The flexible wooden furniture are a result of experiments also made at the Paimio Sanatorium. At the time of those experiments the first tubular chromium furniture was just being constructed in Europe. Tubular and chromium surfaces are good solutions technically, but psychophysically these materials are not good for the human being. The sanatorium needed furniture which should be light, flexible, easy to clean, and so on. After extensive experimentation in wood, the flexible system was discovered and a method and material combined to produce furniture which was better for the human touch and more suitable as the general material for the long and painful life in a sanatorium.

The first picture of the Viipuri Municipal Library shows only one part, but the most important part, of this building. The main problem connected with a library is that of the human eye. A library can be well constructed and can be functional in a technical way even without the solving of this problem, but it is not humanly and architecturally complete unless it deals satisfactorily with the main hu-



"Diffused sunlight enters the combined hall and reading room of the Viipuri Library through conical skylights calculated to catch the sun's rays even at their highest angle and to scatter light uniformly on the reader's book."

man function in the building, that of reading a book. The eye is only a tiny part of the human body, but it is the most sensitive and perhaps the most important part. To provide a natural or an artificial light which destroys the human eye or which is unsuitable for its use, means reactionary architecture even if the building should otherwise be of high constructive value.

Daylight through ordinary windows, even if they are very large, covers only a part of a big room. Even if the room is lighted sufficiently, the light will be uneven and will vary on different points of the floor. That is why skylights have mainly been used in libraries, museums, and so on. But skylight, which covers the entire floor area, gives an exaggerated light, if extensive additional arrangements are not made. In the library building in the accompanying illustrations, the problem was solved with the aid of numerous round skylights so constructed that the light could be termed indirect daylight. The round skylights are technically rational because of the monopiece glass system employed. (Every skylight consists of a conical concrete base six feet in diameter, and a thick jointless round piece of glass on top of it without any frame construction.) This system is humanly rational be-

Auditorium in the Viipuri Library.

cause it provides a kind of light suitable for reading, blended and softened by being reflected from the conical surfaces of the skylights. In Finland the largest angle of sunlight is almost 52 degrees. The concrete cones are so constructed that the sunlight always remains indirect. The surfaces of the cones spread the light in millions of directions. Theoretically, for instance, the light reaches an open book from all these different directions and thus avoids a reflection to the human eye from the white pages of the book. (Bright reflection from book pages is one of the most fatiguing phenomena in reading.) In the same way this lighting system eliminates shadow phenomena regardless of the position of the reader. The problem of reading a book is more than a problem of the eye; a good reading light permits the use of many positions of the human body and every suitable relation between book and

Room for horizontal man in the Paimio Sanatorium. The ceiling light is out of sight, the patient can see the surrounding forest from the bed; feet heated by panel in the ceiling, head cool.

eye. Reading a book involves both culturally and physically a strange kind of concentration; the duty of architecture is to eliminate all disturbing elements.

It is possible in a scientific way to ascertain what kinds and what quantities of light are ideally the most suitable for the human eye, but in constructing a room the solution must be made with the aid of all the different elements which architecture embraces. Here the skylight system is a combined product of the ceiling construction (a room almost sixty feet wide needs a ceiling construction with beams high enough for the erection of the deep cones) and special technical limits in horizontal glass construction. An architectural solution must always have a human motive based on analysis, but that motive has to be materialized in construction which probably is a result of extraneous circumstances. The examples mentioned here are very tiny problems. But they are very close to the human being and hence become more important than problems of much larger scope.

THE TROUT AND THE STREAM

This much-quoted article, originally published under the title "Architettura e arte concreta" in the Italian journal Domus in 1947, was Aalto's last pronouncement in the theoretical debate on the problems of rationalism in architecture. Among the determining factors of architectural design, he included the cultural heritage, anchored deep in the human psyche, and the assimilation of personal experience. This did not mean capitulation to romantic or irrational fancies, but a matter-of-fact recognition of the profound and highly ramified and yet rational complexity that governs life. At the same time, he abandoned any illusions he had ever had about discovering ultimate truths or attaining timelessness in his work. His ideas and works have a provisional quality about them, but this is precisely the reason for their vitality and continued impact.

(*Domus/Arkkitehti*, pp. 7–10, 1948):

As a practicing artist, I obviously find it difficult to write about the arts from the same perspective as a critic or theorist who is entirely outside the profession. Nor can a professional have the art historian's impartiality towards today's creative artistic work and his colleagues. Thus what follows is merely a series of reflections arising mainly from my own work.

The question of the connection between architecture and the free arts has always been on the agenda. Usually it takes the form of a desire for more sculpture and painting in works of architecture. Various suggestions have even been put forward for the active exponents of these "three arts" to work together—sometimes for what would almost amount to the same as a congress of priests and doctors.

Usually this demand has taken the form "more monumental paintings in public buildings!" Oddly enough, demands of this kind very rarely come from leading artists—more commonly they come from the general public or, at best, as proposals on art policy from arts associations and similar bodies.

I am not opposed to these demands—far from it. The country to which I am attracted more than most others is Italy—the classical home of the partnership between the three arts. The news of the destruction of Mantegna's little chapel in the Chiesa degli Eremitani caused me personal pain. All the same, I think that the whole question and the solution to it lie far deeper. In no case can a *quantitative* rapprochement of the three arts get to the heart of the matter.

When Dr. Rogers asks me about "the relationship of architecture to abstract art (*art concret*)," I think this may be the way to reach deeper, closer to the core of the relationship.

On the one hand, abstract art forms have served as a stimulus to contemporary architecture—indi-