Zeitschrift: Bauen + Wohnen = Construction + habitation = Building + home : internationale Zeitschrift

Herausgeber: Bauen + Wohnen

Band: 20 (1966)

Heft: 2: Forschungs- und Laborbauten = Bâtiments de recherche = Research buildings and laboratories

Rubrik: Summary

Summary

Hans Rudolf Suter, Basel

Research – Brainwork

(Pages 43–45)

When one speaks nowadays of research, one thinks of the vast testing and experimental laboratories attached to the chemical and mechanical industries or of those of the institutes of technology which have developed so tremendously over the last 20 years. Now then, this impression is a very partial one: it corresponds to the specific intellectual evolution of our technological era, in which the natural sciences are enjoying a privileged position, which explains a certain monumentality in the architecture of research buildings.
Such an over-estimation of the purely scientific realm leads to the following questions: What does research mean?
What does the work of a researcher consist of?
What is the spatial climate that best corresponds to work of this kind?
Research leading to new discoveries ought certainly to be based on logical thought, but intuition as well plays a considerable role here. This intellectual application relates to all the spheres of human knowledge. Depending on the nature of each sphere, it necessiates diverse sorts of facilities and installations, but research remains primarily brainwork.
The general idea people have of a research worker's place of work is of an isolated room, where the worker, relying solely on himself, dedicates himself to his discoveries, which he communicates to the outside world via writings, formulas and a series of experiments whose result can serve as the basis of further research. This manner of acquiring scientific knowledge is still of primary importance, as it was for Pythagoras, for the monks of the Middle Ages in their ascetic cells, for Paracelsus in his narrow chamber, for a universal genius like Leonardo da Vinci in the Renaissance or for modern researchers in their sober laboratories. The centre of a research building, whether it be old or new, is always the library, which contains the specialized knowledge of all the centuries. The research work that is carried on in isolation remains of primary importance and ought to be favoured by spatial arrangements even where a large number of researchers are working together. At the present time research is being pursued generally within the scope of group work in various centres which are interconnected and which are supplemented by computers.
However, this teamwork in groups, treating independently the different aspects of a given problem in order to coordinate them for economic reasons, does not in any way limit the function of the researcher, who ought to be able to withdraw into an isolated cell and dedicate himself to individual projects.

Contact with the outside:
Besides his secluded work, in a retired milieu, the research worker needs contact with the outside world in order to preserve his quickness of mind, which is stimulated by external influences.

Various spheres of research:
The spheres of research are multiple. They are distinguished by the more or less close dependence of research on industrial production which is governed by the principle of material gain. Certain realms of purely scientific research have no connection with material considerations and will never be directly exploitable; other realms are destined to develop a theoretical idea to its maximum possibility of realization. Between these two extremes are located all the other types of research project.

Industrialization of research and specialization:
Whereas research ten years ago was carried on only at universities and in certain large-scale industries (notably the chemical industries), at the present time even medium-scale enterprises with varied production are furthering their own expansion by means of a research section. Often research projects result in products that are totally different the manufacture of which turns out to be profitable.
Now then, this flourishing of research entails specialization, which necessitates complex equipment and which in the long run determines the scale of a research center, where the interconnection of several laboratories is necessary to ensure the staff indispensable to specialization.

The laboratory as core of a research center:
The lab has changed very little over the years. The width as well as the depth remain around 6.50 meters, and the essential elements are made up always of a central unit, shelves against the walls, work-sites and water outlet. Moreover, for modern labs, there is the "cubicle", that is, the isolated cell, where the research worker can pursue his work removed from the bustle and agitation that prevails in every laboratory.

Flexibility of interior fittings:
While remaining the same, the principal elements of a lab are, nevertheless, constructed differently. The conditions of adaptability require a high degree of flexibility in the fittings, which, in the case of offices, is ensured by movable partitions; this does not work for labs owing to the factor technical installations. The laboratory needs easily modifiable furniture, including attached installations, which are largely prefabricated. For reasons of economy, flexibility and precision, the interior fittings are composed finally of standardized elements (as in a kitchen) which are mutually adjustable and for which it is enough to provide power outlets designed for general laboratory equipment.

Hans Maurer, in association with the SSW planning office, Erlangen

Associates: Gábor Pétery and Florian Wisiol

Siemens Schuckertwerke AG research center in Erlangen

(Pages 46–55)

Since research is aimed at unknown realms, the architecture of such a building becomes in itself an experiment. This process of dynamic research likewise leads to the modification of the plan and of details while the work in under way.
The study is based on two contrasting American types: the large plant comprising all functions with flexibly arranged technical installations and a composition made up of small units each corresponding to a given function.
The final version that is envisaged necessarily falls between these two extremes: large areas for research and development offering all the advantages of technical flexibility, plus: small buildings for special fields calling for special installations. This functional idea as well as town-planing considerations were decisive as regards the general lay-out.

The firm of Siemens requires an assembly plan to which is subordinated each construction stage. Thus, a coordinating modular grid has been elaborated for the entire site, and the different buildings have been grouped in accordance with functional and economic considerations: the research section is made up of research labs, development labs, reactor development and central shops. The over-all arrangement of these groups is determined by the idea of coordination and introversion. This approach yields closed interior spaces, squares and yards which are either very lively or calm and which are readily adapted to open-air meetings. Moreover, it ought to be possible to extend each group independently of the others.

The widely varied fields of research of SSW call for large areas designed for open-air testing.

The over-all conception takes into account all these special factors and yields a grid for the underground installations which permits polyvalent use of the labs and the testing sites as well as pre-fab buildings housing the offices and the measuring rooms. The assembly plan, which comprises not only research but also production facilities, recreation areas and housing for employees, is set along a central thoroughfare which is connected with the general highway network via three large parking areas. The final stage of this project will be a new built-up district 2.5 km. long comprising places of work, housing and community installations, for which there are being preserved from the outset the already existing forests and bodies of water, all this to constitute a green zone ensuring the atmosphere of calmness so necessary to such a research center.

Suter and Suter, Basel

CIBA research center at Goregaon near Bombay

Suter and Suter, F. Maurer, A. Th. Beck

Associates: Ph. Kudinavala, Bombay (of Gregson, Batley and King, Bombay)

(Pages 56–61)

This branch of CIBA Basel was inaugurated in March 1963 in the presence of Nehru after a construction period of 22 months. It is designed for pharmaceutical and dyestuffs research.

The site, located around 30 km. west of Bombay near the north highway, is surrounded on the south by a green zone (dairy farm) and on the east by a palm grove. A hill divides the site into two sections which determine the grouping plan for the 27 buildings constituting the research center: to the west are all the research labs and the technical facilities, along the hill are the administration office and the canteen, to the east are the housing accommodations of the research and technical staff, and on the top of the hill are the executives' bungalows as well as the guest quarters. The hilltop commands a view over the sea. All these parts, which are highly differentiated in accordance with the contours of the site, are interconnected by covered passageways whose west face is protected by concrete slats against the monsoon winds, ample circulation of air being at the same guaranteed. All the labs on the north side open onto quiet interior patios; the outside passageways on the south are protected by perforated walls which allow the cooling sea breezes to enter and make for diffuse light. The research area is separated from the entrance by technical buildings accommodating the electrical and electronic installations shops, the glass-blowing shop, the precision instruments and, above all, the water supply system delivering 160,000 l./h. Covered passageways run in all directions from the parking sites. The canteen, which closes off the east side of the complex, is equipped very simply and serves 270 persons per meal. There are pleasant lounging areas at grade level on pilings arranged around pools and flowers.

Even during the planning stage account was taken of local conditions: this center intended exclusively for Indians is constructed entirely of local materials, and local techniques were applied, which entailed a very simple approach entirely based on manpower: the supporting structure is of reinforced concrete. The non-supporting walls are composed of bricks made on the site and of hollow blocks, of concrete slats and natural stone. The doors, windowframes and interior fittings are of teak. The apertures are protected from insects by metal screens.

Thus only certain apparatus and technical installations had to be imported. Despite the utilization of very simple resources, this complex meets the modern needs of a flexible research center, and it is adaptable to subsequent extensions.

Gordon Bunshaft, with Skidmore, Owings and Merrill, New York
and Mathews, Ryan and Simpson, London

Administration and laboratory building of the H. J. Heinz preserves factory in Hayes Park, Middlesex, England

(Pages 62–66)

A firm with an international reputation selects architects with an international reputation to construct an administration and laboratory building near London airport in Middlesex. The half subterranean buildings are situated in a park with old trees which had to be spared as much as possible. The central administration tract is arranged around a courtyard ornamented with a pool in which the building is reflect-

ed, with an island planted with azaleas. The lobby and the canteen open directly into this courtyard. Near the main entrance on the east side are situated the parking sites. The ground floor comprises the lobby, the staff cloakroom, the telephone central, the post office, the duplicating room, the kitchen and the canteen as well as two labs. The two upper floors are made up of office tracts on the façades grouped around an interior face surrounding the courtyard; in the core there are situated large office tracts. The communications and installations cores are located on the north and on the south between the corridor and the large office tract. The module is 700/845 cm. The laboratory building comprises research labs, testing kitchens, a library and the technical rooms. One of the labs runs up to a height of two floors.

For the first time SOM hade renounced the idea of curtain-wall elevations for a bank in Brussels under the pretext that in this way they could better integrate the new building in its setting of old structures.

Moreover, the architects do not visualize curtain-wall elevations solely in combination with a steel skeleton.

Since reinforced concrete is cheaper in Europe than steel, it was selected for the supporting skeleton both of the bank, where the inter-axial space is only 1.50 m., and of the Heinz buildings, where the span is greater (700/845).

The face of grey absorbent glass, situated in recessed position behind the skeleton, results in canopies, which serve as balconies from where the exterior cleaning work can be effected.

The articulations of the pillars are located in the upper part (and not in the middle as in the case of the bank). Although these faces are the outcome of static considerations, they do not lack a certain formalism that is open to criticism.

The structure is made up of cruciform columns (in section) of reinforced concrete, with an exterior face of washed white cement, the section of which varies according to the bending moments. At deck level they form T-wings. Horizontal stringers laid on supports that are integrated with the columns and anchored by steel rods of 3 cm. ϕ, which are restressed after assembly, take the load of the decks, which are 22 cm. thick (38 cm. to the right of the columns).

The load distribution is effected by means of a polished chrome-steel bearing fitted into each element.

The installations are situated between the deck and the suspended ceiling.

Interior appointments:

Floors of light brown linoleum (wall-to-wall carpeting for executive offices). Floors of the entrance hall, the kitchen and the canteen are of agglomerated stone flags. Walls painted white except for those of the vertical cores, which are light blue. Metal frame elements painted in accordance with the adjacent walls. Partitions between offices and corridors of tinted glass in aluminium frames running from floor to ceiling. Brise-soleil, white, 31 cm. wide, outside each window except for those of the pilotshop. Lateral and circular movements through 180°. Tables and cabinets of teak and other wood painted white. Chairs and settees red, furniture in executive offices of natural colour wood. Laboratory tables of teak, with white synthetic panel tops and chromium-plated drawers.

Air-conditioning:

The air is conditioned by two aggregates for the 2 upper levels of the administration building (420 vents serving 2800 sq. meters of utility surface). An independent system ventilates the central tract. The exhaust air is taken over by an independent system via vents located in the suspended ceiling.

The canteen and the entrance hall are ventilated by a double system (700 sq. meters) which is horizontal. A double system ensures the air-conditioning of the laboratories whose exhaust air outlets are combined with the lighting fixtures. Individual thermostats regulate the temperature in the various rooms.

Peter C. von Seidlein, Munich

Institute of Physiological Chemistry of the University of Tübingen

Plan: 1958
Built: 1965

(Pages 67–72)

Conception:

Building of three levels on rectangular plan, entirely surrounded by escape balconies, with entrances situated on the narrow ends.

Ground floor: entrance hall, auditorium, laboratories for students running along the entire long face of the building.

Basement, under the interior courtyard adorned with fountains is situated the large auditorium with cloakrooms; on the outside walls, there are the animal cages and small labs (isotopes, etc.). Upper floors accessible via an entrance and special stairs comprise research labs and blind labs (measurements, cold storage, etc.). To the south there are the administration offices (1st floor)and the library (2nd floor). The glazed corridor opens entirely onto the interior courtyard. Superstructure of steel situated in recessed position houses the technical installations and the air-conditioning plant.

Construction:
Skeleton of reinforced concrete, ribbed decks; module: 40/8.00 meters. Solid supporting walls only at basement level. Curtain-wall elevations of wood and metal, with absorbent glass (upper third). Escape and cleaning balconies without railings, with outside emergency stairs (danger of explosions!). Flooring of stoneware or PVC; ceiling heating system (concrete for labs, suspended ceiling for central zones). Partitions fixed in concrete blocks, other partitions mobile of plaster panels; installations mains, executive partions and corridors with woodwork facing.

Cost of construction: 7.2 million DM, cost per cubic meter of constructed volume: 137.30 DM.

Walter Henn, Brunswick
Wolf Krüger, Varta, Frankfurt

Varta, Research Center at Kelkheim, Taunus

(Pages 73–76)

Our future is determined by progress and by research. Thus, research centers are springing up everywhere, contact between the universities and industry is becoming more intensified and association in the field of research is even bringing together rival business enterprises. Tax facilitations favour investments, and there are multiple possibilities of direct application stemming from research.

Now then, these investments going into research centers have as their purpose the provocation of a maximum of calculable results. Thus, the research buildings ought to permit a flexibility of use which is even greater than that of a functional industrial structure. The duty of the architect is therefore to plan laboratories, workshops and technical installations that are as flexible as possible.

For the Varta research center the proprietors demanded a complex whose exterior was to express the spirit of teamwork: the spirit of contact, permanent teamwork, among the scientific researchers, the necessity of a communal feeling with a view to solutions of the highly complex problems facing them – all this is just as important as technical processes and ultra-modern equipment.

After a number of variants were tried out, the final plan offers a maximum number of advantages and flexibility, which permitted a group of highly specialized researchers to work while construction was under way on the complex, which, even so, remains a unified entity well adapted to many other kinds of uses.

The lay-out consists of an administration building with management offices, library, conference rooms and auditoriums, chemical and physical labs, facilities for scientific research on electrotechnical systems, shops, permanent testing rooms and special premises. The service tract comprises cloakrooms with lavatories, vending machines, a coffee bar and kitchens. The technical rooms are grouped together with the power plant, the storerooms and the superintendent's apartment.

The site is in open green country on the edge of the Taunus forest. The assembly plan provides various stages of which the first offers 130 worksites, which can be augmented by 30% without additional construction being necessary. The second stage is intended for the development of prototypes. A third stage comprises new labs and the extension of the technical installations and of the services premises for 500 employees. The ground floor comprises the entrance hall, exhibition tracts and seating groups, with separate access to the labs and to the conference room with coffee bar designed for use by the public. A large office tract 600 sq. meters in area serves the technical managers, the research directors, the general management, the library, temporary worksites for research workers who are generally in the labs and discussion tables. This area, an arena of intersection of so many different activities, encourages the feeling of teamwork to which great importance is attached, for this favours creative work.

The laboratories guarantee maximum flexibility:

The mains are freely attached against the basement ceiling, from where they feed "power columns" scattered throughout the upper tracts, which arrangement permits a disposition of lab tables of varying heights and construction that is very flexible. The transparent partitions between the labs are provided only for points whose function remains fixed. A very complicated system of power distribution as well as movable partitions allow for subsequent rearrangements.

Construction:
Skeleton of steel (module: 11.60/11.60 m.), basement of reinforced concrete. The lowsilhouette buildings harmonize well with the surroundings and the nearby forest, which forms an agreeable contrast to the severe aluminium faces.

Rasser and Vadi, Basel

Enlargement of the consultation section of the maternity hospital of Basel

(Pages 77–82)

Research is assuming ever increasing importance in hospitals.

This new section of the maternity hospital, located between two already existing buildings, which determine the height of its stories, comprises, on the top floor, the nurses' premises, on the second floor, the operating rooms and wards, on the first floor, the laboratories (urology, hematology, chemistry, hormone, cystology, spermatology, histology, electromicroscopy, preparation and coagulation, with a special room and a chromium-sheet room) along with the required utility rooms.

The laboratories, interconnected in accordance with their functions, open onto the interior courtyard, while the consulting rooms and the darkrooms are situated on the other face. The ground floor comprises the gynecological out-patient clinic with consulting rooms and attached treatment rooms.

The first basement level comprises X-ray therapy and radioscopy, the second basement the technical installations and the third basement a first-aid station with operating rooms and sickrooms.

Construction:
The supports are flush with the elevations, which is composed of light-metal pre-fab elements 1.50 meters wide, with outside Venetian blinds. The apparent decks are faced with artificial stone slabs.