Studies on Types

Laboratory EAST

Dormitories

Studies on Types: Dormitories
Laboratory EAST

ENAC Institute of Architecture
École Polytechnique Fédérale de Lausanne

Concepts of type and typology are not specific to architecture. Rather they represent an interdisciplinary approach to ordering knowledge and gaining insight. In the field of architecture, the study of types and typology offers a didactic perspective that allows us to see the complex network of interconnections between theory and practice as an inseparable material and social construct. While the ways in which knowledge is structured in architecture have changed over time, the study of past experiences continues to serve as a basis from which to expand on and renew them.

We are convinced of the value of typology as an analytical and operative instrument. In our years of experience as teachers, we have seen how typological and morphological analysis contributes fundamentally to our students' intellectual and creative faculties. As an analytical tool, it helps them understand the context, programme and formal and spatial qualities of architectural examples, and as a conceptual instrument, it informs the process of design.

In "On Typology" (1978), Rafael Moneo suggests that the concept of typology raises an inherent contradiction in the essence of the architectural object: its uniqueness and its repeatability. The latter refers to the typification of architecture as the classification of groups of objects characterised by the same formal structure. Here type serves as an organising principle through which a series of elements that exhibit certain relationships acquire a specific structure. A significant change to the system of relationships or to the elements themselves can transform a type, or give rise to a new type, even if within the same typological series. Accordingly, the type is both stable and transformative. It responds to social change or new technologies – in turn emphasising both the inventiveness but also generality of architecture as a discipline.

In our teaching, the interest in working with type lies especially in its capacity – due to its specific function, position, dimensions and in particular its characteristic form – to act as a catalyst for urban growth. Not infrequently, types outlast generations of buildings, are appropriated by different social systems, change their function and meaning sometimes multiple times and yet remain recognisable in their architectural form. In the research project "Studies on Types – Dormitories" we have attempted to develop a framework for analysing the reciprocal relationships between form, content and meaning. We began by investigating the extent to which particular systems of dormitory forms and floor plan organisations emerged as historical constants and could thus be identified as types. As classification systems of embodied knowledge, these types

provide a vehicle for creating new forms in response to the changing demands of our present time, and its accompanying social and societal needs. At the same time, changing conditions can render certain types obsolete, although their embodied knowledge still persists in the surviving structure. The challenge is then how to give such distinctive forms new meaning, roles or purposes without compromising the underlying constituent principles that determined their spatial, volumetric and structural form. Here we must modify existing types without deforming them, and make transformative adaptations but at a small-scale, all the while grounded in contextual relationships.

In the first part of this publication, we present a series of conference papers and theoretical reflections on the relationships between form, content and meaning in the design of dormitories from different historical, social and societal contexts. A focal aspect here is the dialogue between the ideals of order and composition and the concerns of programme and context born of the respective circumstances. Most tangibly, however, architectural knowledge is inscribed in the architectural artefacts themselves. The second part therefore presents an examination of architectural works and project designs conducted as part of the EAST Design Studio's "Tackle the Type" programme at the Institute of Architecture at EPF Lausanne. A graphical analysis of the historical precedents in this collection of projects illustrates both the subject of our study and its operational purpose by revealing the different organisational strategies used to create hierarchy, unity and order, and to organise space and programme. The range of different types depicted achieves a critical mass that is of relevance here in that they present different, opposing strategies alongside one another.

The ongoing reappraisal of types and their essence through typological consideration is, we believe, of fundamental value to architectural research and to changing disciplinary knowledge. It is also a sound basis for talking about architecture. In our teaching, therefore, both history and architectural analysis inform the design process. By examining types of the past, we can draw on the lessons they hold to deal with and respond to architectural transformations and shifts in context and meaning in the present and the future.

This publication is the first of a series of research studies by Laboratory EAST at EPFL.

Part I

Theories

Horizontal Healing

A

Anja Fröhlich

The Dormitory as a Space of Healing. A Consideration of Typologies for Housing the Sick as a Spatial Manifestation of Knowledge

Prologue

When it comes to designing human habitation from the standpoint of hygiene, one could argue, like Georges Teyssot, that not architects but engineers, technicians and physicians have made the greatest contribution to the development of human housing.[1] Certainly the role of specialists cannot be underplayed but what is more interesting is the extent to which, through specific knowledge, it is possible to establish a particular compatibility between people and buildings, as well as to form characteristic, meaningful spaces and develop architectural design types. In the following, we examine how the horizon of knowledge manifests itself in the design of space by looking at the ways in which rooms for healing the sick have developed over the course of history.[2] The focus here lies not on the role of specialists but on how new insight shapes space and leads to characteristic design solutions. We draw an arc from the symbolic motif of the cruciform plan arrangement of halls for the sick, via ventilation-motivated ideas for monumental domed halls, to linear spatial arrangements defined by the bed as a space-determining structural unit.

Our intention here is to reveal the knowledge inherent in these projects as typological characteristics so that we may identify the range of distinct types of dormitory spaces for housing the sick in the hospital context based on structural similarities in their characteristic features. The typological series[3] discussed here has been chosen with a view to examining the reasons behind the forms as well as the relationship between the individual elements and their influence on the overall geometry so that we may gain a better understanding of their architectonic essence. In principle, this means probing the very core of architecture: tracing the design process, techniques and methods as a form of cultural production as well as exploring the ultimate goal of architecture, the creation of space in all its dimensions.

Healing and Christian Faith – The Cruciform Plan

The first institutions for caring for the sick were Christian hospices. As places of refuge, they provided help and shelter to pilgrims, the poor and the needy. Founded on the idea of charity as described in the New Testament, the first hospices emerged in the Middle Ages through religious orders as communities of faith and care. The unity of healing space and

sacred place is seen most clearly in the connection between bed and altar. The sick person's gaze was directed towards Christ on the cross; they saw an image of a human body in suffering – just like themselves. This symbolism dictated the arrangement of the interiors of early bed halls and emphasised the importance of the altar in the context of healing.[4] The eastward orientation of the altar or altar space determined the longitudinal orientation of the mostly single-storey, unheated halls from west to east. There were comparatively few other rooms as all central activities, such as eating, sleeping and washing, were carried out in front of the altar in the communal space of the bed hall.

A striking example of this is the *Hôpital Notre Dame des Fontenilles* in Tonnerre in France, founded in 1293 (Fig. 1). It resembles a single-nave church hall in which 20 small cubicles were arranged lengthwise on both sides in which the sick lay with a line of sight to the altar. Each cubicle had a bed that could be cordoned off from the common room by a curtain. The patients could therefore follow the religious rites visually or at least acoustically from their bed. To accommodate twice as many sick people, two such halls were arranged either side of the altar, guaranteeing a view of the altar from both sides, as seen in the *Hôpital du Saint Esprit* in Dijon (Fig. 2).

As more halls were added around the altar, the cruciform plan arose. The building and the underlying architectural concept drew its form and centralised layout from the symbolism of the cross, as an analogy for the redemption of humanity from suffering and death through Jesus Christ. The altar, as the repository of the healing relic, was placed at the intersection. On the one hand, this was the most significant point at which all four halls convened, affording the sick in each room a view of the altar, and on the other it had the rational benefit of allowing the carers to monitor four times as many patients from one spot.

The first buildings of this type arose in Italy in the mid-15th century. A precursor to this type is the *Ospedale Santa Maria Nuova* in Florence (Fig. 3). The hall and the altar of the hospital for women date from 1315. The cross shape only came about through later extensions. Between 1420 and 1480, a series of hospitals were built in this manner in Genoa (Fig. 4), Siena, Brescia, Pavia (Fig. 5) and Mantua (Fig. 6). In 1456, construction began on what is probably the most important Italian Renaissance hospital, the *Ospedale Maggiore* in Milan (Fig. 7), designed by Antonio di Pietro Averlino (called Filarete). This complex consists of three sections: the central part is formed by a large courtyard with a church in the centre and four bed halls on each side to the left and right arranged in the form of a cross-shaped hall with an altar at its centre. The cross-shaped bed halls of the

Ospedale Maggiore have the proportions of a Greek cross with four sides of equal length and each is framed by a square portico structure. There are also examples of hospitals that took the form of a stump of the cross, i.e. where only three bed wings were grouped around the altar, such as the *Ospedale Santo Spirito* in Sassia in Rome in 1477 (Fig. 8) or later the *Ospedale Santa Maria della Pieta* in Cremona in 1583 (Fig. 9). The *Hotel Dieu* in Paris (Fig. 10) follows this same pattern, although its irregular cross shape is a product of the pre-existing buildings. As these hospitals have bed halls of unequal size that meet to form a cross, the assumption is that these did not follow a preconceived master plan.

The cruciform plan also emerged in England and Spain in the early 16th century. The only English example built is the *Savoy Hospital* in London in 1519 (Fig. 11). The first buildings in Spain are the *Hospital de los Reyes* in Santiago de Compostela in 1511 (Fig. 12), the *Hospital de Santa Cruz* in Toledo in 1514 (Fig. 13) and the *Hospital Real* in Granada in 1522 (Fig. 14). All three were designed by the architect Enrique Egas. The ground plan of the *Hospital de Santa Cruz* takes the form of the Latin cross, with a long trunk and a short crossbeam, which recalls the outstretched arms of Jesus Christ on the cross. These cross-shaped halls also had two storeys which were joined at their crossing by a full-height space, connecting all eight bed halls to the central chapel. At the centre of the chapel was a huge cross that was said to possess healing powers because it supposedly contains a splinter of the cross of Christ. Its name, *Santa Cruz*, probably refers to the relic of the cross kept there. At the *Hospital de los Reyes* in Santiago de Compostela, four three-nave two-storey halls meet at an octagonal chapel. Egas heightened their effect by also making a two-storey altar. In the *Hospital Real* in Granada in 1522 and *Hospital de la Sangre* in Seville in 1600 (Fig. 15), the underlying plan in each case takes the form of the Greek cross (with sides of equal length), which were intended as a symbol of triumph, thanking God for his help in vanquishing enemies. Other cross-shaped hall plans with a Greek cross can be found in 17th century France, Germany and Italy, such as Philibert Delorme's proposal for Paris (Fig. 16), a design by Joseph Furttenbach (Fig. 17) in his "Architectura Civilis" from 1628 or the *Albergo dei Poveri* in Genoa built in 1654 (Fig. 18).

The cruciform plan persisted until late into the 18th century, for example in Lamandé's Hôtel-Dieu in 1777 (Fig. 19) and the *Hospital Naval* in 1789 in Ferrol, Galicia (Fig. 20). The sheer number of projects with a cross-shaped layout testifies to its appeal as a central characteristic of hospital design over a long period of time. The diagrammatic scheme of wards around a central hub was an obvious pattern that could also be used to meet the increasing demand for hospital capacity. Towards the end of the 17th century,

Fig. 01 Hôpital Notre Dame des Fontenilles, Tonnerre
1293, Architect unknown

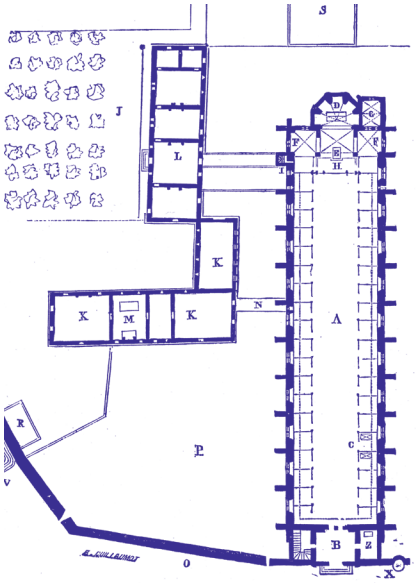


Fig. 08 Ospedale Santo Spirito di Sassia, Roma
1473 – 77, Baccio Pontelli

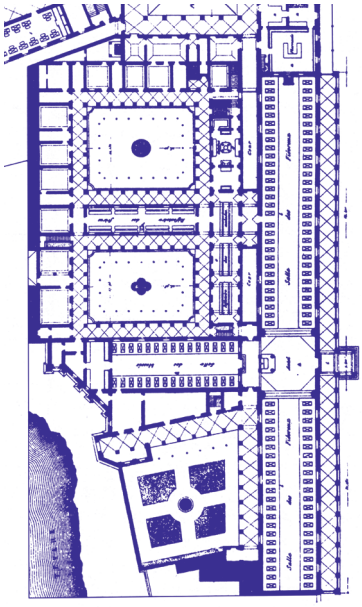


Fig. 09 Ospedale Santa Maria della Pietà, Cremona
1583, Architect unknown

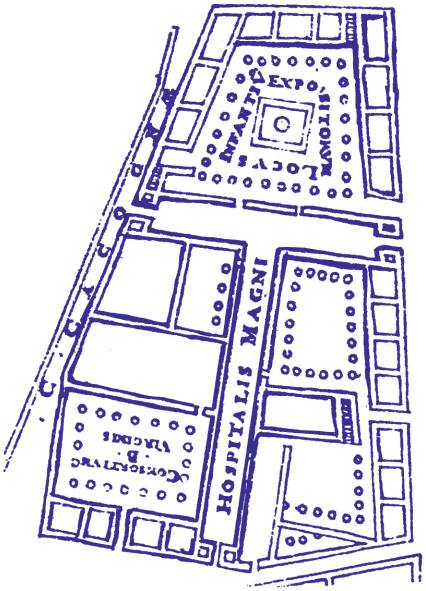


Fig. 10 Hôtel Dieu, Paris, founded 1195, State of
extension, 1770, Architect unknown

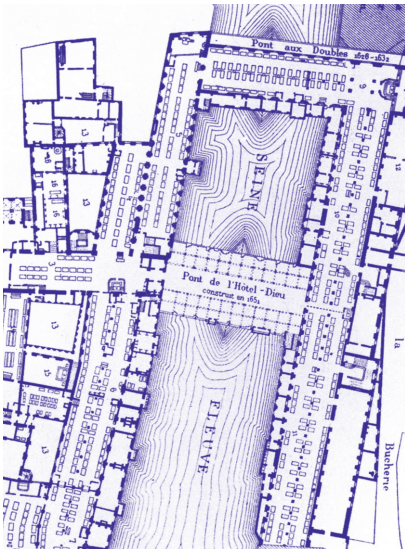


Fig. 03 Ospedale Santa Maria Nuova, Firenze, 1334
Architect unknown

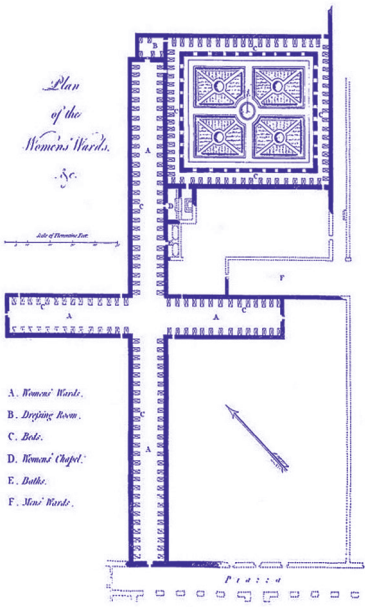


Fig. 13 Hospital de la Santa Cruz, Toledo, 1504 –1514
Enrique Egas

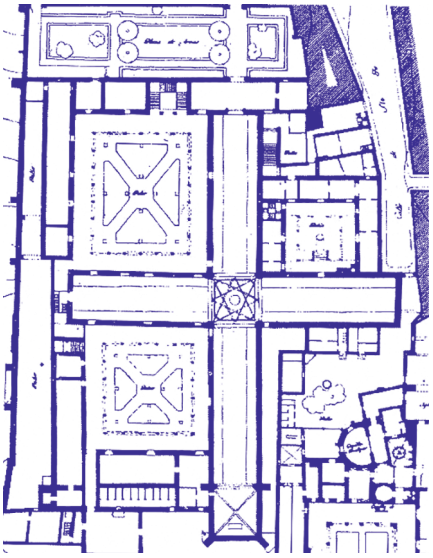


Fig. 11 Savoy Hospital, London, 1510 – 1519
Architect unknown

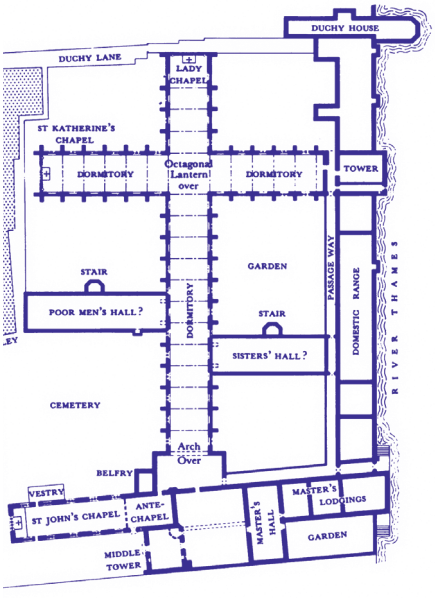


Fig. 04 Ospedale Pammatone, Genova, 1422 – 1442
Architect unknown

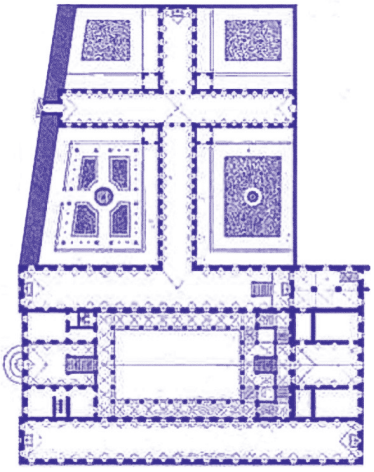


Fig. 06 Opedale San Leonardo, Mantova, 1472
Luca Francelli

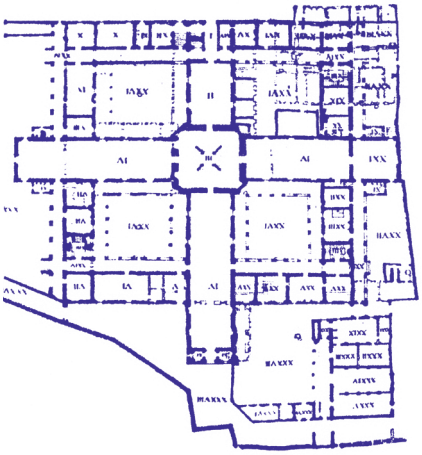


Fig. 17b Hospital Project, Ulm, 1655
Joseph Furttenbach

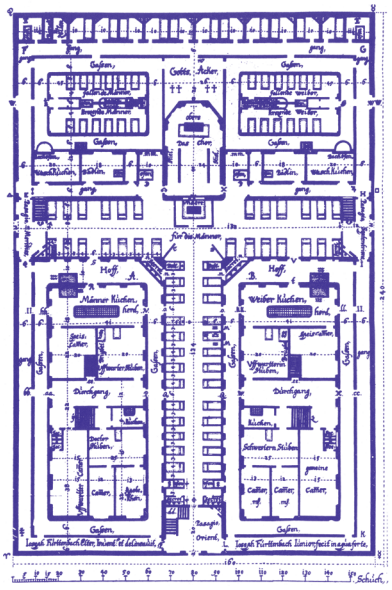


Fig. 05 Ospedale San Matteo, Pavia, 1465
Architect unknown

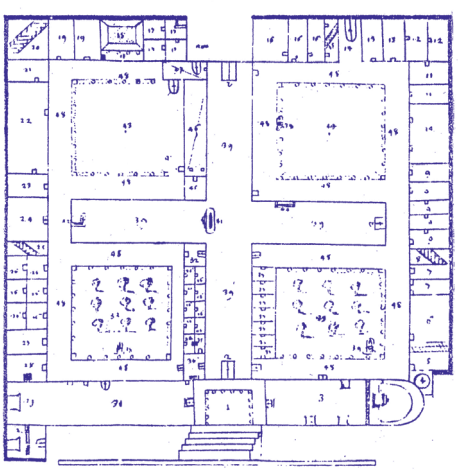


Fig. 07 Ospedale Maggiore, Milano, 1456
Filarete

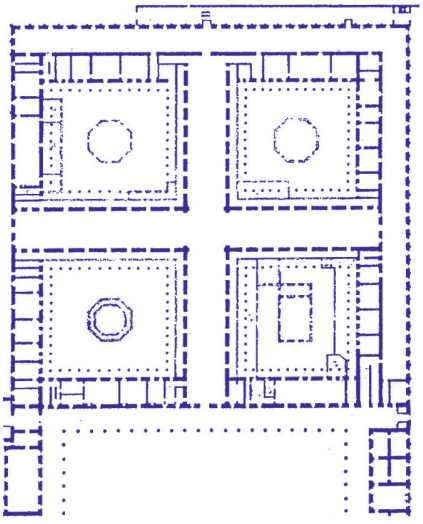


Fig. 12 Hospital de los Reyes, Santiago de Compostela
1501–1511, Enrique Egas

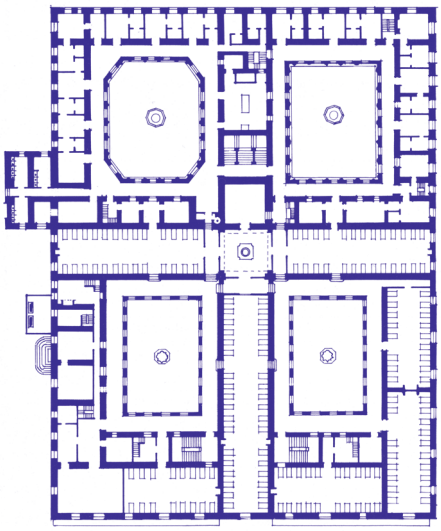


Fig. 02 Hôpital du Saint-Esprit, Dijon, 1204
Architect unknown

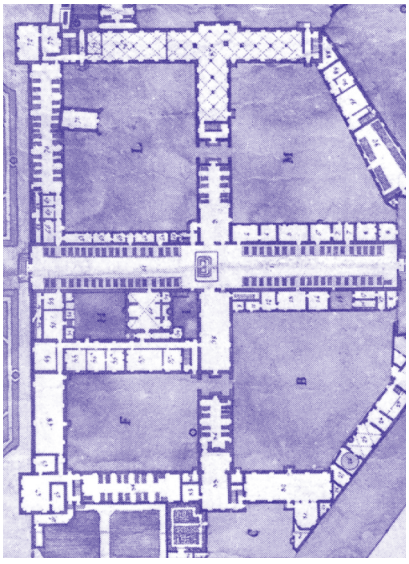


Fig. 14 Hospital Real Granada, 1514 – 1522
Enrique Egas

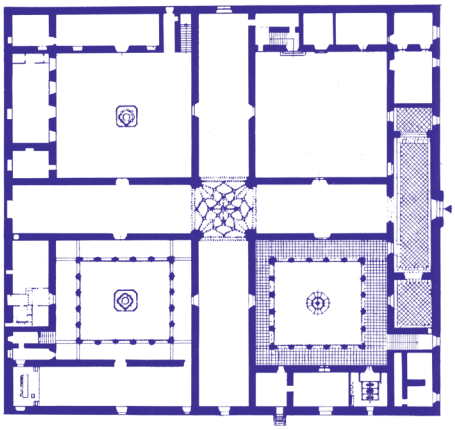
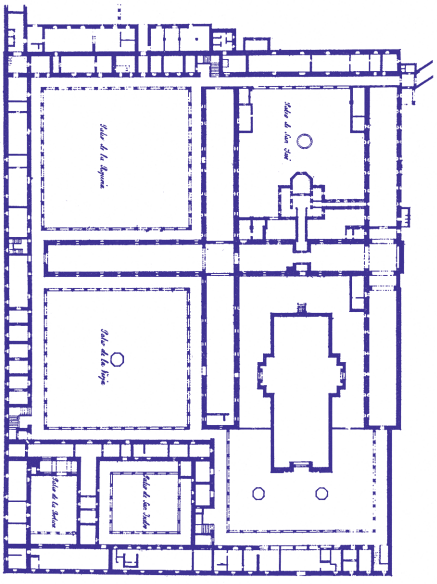


Fig. 15 Hospital de la Sangre, Sevilla, 1546–1600
Enrique Egas



Antoine Desgodets proposed a variant (Fig. 21) of a Hôtel Dieu with eight bed wings by superimposing two cross-shaped layouts in a square frame. Antoine Petit made a proposal with 6 wings in 1774 (Fig. 22) this time in a circular frame, and in 1785 Claude-Philippe Coquéau and Bernard Poyet took this idea even further in another concept for a hospital with 16 wings, effectively overlaying four cross-shaped layouts (Fig. 23). The increased number of wings necessitated optimisations to the floor plan. The original underlying concept of the crossing point at the intersection of the wings gave way to the idea of a radial layout. Similarly, the enclosing square frame became a ring shape.

Despite this change in form, these variations can still be seen as an extension of the same underlying centralised typology. With its religious origins in the Christian faith and the symbolism of the altar as the focal point of the cross-shaped hospital, the layout extends from the central point. In later developments, the composition shifts to a strictly rationally-motivated radial arrangement in which the wings extend outwards from the centre in rhythmic fashion with secondary functions such as the kitchen, laundry, pharmacy and medicinal herb garden arranged around and between them.

The series of examples discussed so far also demonstrate the interplay of form and symbolic meaning. The symbolic form of the cross as manifested in the morphological structure of the buildings consistently expressed the inherent idea for which it stands. Only as new scientifically-grounded methods of medical treatment began to emerge did the dominance of the central altar begin to wane accompanied by a corresponding obsolescence of the cross-shaped bed hall arrangement. With this came an increasing profanation of hospital care, and a shift in the responsibility of care provision from the church to the municipalities, which in turn gave rise to new building types.

Monuments to the Logic of Air Currents – Vaulted Ceilings and Domed Halls

The ongoing development of large-scale architectural forms for accommodating the sick went hand in hand with more complex approaches to medicine and a simultaneous desire to accommodate as many sick people as possible. Public health concerns also led to an awareness of hygiene in the 18th century, which had enormous relevance for the debate on the design of hospitals. No longer were they charitable institutions for the care of the sick and poor; instead, they became health facilities informed by the findings of physicians and physicists. Similarly, with the increasing focus on specific medical treatment came a shift in the perception of the sick as patients. In France, this new direction led to the

creation of an expert commission of the Académie Royale des Sciences in 1777.[5] Medical experts believed that a lack of fresh air was one of the main causes of high mortality rates in hospitals, and consequently paid special attention to improving hospital ventilation and separating the sick.

By that time, there was already a basic understanding of the composition and chemistry of the elements. An encyclopaedia from the year 1765 made mention of the "unfavourable properties" of air such as "its impurity, sudden variations in weight, lightness, heat, cold"[6]. The assumption that impure air was damaging to health led to attempts to relate the volume of air in a room to the volume of air in the lungs and its necessary oxygen capacity. Calculations assumed that the smallest amount of clean air required was 20 cubic metres per bed, and ideally per person, in an hour. The need to create air reserves, and thus to enlarge the room volume, became a driver of new hospital design, along with the need for the building structure to produce climatic effects.

A look back at the earlier examples of medieval church halls shows that the volume of air was already sufficient, as for example in the previously mentioned *Hôpital Notre Dame des Fontenilles* (Fig. 24). Its huge bed hall, some 90 metres long and 20 metres wide, was crowned by a monumental, 20-metre-high ceiling vault, and each of the 40 beds benefited from more than 500 cubic metres of air volume. The problem, so it seemed, was not the lack of adequate air space, but poor air circulation.

This was to change in the mid-18th century. To improve the indoor air quality and bring about better air circulation, new ways of applying the logic of air flows to buildings were sought. Among these were mechanisms originally devised by the English explorer Stephan Hales, who as early as 1741 invented fans that could be used to exchange air in mines, prisons, hospitals and inside ships. These inventions spread in France through the work of the chemist and engineer Henri-Louis Duhamel du Monceau[7] who also came up with further ideas of his own. It was already well-known how effective the huge barrel roofs of the hospital dormitories were as air reservoirs, and how warm, stale air accumulated in them, especially at the apex of the vaults. An obvious solution was to ventilate this space by allowing the stale air to be drawn out by employing natural thermal lift. In 1748, Duhamel De Monceau presented a project that would ensure air exchange by means of a cylindrical ventilation shaft in the ceiling of the dormitory (Fig. 25). However, because the natural stack effect was comparatively small, a single shaft was not very effective on its own.

A similar principle can be seen in a proposal by Julien-David Le Roy and Charles-Francois Viel in 1773 (Fig. 26). Here, too, ventilation shafts were

Fig. 19 Hôtel Dieu, 1777
Lamandé

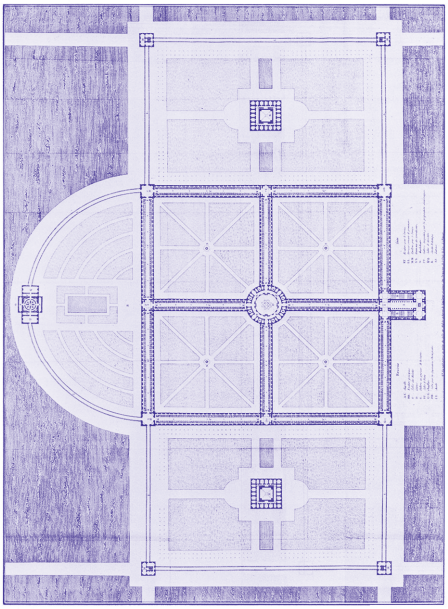


Fig. 17 Hospital Project, 1628
Joseph Furttenbach

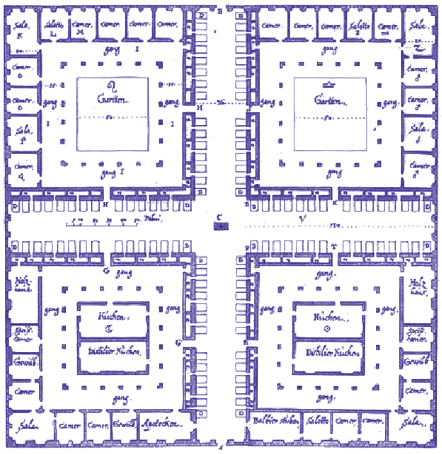


Fig. 20 Hospital Naval, Ferrol, Galicia, 1789
Architect unknown

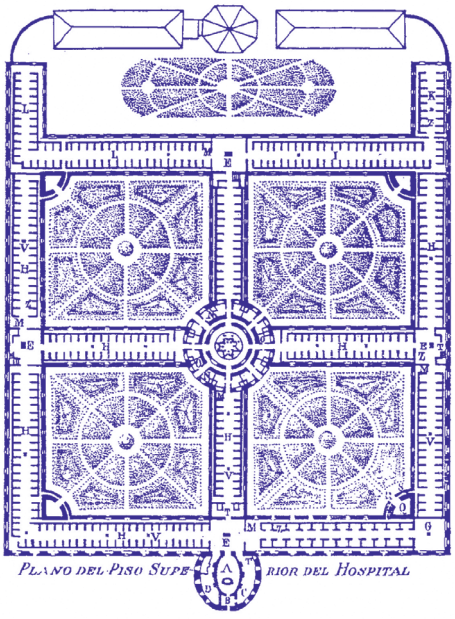


Fig. 16 Hôtel Dieu, 1570 (1626)
Philibert Delorme

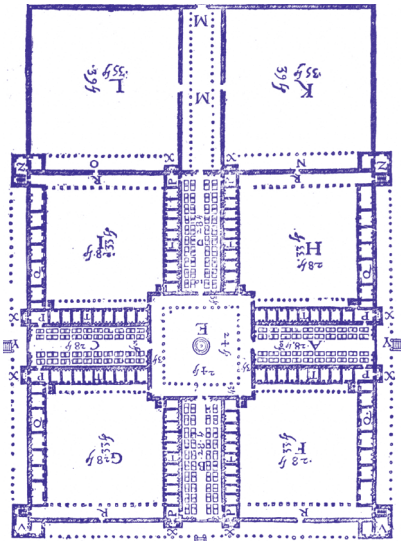


Fig. 18 Albergo dei Poveri, Genova, 1654
Architect unknown

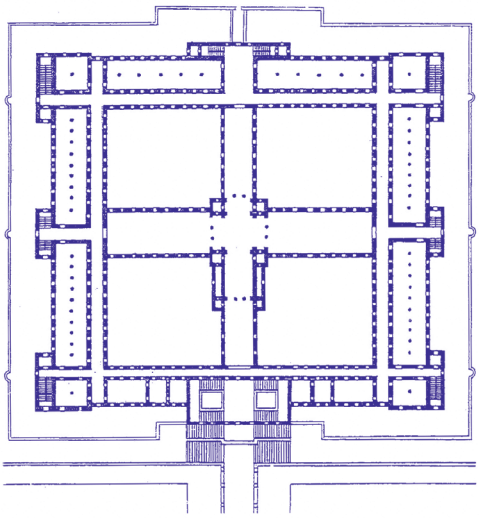


Fig. 21 Hôtel Dieu, 1784
Antoine Desgodets

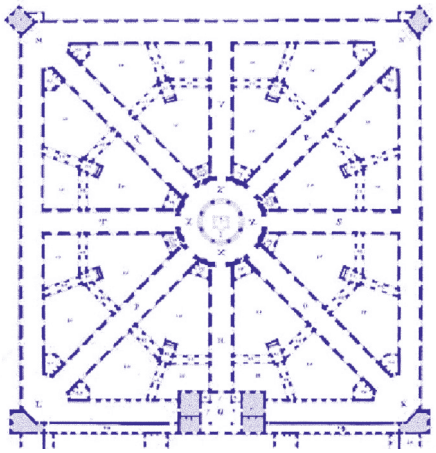


Fig. 22 Hôtel Dieu, Paris, 1774
Antoine Petit

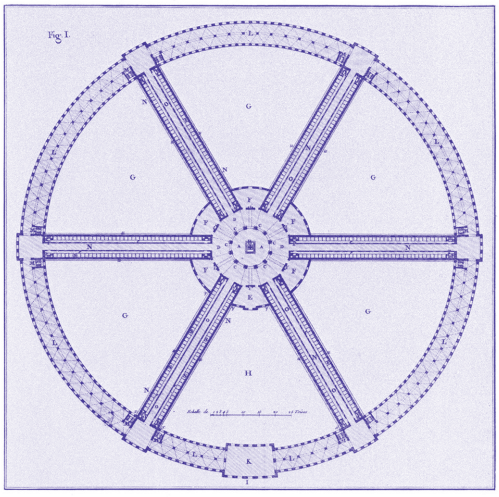


Fig. 23 Hôtel Dieu, Paris, 1785
Bernard Poyet

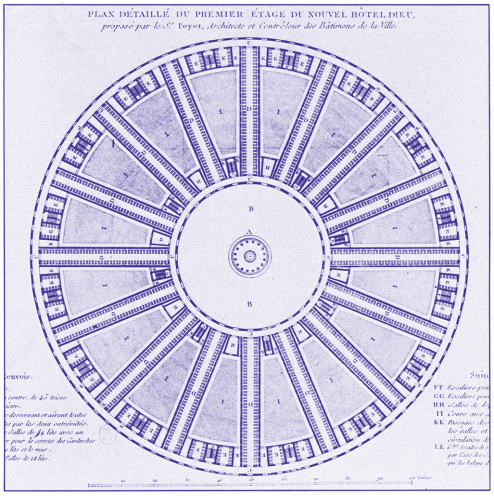


Fig. 24 Hôpital Notre Dame des Fontenilles, Tonnerre
1293, Architect unknown

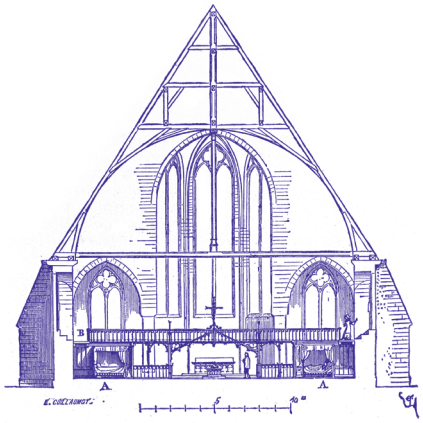


Fig. 27 Hôtel Dieu, Paris, 1774
Antoine Petit

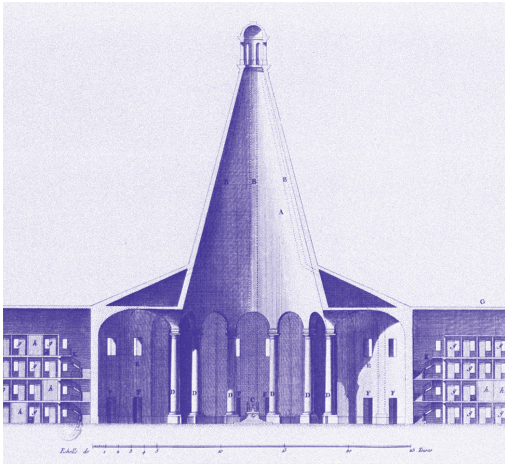


Fig. 25 Hôtel Dieu, Paris, 1748
Henri-Louis Duhamel De Monceau

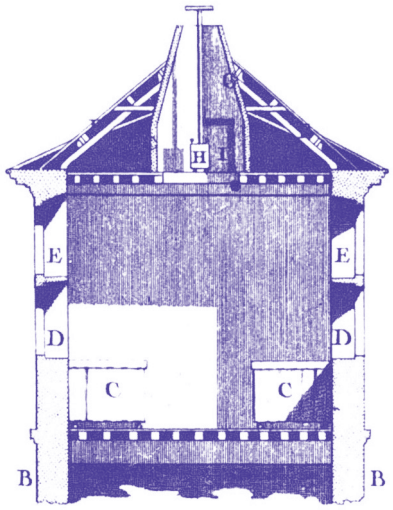


Fig. 30 Krankenhaus Am Friedrichshain, Berlin, 1868–1874
Martin Gropius / Heinrich Schmieden

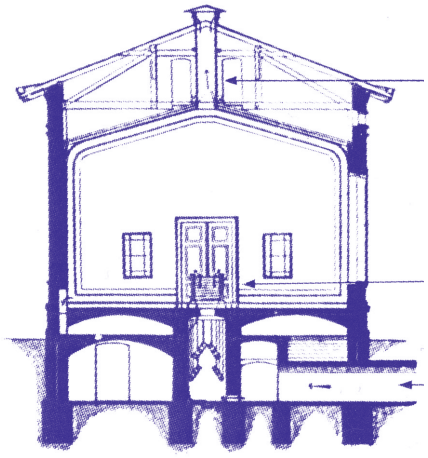


Fig. 28 Hôtel Dieu, Dijon, 1782
Hugues-Bernard Maret / Jacques-German Soufflot

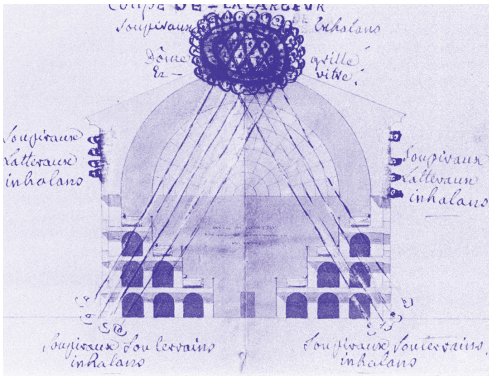


Fig. 29 Hôpital militaire, 1770
Laugier de la Ferraye

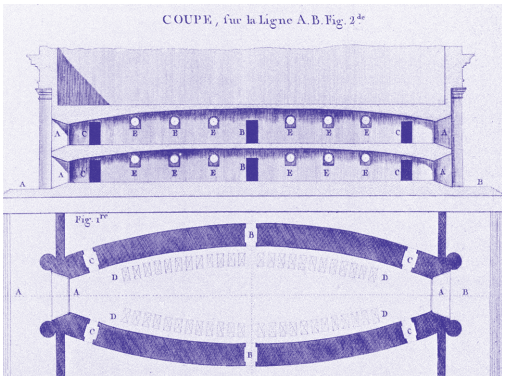


Fig. 26b Hôtel Dieu, Paris, 1773
Julien-David Le Roy / Charles-Francois Viel

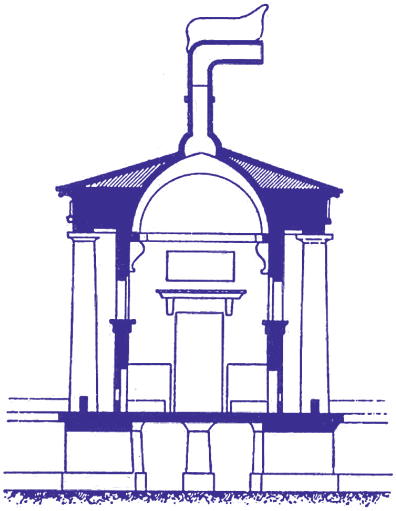
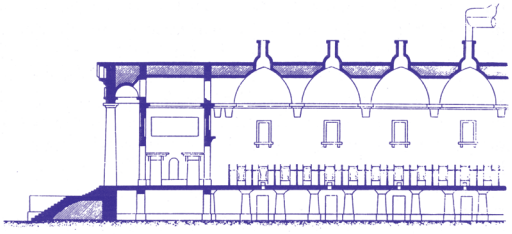


Fig. 26 Hôtel Dieu, Paris, 1773
Julien-David Le Roy / Charles-Francois Viel



integrated into the ceiling of the bed hall but in this case the hall ceiling was ventilated by a long row of chimneys. To increase the effect, the ceiling was dome-shaped around the flues. A supply of fresh air was ensured by "puits à air", so-called air wells in the floor of the ground level. What makes this project particularly remarkable, however, was Le Roy and Viel's attempt to isolate the patient by architectural means: around each person they organised individual air circulation.

The proposal for a building with a conical shaft, turning the altar and church into an effective ventilator to extract stale air from the wards, is probably one of the most spectacular hospital projects in France. For the *Hôtel Dieu* in Paris in 1774 (Fig. 27), Antoine Petit planned six long wards extending radially from a central round church (Fig. 22). Since it was important to create large continuous spaces rather than smaller enclosed spaces, the halls were conceived as four-storey spaces joined by a vertical open atrium arranged between the cubicles placed on either side for the sick. Petit envisaged 300 – 400 beds in each of the six wings, achieving an enormous capacity of nearly 2000 beds. This gigantic building structure was not the product of megalomania, but rather an attempt to find an appropriate solution to the increased need for beds in relation to an adequate volume of air.

Two other projects reveal the degree of experimentation that some went to at the time. The design for a military hospital in 1770 by Laugier de la Ferraye proposed a huge air space by means of an atrium formed by a terrace-like structure on which the beds were placed. Openings in the dome and the outer walls were intended to provide a supply of fresh air (Fig. 28). Hugues-Bernard Maret and Jacques-German Soufflot take an elliptical floor plan for the dormitory as a starting point. Their hospital design for Dijon in 1782 also utilised wind currents and temperature differences between outside and inside – but not in a vertical direction through domes or chimneys. Instead, the sick person was placed in a kind of horizontal wind tunnel created by the aerodynamic shape of the dormitory which would direct airborne infections away from the patient's bed. Two large funnel-shaped openings at the narrow ends sucked in fresh air and passed it on directly to the dormitories on the ground and upper floors (Fig. 29).[8]

While the expert commission of the Académie Royale des Sciences published all these proposals, none of these projects were pursued or built. The fact that, had they been built, the resulting buildings would have been almost useless from an operational standpoint was of no consequence. As the century in which the fundamental laws of the chemistry of gases were discovered, the principle of ventilation trumped all other

considerations. If poisonous gases could kill and bodily exhalations caused disease, the elimination of pathogenic germs was deemed of overriding importance. Accordingly, the project examples mentioned here demonstrate the use of architectural form as a means to solve a problem: to draw in and circulate fresh air and to expel stale air. The rich variety of ambitious solutions and remarkable degree of sophistication led to the design of dome-like sculptures informed by the logic of air flows and also reveal a new sense of social awareness that is inscribed in the well-defined architectural forms.

Ultimately, this archetype represents a stimulating but also unfeasible episode in the context of ideas for ventilating hospital spaces. It did, however, prepare the ground for what would later – from the late 19th century onwards (Fig. 30) – be regulated using highly technical means of room climate adjustment.

The Bed as Space Generator – Linear Repetition Within a Room

In view of their primary use, collective spaces for housing and treating the sick are first and foremost spaces filled with beds. Their space design is therefore inevitably closely linked to the specific characteristics of hospital beds and their arrangement in a room. The bed as the individual territory of the sick is the smallest spatial unit. It is here that the patient is examined, treated and cared for. The importance of the bed and its role in the context of the hospital space has changed over time, becoming gradually more complex until it finally developed into the primary unit determining the design of the room.

Since the early Middle Ages, communal spaces in hospitals contained bed cubicles, wood-framed enclosures that could be closed off with curtains. As a “house within a house”, they guaranteed a minimum of privacy in the large sick halls, keeping in warmth in winter and separating the sick to prevent the transfer of infection.[9] Arranged in linear rows of dozens of beds, the cubicles were reached via passageways between them. Sometimes there were several parallel passageways, as in the *Heiligen-Geist Hospital* in Lübeck in 1287 (Fig. 31). However, this arrangement made it difficult to monitor the sick. An alternative solution seen, for example, in the *Hôpital Notre Dame des Fontenilles* in Tonnerre (Fig. 1, 24), was two elevated galleries on either side which allowed carers to circulate freely and supervise the cubicles from above.

Over time the partitioned spaces gave way to beds and associated furniture. For the *Ospedale Maggiore*, Filarete planned a small chest at the foot of the bed for storing clothes. Next to the headboard was a folding table

Fig. 31 Heiligen-Geist-Hospital, Lübeck, 1287
Architect unknown

Fig. 32 Ospedale Maggiore, Milano, 1456
Filarete

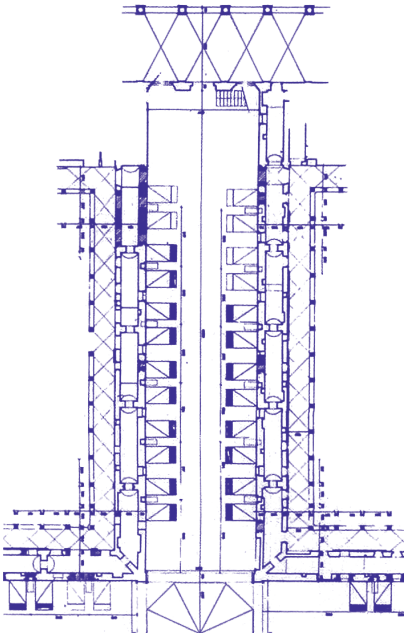


Fig. 35 St. Thomas' Hospital, London, 1871
Henry Currey

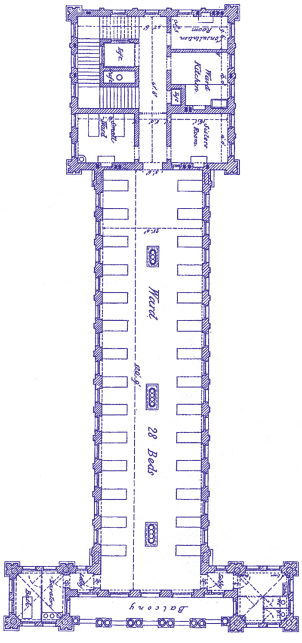


Fig. 34 Städtisches Krankenhaus, Nürnberg, 1893
Heinrich Wallraf

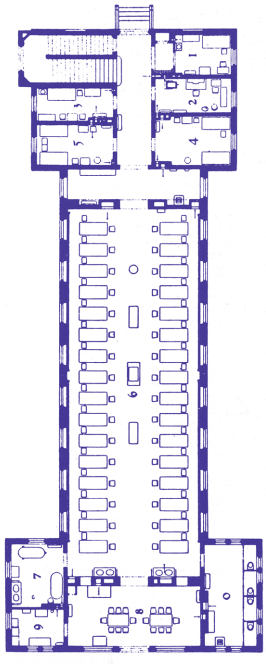


Fig. 41 Dosquet Krankenhaus, 1926
Wilhelm Dosquet / Mohr and Weidner

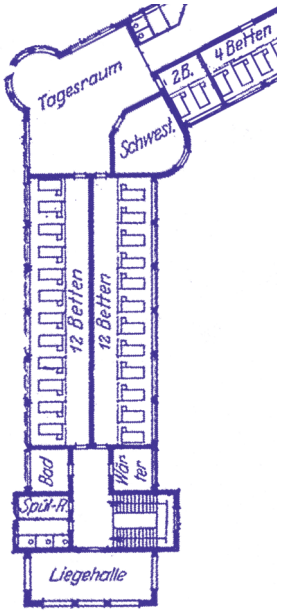


Fig. 42 Freiluftkrankenhaus, 1901
Heinrich Becher / David Sarason

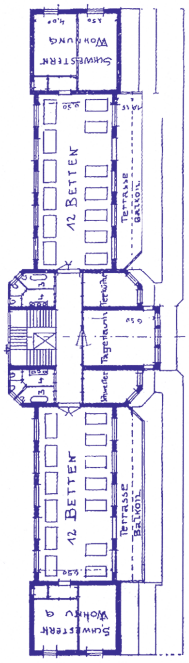


Fig. 33b Royal Infirmary, Edinburgh, 1748
William Adam

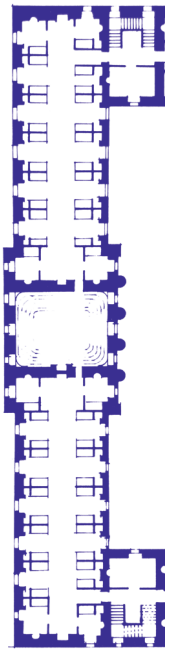


Fig. 40 Krankenhaus, Zwickau, 1920
Wilhelm Dosquet

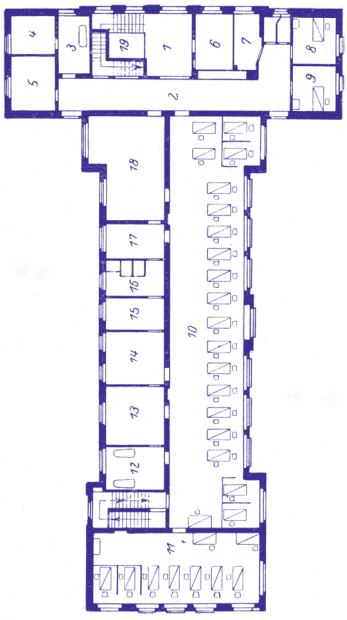


Fig. 43 Ward layout, Waiblingen Hospital, 1926
Richard Döcker

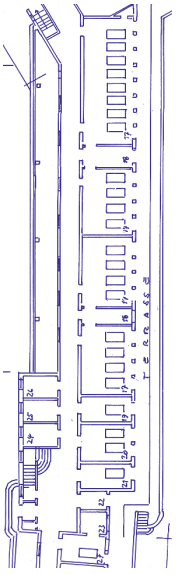


Fig. 44 Hôpital-Sanatorium Sabourin, Clermont-Ferrand
1936, Albéric Aubert

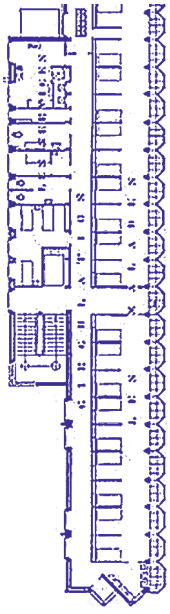


Fig. 33 Heiligen-Geist-Hospital, Frankfurt a. M., 1835
Architect unknown

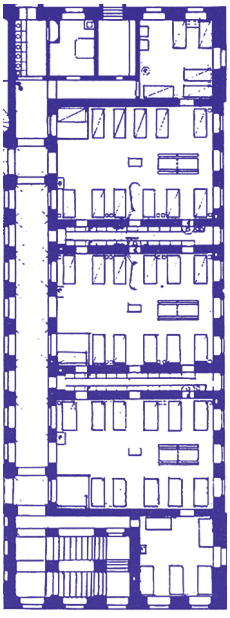


Fig. 36 Frederik's Hospital, København, 1750
Nicolai Eigtved

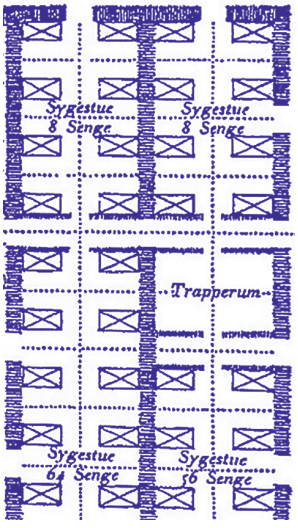


Fig. 37 Floorplan Study for 10 beds, 1930
Schachner / Schmieden / Winterstein

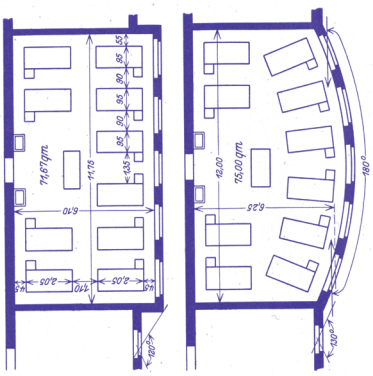


Fig. 37b Floorplan Study for 10 beds, 1930
Schachner / Schmieden / Winterstein

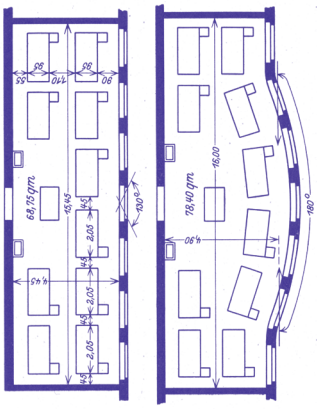


Fig. 38 Rigshospitalet, København, 1909
Martin Borch

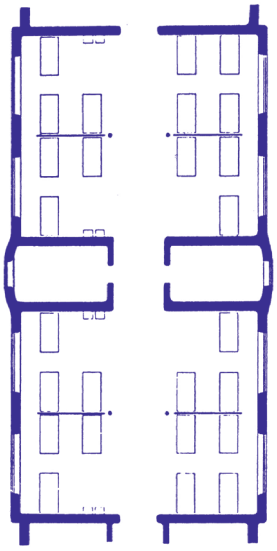
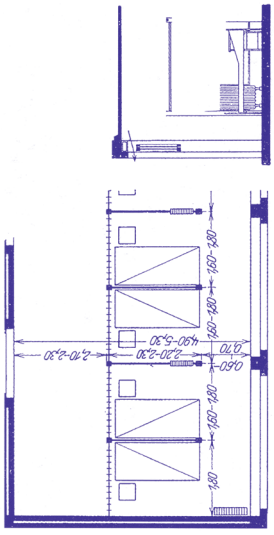


Fig. 39 Krankenhaus, Berlin-Nordend, 1905
Wilhelm Dosquet



that could be used for eating and then tipped up to serve as a refuse chute emptying directly into the canal (Fig. 32). Even in the early hospitals, the standard notion of the floor plan was invariably a large linear, open space, with beds arranged along both long sides and a central corridor running between them. This spatial constellation of medical care was predominant until the 19th century, although the arrangement of the beds within the hall sometimes varied. Usually, they stood at right angles to the windows, but also sometimes parallel (Fig. 33), in pairs (Fig. 33b), or evenly spaced. The freestanding bed deprived the patient of privacy, but at the same time facilitated easy access to the beds. To allow the doctors to administer treatment and the nurses to provide care, they needed access to both long sides of each sick bed. The narrow end at the head of the bed could be pushed up against the wall, unless it was a wall of windows. In such cases, a space was generally left to allow nurses unobstructed passage behind the beds to open and close the windows (Fig. 34, 40).

The English nurse and social reformer Florence Nightingale also advocated placing the beds perpendicular to the walls, spaced widely apart with a window between each for continuous cross ventilation. In her influential book "Notes on Hospitals"[10], she outlined a series of key factors for minimising the rate of cross-infection in the hospital room by maximising light and air. Her suggestions were widely adopted, for example in *St. Thomas' Hospital* in London in 1871 (Fig. 35).

The Danish architect Nicolai Eigtved had already made concrete recommendations for bed spacing around 1750 for the floor plan of *Frederik's Hospital* in Copenhagen. He explicitly derived the size and proportions of the bed halls from the dimensions of the bed[11] and an inter-bed spacing of 1.80 metres (Fig. 36). Each bed has a comparatively spacious floor area of 15 m². A much more condensed floor plan layout is documented in a study by the German architects' group Schachner, Schmieden, Winterstein at the beginning of the 20th century, who envisaged a distance of only 0.90 m between each bed.[12] They made proposals for different room shapes as well as variants for the positions of the beds, but always for the same number of 10 beds (Fig. 37). Here, each bed has a significantly smaller area of only 7.5 m² at its disposal.[13] The study also recommended an optimal number of 10 – 12 beds per hospital room,[14] but at the same time stipulated that a maximum of 50 beds per room should not be exceeded.

To give patients more privacy, in 1909 the *Rigshospitalet* in Copenhagen began dividing the large linear open bed-hall into smaller groups of beds. Instead of arranging the beds at right angles to the window walls, they were arranged parallel to the outer walls in groups of four with an open corridor passing along the middle between each group (Fig. 38). Floor to

ceiling partitions made it possible to separate off groups of four beds at a time. A notable advantage of this constellation was that the sick had a glare-free view out of the window from their beds. This arrangement was common until the 1950s when fixed walls replaced the partitions resulting in separate four-bed patient rooms.

At the turn of the 20th century, the German physician Wilhelm Dosquet took the idea of partitioning in cubicles a step further, developing a system of partitions and curtains suspended from the ceiling that could be drawn around the bed. The size of the cubicles could be reduced to such an extent that it became possible to partition off individual areas within the bed hall (Fig. 39). The ability to temporarily screen off a space around a bed, much like the early wooden bed-cubicles, allowed private examinations or treatments to take place directly at the bedside. This was further facilitated by the adjustability of his system, in which the patient's feet or head could be raised independently of the rest of the body.

A further aspect that emerged in the mid-19th century was the idea of providing better light and ventilation for the patients in their beds. Influenced strongly by theories of climate therapy and treatments for tuberculosis, new designs arose in which all the windows or an entire wall of a bed hall could be opened to allow fresh air to circulate. Preferably, such spaces were south facing to maximise sunlight. Wilhelm Dosquet also developed an ambitious solution for this as early as 1905 that employed a vertical sliding window system,[15] that could provide light and air for the sick without the need to change the position of the bed. The beds were arranged at right angles to the window to ensure an optimal supply of fresh air. Ideally, the long sides of the hall were to be open as much as possible and, taking this idea further, he proposed replacing the deep halls with shallow but long rooms with just a single row of beds accessed via by a corridor[16] (Fig. 40). To avoid this resulting in tube-like buildings, Dosquet proposed arranging two such spaces back-to-back, each with a single window front, to achieve a greater building depth (Fig. 41). This, however, meant a departure from the principle of cross-ventilation. Advances in the medical understanding of bacteriology and germ theory had, in effect, freed epidemiology from its single-minded focus on infectious aerosols, and introduced other methods of combating bacterial infection by means of antiseptic procedures. The role of sunlight was by no means disregarded, and indeed it was shown to have direct therapeutic and antibacterial properties in the treatment of tuberculosis and rickets. From this came the idea of placing the sick in their beds in front of rather than behind the glazing, completely outdoors on sunlit terraces. This can be seen in a proposal for an open-air hospital in 1901 by the German physician David Sarason and the architect Heinrich Becher (Fig. 42) but it was not until

some 25 years later that such climate therapy principles could be consistently implemented by the architect Richard Döcker in his project for *Waiblingen Hospital* (Fig. 43). Flush thresholds ensured that beds could be pushed easily out of the bed hall onto the terraces. We see the same rigorous principle in the *Sabourin Sanatorium* in Clermont-Ferrand, where in 1936 the French architect Albéric Aubert developed a building with a gigantic 96-metre-long terrace for the sick to partake of fresh air (Fig. 44).

The bed, now a kind of mobile stretcher, was not only moved in and out of the bed hall onto the terrace, but could also be taken to other treatment areas. As a mobile treatment location, it began to be a determining factor for other aspects of hospital design, such as door and corridor widths and room sizes, window widths and terrace depths. At the same time, the bed also became a place from which the patients could visually experience their immediate surroundings and the wider landscape. The Finnish architect Alvar Aalto deliberately designed sections of *Paimio Sanatorium*, built from 1928 – 32, from the viewpoint of the patient lying horizontally in bed. This informed the design of the entire space:[17] the view through the window was calculated from the perspective of the bed,[18] resulting in low parapets on the terrace and thin railings for the balustrade to afford the sick person an unrestricted view while lying horizontal. By this time, patient rooms were no longer large, linear open halls but already smaller, more manageable spatial units.

The examples discussed here show clearly how the bed was not only a spatial module subdividing the bed hall but also became a structure-determining unit, dictating room sizes through linear arrangement variants as well as the sequence of nursing actions. It therefore had a major influence on the design of rooms for healing the sick. While such dormitories with linear bed arrangements for upwards of 12 patients still existed until well into the 1960s, there was an increasing tendency towards smaller rooms with 8, 6, 4, or 2 beds as well as single-bed rooms. Over time the dormitory space or bed hall disappeared entirely from modern hospital contexts.

Epilogue

In addition to organising and classifying architectural knowledge, this typological consideration of the hospital dormitory and its specific geometries also serves as a vehicle for memory. It is, in principle, therefore also a fragment of the history of the hospital dormitory itself. This long history and process of evolution represents a rich source of knowledge that shows how developments in the typology of the hospital dormitory reflect parallel changes in society as well as how an increasingly humanitarian

outlook and advances in technology and medical practices have brought forth new typological forms.

Lastly, the examination of typological aspects also reveals the complexity of architectural thought, the many requirements it is subject to and the diverse disciplines that contribute to shaping these. This brings us, in turn, back to Georges Teyssot's declaration at the beginning of this article. Our typological consideration shows one can reasonably assert that no form-giving, space-defining decisions can exist without the social, cultural, technical or environmental context in which they are made. As such, we can contend that, over the course of history, architects do emerge as the actual experts in the design of human habitation – namely through their conscious inscription of specific knowledge in space through the means of architecture.

1 Georges Teyssot, *Die Krankheit des Domizils: Wohnen und Wohnbau 1800 – 1930*. Bauwelt Fundamente Vol. 87, Braunschweig / Wiesbaden 1989
2 The study concentrates on the European context, and on dormitory spaces for housing upwards of 10 people.
3 The typological series does not claim nor intend to be comprehensive.
4 Not least because at that time there were few alternative therapies or other possibilities for influencing the course of serious illnesses.
5 It was here that the leading scientists (physicians, mathematicians, chemists) of the day debated at length on how hospitals should be built and how the health system of the nation should be organised.
6 Denis Diderot, Jean Baptiste le Rond d'Alembert, *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers, VII*, 1765, p. 386
7 Henri-Louis Duhamel du Monceau, *Moyens de conserver la santé aux équipages des vaisseaux, avec la manière de purifier l'air des salles des hôpitaux, et une courte description de l'hôpital Saint-Louis, à Paris*, 1759
8 Hugues-Bernard Maret, *Mémoire sur la construction d'un hôpital dans lequel on détermine quel est le meilleur moyen à employer pour entretenir dans les infirmeries un air pur et salubre*. Académie des sciences, arts et belles-lettres. Nouveaux mémoires de l'académie de Dijon pour la partie des sciences et des arts, 1782–1785, 1er semestre 1782, pp. 25–68. This text was published in 1782 by the Académie des Sciences in the form of a brochure, and also appeared in the Journal de Paris on 10 April 1780.
9 In many cases, however, the effectiveness of separating patients must be questioned, when one considers, for example, that one bed was often used by multiple patients. In the Hôtel-Dieu in Paris it was not uncommon for up to 5 people to share a bed even well into the 18th century.
10 Florence Nightingale, *Notes on hospitals: Being two papers read before the national association for the promotion of social science with evidence given to the royal commissioners on the state of the army in 1857.* London: John Parker & Son, 1859
11 3 feet (0.91 m) wide and 6 feet (1.82 m) long.
12 The size of the beds was 2.05 m × 0.95 m.
13 This size corresponds to the Prussian regulation of 1850 that defines the minimum floor area per bed, as well as a volume of air per bed of 25 m³. See: Schachner, Richard, Schmieden, Heinrich, Winterstein, Hans: *Krankenhausbau*, Springer Berlin, 1930, p. 13
14 Ibid., p. 8
15 Wilhelm Dosquet: *Die offene Wundbehandlung und die Freiluftbehandlung*. Leipzig 1916
16 This system was used in hospitals in Köln-Lindenburg (1908), in Zwickau (1912–1926) and Berlin-Nordend (1924).
17 This meant that not only the window but also the ceiling of the room became important. Since this is in the patient's field of vision, light sources could not be integrated in the ceiling.
18 The psychological effect of the window on the well-being of the patient played a special role. This relationship was further enabled by the architecture and its construction, for example, skeleton construction made it possible to reduce outside walls to glass surfaces and thus open them fully to the sun, air and light.

Sleeping in Rank and File

B

Arne Winkelmann

On the Political Dimension of Dormitory Accommodation in Children's Holiday Camps

Alongside military barracks and hospitals, dormitories can also be found in facilities for children and young people such as children's homes and orphanages, youth hostels and children's holiday camps. That the apparently innocuous arrangement of many beds in a large room can also have a political dimension can be seen, in particular, in this latter type. This article examines the *colonies* of fascist Italy and compares them with the *youth pioneer camps* of the Soviet Union from the second half of the 20th century. Their political backgrounds and their objectives could hardly be more different: on the one hand, the fascist ideology of nationalism under the dictatorship of Mussolini, and on the other communism and the bureaucratic socialism of the Soviet system.[19] Both regimes built hundreds of children's holiday camps over two decades, not as single, mass-produced building types, but as individual buildings and facilities, often with spectacular designs and spatial concepts (Fig. 45, 46).

The typology of holiday camps comprises various spaces and facilities, such as dining halls, large-scale kitchens, sports facilities, roll call areas, recreation rooms and so on in varying constellations, but what they all share is communal accommodation in dormitories. These dormitories usually house about eight to ten children, neatly arranged in rows – "in rank and file" to use military parlance – and at first glance, they seem to be largely identical. Each bed usually has a small bedside cabinet for stowing personal belongings, but otherwise the rooms rarely contain any other kind of furniture such as cupboards, tables or chairs. As such, dormitories really only provided overnight accommodation.

Their common origins lie in camps of the early 1920s in which children were accommodated in canvas tents, which were often former military tents. How they were accessed and which other facilities or elements – such as arcades, forecourts or recreation rooms – these camps contained varied over the years significantly. The broader cultural and architectural context gave rise to a wide range of metaphors and formal languages – from a general machine aesthetic to the specific motif of a ship in concrete, or from light, tent-link pavilions to sparse mass barracks blocks or alternatively grand, palatial manors.

A key to understanding the role of dormitories is to see how they were embedded in the processes and activities of the respective holiday camp. They played an integral part in often strictly regulated daily routines as

well as in the ideological and pedagogical philosophy of a camp. Dormitories must therefore be considered in the context of their use in practice and the overarching socio-political framework.

The Italian children's holiday camps, the *colonie*, were originally founded by philanthropic doctors at the end of the 19th century as institutions for improving the health of children in the big cities: fresh air, swimming in the sea and sunbathing were intended as a means of strengthening physique and constitution. When the fascists came to power in 1922, they saw these an opportunity to form a "new generation" of Italians. Children and young people would be physically trained, properly nourished, exercised, and also indoctrinated. As such the camps were ultimately a tool for instilling fascist doctrines and cementing power. Built on the underdeveloped shores of the Adriatic and Tyrrhenian coasts, they also acted as a motor for mass tourism on the Italian coastline.[20]

The fascist youth organisation was called Balilla, later GIL – Gioventù Italiana del Littorio. It had a strictly hierarchical structure: the smallest unit was a *squadra*, a squad or group of ten boys; three such squadre formed a *manipolo*, in English a maniple; three maniples made up a *centurie*, a centuria of about 100 boys; three centurie in turn formed a *coorte*, a cohort; and finally, three cohorts comprised a *legio*, a whole legion. This hierarchical structure echoed that of the Roman army and employed the same nomenclature and organisational units. The Italian army of the 1930s and the fascist militia MVSN, the so-called *Black Shirts*, also followed this historical model.

If one looks, for example, at the *Amos Maramotti* colony in Riccione against the background of this organisational structure (Fig. 47), a clear picture emerges: each dormitory provided space for ten beds, i.e. a *squadra*, and three dormitories were arranged in a row, together housing a *manipolo*. Each floor of the colony had three such wings, and thus a floor corresponded to one *centurie*. Consequently, the three-storey colony building housed a *coorte* (Fig. 48).

This structural correspondence to military hierarchies can be seen in almost all colonies. Another example is the colony of the Fascist Combat League of Turin in Marina di Massa (Fig. 49). With a length of 180 metres and several building wings and courtyards, it was the largest children's holiday camp in Italy. Reflecting its dimensions, the dormitories are much larger, but here too one finds *squadre* as orderly rows of ten beds (Fig. 50). One dormitory contained three such rows and thus one *manipolo*. Together with the two identical neighbouring dormitories, it housed a *centuria* of children. All the dormitories on one floor represented a *cohort*, and since

this building also had three floors, it housed an entire legion of *Balilla* – i.e. 900 children in one building complex! This colony was in essence nothing other than an army barracks for children.

Such military motifs recur in the designs and propagandistic expression of many colonies: the marine colony with the name *XXVIII Ottobre* in Cattolica, for example, has a form akin to a small fleet of warships (Fig. 51). In contemporary postcards, this colony was also called *Le Navi* – the ships – and the central building with the rotunda at the top was called *nave ammiraglia*, the flag ship. The four elongated dormitory buildings fan out radially from the flagship rather like long speedboats or even torpedoes. Inside each of these dormitory ships, the beds are arranged end on end, head to toe in four rows of about 100 metres that extend the length of the building (Fig. 52). While in this case, the organisational structure is not subdivided into smaller units, the total number of beds again follows the hierarchy of the *Balilla*: each wing houses 225 beds, so that the sum of the four wings is again 900 children, corresponding to a legion. A propaganda photo showed a troop of *Balilla*, led by a Black-Shirt officer, posing on the stairs of one of the dormitories as a band of sailors (Fig. 53). In their cadet uniforms with white sailor caps and dark shirts, the approximately nine- or ten-year-old children imitate navy soldiers. Such imagery speaks clearly of the colonies' actual programmatic purpose. In the same series of photographs is a photo of a marine guarding the camp next to a cannon (Fig. 54). Children stand on the roofs of the dormitories, flags flying above them, an image that echoes that of ships about to set sail and depart for war. Mussolini's idea was to forge soldiers out of Italian's youth and make them ready for battle.

Perhaps the most spectacular example is the marine colony founded by the car manufacturer FIAT in Marina di Massa (Fig. 55). It took the form of a huge tower in which the circular levels were accessed via a gently sloping, circular ramp that surrounded a huge inner atrium. The whole tower was therefore essentially a single space; all the children slept in one large, continuous space. On each level, half-height walls divided the rows of beds into niches with two beds each (Fig. 56). Built into the outer walls and inner parapet were small cupboards in which the children could store their belongings. The floor plan shows how the niches were arranged around the atrium and the ramp (Fig. 57). The dormitory was a single, vertically spiralling room ascending the equivalent of thirteen storeys. And yet the niches seem almost intimate and cosy.

A counter example is the dormitory of the *Dux* mountain colony in Ponte di Legno, which could hardly have been colder and more inhospitable (Fig. 58). The dormitory comprised not just double but also triple bunk

Fig. 51 Colonia XXVIII Ottobre, Cattolica, 1934
Clemente Busiri-Vici

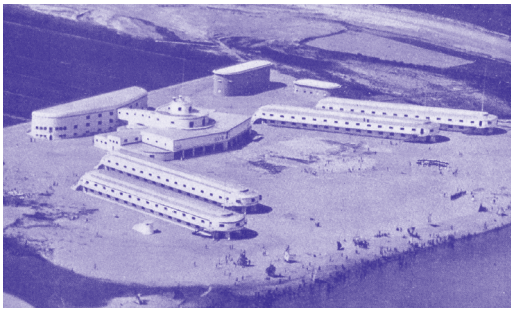


Fig. 52 Colonia XXVIII Ottobre, Cattolica, 1934
Clemente Busiri-Vici

Fig. 47 Colonia Amos Maramotti, Riccione, 1934
Costano Costantini

Fig. 49 Colonia XXVIII Ottobre Turino, Marina di Massa
1938, Ettore Sottsass, Alfio Guaitoli

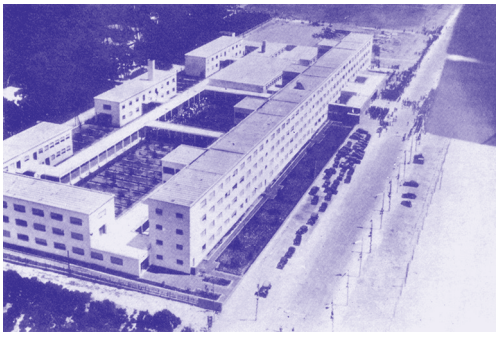


Fig. 45 Colonies of Fascist Italy

Fig. 46 Youth Pioneer Camps of the Soviet Union

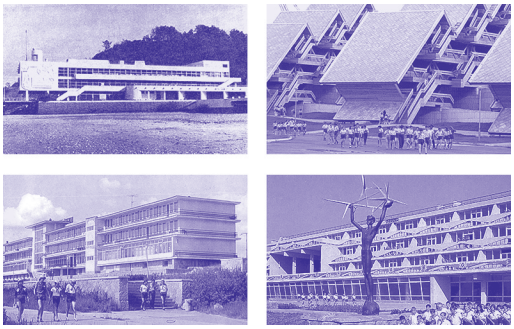


Fig. 48 Colonia Amos Maramotti, Riccione, 1934
Costano Costantini

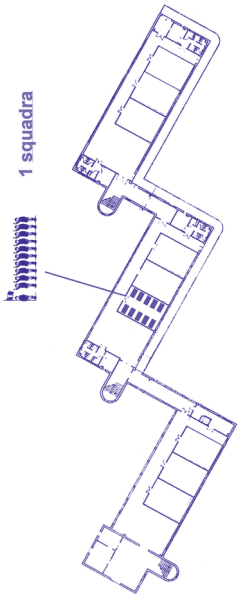


Fig. 50 Colonia XXVIII Ottobre Turino, Marina di Massa
1938, Ettore Sottsass, Alfio Guaitoli

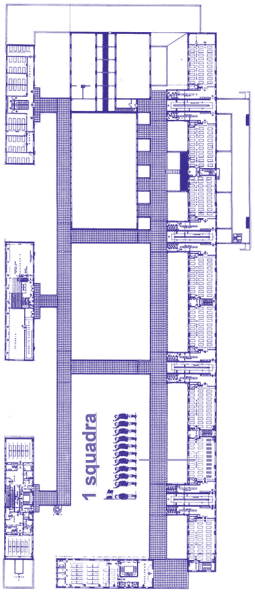


Fig. 53 Propagandistic Performance of Children as Sea Cadets

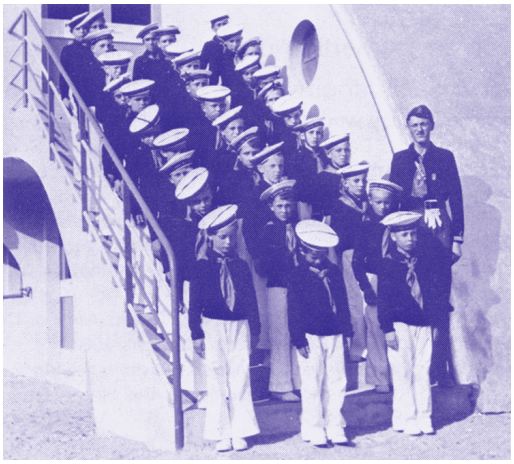


Fig. 54 Propagandistic Performance of Children as Sea Cadets

Fig. 58 Colonia Dux, Ponte di Legno

Fig. 56 Artek Pioneer Camp, 1957, Hursuf, A. T. Poljanskij

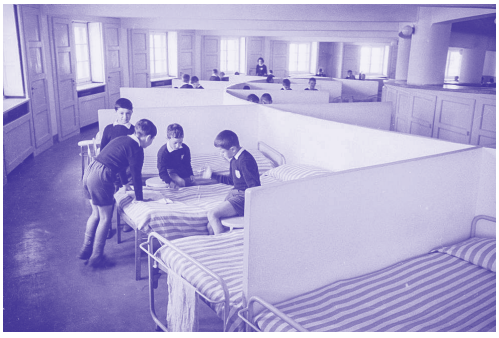


Fig. 59 Artek Pioneer Camp, 1957, Hursuf, A. T. Poljanskij

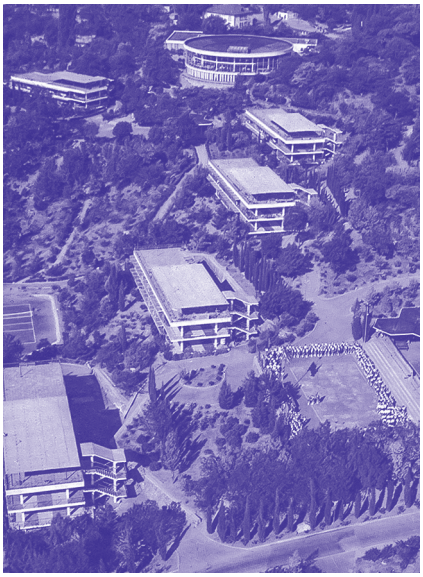
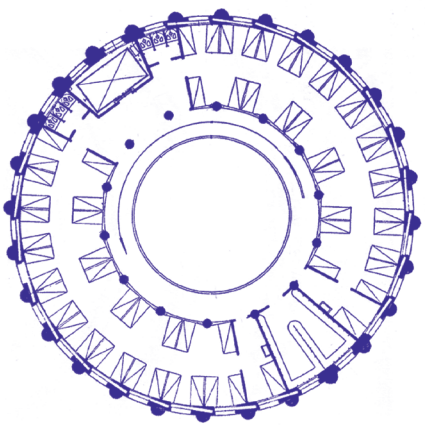


Fig. 60 Artek Pioneer Camp, 1957, Hursuf, A. T. Poljanskij

Fig. 55 Colonia Torre Balilla, Marina di Massa, 1933
Vittorio Bonadè Bottino

Fig. 57 Colonia Torre Balilla, Marina di Massa, 1933
Vittorio Bonadè Bottino



beds, and these were additionally suspended from the ceiling. The poles from which they hung doubled as the ladders to the bunks. To prevent the children falling out of bed – some of them from a considerable height – the beds had side railings. While this made cleaning the floor much easier, the overall impression is one of a cold, barren and hostile space. The photograph conveys powerfully, if unintentionally, the subordination of the individual to the mass in fascism.

The pioneer camps of the Soviet era represent a complete contrast to the Italian colonies. While the first of these was already founded in the 1930s, only a few such holiday camps for children existed in the Soviet Union until the 1950s. This changed after Khrushchev became party leader in the mid-1950s. Under his leadership, the system of Soviet youth organisations – the *Komsomol* and the *Young Pioneers* – was actively expanded with the intention of reaching as much of the youth in the Soviet Union possible. Every child was expected to join a youth organisation and could thus be politicised along party lines. In line with Khrushchev's ambitious programme of expansion, numerous pioneer camps were set up throughout the Soviet empire and also in other Eastern bloc countries in the 1960s.[21]

The first and most famous camp was the *Artek pioneer camp* on the Crimean Peninsula. When it was at its largest in the 1980s, the huge holiday complex could accommodate some 8000 children at the same time (Fig. 59). As can be seen at the *Morskoj* sub-camp, the children were not housed in one huge building, but in many smaller, comparatively lightweight pavilions spread over an area of about 320 hectares along the shore of the Black Sea (Figs. 60, 61).

The pavilions followed a modular construction principle made of a kit of prefabricated reinforced concrete elements. The warm climate made it possible to construct slender and lightweight structures without thick walls, and the dormitories were in effect little more than tents. Scattered amongst the lush natural surroundings, it looked almost as if the pavilions had alighted there like butterflies (indeed in Late Latin the word papilio serves as the root for both pavilion and butterfly). This open and transparent synthesis of architecture and landscape had an enormous influence on Soviet architects and planners in the 1960s. Its architecture also perhaps most clearly expresses the climate of greater openness and liberalisation during the political thaw of the Khrushchev era.

In *Artek* the dormitories also had ten beds (Figs. 62, 63). The front of these dormitories was completely glazed, providing a spectacular view of the Black Sea. Here, too, each child had only a small bedside table for their private belongings. There was no need for wardrobes, because on entering

the camp, the children exchanged their own clothes for a standard uniform, comprising a white shirt, blue swimming trunks, a red boat cap and the red pioneer neck scarf.

This group of ten children recalls the smallest unit of the Italian fascist holiday camps, the squadra, but despite the militaristic appearance of the young pioneers' uniformed attire and daily roll calls, the camps were not structured like an army. The term used was that of a *collective*. This denoted not just the entity of the pioneer camp as a whole, but also the generic principle of the Soviet camp's educational concept.[22] To become a good socialist citizen, a child had to develop and improve its social skills from an early age. A child was educated in and through the collective, i.e. the child's personality was formed and shaped by the comrades of the collective. As the child itself is also part of the group, it also shapes and moulds its comrades. To encourage these social skills, the holiday camps employed the means of competitions to bring out the best in the collectives, awarding prizes to the best in various disciplines. As it was already a great privilege to be invited to stay at *Artek* – "Only the best go to *Artek*" – the climate was one of constant competition and striving for improvement.

To counteract situations where children within a collective got on particularly well, becoming a circle of friends, the system had a form of built-in rotation. When everyone gets on and enjoys working, learning and competing together, individuals do not necessarily improve their social competencies or learn group discipline. To eliminate the random nature of optimal interpersonal interaction and cooperation, each child was required to change collective from time to time. Only when a child's ability to adjust to a new set of group members and contribute to that team performing well, did they demonstrate their full collective potential. This began with the break of day: a child would leave its *contact collective* in the dormitory and set the table and serve breakfast for another collective in the dining hall. After breakfast, they would change collective again, joining a new football team, or competing in athletics. There were also science collectives. Due to its polytechnic learning concept, the pioneer camps often also had ateliers, laboratories or testing facilities. Musically gifted children could join a choir or play in a band. Other collectives took trips within the camp or visited nearby sights. For the grand closing ceremony on the last evening of a trip, the collectives rehearsed and presented musical, dance, artistic or other types of performances (Fig. 64).

As *Artek* was conceived as an international camp, these closing ceremonies often had the theme of international friendship and solidarity, as evidenced by the different ethnic attire and costumes (Fig. 65). The intention was to make the young pioneers aware of themselves as part of a large global

Fig. 64 Various Collectives of Explorers, Musicians Adventurers and Performers

Fig. 62 Artek Pioneer Camp, 1957, Hursuf, A. T. Poljanskij

Fig. 61 Artek Pioneer Camp, 1957, Hursuf, A. T. Poljanskij

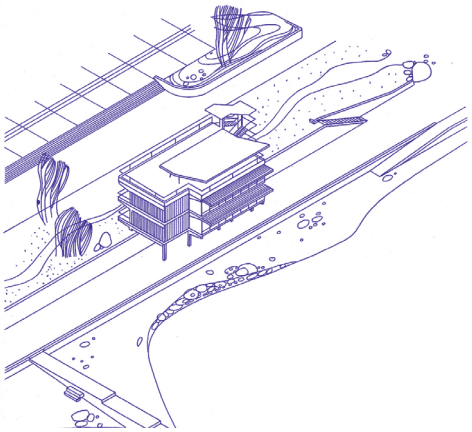


Fig. 63 Artek Pioneer Camp, 1957, Hursuf, A. T. Poljanskij

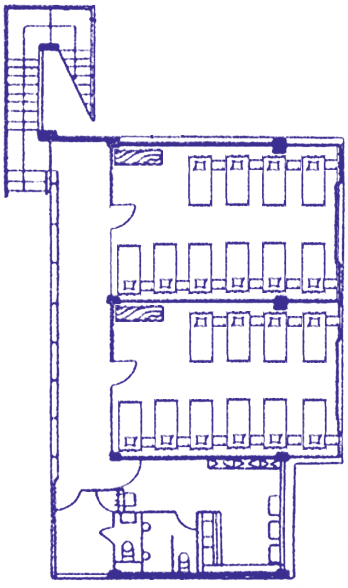


Fig. 65 Closing Ceremony

family – an international community spanning the world that acted as a kind of *meta-collective*. The contact collective within the dormitory was therefore a kind of *micro unit* that was ultimately part of the macro-unit of the state. The processes of the pioneer camps and of the pioneer organisations back in the respective childrens' home countries therefore followed the principle of horizontal and vertical collectives. Unlike the hierarchical structure of the fascist youth camps, the groups of ten children in these dormitories were the only units. There was no further repetition of configurations in groups of three, or hierarchical militaristic structure. As such, these camps were not conceived as miniature barracks preparing the children for a future war.

To conclude: in morphological terms, dormitories with ten beds do not differ significantly from one another. Superficially, they are simply a series of beds strung together in a row. This purely positivistic perspective, however, tells us nothing about the socio-political objective of the children's holiday camp of which the dormitory is a part. To properly understand and interpret these dormitories, one must therefore consider their social, cultural and political context.

The examples discussed here have shown that dormitories can be an instrument of fascist and nationalist indoctrination, preparing children through a system of obedience and subordination of the individual for a future war. Here a child is little more than an atom in the mass of a greater cause. A dormitory can, however, also be a vehicle within and by a collective for helping children develop their social skills in different collectives.

Common to both these concepts is that architecture can serve as an instrument of education in the formation of young individuals. But not all dormitories are the same. Rather they must be considered in terms of their social and political implications. A stylistic examination that embeds the formal language, symbols and metaphors within a political context can complement a structural analysis but not replace it. And this is a principle that also applies to other building typologies which exhibit apparent similarities to each other.

19 Egbert Jahn, *Bürokratischer Sozialismus: Chancen der Demokratisierung? Einführung in die politischen Systeme kommunistischer Länder*. Frankfurt 1982

20 *Cities of Childhood*. London 1988; Building for a new era: Health services in the '30s. In: *Domus*, 1985, Vol. 659, pp. 2–29; *Colonie a mare*. Bologna 1986; *Colonie per l'infanzia*, Santarcangelo di Romagna 2009

21 Andrej W. Ikonnikov, Soviet Architecture of Today. 1960s – early 1970s. Leningrad 1975, pp. 144–159; Anatolij T. Poljanskij, *Artek*. Moscow 1966; Stanislaw Furin, Orlyonok. Moscow 1987

22 Ruth Boldemann, *Probleme und Möglichkeiten der Kollektiverziehung im Pionierlager. Leipzig 1967; Helga Fernau, Zentrale Pionierlager. Richtlinien zur Planung und Projektierung*. Berlin 1985ff; Nigel Grant, Schule und Erziehung in der SU, Bern 1966

Resting and Sleeping in a Confined Space

C

Estelle Lépine

The Bed as a Compositional Element in the Work of Jakob Eschenmoser

Mountain huts have only fairly recently become a subject for architectural consideration. It is thanks to a leading figure in the field, Jakob Eschenmoser (1908 – 1993), together with a number of others, that huts emerged from their vernacular style to gain in architectural, morphological, structural and spatial quality. It is undeniable that in his work the bed represents the elementary and fundamental component in the constitution of a mountain refuge. Indeed, the primary purpose of this construction type is to offer a place of rest. Even if at first glance there is no spatial, functional or structural link between building and bunk, the considerations of this Swiss architect will help us to understand the potential of such projects in terms of refocusing our reflection on the bed and on the dimensions of the human body upon which the architectural composition is based, as an essential constitutive element for the development of this type of construction.

First, it is important to spend a moment on the historical and typological analysis of mountain huts, in order to understand the problem encountered by vernacular buildings on which little thought was expended and whose construction and alterations were made in response to basic requirements. Based on a vernacular architecture deeply influenced by the technical and geographical constraints of their location, little or no spatial consideration went into the design of early mountain huts. Secondly, exploring the ideas of the most active thinker of Alpine constructions, Jakob Eschenmoser, allows us to demonstrate the ability of an at-first-glance insignificant typology to join the mainstream of architectural reflection on space. The architect develops a structural, constructive and spatial thinking around the study of human dimensions to build projects based on the smallest constitutive entity of the mountain hut: the bed.

Finally, exploring recent developments in the latest mountain constructions, the continued influence of the work of Jakob Eschenmoser will be demonstrated, even if that interpretation is only partial. It will be shown how, even if it is sometimes unconscious, the bed influences the growing search for comfort in new constructions, their dimensions and morphology, and further, how it influences the perception of a unique and hostile territory.

Thinking about architecture from the perspective of the bed, is it not simply the case that the dimensions of the human body are placed at the centre of the architecture project. In a place where scale is distorted like the

high mountains, it is certainly opportune to understand their significance in the perception of buildings, in terms of their approach and implementation, because it is subsequently the entire high mountain environment that will be experienced in a spatial sense.

History of an Architectural Type in Search of a Definition

While Alpine construction does not form part of the main currents of architectural thinking, unlike many other building programmes that have interested architects, it is nevertheless part of a long tradition of vernacular construction. These were initially simple staging posts for mountain ascents taking advantage of accidents in the terrain and the protection offered by erratic boulders used to shelter from the weather. As climbing became more popular, alpinists gradually began to erect proper constructions. The first official mountain hut of the Swiss Alpine Club,[23] the *Grünhornhütte* (1864), initially comprised four stone walls with a removable tarpaulin that had to be folded and unfolded. The humidity and insalubrity of the space led the climbers to build a small wooden frame to protect the interior and make it the first true mountain building. Thus began a long tradition of constructions to enable climbers to rest during the ascent of summits.[24]

The early refuges reflected the technical and physical capacities of the builders of the period, such as limitations on transporting materials and knowledge of carpentry, when building structures that can only be accessed on foot. Initially, they were built mainly in timber, drawing on the tradition of chalet and valley farmhouse construction, creating single spaces for eating and sleeping without distinction of function. They operated on a first-come, first-served basis. The beds, where they existed, were simple wooden platforms where climbers crammed in and found space to sleep wherever they could. They sloped slightly to drain the damp from melting snow brought in on clothing and boots. They were covered with hay from the surrounding mountain pastures, the only material available to improve comfort. The space was rudimentary, and these earliest refuges were markers along the ascent routes that often failed to provide real rest to alpinists due to the crowded conditions, and the uncomfortable, noisy and often insalubrious spaces.[25]

These constructions were vulnerable to bad weather and often could not withstand the demanding climatic and geographical conditions of the high mountains. As a result, they were frequently destroyed and rebuilt. To compensate for their weaknesses, and under the influence of the *Heimatschutz*[26] movement, between 1910 and 1960 a masonry outer shell of the buildings became common to increase their durability, improve

their weathertightness and therefore their resistance to water ingress and the resulting ice damage. The original huts were preserved, leaving the interiors with their familiar timber appearance, and providing an initial layer of insulation against the demanding environment. These constructions came to develop a recognisable architectural style with a language marked by the size of the windows and door frames, pitched roofs, the colours of the shutters and the composition of the façades, but also by a simple and symmetrical organisation in plan centred on the entrance, often located on the main gable.[27]

There could only be a single course of action for functional and structural improvements when it came to enlargement or reconstruction. This is why, during this historical period, the functionality of the spaces barely evolved. The refuges grew larger, increased in height and altered under pressure from the demands of the growing number of climbers, especially on famous routes. The single, confined space became inadequate for the intermittent crowds engaging in multiple activities. In order to improve the comfort of the refuges, a fundamental separation between functions took place, identifiable on the plan. The first space to be identified and separated from the single interior room was the dormitory, either moved to the upper floor or isolated on the same floor. The purpose of seeking rest took priority in the design of mountain huts, leading to the role of the bed taking a predominant role in Alpine construction. Next came the identification of the entrance hall and the kitchen, as elements defined in particular by a need for functionality, driven by the growing number of visitors to reception areas; then came the separation of spaces devoted to the guardians and to the winter refuge.

Jakob Eschenmoser, the Architect of High Mountain Cabins: Or, the Definition of an Architectural Type

Despite the emergence of a willingness to think more carefully about the design of new constructions on the part of the Swiss Alpine Club, the permanent rise in climber numbers led to enlargements to existing buildings, often undertaken hastily. Successive alterations to existing structures took place with little reflection on spatial, functional or construction issues. These changes, without raising questions about longer-term considerations, led to aberrations such as increasing the number of bunks without increasing the dimensions of the sleeping area, raising the height of buildings without consideration for the need for acoustic insulation and/or without a corresponding increase in the size of common spaces. As a result, technical and architectural mistakes were made. This situation led to the emergence of the ‘myth’ of the mountain hut where it is impossible to sleep well due to a lack of space, discomfort and noise. In response,

the Swiss Alpine Club and those in charge of building programmes had to take a more professional and qualitative approach to huts.

Hans Leuzinger: Initial Architectural Reflections

Before we turn to the figure who would definitively take the Alpine refuge out of the realm of vernacular architecture, let us reflect for a moment on the work of a Swiss architect, Hans Leuzinger (1887–1971).[28] His contribution is notable due to the fact that in two projects, Leuzinger opens up the world of architectural studies to a building type that had been wholly vernacular up to that point, and demonstrates the ability of a reduced programme to play a part in the history of architecture. Leuzinger was undeniably influenced by the ideas of the Modernist architects active in the period. In these projects, he brought together for the first time professional reflection on design with a programme managed by the builders to produce two constructions that are diametrically opposed on the formal level. In allying modernity and regionalism, he demonstrates the ability of refuges to be part of architectural reflection, introducing in the 1920s the first stirrings of the spatial and typological considerations that Jakob Eschenmoser would deepen some years later in his own projects.[29]

The plans for the huts *Fridolin* (1920) and *Planura* (1930) are distinguished by their form, even though their internal organisation is analogue in plan. The entrance and kitchen form a main axis of central symmetry for the distribution of the other spaces (dining room, dormitories and other subsidiary rooms). The *Fridolinhütte* follows in a direct line of influence from the *Heimatschutz* thanks to its overall volumetric and morphological composition, even if the architect introduces tensions into the façade due to the asymmetrical openings. The *Planurahütte*, meanwhile, achieves integration into the surroundings by placing the axis of entry at the centre of a fold in the building, thereby emphasising it. This formal development imitates the surrounding rocks, creating irregularities in the façade and roof, a morphological assimilation of the crag on which the hut is placed. The architectural language is a frank attempt to camouflage it with the mountain, while employing modern construction knowledge to provide larger openings and in the same stroke strengthen the interior-exterior relationship with attention to the views.

Hans Leuzinger bases the project for the hut on a response to the need to introduce considerations of spatial organisation, integration into the landscape, and its functions, seeking to develop the architecture of a specific programme to inscribe it in the currents of modernist architecture active in the early twentieth century. These two projects have the merit of introducing a real architectural perspective for the first time. It is also

worth noting the proximity of the plans of Leuzinger's cabins to the ideas of Jakob Eschenmoser. Even if the bed was not yet at the heart of the project, it is Eschenmoser who through his work and his ideas would soon come to define the architectural programme of mountain huts.

Jakob Eschenmoser, or the Development of an Architectural Concept in the Construction of a Relationship with the Landscape

Jakob Eschenmoser (1955 – 1986) was both an architect based in Zurich and a passionate alpinist. These two aspects of his identity allowed him to progress naturally within the Swiss Alpine Club to become the person responsible for the management of the mountain huts. Over the course of his career, he was directly involved in some fifteen projects, ranging from enlargements and renovations to new constructions, making him one of the leading figures in Swiss Alpine construction.[30]

It is impossible to ignore the fact that Eschenmoser was also an excellent draughtsman. He illustrated and published his journeys through the country's various cantons in a series of travel journals between 1973 and 1988. His excursions, observations and above all their transcription profoundly influenced his vision and conception of high mountain construction, notably with regard to the issue of integration into the landscape and adaptation to the specific environment of the mountains.

The most important book for gaining insight into the architect's ideas about mountain huts is *Vom Bersteigen und Hüttenbauen* (1973).[31] This is neither a book of architectural theory nor a construction guide; the author expresses his impressions, doubts, thoughts and experiences in the course of the different sites and projects he works on. The interest of this text lies in the convergence of both the thoughts of an architect and those of an alpinist. As a result, his technical knowledge meets an awareness of function and sensibility in a unique setting. His attention to Alpine landscapes leads him to ask questions about the siting of buildings. Eschenmoser focuses his thoughts on sensitivity to place, landscape integration, the use of materials from the site itself, the function of the programme, the rationalisation of the space, and many more aspects. In this way, he expresses a willingness to integrate with the high mountain environment, with sensitive reflections on space and built morphology.

The first real architectural consideration to simultaneously encompass space, functionality, structure and landscape integration is his work on the *Domhütte* project in 1956 – 1957. The development of the plan for this project between the two alternatives proposed demonstrates his capacity to integrate the essential and intrinsic element that is the bed into

the programme, in an overall consideration that is based on *providing a maximum of interior space while maintaining a minimum exterior surface area*, aimed at economy and efficiency of construction. He thus favours an optimal functionality for climbers while assuring the durability of structures, limiting the surface area of façades, seen as a weak point in high-altitude constructions. To find a balance between interior and exterior, Eschenmoser redefines the dimensions of the sleeping area as close as possible to human dimensions, reducing the width of bunks at foot level, considered wasted space, while preserving a width of 80 cm at shoulder level (Fig. 66). By adding bunks of this shape together, the resulting form produces the polygonal plan of the dormitory. This shape has an impact on the overall form of the building and, more subtly, the entire interior distribution, structure and morphology. This exceptional idea, the result of the encounter between a passion and a profession, is the basis of a draft theory and a typology of Alpine architecture which still influences contemporary projects, as stated here by the author:

> *Designing on the basis of human dimensions a maximum interior volume for a minimum external façade area, in order to reduce the weak points of a building while enhancing the functionality of the interior spaces.*[32]

Jakob Eschenmoser was sensitive to the rational, effective and functional distribution of spaces. The layout of the dormitories allowed him to concentrate the structure and the distribution around the centre of the building and the entrance lobby, pushing functions such as the dining room and kitchen towards the façades, towards the light and the view. He thus makes efficiency gains in both plan (space and function) and volume. The architect's ideas gave rise to refuges with a polygonal form and volume that were set in the landscape in a respectful manner that fitted the elements of the site. Eschenmoser's work is marked by a characteristic, identifiable formal result. The constructions integrate themselves harmoniously into the landscape. In effect, the exaggerated polygonal morphology brings with it a camouflaging effect with the rocks and the site, and thus a better integration into the Alpine landscape.

Placing the bed at the heart of the architectural project asks a fundamental question about the very definition of the hut. Through his work and thought, Eschenmoser effectively demonstrates in the organisation of his plans how the bed is a structuring element both constructively and spatially. Conceptually, the bed lies at the source of the very definition of the architectural typology that is the mountain hut. This should offer a "safe place where alpinists can rest and eat in peaceful conditions [...] A staging post for ascents [...] it expresses its function as a stage in a longer process

linking the valley and the summit. The common name of *refuge* seems more appropriate to the definition inherently linked to activity." [33] The quality of Eschenmoser's work can be seen in the longevity of his buildings. While a number of them are no longer able to meet the current level of demand due to the constant increase in the number of users, all remain functional and of good quality, and have long contributed to successful ascents.

The Emblematic Projects of Jakob Eschenmoser, or the Anchoring in a Theory of Modern Architecture

To illustrate these ideas, three emblematic projects will be presented to show the importance of the bed in the architect's work and formalisation of his thoughts. These examples also make it possible to demonstrate how a simple constitutive element of a programme can become the engine of the whole concept and project and have a direct influence on the overall plan, the organisation of the space, the structure and the general morphology of the buildings.

Domhütte [34]

Eschenmoser's first intervention was the construction of the new *Domhütte* in 1957. An emblematic project, it already brings together all the architectural characteristics of his ideas at an early stage in his career. It is his first "polygonal" building, whose overall form bears a direct relationship to the floor plan of the dormitories (Fig. 68). The process of arrival at the refuge continues as an interior route that crosses the various programmes assigned to the hut, from the entrance hall, through the dining room, the access to the kitchen, and finally the arrival in the dormitories on the upper floor with, at the centre, as the constructive and spatial structure, the fireplace and the staircase. The spaces are concentrated in a minimum overall volume. The plan is efficiently structured around the layout of the sleeping platforms, which are sized on the basis of the bunk dimensions, in turn based on the dimensions of the human body. The distribution avails of the centre of the volume, the darkest area, pushing the activities to the perimeter. There is a functional logic to the plan. On the first floor, the circulation follows the areas with the greatest ceiling height. The resulting volume merges with the Alpine landscape, a modest and respectful integration with the mountain being a deliberate intention of the designer (Fig. 67).

This refuge, in its built state, represents the first application of the architect's thinking, as well as being a crucial stage in the theoretical development of Alpine architecture. To understand the impact on the project of the architect's reflection on the dimensions of the bed, we must pause

Fig. 66 Concept Sketch of the Bunks by Jakob Eschenmoser

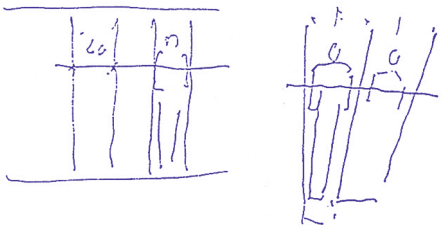


Fig. 67 Domhütte, 1957, Jakob Eschenmoser

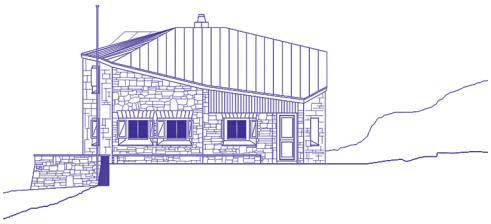


Fig. 70 Domhütte, 1956, Jakob Eschenmoser

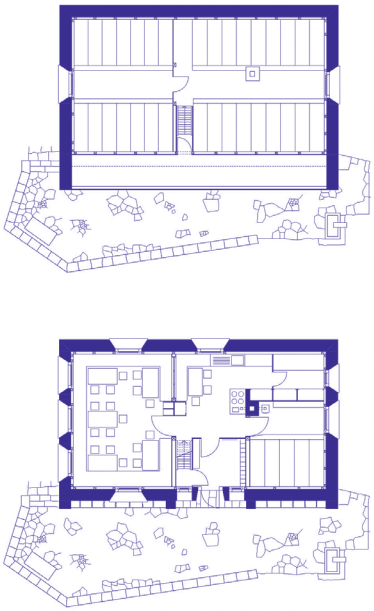


Fig. 69 Domhütte, 1956, Jakob Eschenmoser

Fig. 68 Domhütte, 1957, Jakob Eschenmoser

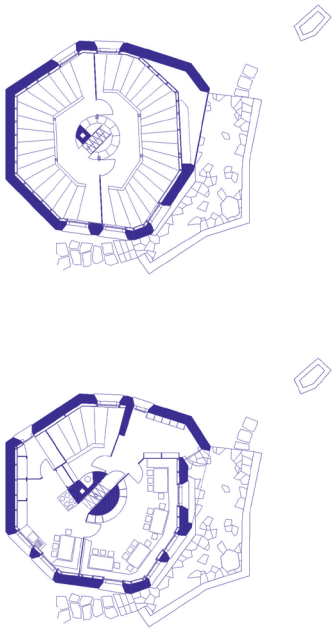


Fig. 71 Albert-Heim Hütte, 1970, Jakob Eschenmoser

Fig. 72 Albert-Heim Hütte, 1970, Jakob Eschenmoser

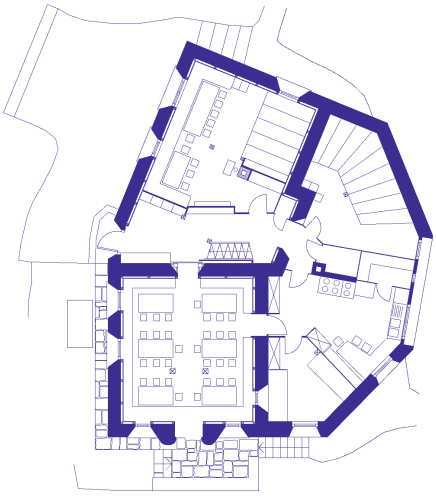


Fig. 73 Albert-Heim Hütte, 1973, Jakob Eschenmoser

to analyse the draft project presented in 1956 and compare it with the project actually built in 1957 (Figs. 69, 70). Examining the drawings, a high level of quality is evident in the conception of the draft plan, with a clear continuity with the tradition of stone construction. By contrast, the spaces are functional. The distribution is concentrated and effective in its centrality, compactness and reduced dimensions. Taking the example of this key element exclusively reserved for distribution, the spaces have a clearly defined function. They are also independent and can be isolated to improve the thermal capacities of the building, depending on winter or summer use. Particular attention was paid to storage and the guardian's quarters, demonstrating a knowledge of the use of the refuges as well as their main drawbacks at the time.

The influence of *Heimatschutz* is clearly visible in the layout of the façades and the overall volumetry of the building. This project introduces all the reflections that will become the central qualities of Eschenmoser's work, without yet presenting the polygonal morphology most characteristic of his work. The architect seems to want to show the efficiency and quality to be gained by a mountain hut programme, when considered as an architectural project in its own right, an idea rarely aired before then, with the notable exception of the *Fridolinhütte* (1920) and the *Planurahütte* (1930) by Hans Leuzinger. The architect appears to gently introduce his concepts that could clearly challenge a decision-making committee more used to the vernacular huts of the *Heimatschutz* type.

By contrast, the formal development of the terrace timidly unveils the first formal stirrings of the architect's thoughts. The organic form accompanies the movement of the climbers' arrival to direct them to the entrance framed by the porch. Despite the traditional form, this hut design is already a conceptually successful project that responds in a literal manner to the morphological tradition of the Swiss Alpine Club's mountain huts. The completion of the *Domhütte* "brings together the heritage and cultural characteristics of Swiss refuges with respect for the tradition, while diversifying the morphology," [35] and demonstrates that the reflection on the simple element represented by the bed leads to a real initial anchoring of mountain huts in theoretical architecture.

Albert-Heim Hütte [36]

Almost a decade later, Jakob Eschenmoser signalled a transformation and remarkable enlargement in the process of unifying a building that had become heterogenous due to successive alterations (Fig. 73). Initially conceived by the architect Gustave Kruck in 1918 (who was very active during the *Heimatschutz* period [37]), the *Albert-Heim Hütte* was a memorial to the

geologist of that name before it became a proper mountain hut. This first stage responds on a formal level to the principles of *Heimatstil* of the epoch: the entrance on the main gable, the arrangement of the spaces, few as they were, and the layout of the façades responding to principles of symmetry. An initial enlargement (Brähm, 1935) was soon carried out in response to the popularity of the hut. The extension saw an increase in the length of the first building, slightly sloping to follow the local topography (Fig. 71). The spaces were added longitudinally, one after the other. This continuity represented a problem for the organisation and distribution of the interior space, leading the designer to divide and displace the entrance to the convex angle between the new and old sections.

This enlargement again became insufficient to the number of visitors, and in 1970 Jakob Eschenmoser began work on a new extension to this hut. The intention was to restore the functional quality to the constitutive elements of the refuge. Brähm had split the entrances, creating confusion in the function of the building and the logic of the internal distribution. In his intervention, Eschenmoser sought distributive efficiency by resizing the entrance to confer it the status of a lobby, when Brähm had only moved it. The function of each space was simplified. Without altering the harmony of the proportions of the existing composition, volumetry and façades, Eschenmoser completes the elbow formed by the two stages of construction with a polygonal volume. He exploits this angle to centralise and concentrate all the circulations, both in plan and in the vertical, serving the existing first floor and the new basement level fitted into the hollow in the ground. The original hut takes on the function of dining room, the first extension being the winter refuge. Eschenmoser's own enlargement is conceived on the ground floor as a dormitory, kitchen and the guardian's quarters, which are closely connected, and also communicating directly with the main dining area (Fig. 72). This organisation demonstrates a great efficiency in the new coherence of the resulting plan, despite the intervention in the existing heterogenous agglomeration. The circulation, resizing and simplification of the spaces together with their distribution serve to demonstrate the capacity of the architect's project to apply ideas he had developed over a number of years for new projects to an existing situation.

Once again, the dimensions of the extension, here too based on those of the dormitories, results in a modest but extremely effective intervention. This project illustrates that spatial and architectural qualities can be obtained by the formal development of the polygonal dormitory, despite the need to adapt it to the disordered existing construction.

Fig. 74 Cabanne Bertol, 1975, Jakob Eschenmoser

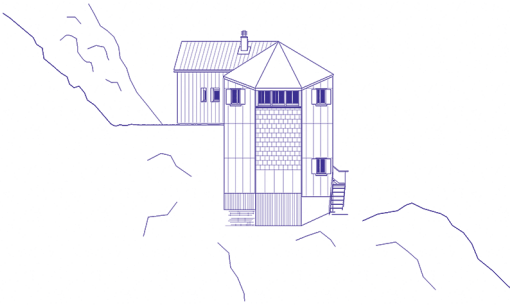


Fig. 74b Cabanne Bertol, 1975, Jakob Eschenmoser

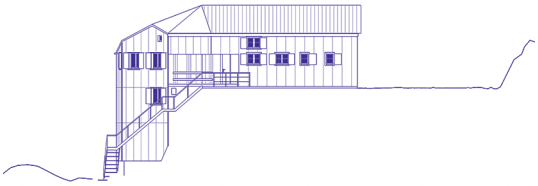


Fig. 75 Cabanne Bertol, 1975, Jakob Eschenmoser

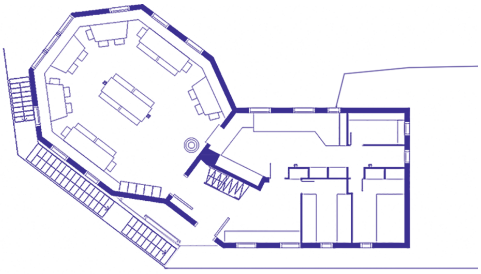
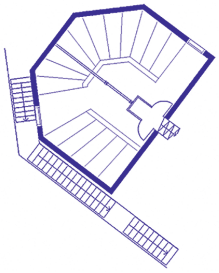


Fig. 75b Cabanne Bertol, 1975, Jakob Eschenmoser



Cabane Bertol [38]

Finally, while the *Domhütte* remains an emblematic project in its relationship to the alteration of the project's conception and the masterful application of the architect's intentions, the hut that leaves the greatest mark on all those who experience it is the *Bertol* (rebuilt in 1975). Situated on the *Haute Route*, linking Chamonix and Zermatt, it stands on a rocky arete suspended between two glaciers. This construction demonstrates the influence of the architect's reflection on the constitutive element of the project – the bunk – and on the overall morphology that results from it, defining as it does both the form and the position of the hut, and as a result profoundly impacting on its integration into its surroundings, thanks to a balance between aesthetics and landscape. Taking advantage of its geometry, the building cannot be identified as part of a particular architectural tradition, but is able to combine its spatial quality with a successful integration into the surroundings.

First erected in 1858, a wooden cabin was placed on the flat part of the arete, appearing to defy the mountain with its hard-to-access site and relatively restrained dimensions. It was successively enlarged by a number of interventions that are difficult to identify, but can be read on the plan. An initial full refurbishment of all the spaces took place in 1945 by Thalmann, allowing a more efficient organisation despite the distributive deficiencies in both plan and section. Eschenmoser intervened in 1975 with a second full renovation of the mountain hut. He took advantage both of the morphology arising from his considerations about the dormitory spaces, and the constraints of the site, emphasising the aesthetic results. The building does not follow any particular architectural trend, but asserts a spatial quality and harmony with its surroundings that makes it one of the 'most emblematic projects [of the architect] thanks to the concordance between the morphology of the building and its siting (Fig. 74, 74b).' [39]

The hut is conceived in two parts, with a first more traditional section on the arete containing the guardian's quarters and the kitchen, and the second polygonal section housing the dining room and a series of dormitories (Fig. 75, 75b). The architect follows the terrain of the arete, meaning the second section stands at an angle to the first. The geometric inflection connecting the two parts of the building contains functions that can absorb this irregularity without undermining the functionality of the spaces, such as the circulation and the entrance lobby. This distortion incorporates a certain dynamic of movement into the entrance space to the hut, marking a transition between exterior and interior. This obligatory passage aims to increase the sense of surprise and discovery of the view from the dining room. This latter, above the series of polygonal dormitories,

Fig. 76 Cabanne du Vélan, 1992, Michel Troillet

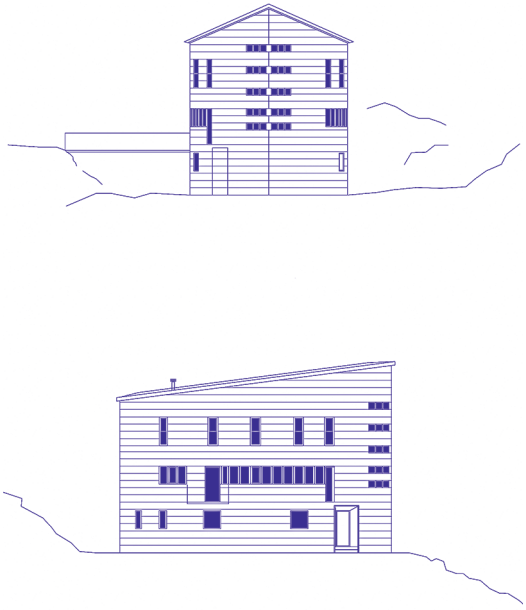


Fig. 77 Cabanne du Vélan, 1992, Michel Troillet

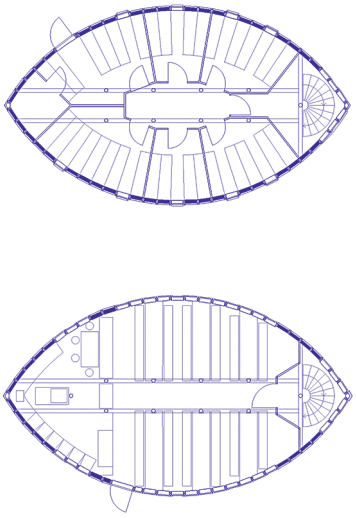


Fig. 82 Monte-Rosa Hütte, 2009, Under the Direction of Valentin Bearth & Andrea Deplazes

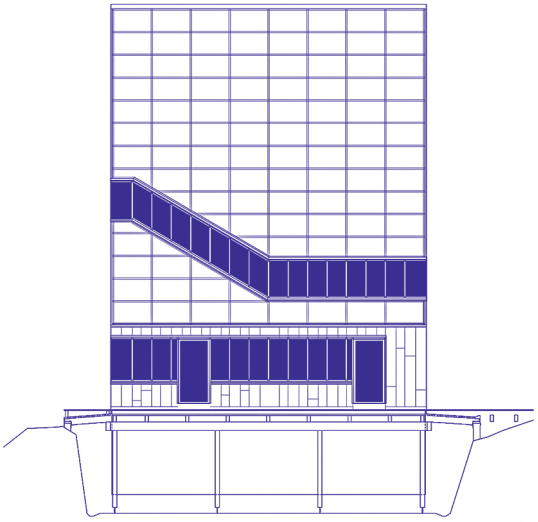


Fig. 83 Monte-Rosa Hütte, 2009, Under the Direction of Valentin Bearth & Andrea Deplazes

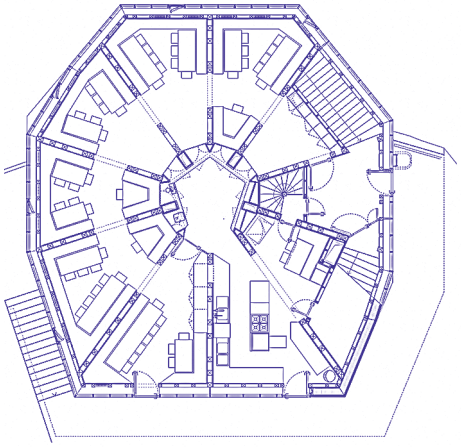


Fig. 78 Topalihütte, 2003, Meyer & Partner

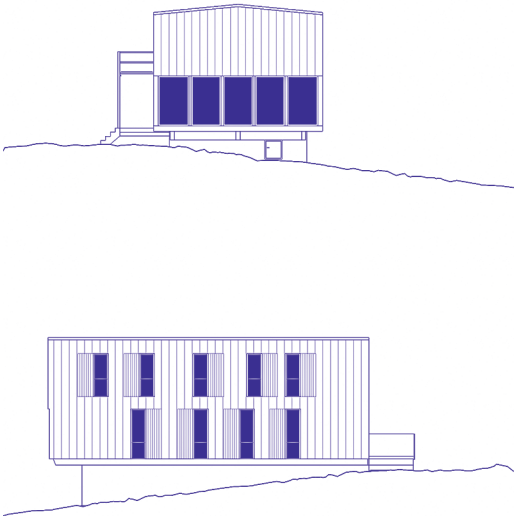


Fig. 79 Topalihütte, 2003, Meyer & Partner

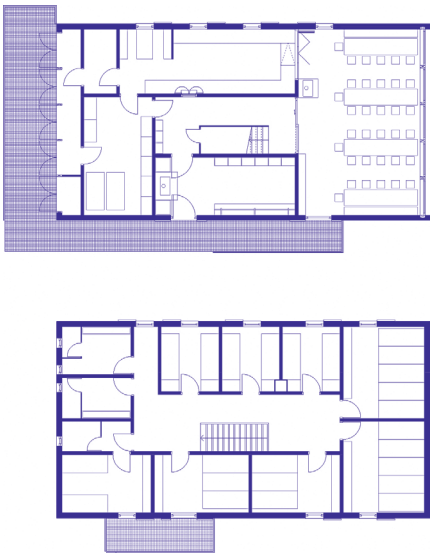


Fig. 80 Cristallina Hut, 2003, Baserga & Mozetti

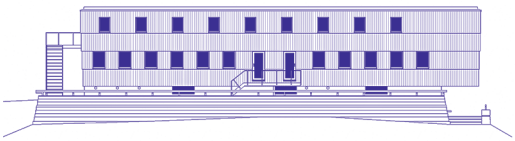


Fig. 81 Cristallina Hut, 2003, Baserga & Mozetti

represents a platform suspended over the void, projecting the visitor into the landscape. This impression and quality are emphasised by the presence of a ribbon window running around the facets of the façade, a radical overhaul of the relationship with the surroundings compared with his earlier projects. The dimensions, which remain tightly controlled and measured, help to protect the climbers by not exposing them to the external elements, while at the same time allowing them to fully enjoy views from this exceptional site.

The unevenness of the terrain means the dormitories could be built below the living space, and here again the central distribution permits a circular arrangement in plan. The form of the dormitories and of the room above it is thus closely linked both to the reflection on the dimensions of the bunk and the integration of the view into the layout of the dining room. Eschenmoser's programmatic and conceptual considerations highlight, as never before, the integration of the landscape through the form and placement. This gesture makes the hut in itself a site, beyond even the memorable architecture. Here, the route leading from the entrance to the intimacy of the dormitories brings to a culmination the idea of the mountain hut as a place of rest, where the bed is the fundamental element. Eschenmoser's reflections on this constitutive element of the hut find here a very strong sense of fittingness between project and landscape, and in spite of the limitations he introduces the idea of interior exploration as an extension of the ascent, heightening the climbers' emotions over the final few metres. The quality of this project is enhanced by the meticulous renovation carried out in 2000 by the architects Widmer and Montmollin. Their delicate intervention extended the hut in the flat area to the rear, increasing the functionality and comfort of the service spaces, and demonstrating real respect for the work of their predecessor.

Influences of the Reflection on Sleeping Space in Contemporary Refuges

In Jakob Eschenmoser's careful consideration of the bed as the basic element in the programme of a mountain refuge, he treated it as an experience that is at once human (sleep), spatial (design of the dormitory) and structural (influence on the whole structure). It is an essential organising factor in the configuration of the spaces, and fundamental to Alpine architecture. Analysing more modern and recent examples, it is possible to observe Eschenmoser's influence and to understand the continued importance of the sleeping space in project design.

One of the key figures to have applied Eschenmoser's ideas is the architect Michel Troillet (b. 1946) in his design for the *Cabanne du Vélan* hut when it was rebuilt in 1992 (Figs. 76, 77). All of the dimensions of the building are

based on the fan-like layout of the bunks, which together make up an oval form, freeing the centre of the building for the load-bearing structure and the circulation routes. The angles, more complicated to manage in terms of utilisation of the space, harbour the vertical circulation, the kitchen and the bathrooms, depending on the floor; in the same way that Eschenmoser planned elements that can fit around the angles in the *Bertol*. The resulting dining space also pushes all the tables to the façade and the windows, offering an innovative relationship with the exterior and the landscape thanks to the dimensions of the ribbon windows. This hut is particularly efficient in its compactness and the size of its reception area. By contrast, it should be noted that Eschenmoser determined the size of the bunks, and the dormitories resulted from this choice. Here, Troillet proposes a compromise between the sizing of the bunks and that of the general plan, allowing himself to reduce the widths of certain bunks to a minimum to obtain a perfect ellipse in plan, but with the result that some are at the limit of usability. His predecessor, despite the restricted dimensions, always respected a practicable minimum. The morphological and spatial result is a striking construction, in more ways than one, and definitely introduces contemporary interventions to the high mountains. It brings huts into the realm of modern constructions, innovative from the point of view of structure, implementation, use of materials and spatial design.

The development of mountain refuges is without question connected with the idea of comfort, notably in the sizing of the dormitories, and the limitation of the number of bunks in each room, or even the provision of private rooms. This tendency has an influence on the architecture and beyond, with the democratisation of access to summits, changing the very perception of the mountains. The dormitories are limited to a maximum of ten persons each, while increasingly family or double rooms can be found, following a hotel model. The standardisation of bed dimensions with a minimum width of 80 cm (ideally 90 cm) drives increasing volumes of spaces and therefore of refuges. Compare the plans for the *Topalihütte* (Meyer & partners, 2003)[40] (Figs. 78, 79) and the *Cristallina* hut (Baserga and Mozetti, 2003)[41] (Figs. 80, 81) and, even though the latter has twice the number of bunks, it is easy to see the influence of the multiplication of dormitories and individual bedrooms in the latter. The width of the bed offering the same standard as an ‘urban’ bed imposes significant consequences for the size of new constructions. The *Cristallina* is of particularly striking dimensions given its siting. Although in this case, the bed does not seek to influence the overall form of the refuge, it is an element that clearly governs the general morphology. Beyond a question of formal reflection, offering individual rooms alters the perception of Alpine lodgings, in a democratising and urbanising manner.

The *Monte-Rosa Hütte* (2009)[42] was developed as part of a teaching project at the Swiss Federal Institute of Technology Zurich (ETHZ) under the direction of professors and architects Valentin Bearth and Andrea Deplazes (Figs. 82, 83). Familiar with the projects of Jakob Eschenmoser,[43] they retained a search for efficiency with a form that limited the surface area of the façades. In the project, the desired ideal form was the sphere. This figure is a volume that is difficult to achieve within the framework of a building of this size and with the constraints arising from the altitude. The project thus proposed to create a faceted façade, while preserving a radiating structure like that of an orange.[44] This is where the comparison and the possible link with the reflections of Jakob Eschenmoser ends. The interior layout is subject to the overall formal intention, and the distribution of the beds follows the space allocated to the dormitory, rather than the other way around. Even if the structure is concentric, the circulation, pushed against the façade, offers a unique interior architectural trajectory. This element leads to a considerable loss of space for the vertical circulation, producing a result that is the opposite of Eschenmoser's search for compactness. This refuge, analysed on its own account, demonstrates undeniable conceptual qualities related to spatial and structural considerations. On the other hand, in terms of a historical analysis and the typology of the high mountain refuge, it marks a commitment towards a type of high-altitude building which is not a refuge in the sense once widely understood. This building, in its definition of space and function, its size and its technical constraints, opens up a new field of design for mountain huts that clearly makes them something other than an exclusive and simple place of rest.

Conclusion

The bunk is the smallest constitutive element of a high mountain refuge and, as Jakob Eschenmoser demonstrated, it lies at the centre of the very definition of this type of building. Its design and arrangement are together capable of impacting on the plan of a building, its dimensions, morphology, and beyond that the overall spatial experience. In this way, the bunk is the driver of the project, the heart of the very definition of the mountain hut and a catalyst for how the conception of architecture can alter our perception of the Alpine environment.

23 The Swiss Alpine Club (SAC) is the main proprietor and leading player in Swiss Alpine constructions, with the exception of a few private huts owned by clubs or guide associations.
24 Roland Flückiger-Seiler, '150 ans d'implantation de cabanes dans les Alpes (1re partie). De l'abri de fortune à l'auberge solide' in Les Alpes, 7, 2009
Estelle Lepine, *Altitude. Architecture alpine et environnement de haute montagne*, Thesis no. 7089, Lausanne, EPFL, 2016, p. 218
25 Julius Becker-Becker, *Les cabanes du Club Alpin Suisse, Genève, Wyss and Duchêne*, 1892 [Translated by A. Bernoud]
26 The *Heimatschutz* was a cultural movement that sought to protect local traditions and that from the late 19th century influenced mountain architecture by imposing a number of identifiable elements (stone construction, shutters, spatial organisation, use of colours, ornaments...)
27 Gustav Krug, *Die Klubhütten des Sektion UTO, S.A.C*, Zurich, Published by Sektion UTO S.A.C., 1922
Estelle Lepine, *op. cit.*, p. 238
28 Inge Beckel, *Hans Leuzinger 1887–1971–pragmatisch modern*, Zurich, gta Verlag, 1993
29 Bruno Reichlin, 'Quand les architectes modernes construisent en montagne' in Michel Clivaz and Jean-Paul Brusson (eds.), Patrimoine rural, architectural et paysage de l'arc alpin, Sion, Institut Universitaire Kurt Bösch, 1998, pp. 36–41
Estelle Lepine, *op. cit.*, p. 247
30 Roland Flückiger-Seiler, *op. cit.*
Estelle Lepine, *op. cit.*, p. 247
31 Jakob Eschenmoser, *Von Bersteigen und Hüttenbauen*, Zürich, Orell Füssli Verlag. 1973
32 Estelle Lepine, *op. cit.*, p. 247
33 Ibid., p. 247
34 For an in-depth analysis of the building, see: Estelle Lepine, *op. cit.*, p. 258 and Annexes p. 509
35 Estelle Lepine, *op. cit.*, p.258
36 For an in-depth analysis of the building, see: Estelle Lepine, *op. cit.*, p. 257 and Annexes p. 509
37 Gustav Krug, *op. cit.*
38 For an in-depth analysis of the building, see: Estelle Lepine, *op. cit.*, p. 284 and Annexes p. 509
39 Estelle Lepine, *op. cit.*, p. 527
40 For an in-depth analysis of the building, see: Estelle Lepine, *op. cit.*, p. 285 and Annexes p. 509
41 For an in-depth analysis of the building, see: Estelle Lepine, *op. cit.*, p. 285 and Annexes p. 509
42 For an in-depth analysis of the building, see: Estelle Lepine, *op. cit.*, p. 285 and Annexes p. 509
43 ETH Zurich (ed.) *Nouvelle cabane du Mont Rose CAS. Un bâtiment en autarcie au cœur du massif alpin*, Zurich, gta Verlag, 2010
44 Ibid.

Part II

Artefacts

A Visual Survey

From Precedents to References

D

The Case of “Tackle the Type”

As in many disciplines, the deliberate practice of architecture eventually leads one to think about the meaning of what one practises. In 1984, in a short essay called “Architettura lingua morta 1 (1984)”, the Italian architect Giorgio Grassi questions his practice and articulates some thoughts related to architecture with capital A. Aside from a critique of contemporary production and its preoccupation with volatile questions such as “taste” and “spectacle”, Grassi deals with themes that we believe useful to address during the design process in an academic context. What these themes lack in originality, they gain in constancy and resilience; in other words, one can consider them timeless issues that deserve to be discussed over the drawing board.

To investigate and to work with typology is a sort of unavoidable commitment to the long and all-embracing idea of architecture where “its history is a slow deposition and overlapping of answers, the tenacious renewal of answers”.[45] At the time, believing that the problems of the discipline are always the same, Grassi presented architecture as a united field, comprised of norms, forms and types, diverse contexts and cultures, solemnly guided by time. Between the advantage of inclusion and the danger of oversimplification, architecture seems to be a sum – an *ad aeternum* – of answers.[46]

Interrogating past architectures, distant in time and space, presents two challenges: to engage with architecture represented through drawings loaded with tangible elements, and secondly – a more ambitious one – to mentally reconstitute the experiences of those spaces over time.[47] For the Milanese architect, observation is a tool for learning and these architectures a warehouse of knowledge. In “Architettura lingua morta 1 (1984)”, Grassi evokes relations that comprise “bonds, “debts” and “fidelities”, and turns his attention to architecture that relates and works with precedents. The “architectures” of yesterday, today or tomorrow are put on equal footing.[48] Guided by Grassian optimism, these relations set up criteria that are robust enough to identify “good architecture” and – in all modesty – “architecture worthy of that name”.[49] In the context of this introduction and its objective to present the scope of the “Tackle the Type” workshop, Grassi’s text conveys two important ideas: (one) new architectures always join an “entirely shared corpus” and (two) precedents are relevant and should be considered in the design process.

The construction of a corpus is the basis and starting point of the design studio’s investigation. The intention here is not to assemble a set of

extraordinary and unique case studies, but to collect a variety of artefacts that share the same purpose and answer common issues. Looking at these examples – with Grassi in mind – one could say that all examples are precedents even if not all precedents can become references. Working with precedents and working with references should not be confused even if both can be considered two distinct ways of acquiring knowledge; the former being an inevitable and involuntary condition of the research process – and of architecture – and the latter a conscious relationship born of confrontation and (even) dialogue. To work with precedents is a way of enquiry and discovering unfamiliar answers. To work with references is to deepen a relationship with the object of desire, to transform observation into a dialogue, into an emotional and even material "adventure".

"Tackle The Type" brings together a significant set of spaces that deal with the basic and biological human need of rest. The chosen examples cover a vast and plural temporal period without particular hierarchy or classification. The projects range from permanent to temporary housing, from spaces for training and discipline to political spaces, from places of care to places of belief, from spaces of defence to spaces in movement. Beyond the communitarian role of the dormitory, these are spaces where the human body is in a horizontal position and tends to be immobile. How does one organise a space when the initial question is how to arrange several bodies in a horizontal position? The apparent clarity of the problem, however, conceals two relational issues that need to be considered in parallel. What is the relation between the body and the device – the bed? And what is the relation between the device and the room?

Drawing on the inventory of precedents, the survey was structured in two phases: the collection of information and analysis of documents, followed by the production of drawings and re-analysis of documents, this time achieved simultaneously through reading while drawing. The main goal was the construction of knowledge, or better knowledge, through active reading. The researchers explored the possibilities the drawing offers to read differently. This process is a moment of in-formation: it informs the observer and forms the future architect. Finally, the construction of a new visual corpus of graphic information offers the possibility of new readings. The consistent process of re-drawing – drawing over drawing – and experimenting with new strategies of expression makes it possible to systematise information, flattening the temporal and geographical distance that separates the examples, thereby facilitating comparison between the various cases.

The diversity of the precedents the students studied, reveals recurrences and spatial themes specific to the question of the act of sleeping, which

all focus on the idea of the bed as a device between body and room. In its most rudimentary form, the bed is a functional assembly in a bunker, a response to the condition of urgency. But it can also be a designed and versatile piece of furniture like in the *Abbaye Notre Dame d'Ourscamp* (1254) or the *Hôpital Notre Dame des Fontenilles* (1295), where it has evolved into a more elaborate system of beds, enclosed spaces, mobile curtains and overhead galleries. The bed in plan becomes the bed as a volume, a room inside a room. The imposing presence and autonomy of the device holds the promise of a more private and supposedly healthy environment. The sleeping or ill body no longer lies bare and vulnerable on the bed; it is protected by a constructed shell. As additional functions and accessories are added, the more well-equipped the bed becomes, and the greater the well-being of its occupant. Storage solutions increase comfort: a useful steel hook to hang clothes, a decorated matching bedside table or efficiently integrated shelves for personal belongings. Some pieces of furniture have a wide range of uses: a folding table to eat, a screen to protect the body or a wooden chair by the bed to allow visitors to keep the occupant company. Increasing and improving the facilities for the sleeper comes at the cost of space. In the cases examined, one can see a clear progression from flexible and open solutions where beds on wheels were not an obstacle, towards projects where fixed room-like partitions objectively establish borders between the communal and the private dimension – the wheeling beds of the *Hospital Berlin-Friedrichshain* (1874) and the cabins of *London's Rowton House* (1905) illustrate both extremes. The different possible arrangements and composition in a room were also explored. Firstly, the most common layout also has the least character, where the replication of beds, side by side, extends to occupy the available space and define the zones of circulation; secondly, the singular case of the *Colonia XXVIII Ottobre* (1934) where the position of the beds aligned end-to-end in long ribbons reinforces the long volumetric proportions of the finger-like buildings; and finally, the situation where the position and size of the bed is not only constrained by the form of the building, but is affected and shaped by it. These examples are most apparent in the projects for mountain huts and well-illustrated by Charlotte Perriand's diagram of space optimisation for the *Refuge Tonneau* (1938). A solution also explored in Jakob Eschenmoser's plan for the *Coaz Hütte* (1964), and in the *Cabane du Vélan* (1992) designed by Michel Troillet, where the once autonomous bed has become a continuous mattress-floor for sleeping on.

Lying in a bed is always the product of an individual need to rest, heal or sleep. When done collectively, privacy becomes a key factor of the bed's design and its arrangement in the room. In western societies, we most frequently encounter situations where many people collectively sleep in

the same social space in situations of temporary displacement following an emergency or humanitarian catastrophe – circumstances that are driven by necessity and not by will. While contemporary housing has been reconquering its collective dimensions and re-enacting co-operative formulas through shared layouts such as clusters or redesigned communal areas, shared sleeping areas have not as yet been accorded the same design consideration. To share living quarters in a dormitory cannot be reduced solely to the act of sleeping. It is a social experience, that integrates a series of social protocols that include all the moments before and after the act of sleeping. Sleeping as a collective act is probably the most unconscious experience that one will encounter, and all the features mentioned – type of device, scheme of circulation and even of openings – are part of an architectural equation that needs to be carefully balanced to guarantee the best possible individual and collective experience. Eventually, from the observation and study of the corpus of precedents in this publication – conceived not as a static collection, but as an ever-growing working catalogue – several key characteristics emerged. These, repeated over time, came to form common schemes and create robust types that are now ready to become references for exploring anew.

45 Georgio Grassi, *Escritos Escolhidos, 1965–2015*. 1st ed. Colecção Giorgio Grassi (opera omnia sic) 3. Porto: Fundação Instituto Arquitecto José Marques da Silva, Edições Afrontamento, 2018 (translated by the authors), p. 263
46 Joost Meuwissen, "Growth of Knowledge in Architecture." *OASE*, no. 6, 2003, pp. 6–16
47 Georgio Grassi, *op. cit.*, p. 262
48 Luca Ortelli, "Entre Ancien et Nouveau – Quelques Aspects de l'architecture de Giorgio Grassi." *Matières*, no. 15, 2019, pp. 9–21
49 Georgio Grassi, *op. cit.*, p. 262

27 Artefacts

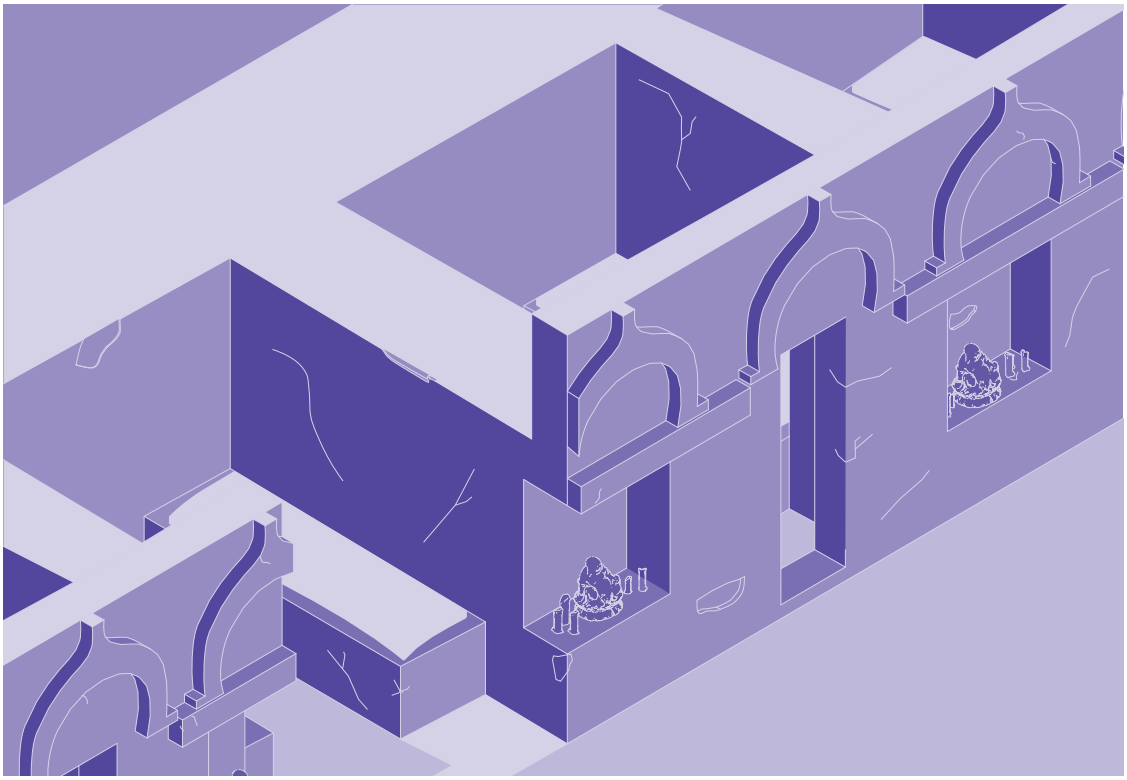
E

Ajantâ Caves No. 12
Maharashtra, India

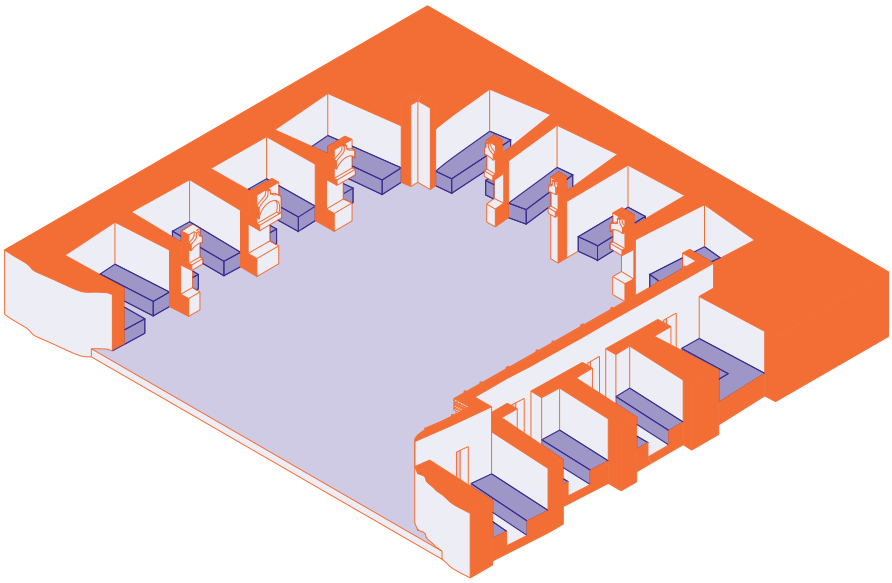
Cave Dormitory
Architect unknown

Excavated II – I BCE
218 m²
24 beds

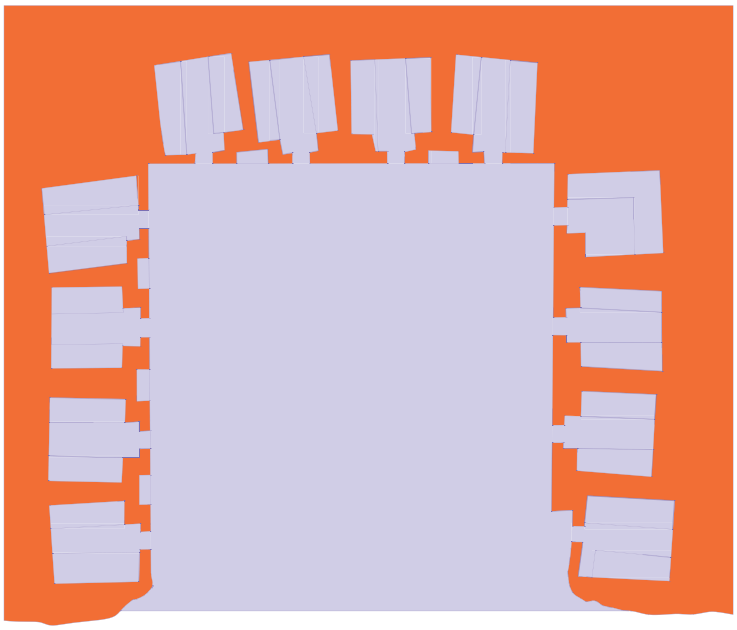
The Ajanta caves are Buddhist monasteries cut into the Aurangabad mountains near Maharashtra in India. The 29 caves were dug in two phases, the first between 200 and 100 BCE during the Satavahana dynasty, and the second between 300 and 500 CE during the Vākāṭaka dynasty. Some caves were used as shelters and dormitories for monks and others as prayer rooms. Cave 12 is one of the shelter types dug during the first phase and comprises a huge square hall providing access to 12 cells, each with two stone beds carved out of the basalt rock. The rooms are each approximately 7 m² with beds that are approximately 90 cm wide and between 2.30 and 2.80 m long. The size of the hall suggests that prayers took place in it.



0 5m



0 5m

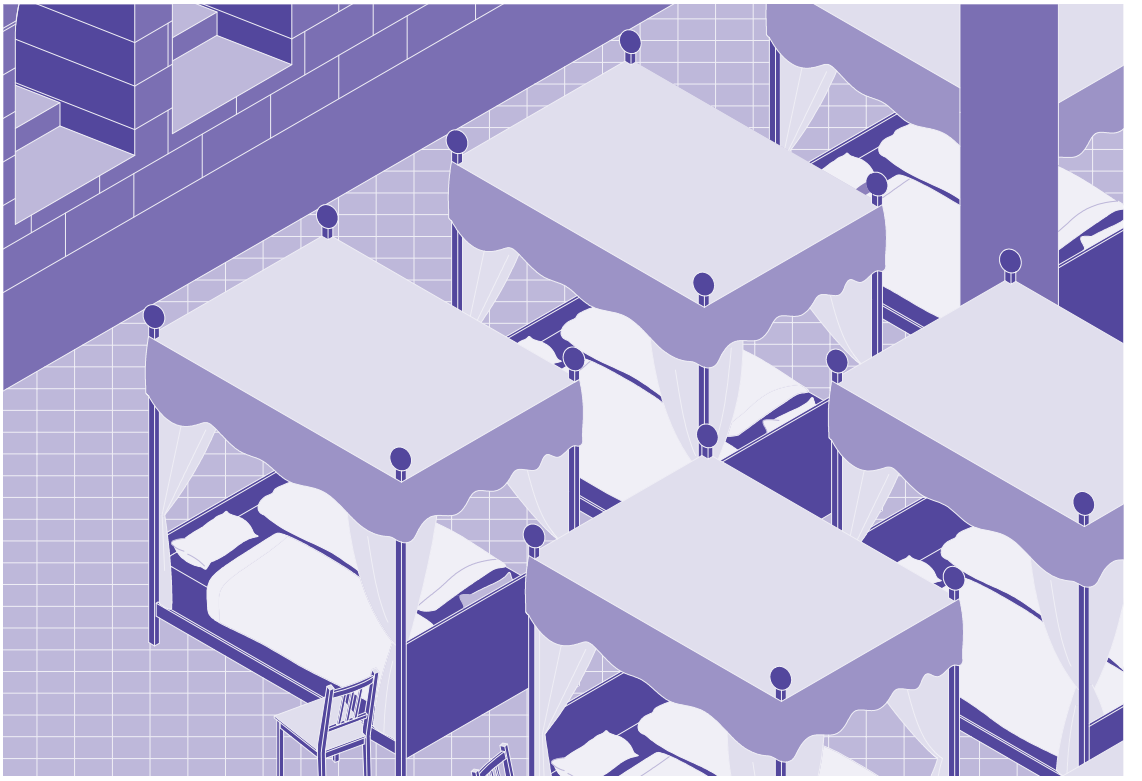


Abbaye Notre Dame d'Ourscamp
Ourscamp, France

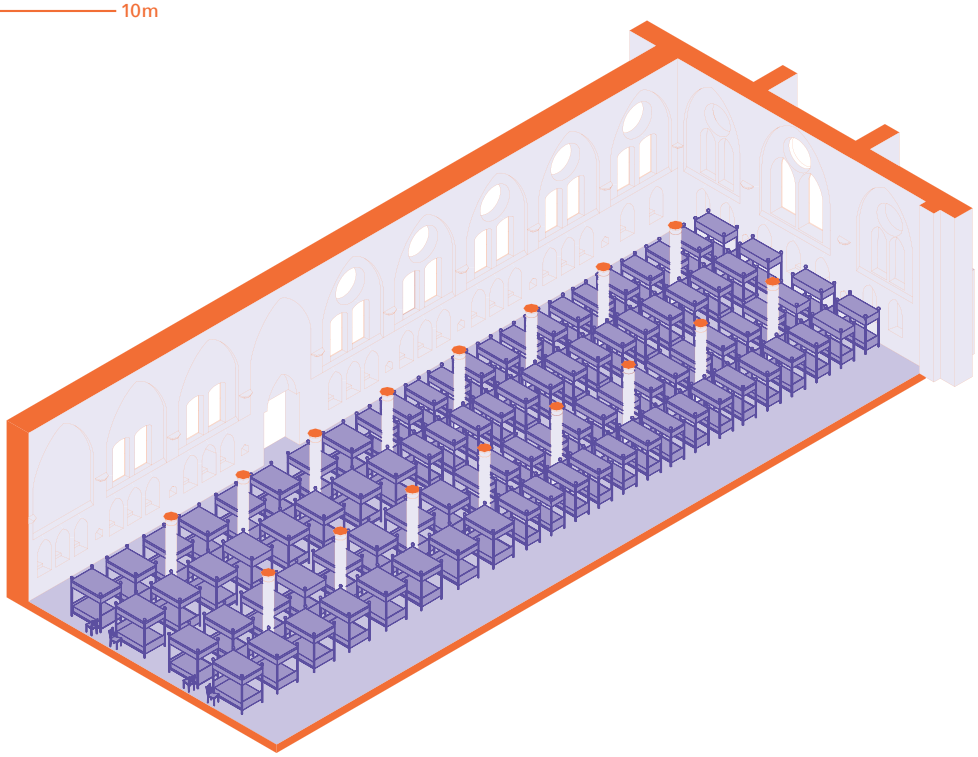
Hospital Dormitory
Architect unknown

Built 1154 – 1254
725 m²
92 beds

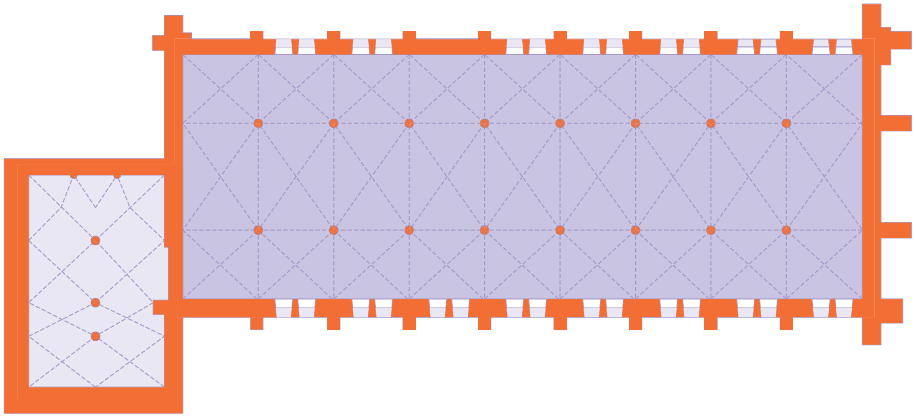
The Abbey of Notre-Dame d'Ourscamp was founded in 1129 and developed rapidly in the following century with the construction of the church and the "salle des morts" which is set off to one side. This 10.6 m high hall was topped by ribbed vaulting and a pitched roof borne by 16 columns in twin rows. The huge hall of the infirmary housed two types of beds, a single bed and a double bed, both of which were four-poster beds enclosing a sheltered space within. It was not, however, uncommon to lay several patients in one bed. Along each wall there are two rows of fixed windows, with the lower row featuring deep window seats. Each window corresponds to a bed and provided a place for patients to store their belongings. The building has since been converted into a chapel.



0 10m



0 14m

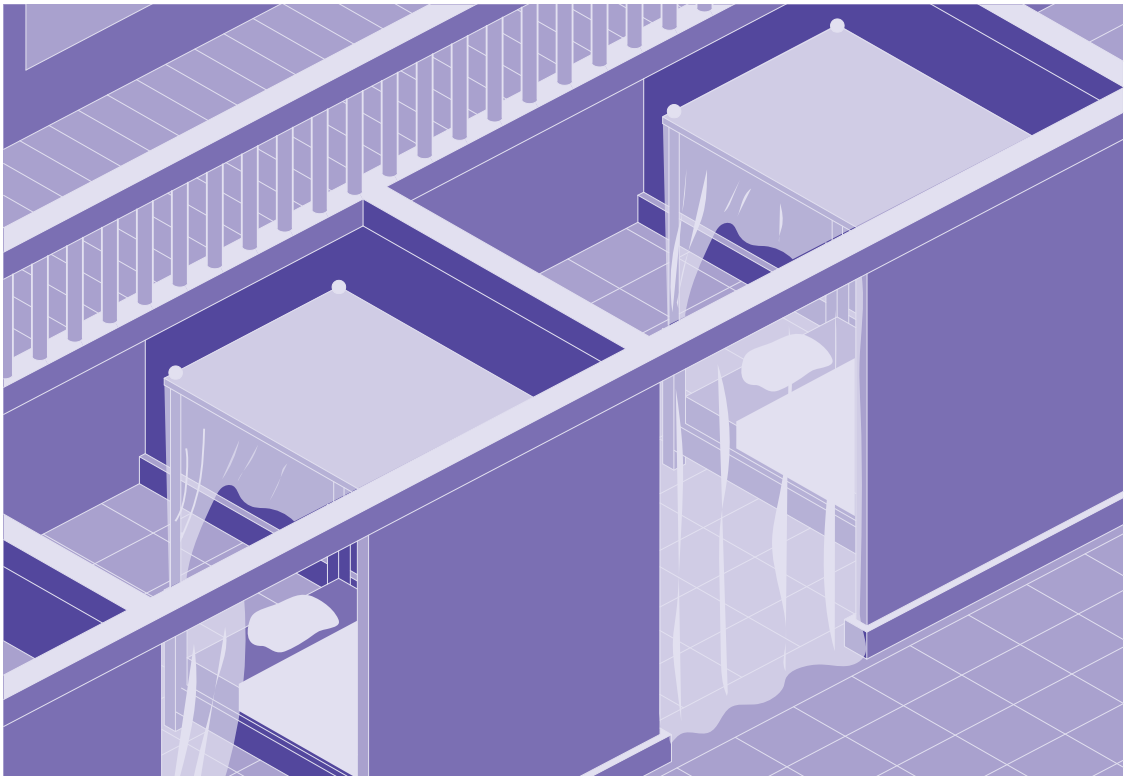


Hôpital Notre Dame des Fontenilles
Tonnerre, France

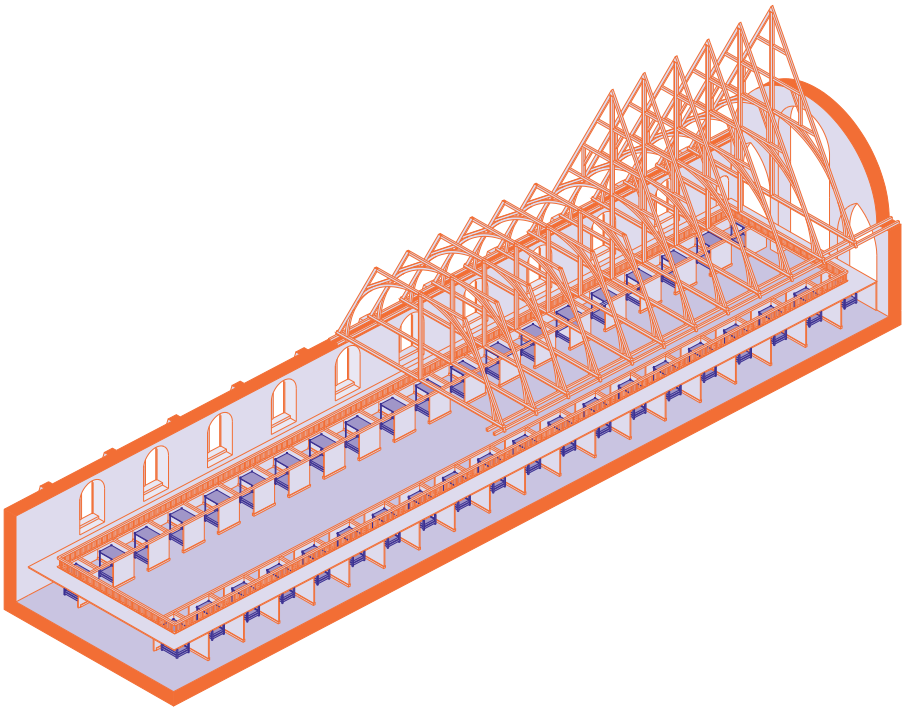
Hospital Dormitory
Architect unknown

Built 1293 – 1295
1600 m²
40 beds

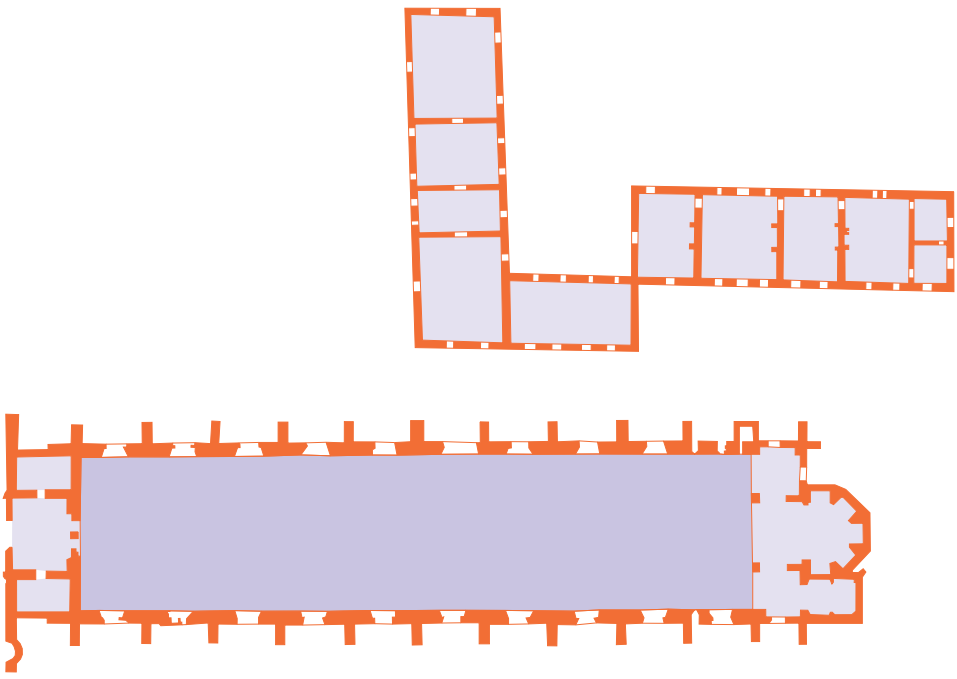
Founded in 1293, the Tonnerre Hôtel-Dieu comprised a single building and is the largest hospital of its kind in Europe from the Middle Ages. The main hall, “La Grande Salle”, is a single large space measuring 80 by 20 m and is topped by a monumental vault that reaches a height of 20 m at its apex. Each side of the building has 10 windows, providing fresh air and light for the 40 patients. Each bed was enclosed by a wooden cubicle, creating small individual “boxes” that can be closed off by drawing curtains. An elevated gallery along the sides of the hall allowed the carers to monitor the patients from above.



0 ——— 22m



0 ——— 28m

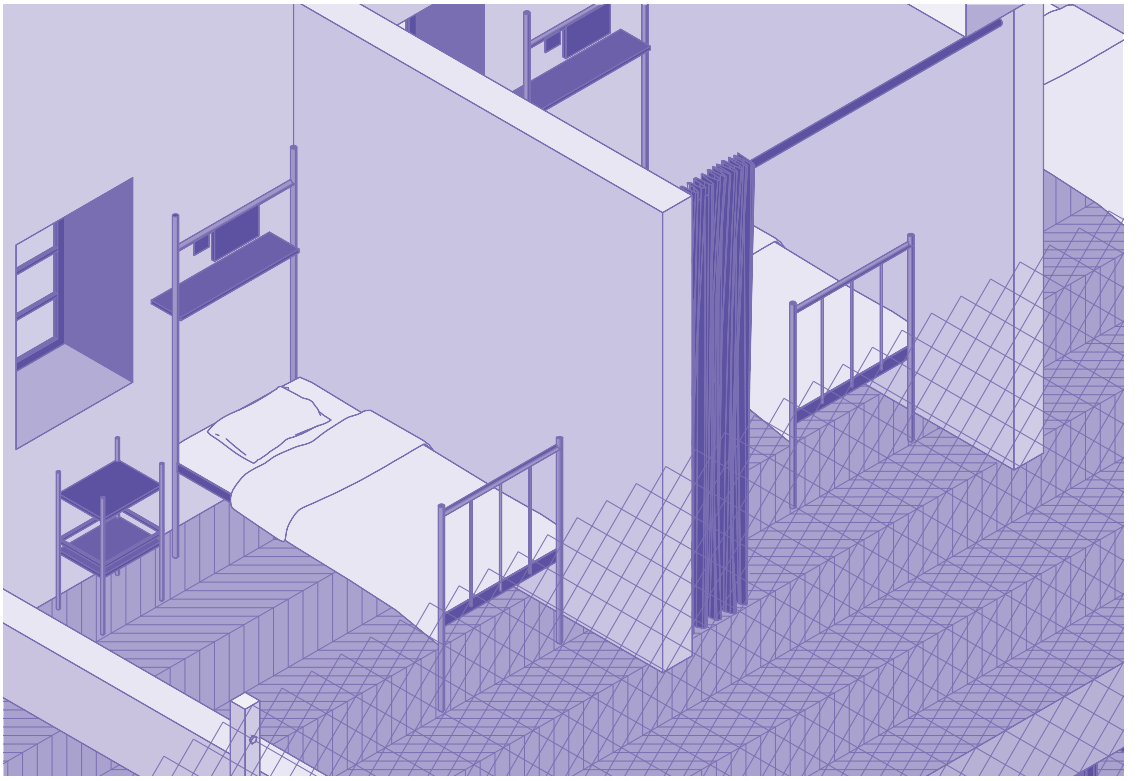


Hôtel-Dieu
Paris, France

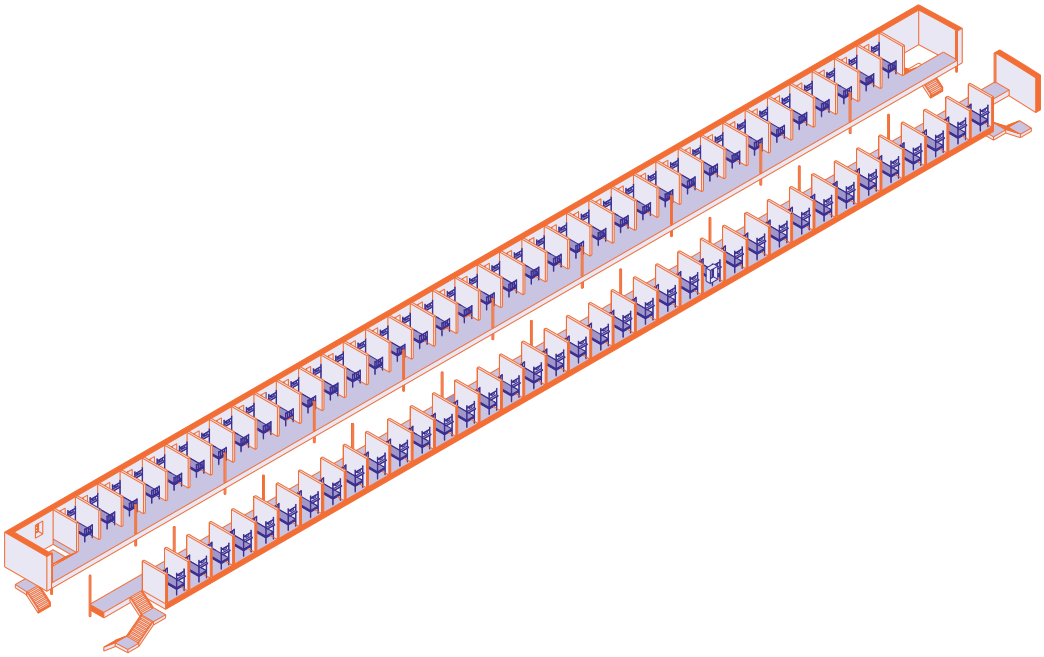
Hospital Dormitory
Antoine Petit

Built 1774
809 m²
74 beds

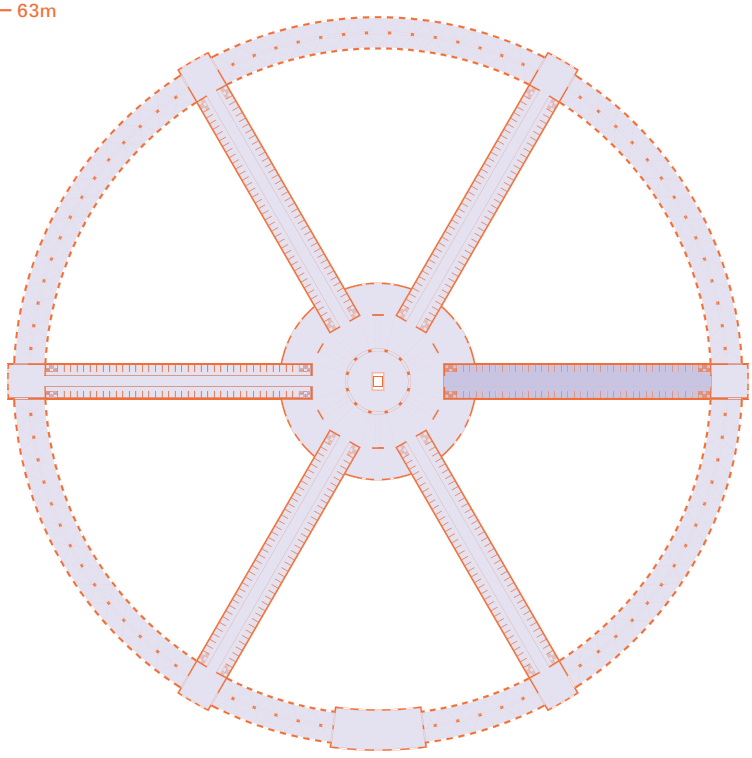
The project has a radial plan with six wings extending outwards enclosed by a colonnade that forms a circle around the complex, maximizing the space within the small complex. At its centre is a circular chapel where the altar is placed. The radial wings, 100 m long and 13 m wide are dormitories with beds on four floors subdivided into individual cubicles. Down the centre of each wing was a 4 m wide full-height space in which heating stoves were placed in winter. A walkway along the front of the patient cubicles provided access and was closed off with wire mesh from floor to ceiling to prevent people falling. The hospital was design to accommodate as many patients as possible in well-built, accessible and well-ventilated bed halls.



0 25m



0 63m

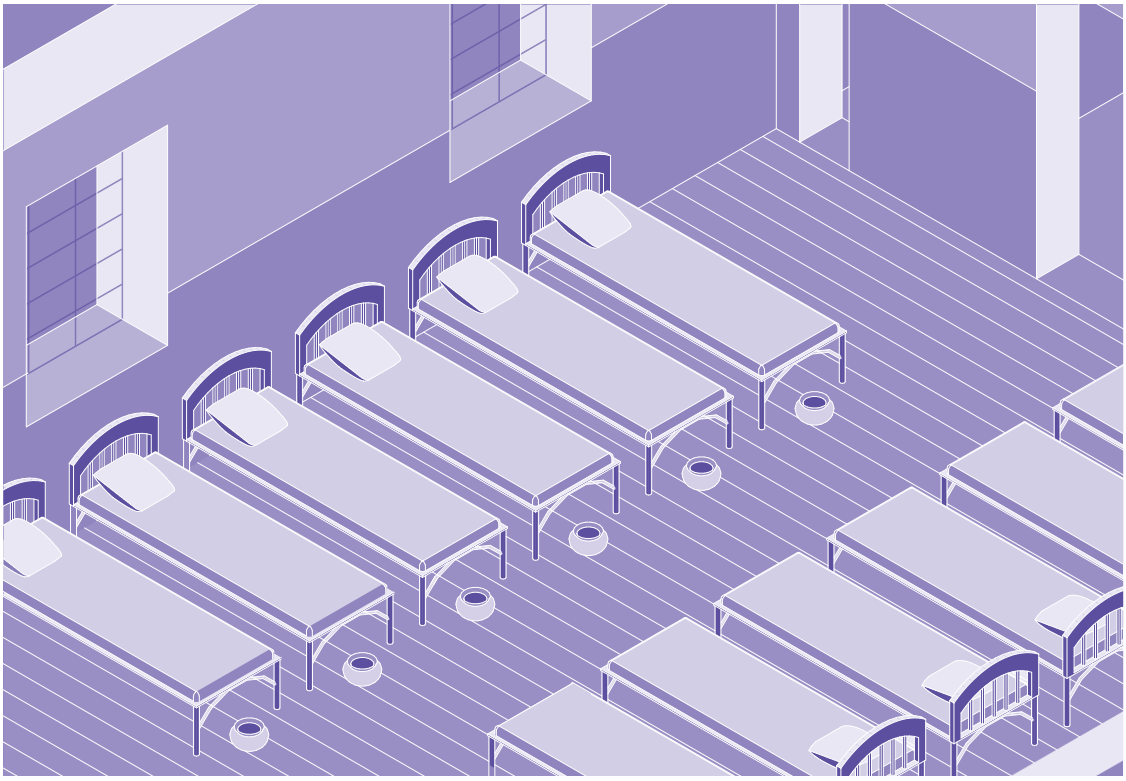


Workhouse
Rotherham, United Kingdom

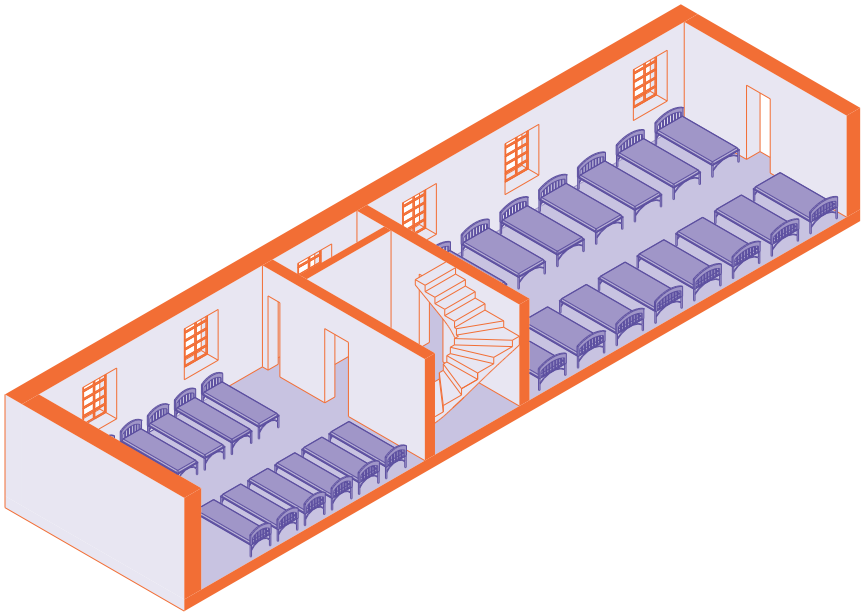
Hostel Dormitory
Sampson Kempthorne

Built 1835
92 m²
27 beds

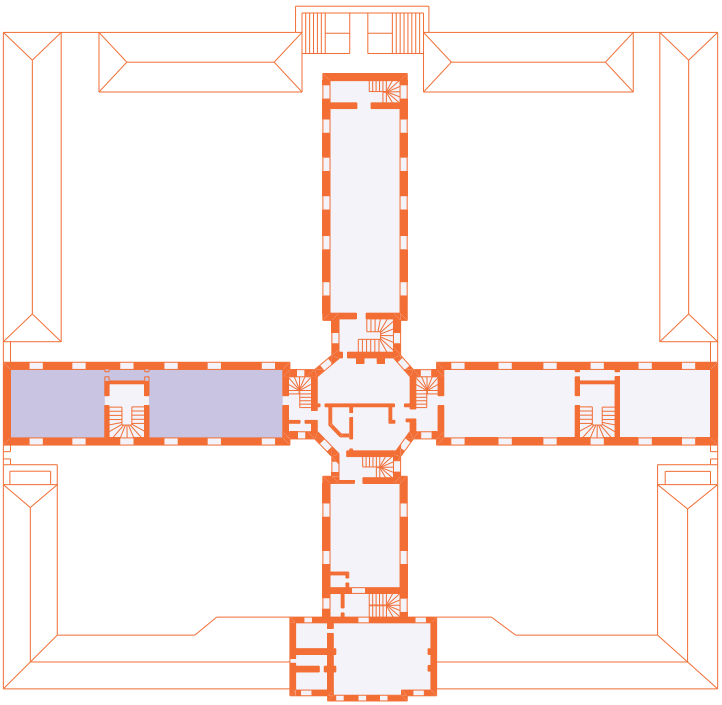
The Rotherham Workhouse is an example of one of 10 Kempthorne-designed square-plan workhouse projects, each housing between 300 and 500 inmates. The workhouse featured a central supervisory hub from which accommodation wings for the different kinds of inmates (sick men, sick women, able-bodied men, able-bodied women, boys, girls and children under seven) were arranged in a cruciform fashion. Utility buildings around the perimeter gave the workhouse its characteristic square outline with an entrance and administrative building located at the end of one of the wings. The outdoor areas between the wings served as segregated exercise yards. The building was constructed one year after the New Poor Law was passed, which made the workhouses primarily a political intervention aimed at caring for poor people. It removed from public view almost all the outsiders that the early modern period had generated. The only unifying element was their potential capacity to work.



0 —— 8m



0 —— 12m

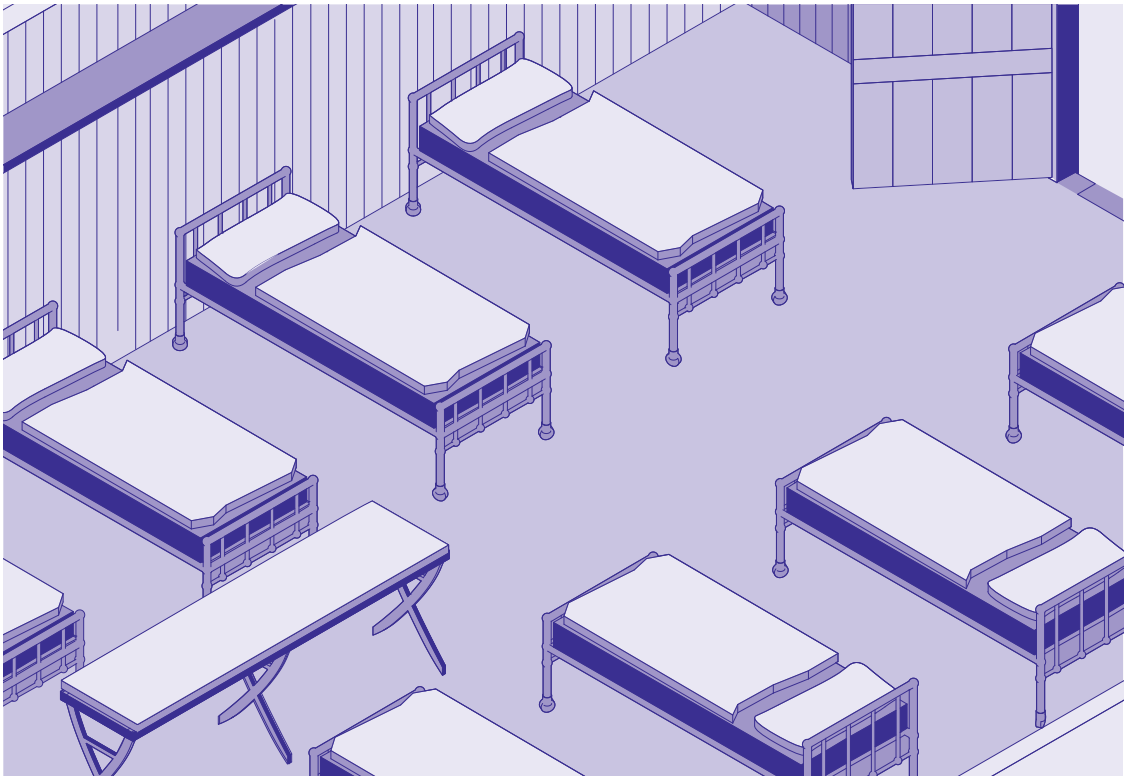


Renkioi Hospital
Dardanelles, Turkey

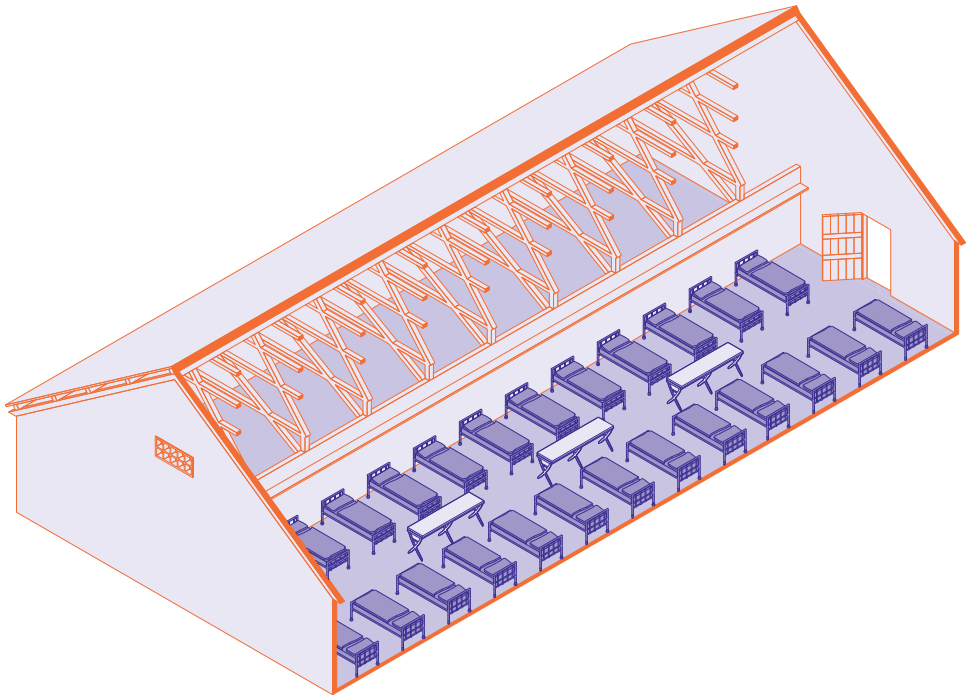
Hospital Dormitory
Isambard Kingdom Brunel

Built 1855
320 m²
50 beds

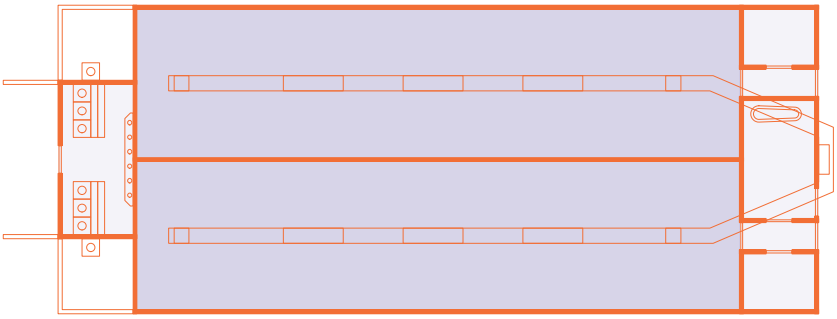
Renkioi Hospital was designed by Brunel as a British Army military hospital during the second half of the Crimean War (1854 – 56). It was made up of pavilion-like barracks, each catering for 50 patients, and could be extended indefinitely, eventually becoming large enough to house 1500 patients. Each pavilion unit was prefabricated of wood and identical in size so that with an infinite length of open corridor to connect them, they could be placed in any constellation making it possible to adjust to the topography of the terrain. A single unit consisted of two dormitories, one nurse's room, a small store-room, bathroom, surgery area, lavatories and ventilating apparatus. To opti-mise ventilation, fresh air was forced into each building by a small mechanical fan capable of supplying up to 1,500 cubic feet of air per minute.



0 —— 6m



0 —— 8m

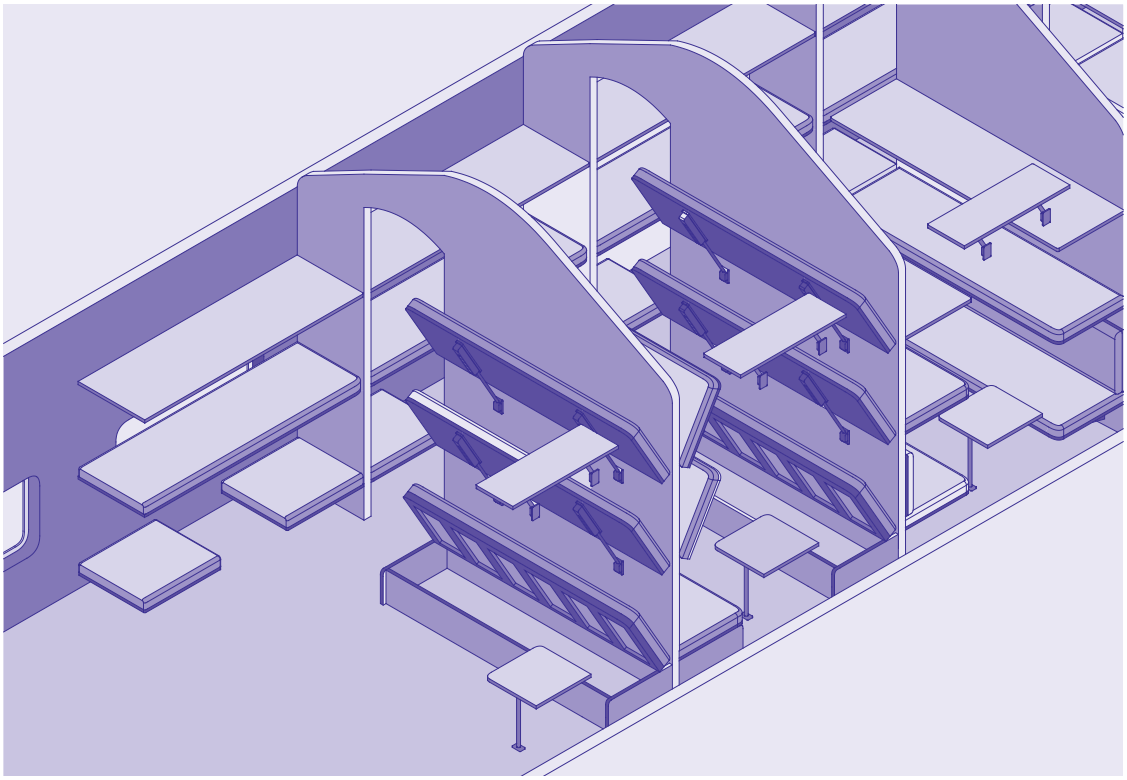


Platzkart
Throughout Russia and Central Asia

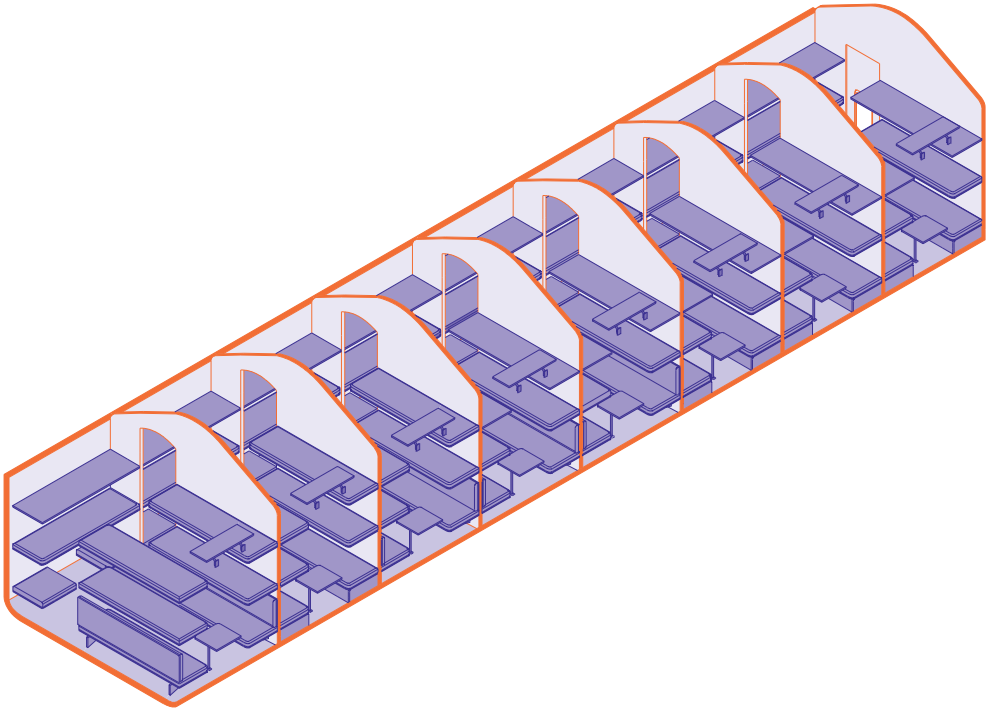
Train Dormitory
Design engineer unknown

Built 1870s
45 m²
64 beds

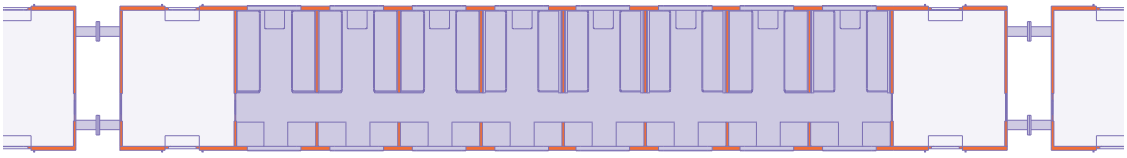
Given the very long distances to cover when travelling across Central Asia, journeys often took many days, requiring sleeper cars such as the so-called “Platzkart” which had three classes of service. Numerous bunks are squeezed into the small space of an open carriage. Each compartment comprises four beds, all of which are simply furnished with little comfort. Between the beds is a small table. The upper bunks need to be climbed into and can be folded down during the day to make space. Luggage is stored beneath the lower beds. The arrangement was optimised to maximise the number of people in a carriage, and its low price means that it remains a popular form of transport in Russia and Ukraine.



0 —— 3m



0 —— 4,5m



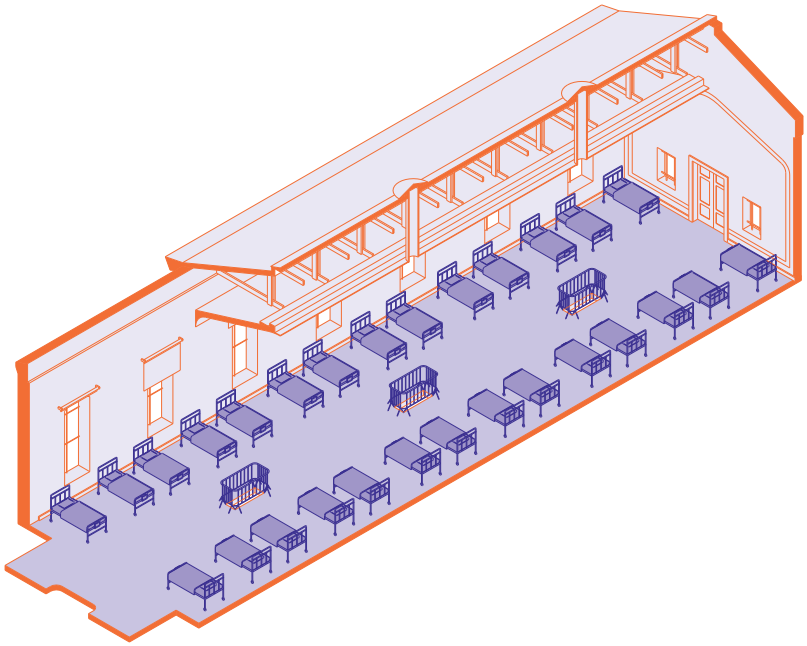
Städtisches Krankenhaus
Am Friedrichshain
Berlin, Germany

Hospital Dormitory
Martin Gropius
Heinrich Schmieden

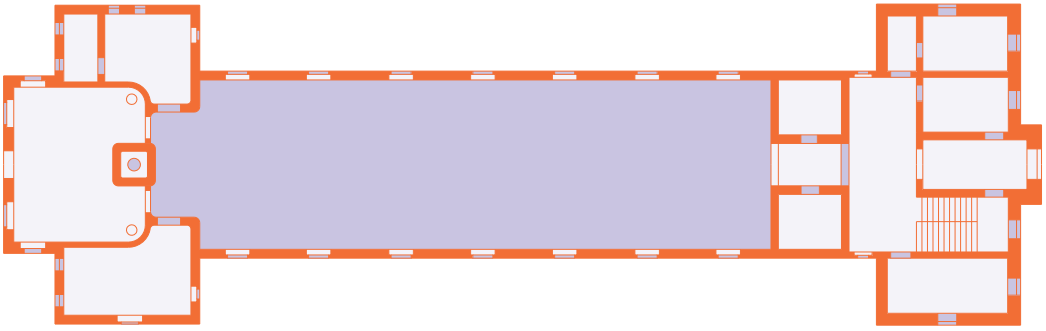
Built 1874
273 m²
28 beds

The project for a municipal hospital with a capacity of 600 beds was commissioned by the Berlin magistrate in 1866 and the first building to house patients was put into service in 1874. Later, administrative, laundry and utility buildings were added. The hospital is organised as a system of pavilions, a concept developed in England that was considered exemplary at the end of the 19th century as the distance between the pavilions allowed optimal air circulation and prevented the spread of infectious diseases. The dormitories were large open halls with about 30 beds arranged in a linear configuration and a ventilation system that was also used for heating. The system was developed with the aim of improving hygienic conditions.

0 —— 8m



0 —— 10m

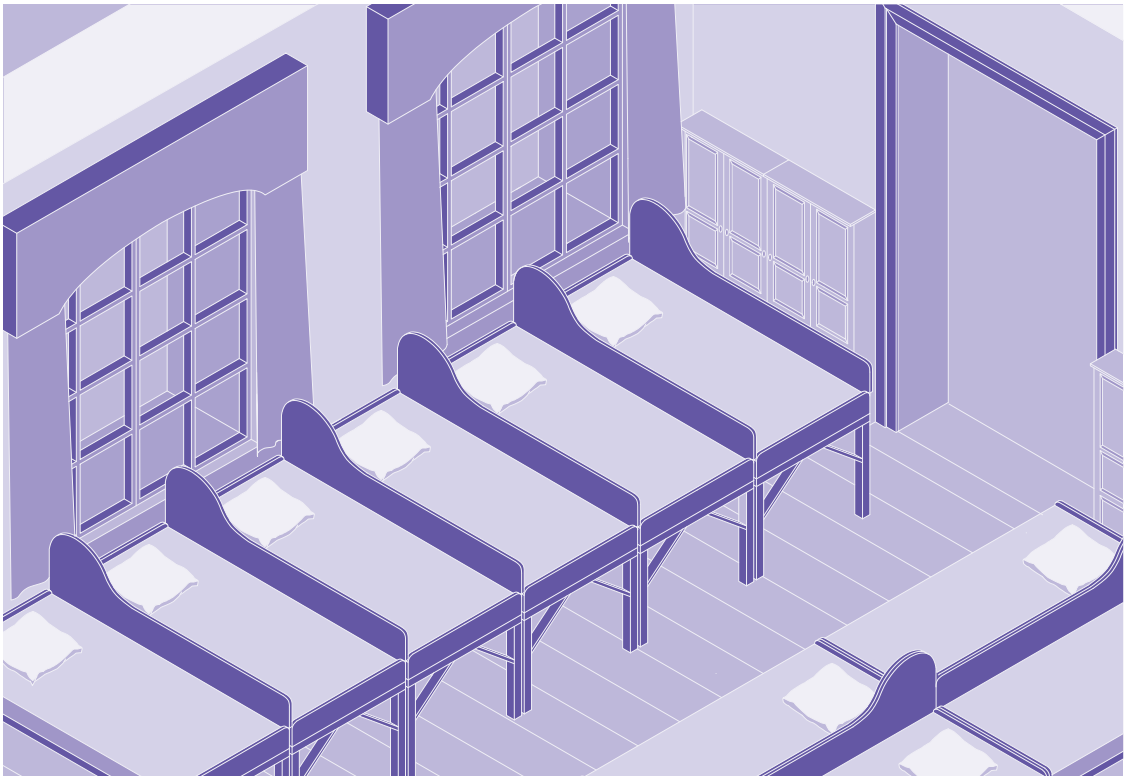


Feuerwache Fischerbrücke
Berlin, Germany

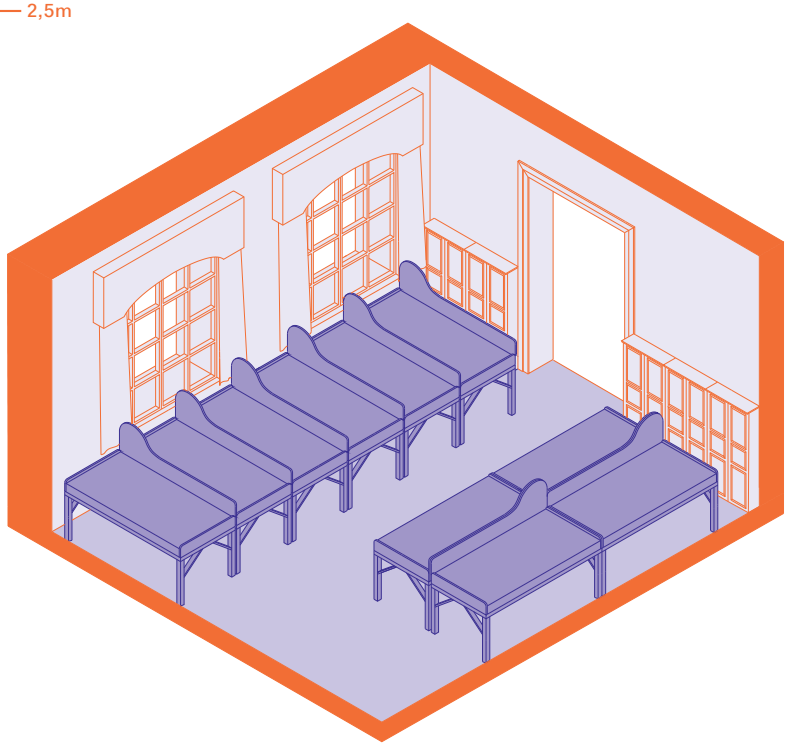
Fire Station Dormitory
Ludwig Hoffmann

Built 1899 – 1901
27 m²
10 beds

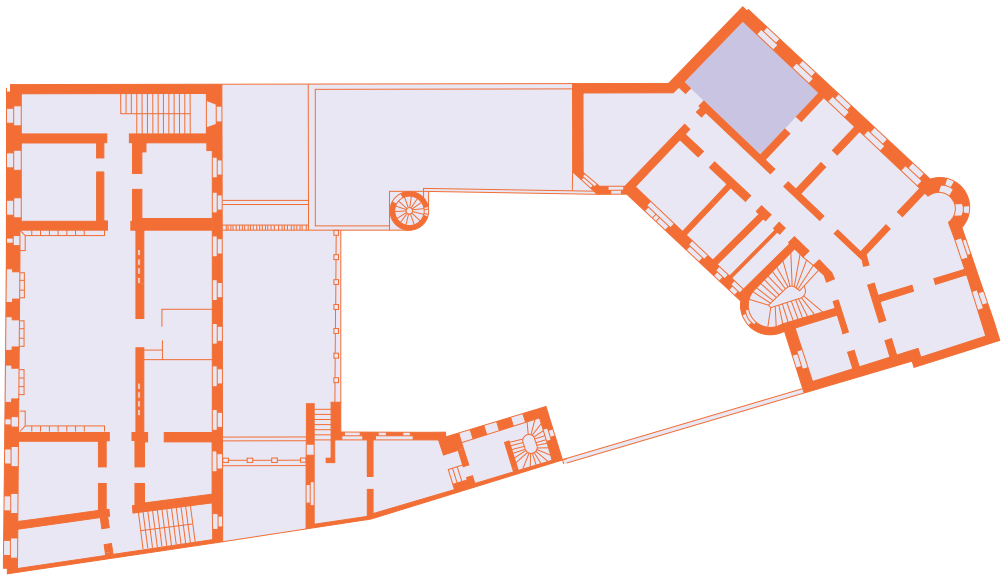
The Fischerbrücke Fire Station is one of Hoffmann's first official works as the director of urban planning and construction in Berlin. Its interiors were given a very simple architectural treatment with unassuming, pleasant interiors drawing their character principally from their different spatial qualities. The large hangar had a wide cross vault over granite pillars on an elliptical floor plan while the heart of the fire station, the vehicle hall and stable was located on the second floor in the middle of the building. The dormitory for accommodating the firefighters during their night watch was small and modest with berths divided only by a small partition between the heads of the beds. The building was demolished in 1973 because it no longer met modern requirements.



0 —— 2,5m



0 —— 11m

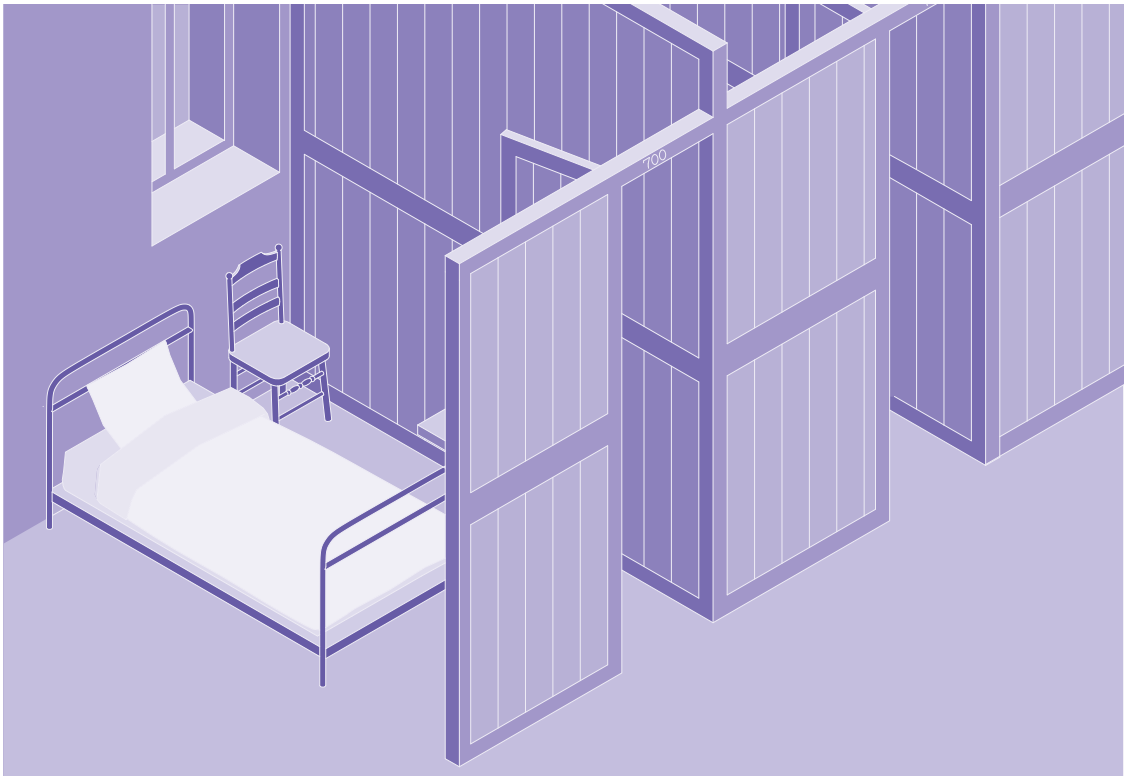


Rowton House
Camden Town, United Kingdom

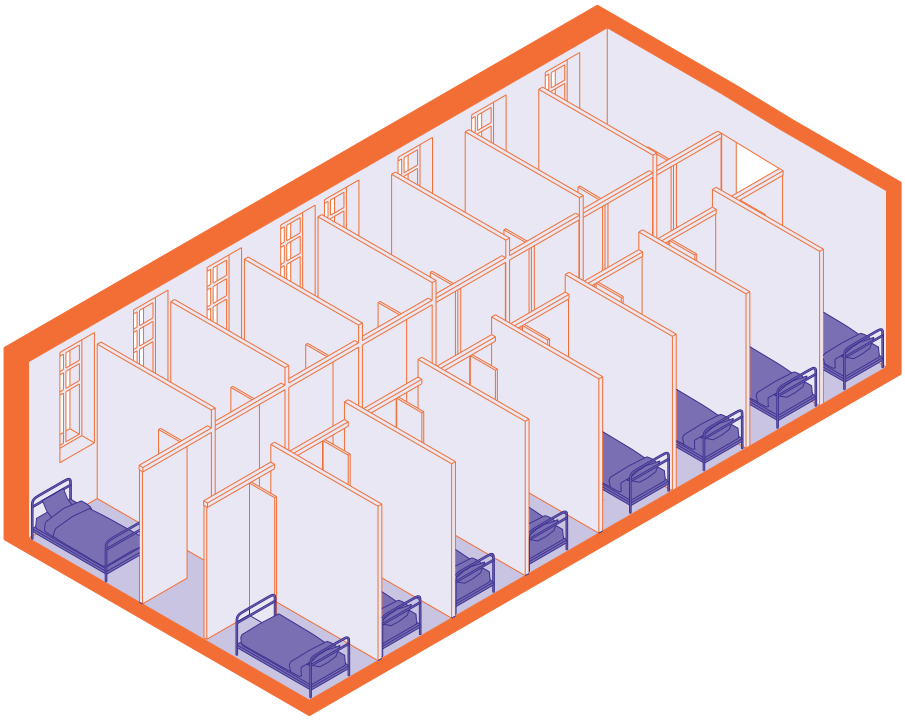
Hostel Dormitory
Harry Bell Measures FRIBA

Built 1905
52 m²
16 beds

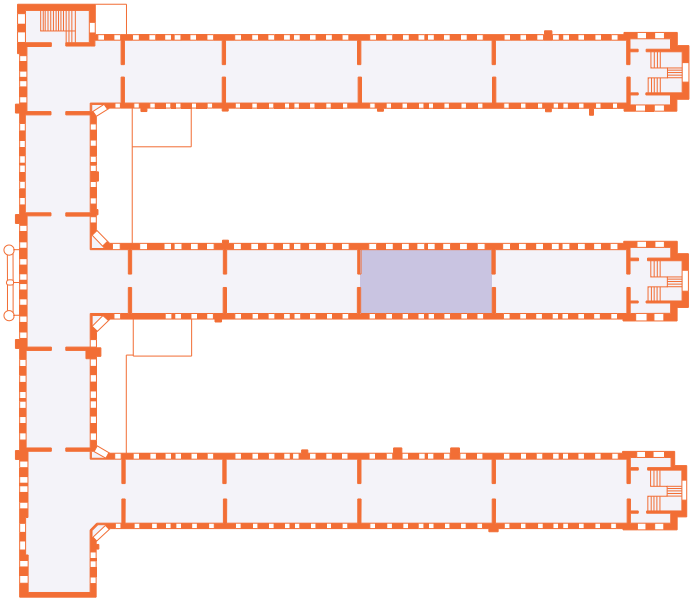
Until the 1890s the main accommodation available for the down-and-out or low-paid workers were dosshouses, charitable lodgings or workhouse casual wards which were free in return for a certain number of hours of manual labour to cover very basic provisions and lodgings. The Rowton Houses, developed by the philanthropist Lord Rowton, aimed to provide cheap accommodation that was better and cleaner than anything else available at the time. The Camden Town Rowton House contained 1103 beds each in a private cubicle. Its particular E-shaped layout allowed as much light as possible into the dormitories. The long wings of the building were divided into smaller rooms containing about 16 cubicles, and in the basement and on the first floor were supplementary services such as reading rooms, hairdressers, toilets and a dining room.



0 4m



0 21m

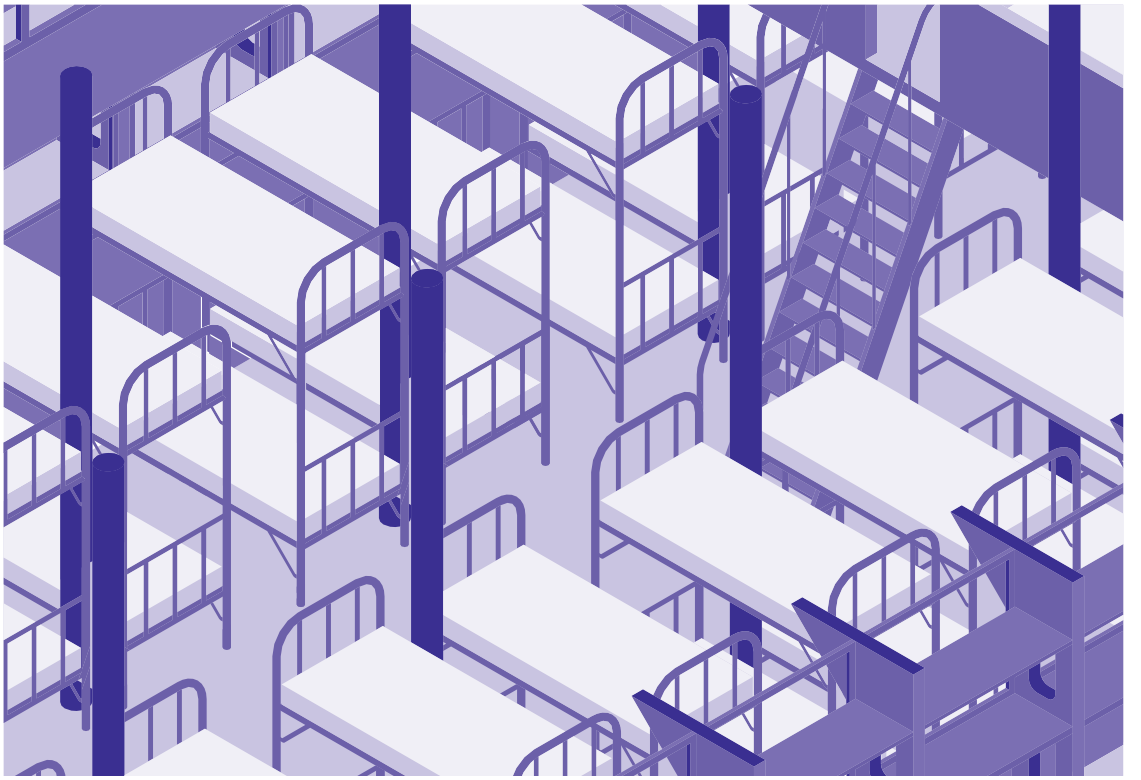


Asile Flottant
(Louise-Catherine Coal Barge)
Various Locations, Paris, France

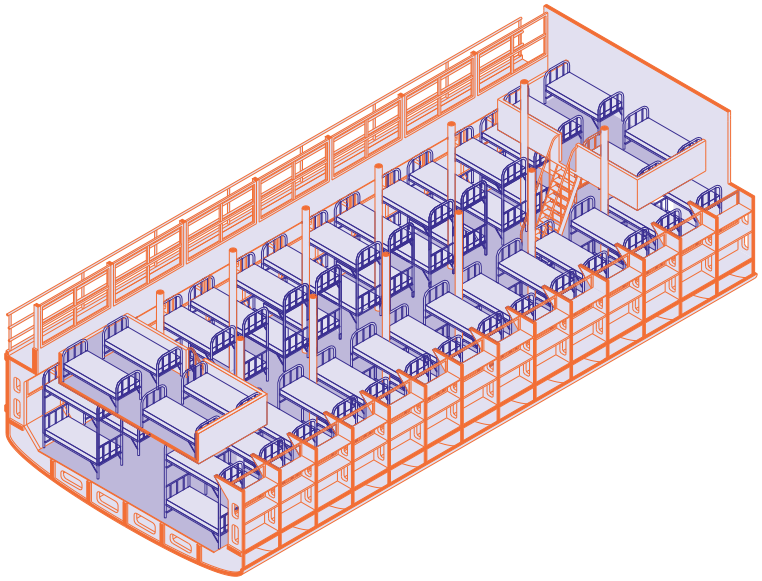
Asylum Dormitory
Le Corbusier

Converted 1929
120 m²
64 beds

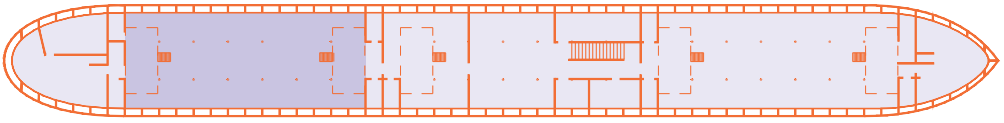
Built in 1919, the reinforced concrete barge was transformed into a floating shelter for the homeless in 1929 by Le Corbusier on behalf of the Salvation Army. He added a raised deck by placing it on slender iron supports under which bunk beds could be arranged. Two pairs of beds fit between each of the two supports to accommodate a total of 160 people in three rows. In addition, he designed a dining room, kitchen, toilets, showers, a berth for the sailor and for the director as well as a terrace. Windows were cut out to let in more light. In winter, the barge was stationed near the Louvre Palace to accommodate the homeless who sought shelter under the arches of the bridges, while in summer it travelled all over Paris. It continued to function until the 1990s, acting as a homeless shelter in winter and as a holiday camp for children in summer. In 1994 it was closed for safety reasons.



0 ——— 5m



0 ——— 15m

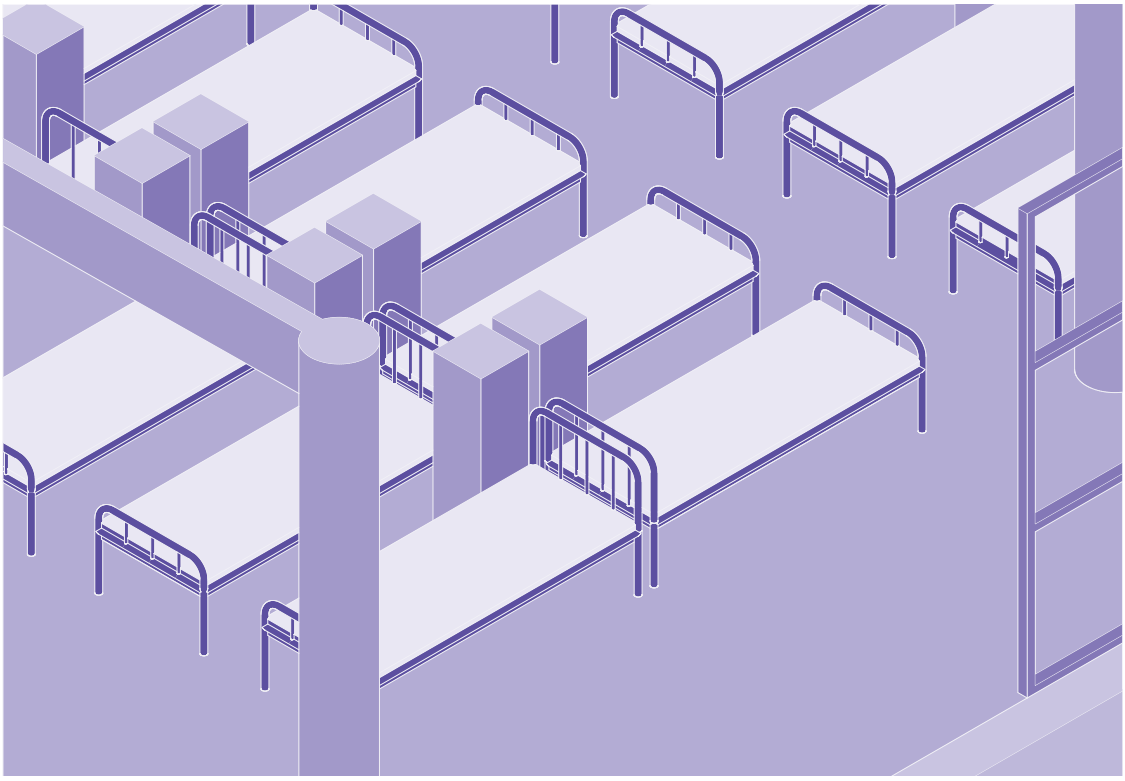


Cité de Refuge
Paris, France

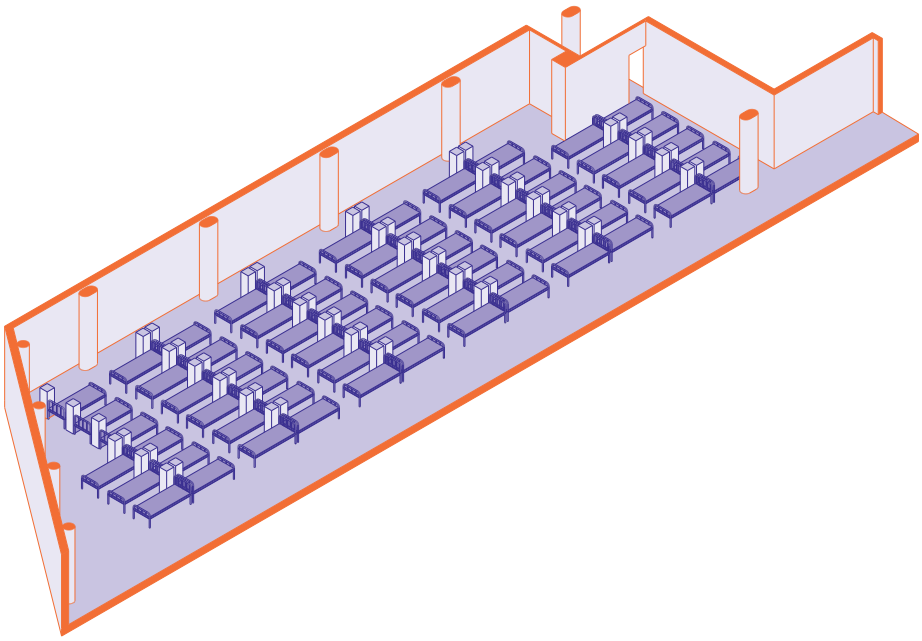
Asylum Dormitory
Le Corbusier
Pierre Jeanneret

Built 1929 – 1933
411 m²
67 beds

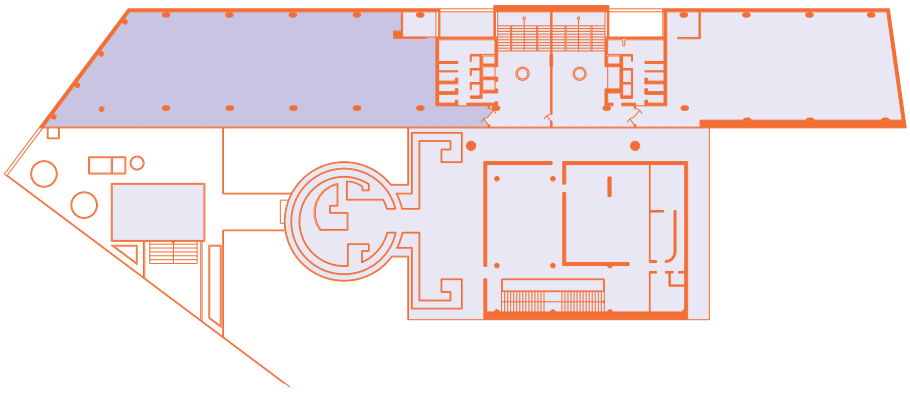
The Salvation Army Refuge in Paris was Le Corbusier's second opportunity to create accommodation for the urban poor. The core of the design was the dormitory block with a glass curtain wall, but it also includes a library, kitchens, and places to work. Nevertheless, the importance Le Corbusier placed on the climatic comfort of the dormitories can be seen in the placement of the beds. The beds were placed parallel to the façade and are barely separated from one another. Corbusier sacrificed personal privacy in favour of allowing light to reach the beds farthest away from the window on the north wall. Male and female bathrooms were provided on each floor. The building was renovated in 2015.



0 —— 7m



0 —— 22m

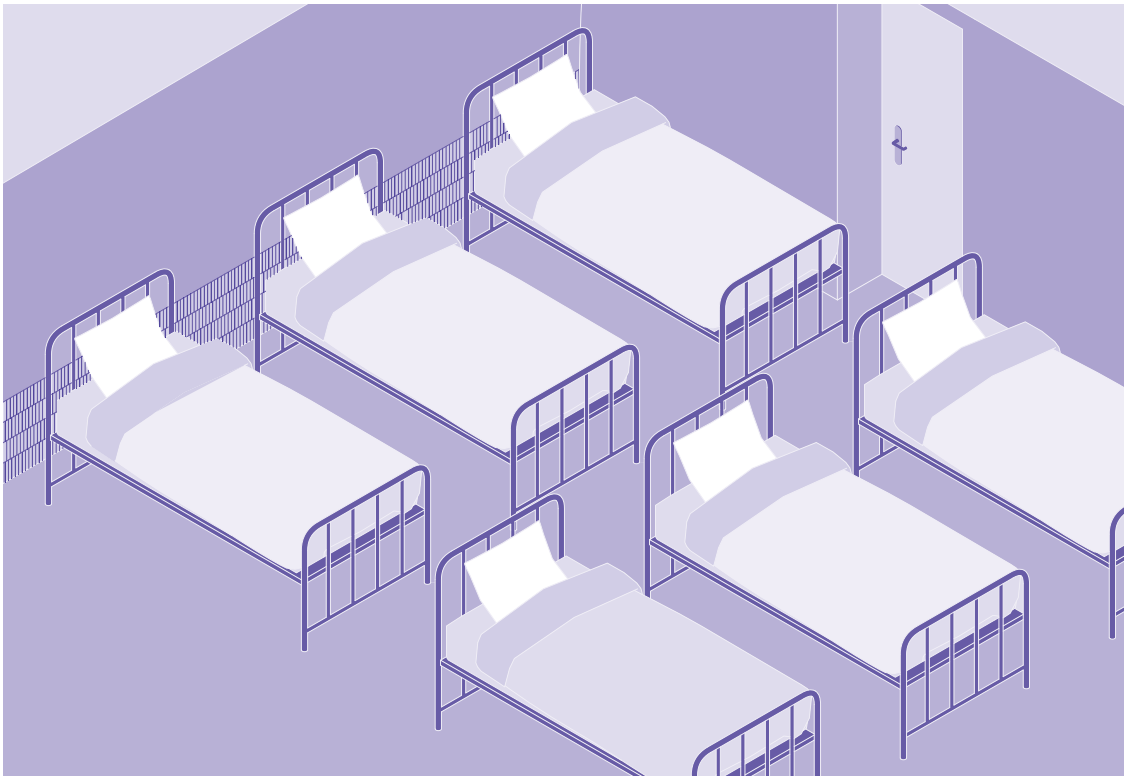


Hôpital-Sanatorium Roc des Fiz
Passy, Haute-Savoie, France

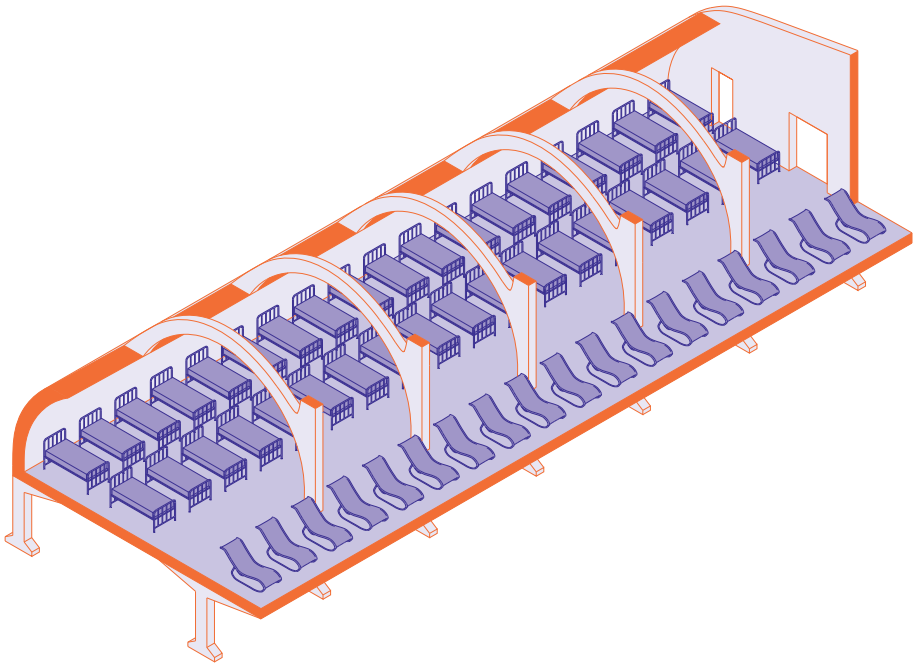
Hospital Dormitory
Pol Abraham
Henry Jacques Le Même

Built 1932
136 m²
36 beds

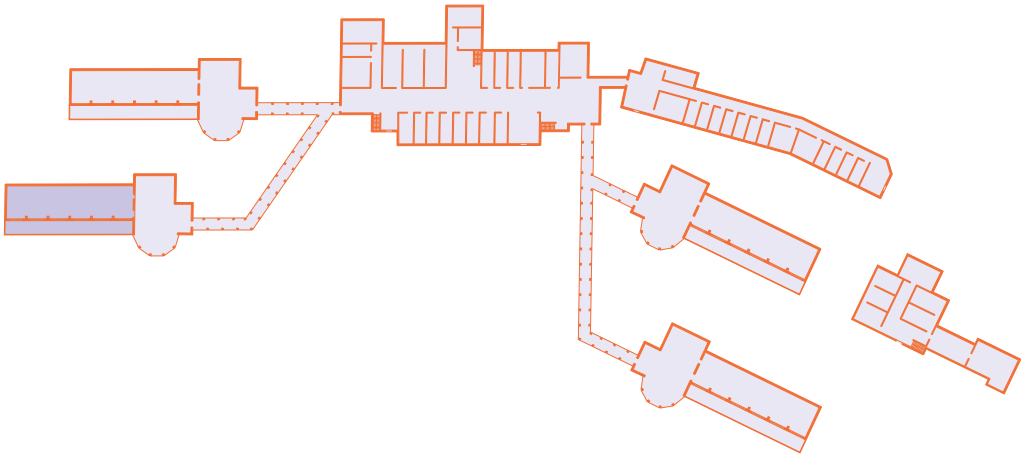
Roc De Fiz on the Plateau d'Assy is a sanatorium built in 1932 to treat children suffering from tuberculosis. It consists of a central building for the medical and administrative services, connected by walkways to four pavilions housing separate dormitories for boys to the west and girls to the east. Each pavilion, which stands on piles, consists of a dormitory with 36 beds and a common playroom in the form of a rotunda. The dormitory was divided into three zones: two rows of beds are located in front of the curved wall facing the glazed frontage, while the main circulation was separated from the outdoor areas. The beds are closely spaced, creating the sense of a common space for the children. The treatment also involved the placing of deck chairs on the terrace in front of the dormitory, from where one had an unobstructed view of the alpine landscape.



0 —— 6m



0 —— 28m

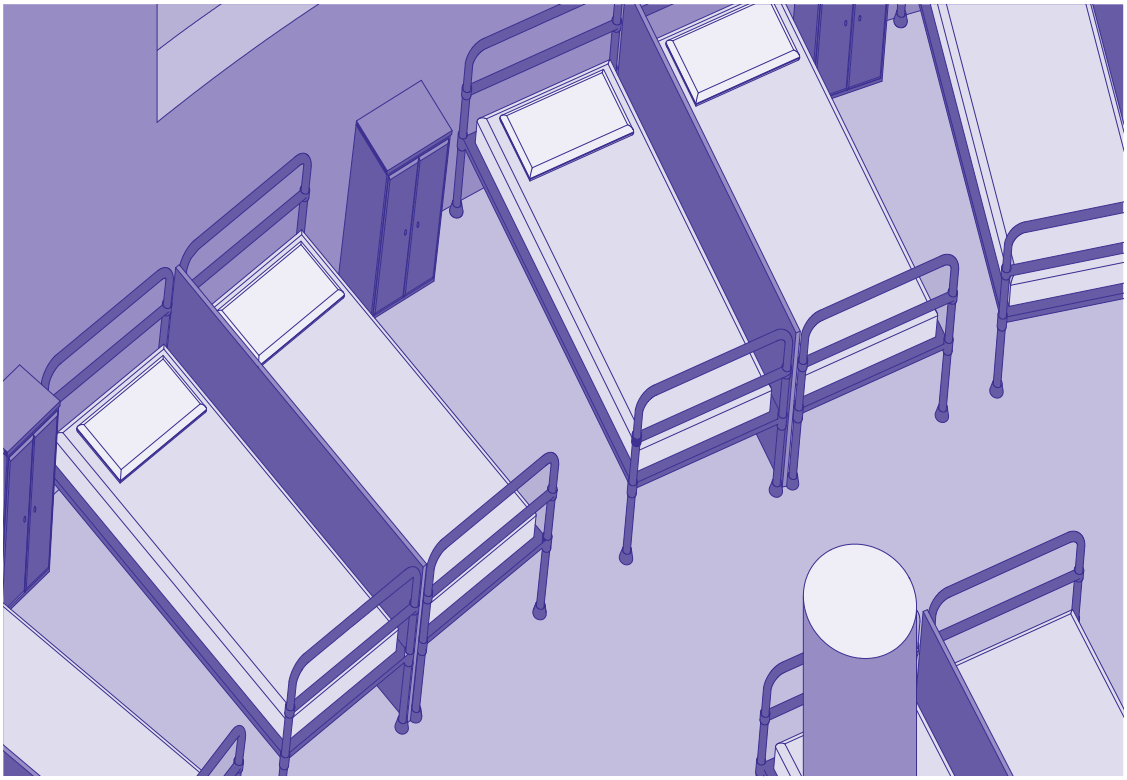


Colonia Torre Balilla
Marina di Massa, Italy

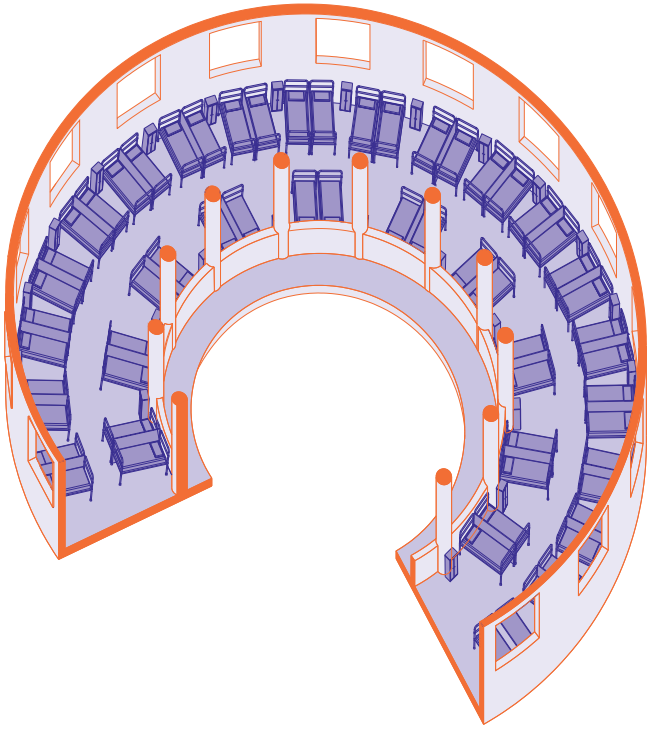
Summer Camp Dormitory
Vittorio Bonadè Bottino

Built 1933
3120 m²
800 beds

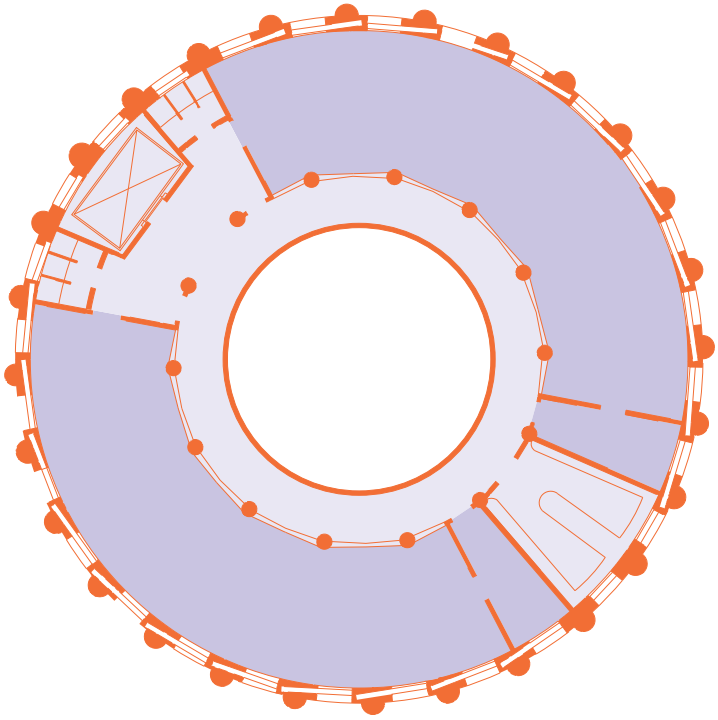
The circular tower overlooking the sea is conceived as “a single, unending dormitory”, 8 m wide and 420 m long, capable of accommodating about 800 children. The beds are accessed via a continuous path at the foot of the beds parallel to the spiral ramp in the centre of the tower. The floor depth is approximately 7 m, of which 5.5 m is the room and the remainder the ramp. Each rotation descends a height of 2.60 m at an average gradient of 5%. This dynamic is subtly visible on the exterior where the windows descend in the same continuous spiral pattern. The incline of the sloping floors is also noticeable in the interiors and the furniture has different length supports to accommodate the difference in height.



0 7m



0 7m

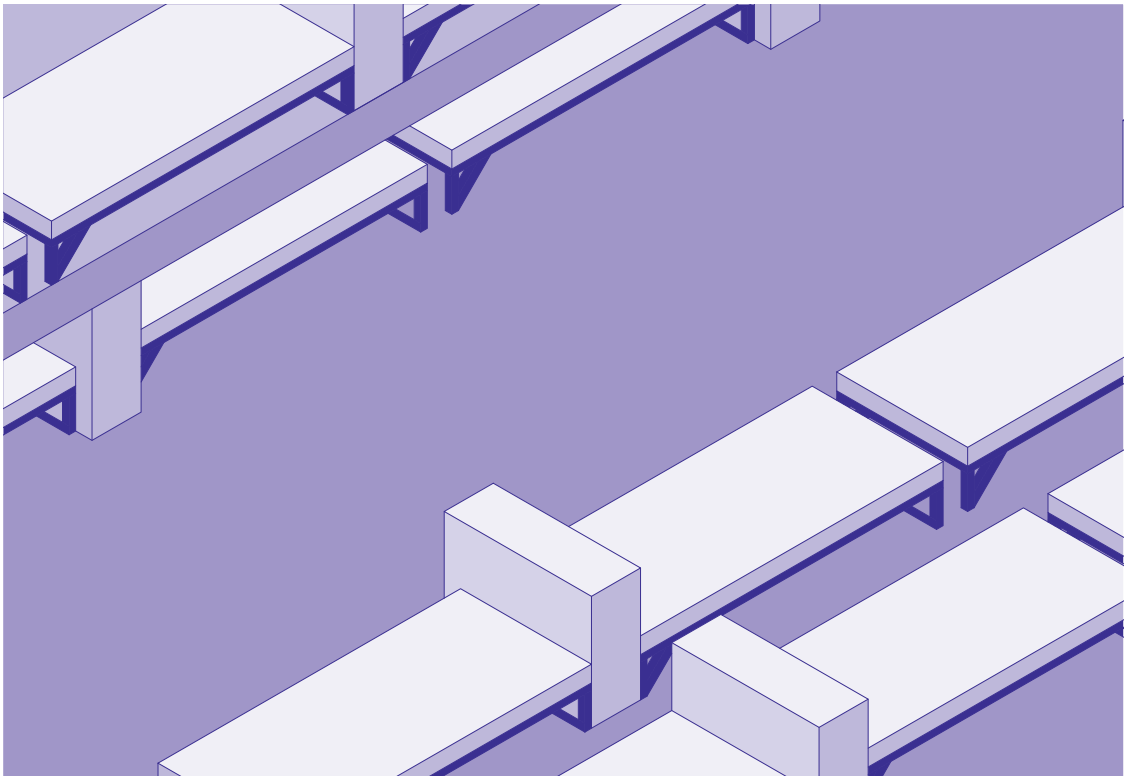


Colonia XXVIII Ottobre
Cattolica, Italy

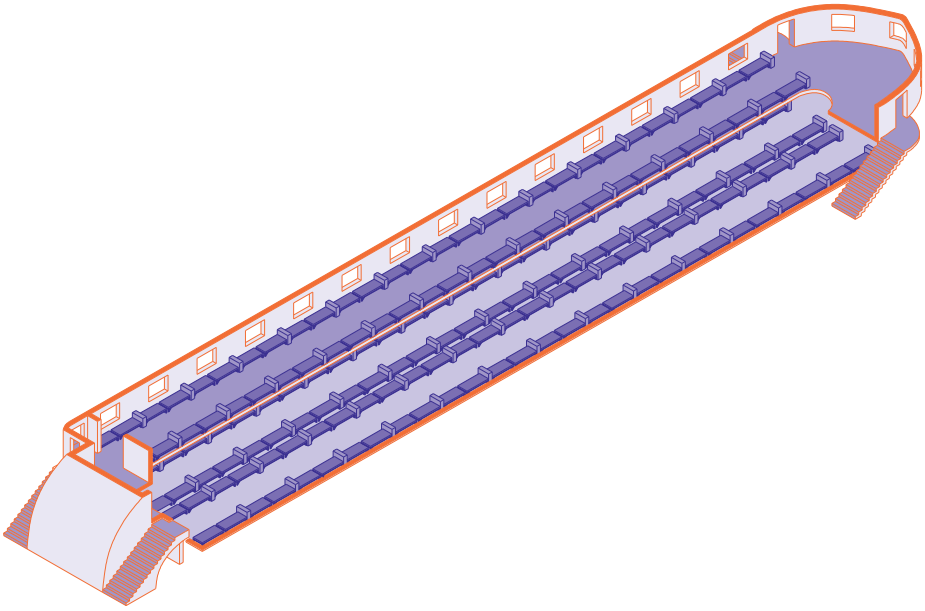
Summer Camp Dormitory
Clemente Busiri-Vici

Built 1933 – 1934
864 m²
224 beds

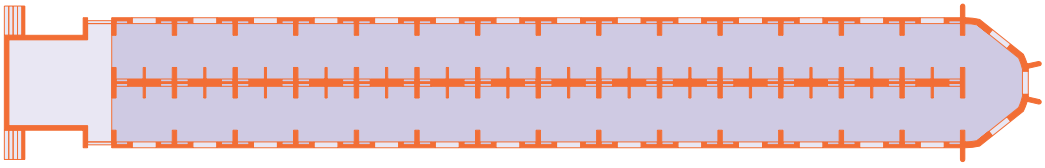
A prime example of 1930s fascist architecture, the seaside summer camp is gigantic in scale. Its building forms are strongly inspired by machines and industrialisation and their composition creates the impression of a fleet of ships. The long dormitory buildings derive their form from the arrangement of the beds. 8 rows of 28 beds are lined up from head to toe, determining the length of the buildings, while the width is a product of the width of the beds and the distance between each row. It is as if the building is a cocoon wrapped around the beds. The heads of the beds were quite high and the structure is curved making it harder to hide behind. The intention was to create accommodation for as many people as possible while still being able to watch over them.



0 ——— 12m



0 ——— 12m

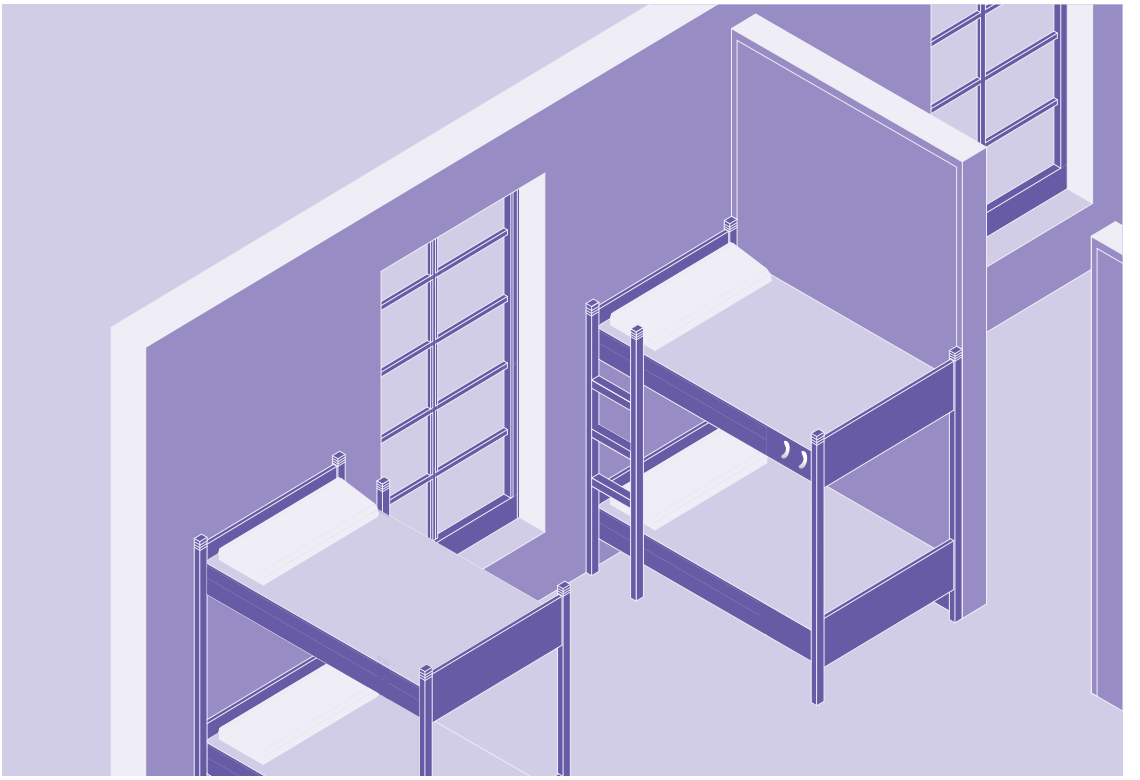


Holmbury St Mary
Dorking Surrey, United Kingdom

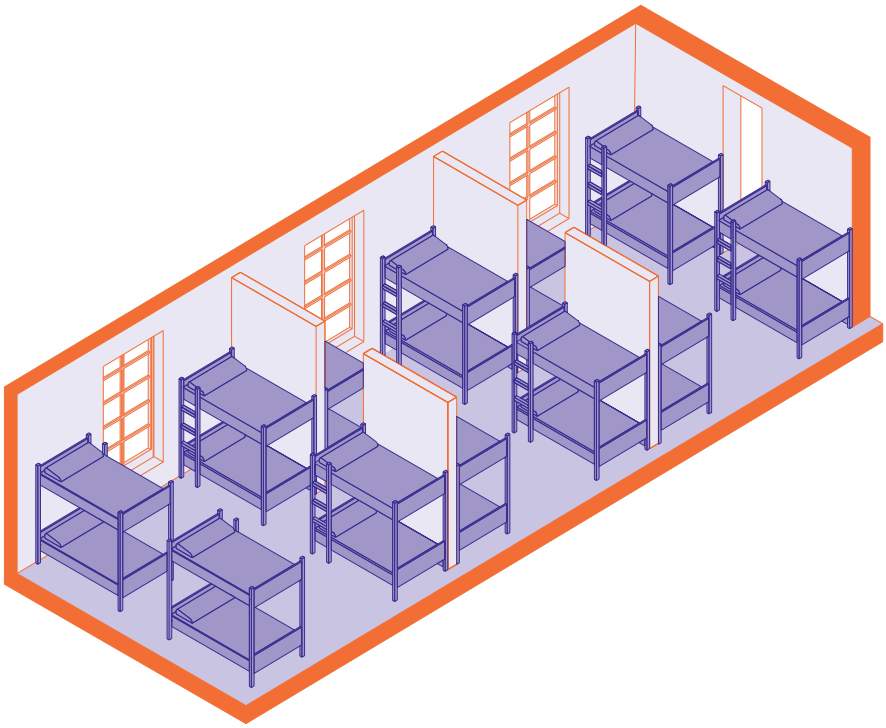
Hostel Dormitory
Howard Viscard Lobb

Built 1935
50 m²
24 beds

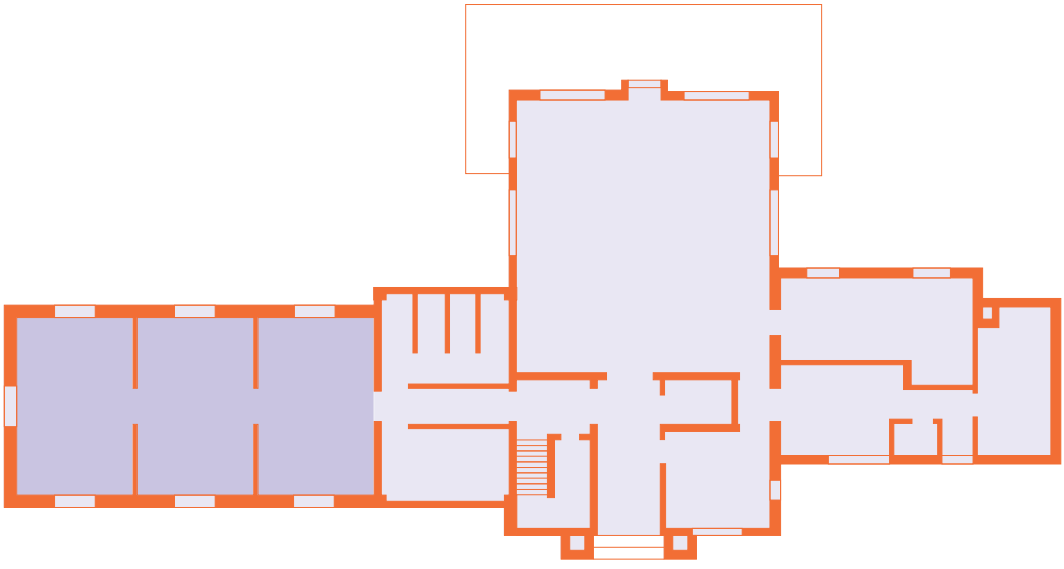
Situated on the Pilgrims' Way between Winchester and Canterbury and completed in 1935, this building was the first youth hostel to be built in the UK. The dormitory has a simple rectangular layout with 24 beds for men on the ground floor and 24 beds for women on the first floor. The dormitory spaces are open spaces subdivided by half-height partitions into six sections to provide a degree of privacy. Each section has four sets of bunk beds, a large window and a locker for belongings. A large common room with a fireplace as well as communal facilities for laundry and cooking were also available. After 40 years in use, the building was modernized and extended in 1975 to improve comfort and capacity.



0 3m



0 5m

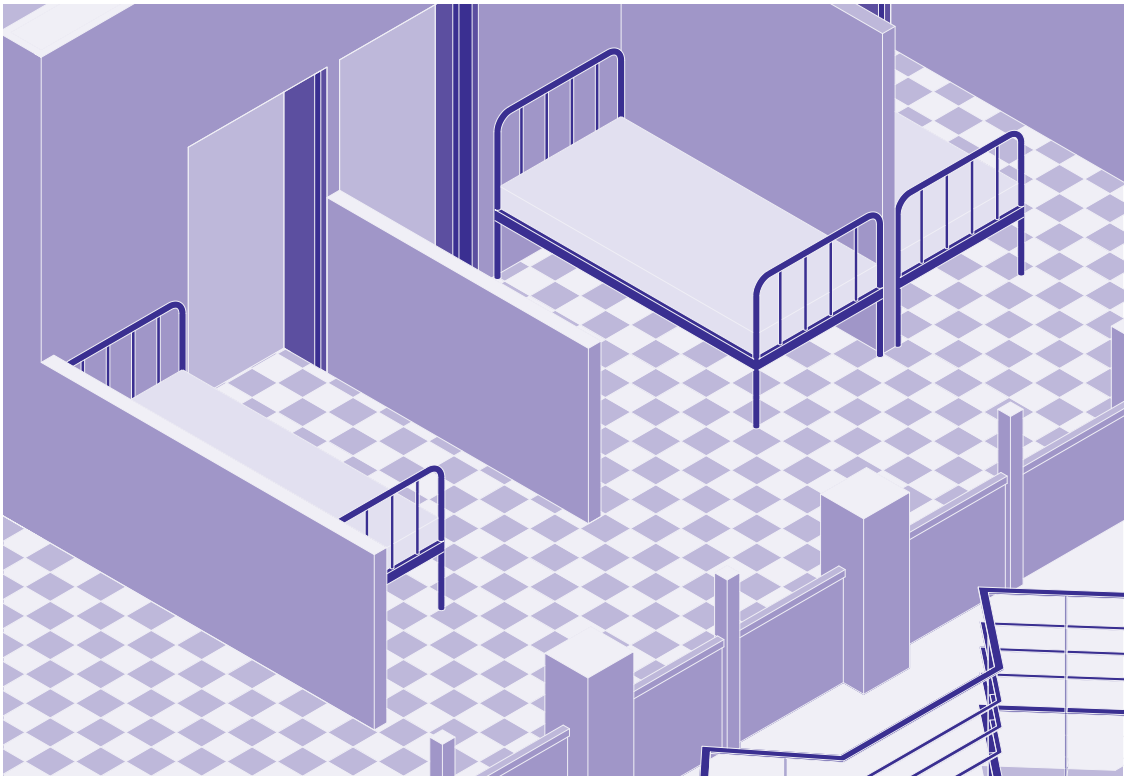


Hôpital-Sanatorium Sabourin
Clermont-Ferrand, France

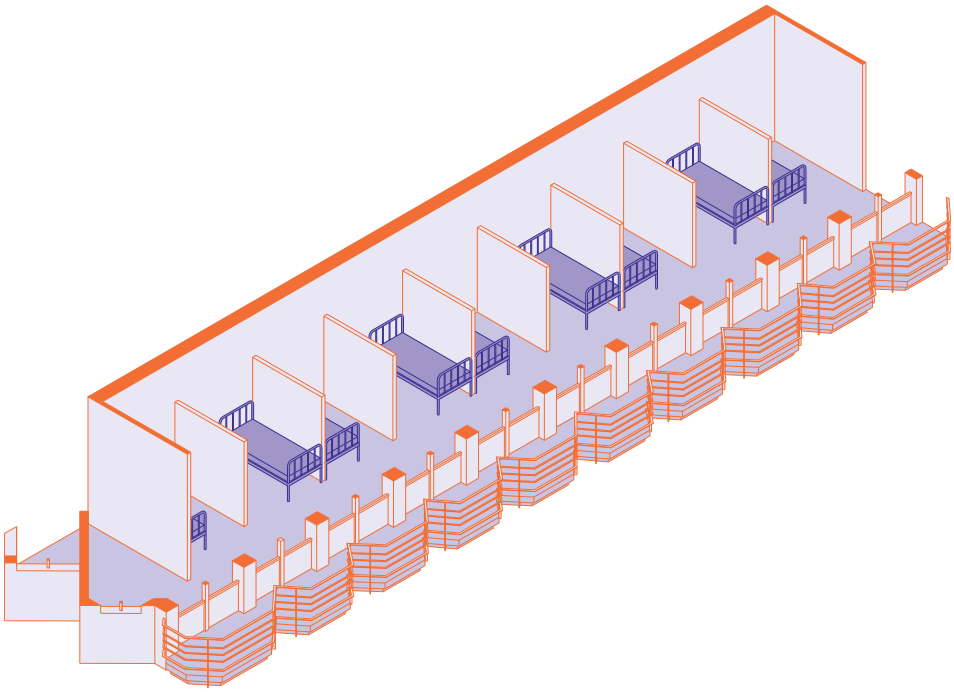
Hospital Dormitory
Alberic Aubert

Built 1936
90 m²
9 beds

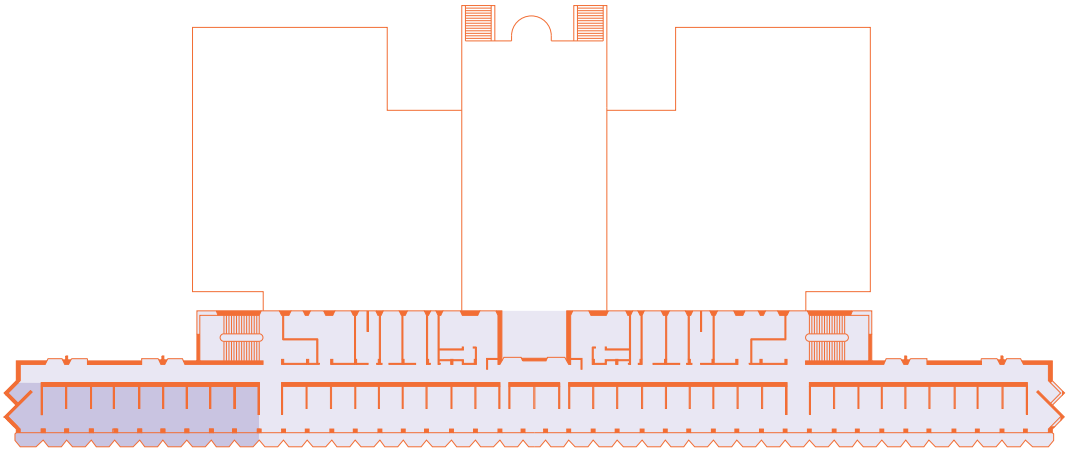
Designed on a T-shaped plan, the building provides a common entrance with separate wings for men and women. The dormitories were situated on the 2nd to 4th floors with single rooms on the 1st floor oriented at 45 degrees to the south-facing façade. The long dormitories are subdivided into individual cubicles with a deep cavity wall to the corridor at the rear housing technical installations. Each cubicle has a window bay maximising the available light. Sliding doors opening onto the corridor made it possible to remove deceased patients without having to pass in front of other patients and demoralising them. The design attempts to provide each patient with a degree of privacy in their respective cubicles, as well as ample light, which also permeated the entire dormitory, and balconies, all of which were intended to help them recover from tuberculosis.



0 5m



0 15m



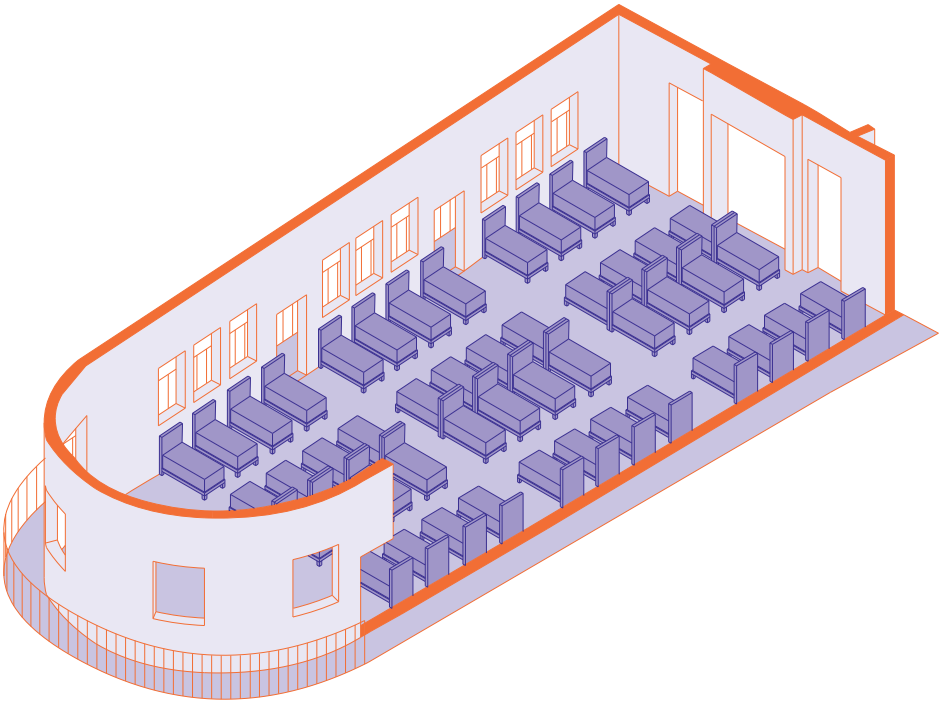
Colonia Stella Maris
Montesilvano, Italy

Summer Camp Dormitory
Francesco Leoni

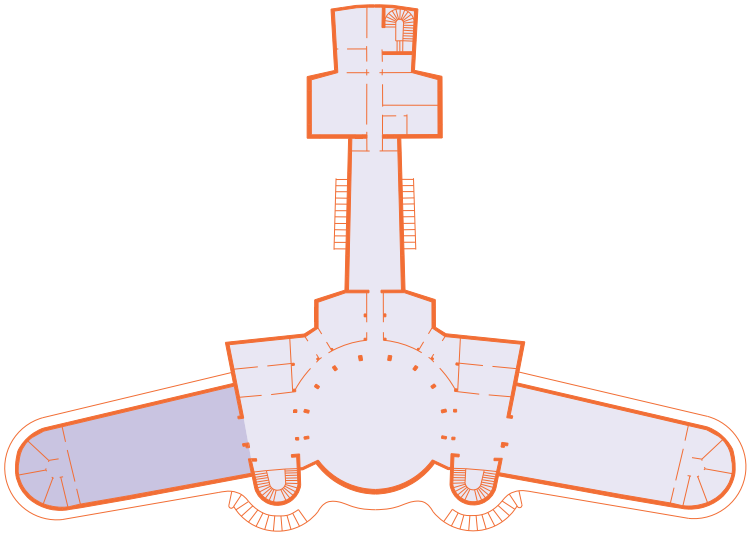
Built 1938 – 1939
318 m²
96 beds

Designed for the Italian fascist party by Francesco Leoni, Colonia Stella Maris was a summer camp for children that would provide them with a military-style instruction. Its architectural composition draws inspiration from machines, specifically from planes, with the wings housing the dormitories, the rump the refectory, the cockpit the cloakrooms and the commandant's apartment at the top. The dormitories were large open spaces tightly packed with beds and afforded no individual privacy. The complex was subsequently used as a military headquarters, a holiday resort and a retirement home. In 1984 the colony was abandoned and slowly fell into disrepair until the early 2000s when work began on restoring it to its original form. The intention is that it will serve a cultural function for the municipality of Montesilvano.

0 —— 7m



0 —— 22m

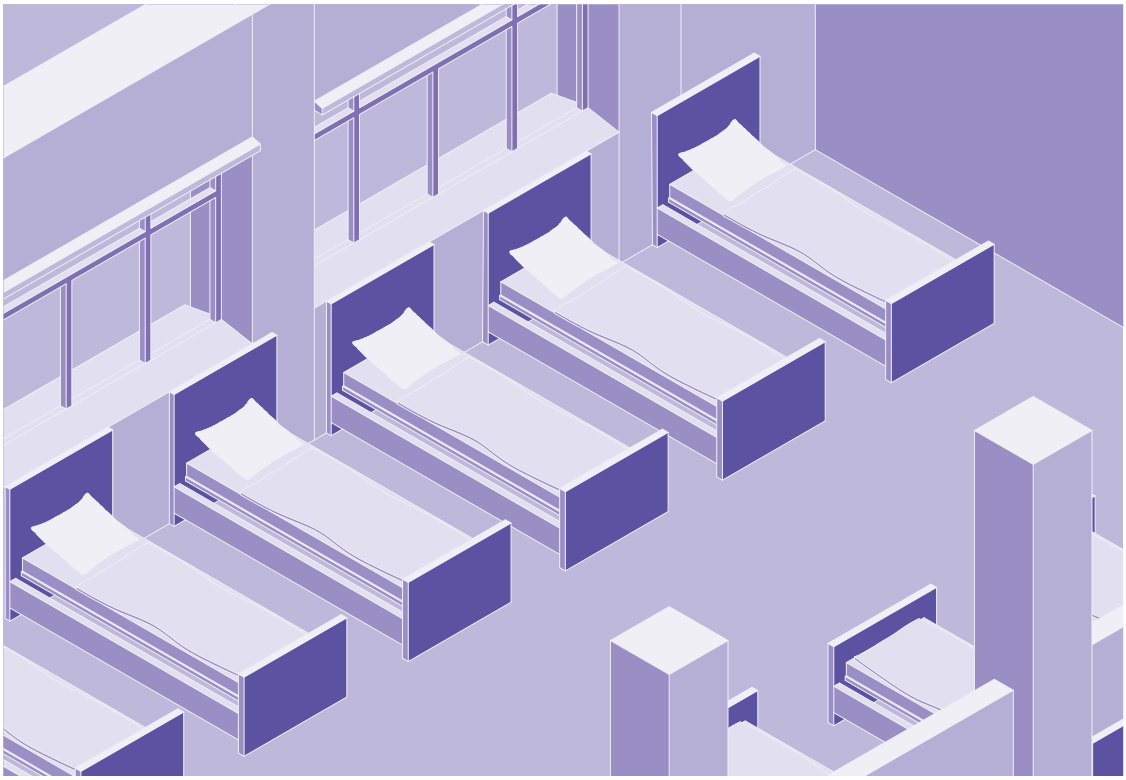


Colonia Gustavo Fara
Chiavari, Italy

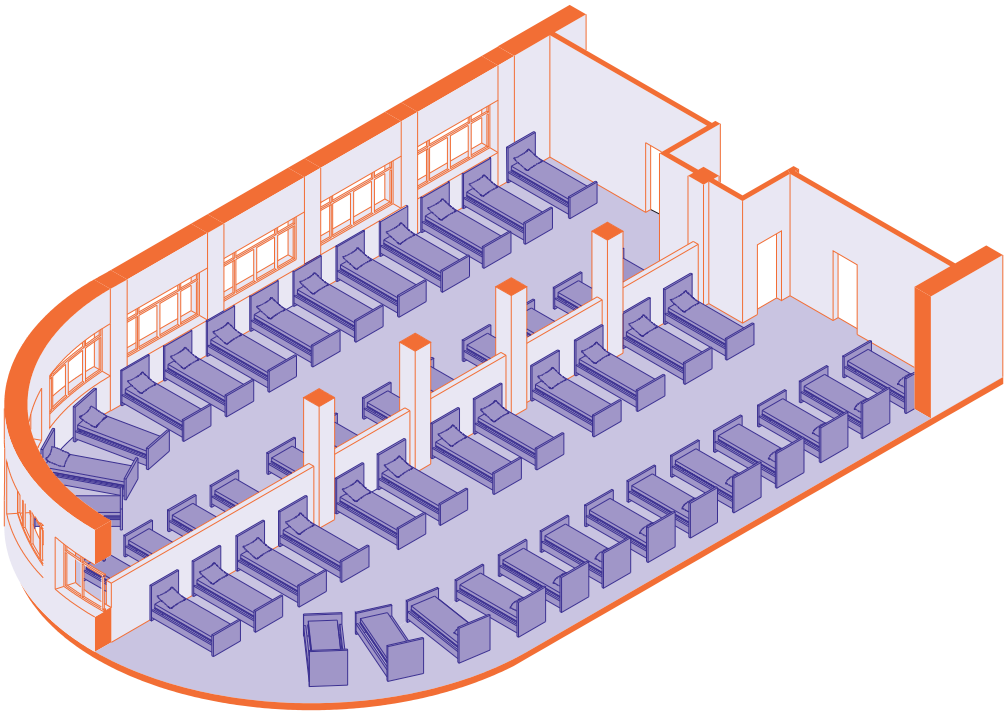
Summer Camp Dormitory
Camillo Nardi Greco

Built 1938
256 m²
50 beds

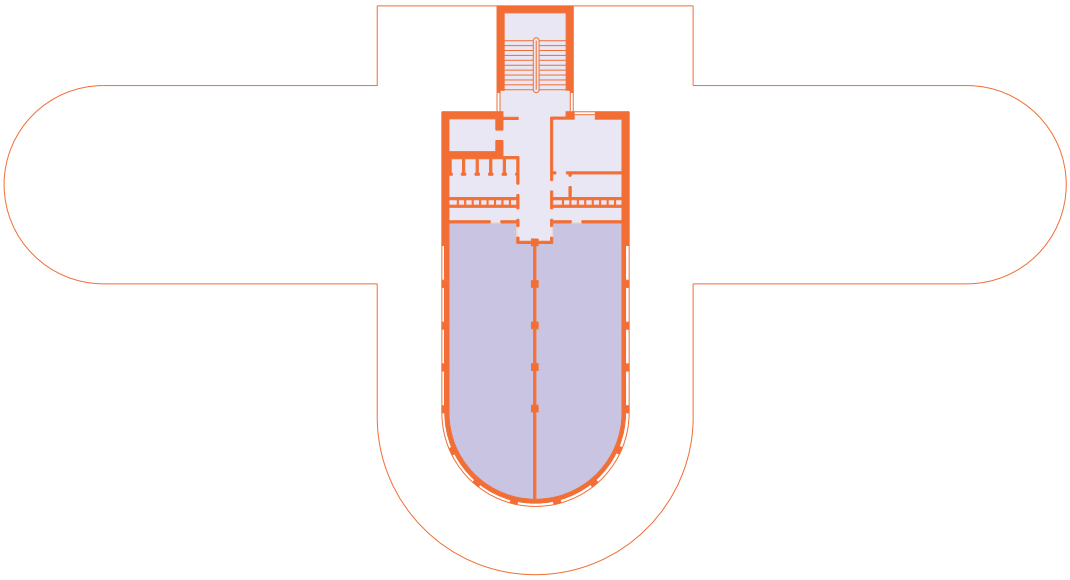
Commissioned by the Italian National Fascist Party under the command of Benito Mussolini and dedicated to the memory of General Gustavo Fara, who had fought for Italy in several wars, the complex was built as a summer holiday camp for up to 400 children and young people. The 11-storey tower contained the dormitories which are divided down the middle by a half-height partition into two 128 m² spaces each with two long rows of beds arranged at right angles to the walls, a very typical arrangement for summer camps. 4 pillars down the centre of the space support the floors. 15 windows around the perimeter provide ample light and ventilation. After only two years of use, the building was converted into a military hospital, and a few years later, in 1947, into a hostel for refugees. It is currently being converted into a hotel.



0 5m



0 12m

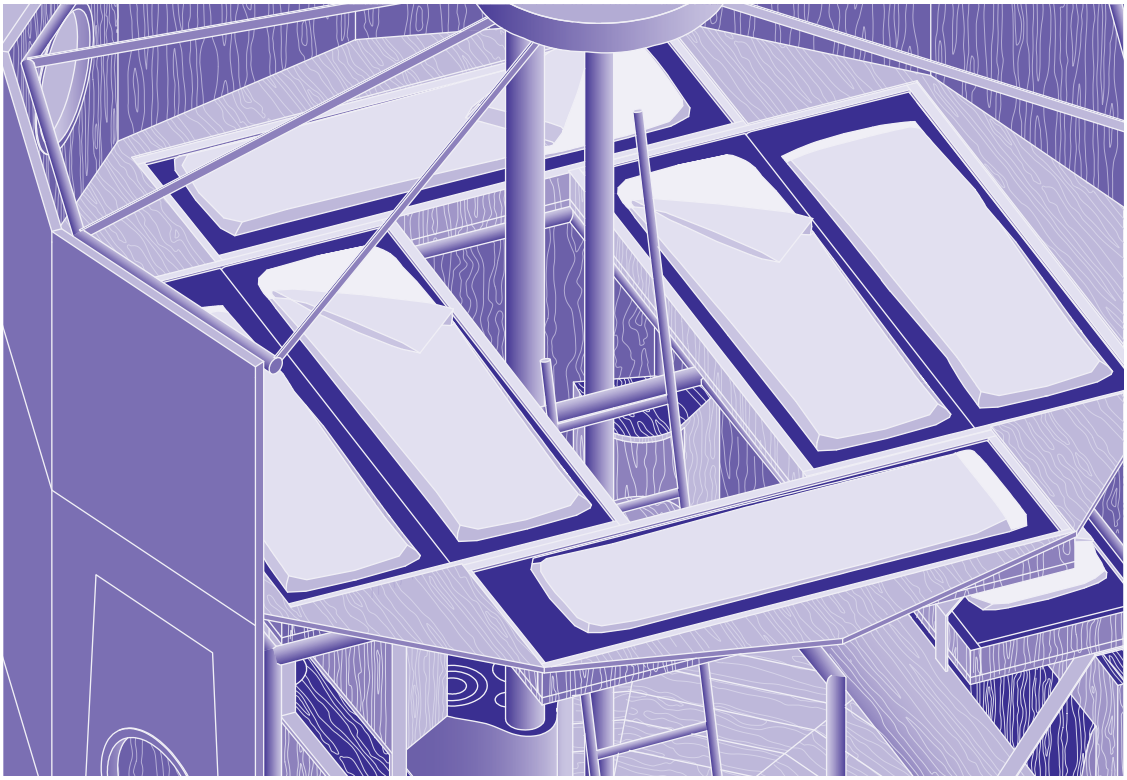


Refuge Tonneau
Various locations, France

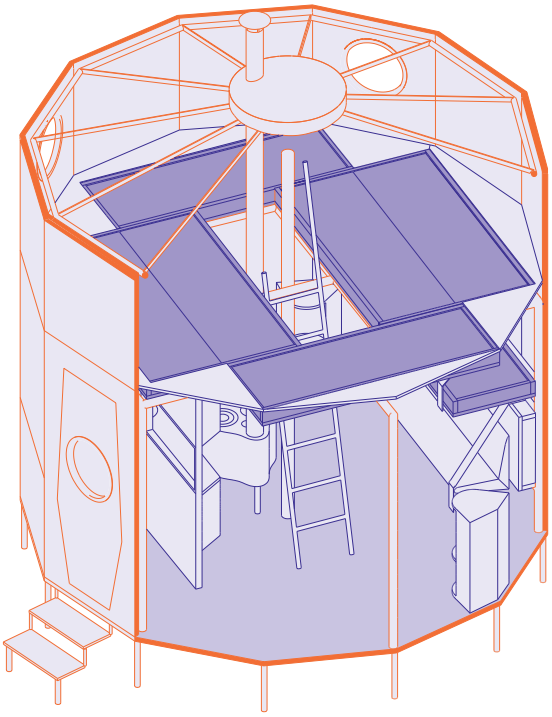
Cabin Dormitory
Charlotte Perriand

Built 1938
12 m²
8 beds

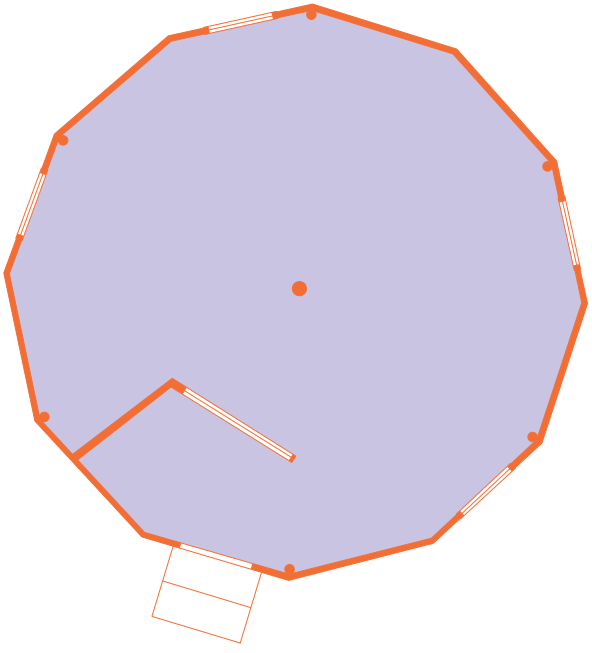
Intended as a transportable shelter, the Refuge Tonneau has no fixed location or orientation. Its dodecahedral ground plan aims to limit wind loads on the structure. The hut needed to be as light as possible so that it could be transported by one person, and also quick to erect within four days. The enclosure is therefore made of lightweight aluminium and the structure is placed on stilts to adapt to any terrain, no matter how uneven. At only 3.8 m in diameter and 4.9 m high, the hut is divided into day and night areas for better privacy. There are 6 beds on the upper level, and 2 beds on the lower level along with an entrance area that serves as a luggage store, kitchen and cooking area.



0 —— 1,5m



0 —— 1,5m

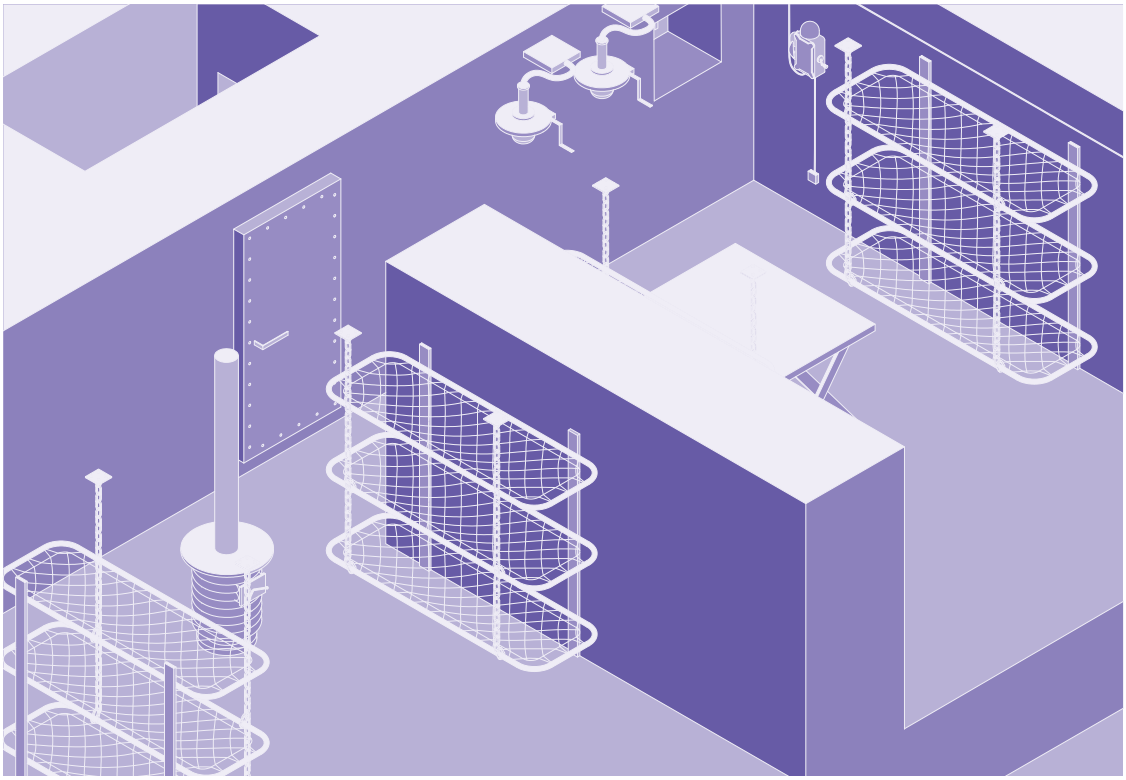


Bunker 10a
Beckingen, Germany

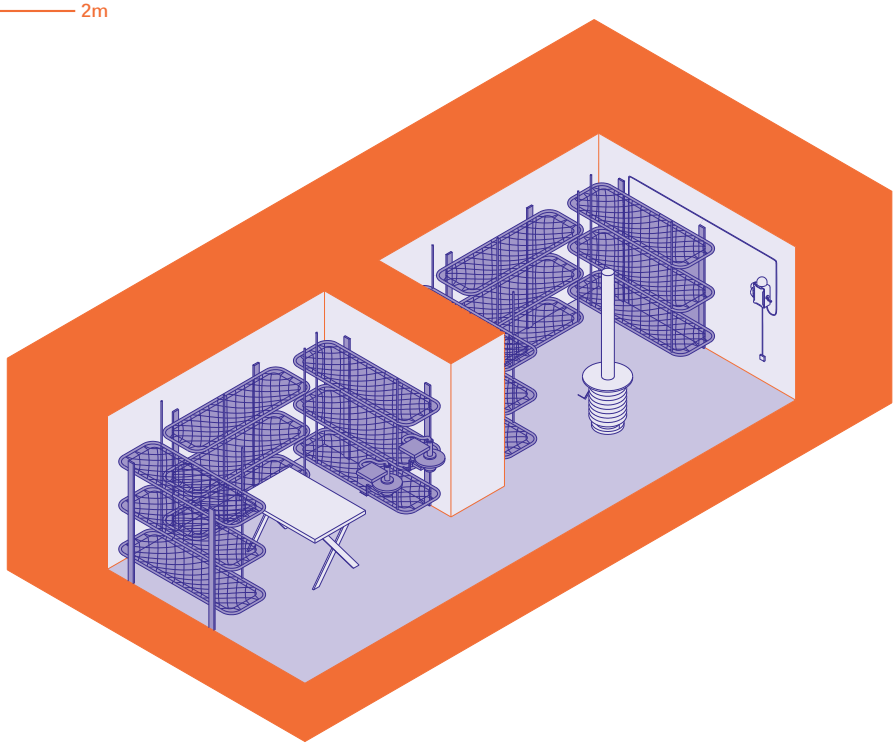
Bunker Dormitory
Organisation Todt

Built 1938
25 m²
18 beds

Bunker 10a is one of the remaining German Second World War shelters built as part of a line of 1800 defensive structures (bunkers, tunnels, anti-tank obstacles) that secured the border along a length of almost 630 km. The construction resembles a reinforced concrete box, partially camouflaged by the surrounding forest so that the entrance is virtually concealed by the terrain. To reach the sleeping area, inhabitants first had to pass through an airlock designed to protect against gas attack. Inside, six triple bunk beds lined the walls with a wall down the centre separating the space into two parts. Apart from beds and a table, there are technical facilities, such as a telephone, ventilators and the stove. The most distinctive feature of the interior is its isolation from the outside world. The exterior walls are 1.5 m thick, and the only source of natural light is provided by two very small openings.



0 —— 2m



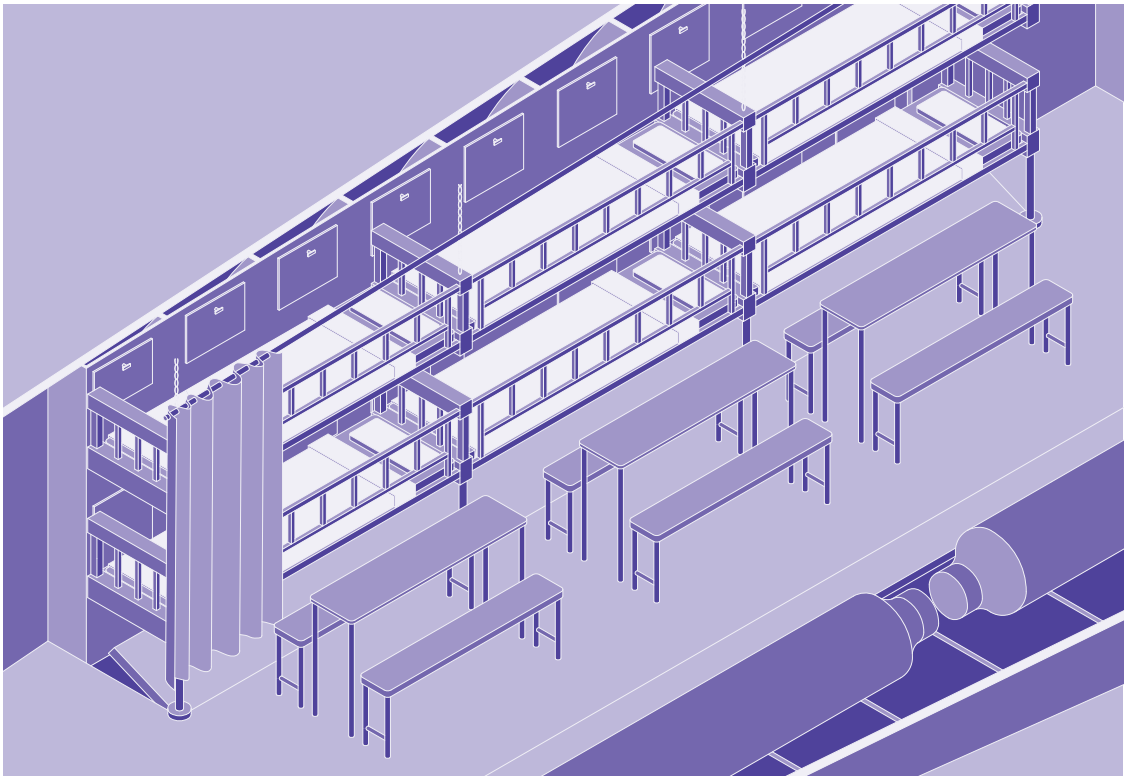
0 —— 2,5m

Submarine VII C
No Fixed Location

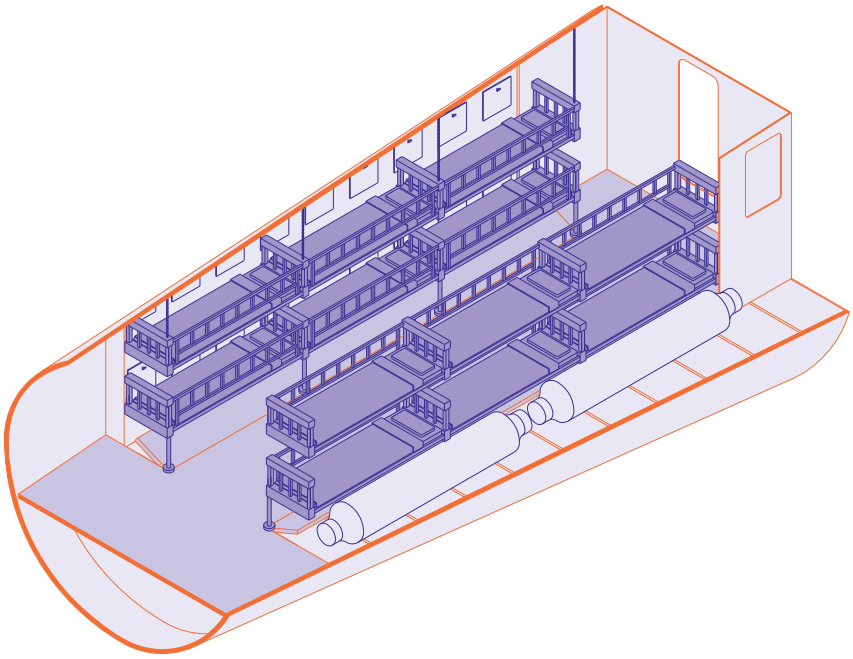
Submarine Dormitory
Unknown

Built 1940
25 m²
12 beds

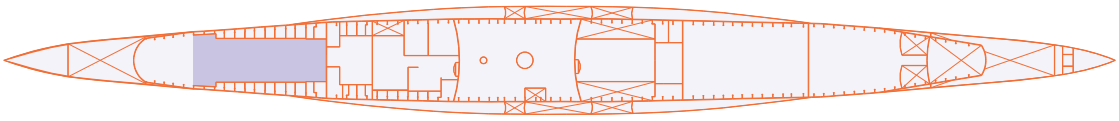
The Type VII C submarine was one of a series built by the German Navy during the Second World War and could accommodate a crew of 41–45 navy soldiers. Some 700 units were produced, more than any other submarine in history. Its purely functional design can be seen clearly in the layout of the dormitory: located in the forward torpedo area, it comprises three sets of bunk beds on each side, sleeping 12 people in a total area of 24 m². The space is not defined by the bunks but rather by the curvature of the submarine shell into which the bunks are fitted. The cavities between the rectangular bunks and wall are filled with lockers for personal belongings. All other furniture is movable and stowable and can be adapted as needed in use.



0 —— 2m



0 —— 10m

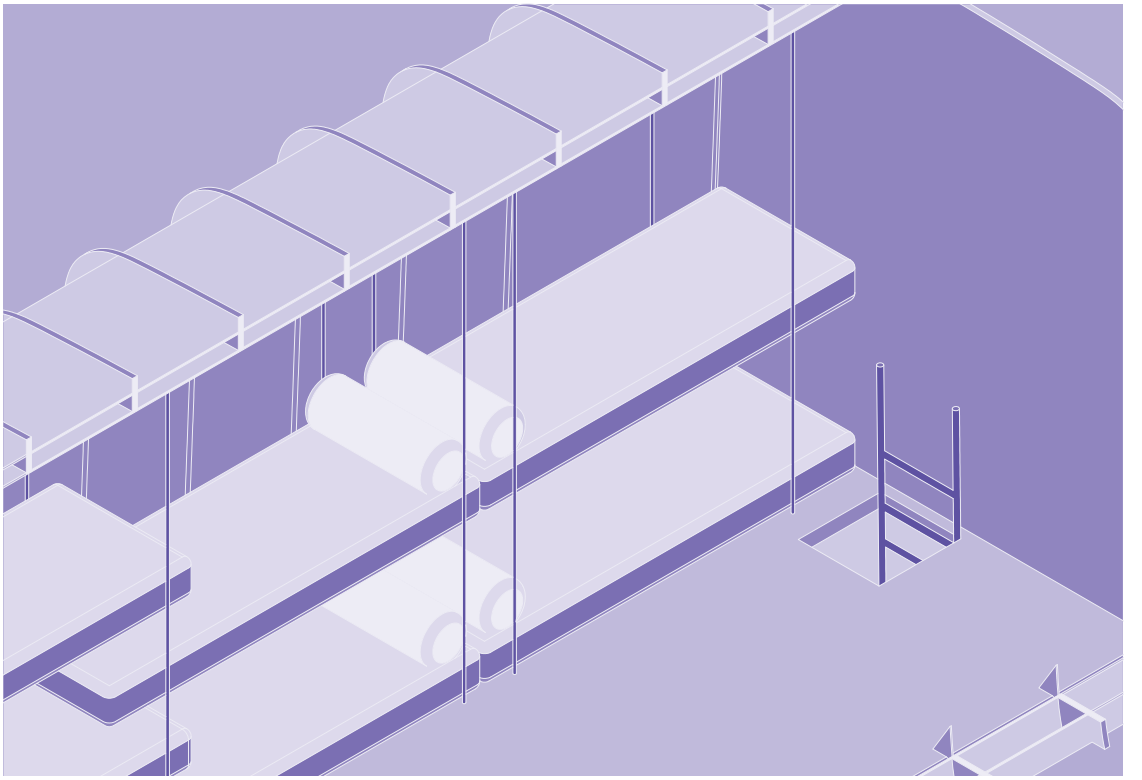


Refuge Bivouac
Various Locations, France

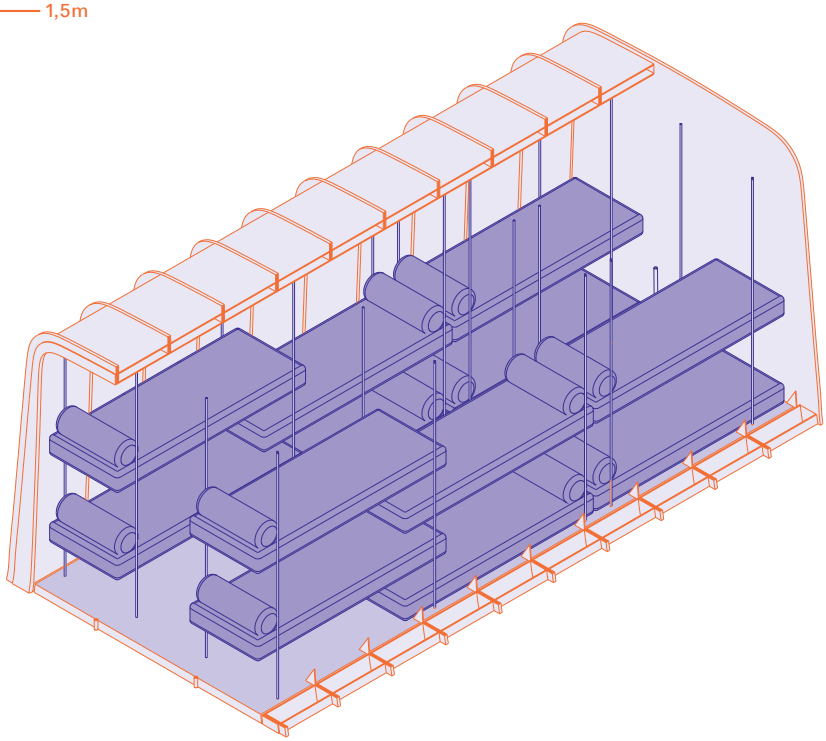
Cabin Dormitory
Jean Prouvé

Unbuilt 1950
30 m²
12 beds

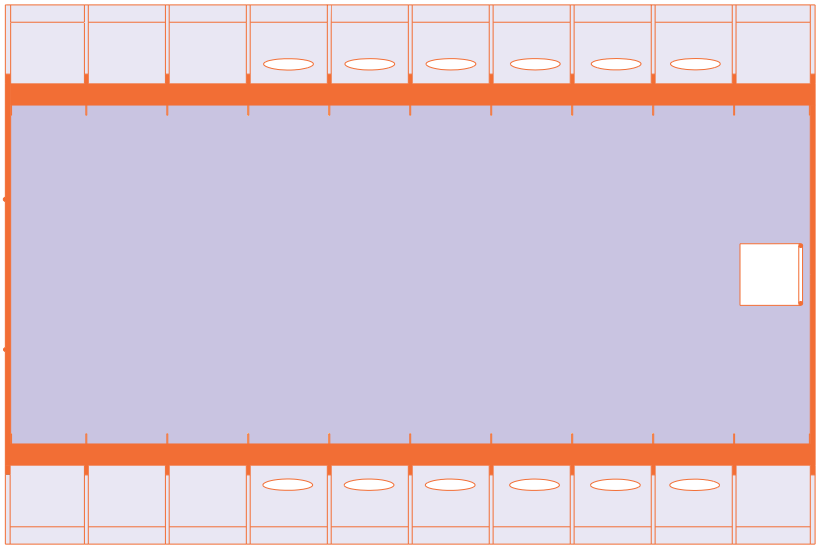
This project for a mountain refuge is typical of the philosophy of Jean Prouvé, who is best known for his simple and quick-to-erect buildings, which are mostly prefabricated. His architecture can be described as lightweight constructions, and the Refuge Bivouac is no exception. It is a small two-storey mountain hut made of metal, most likely steel, with cavities in the structure that would probably have been filled with insulation. The ground floor is for storage, dining and recreation, while the second floor, accessible via a ladder, is a dormitory with 12 bunk beds reached from a central corridor. The room is densely packed to make optimal use of the available space as mountain huts have to offer maximum accommodation in a small building and are constructed in challenging alpine conditions. The project was never built.



0 —— 1,5m



0 —— 1,5m

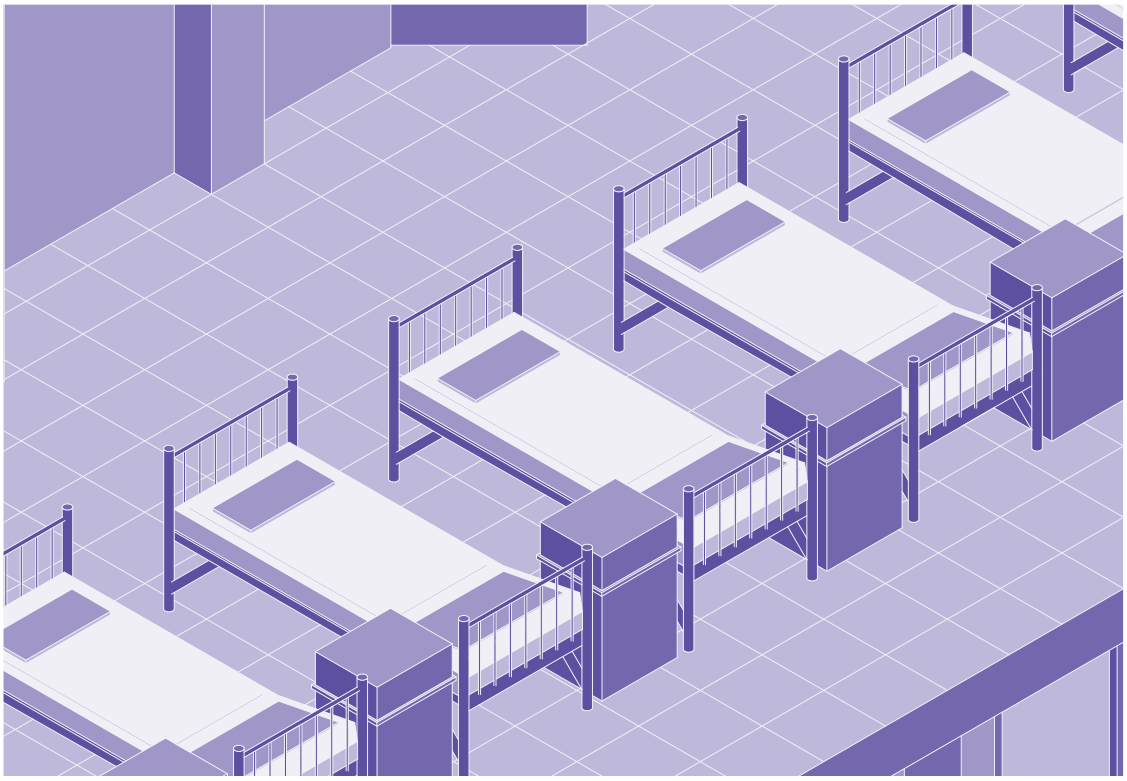


Military Base
Prora, Germany

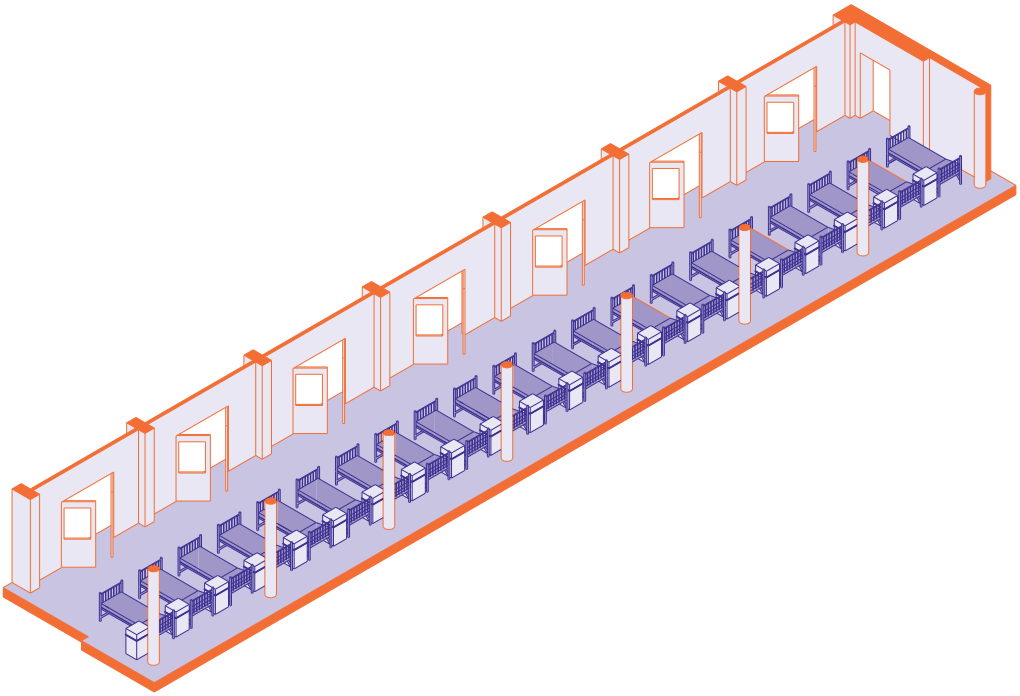
Military Dormitory
Design Office for Structural Engineering Rostock

Converted 1957
135 m²
21 beds

Originally built in 1937 to plans by Clemens Klotz as a seaside resort for the Nazi's Labour Front, the 4.5 km long complex was designed to accommodate 20,000 holidaymakers with the option, according to Hitler's wishes, of being repurposed as a military hospital in wartime. The extreme length of the tall structure is mainly a product of the stipulation that all rooms should have a view of the Baltic Sea. Accordingly, the corridors and sanitary facilities are all on the land-ward side. It included 30-m-long "lounges", loggia-like terraces that were open to the sea to allow holidaymakers to partake of the view and sea air. Windows were added to these by the GDR military command in 1957 so that they could be used as dormitories for soldiers. These were designed to accommodate as many beds as possible in a strict and impersonal military order.



0 5m



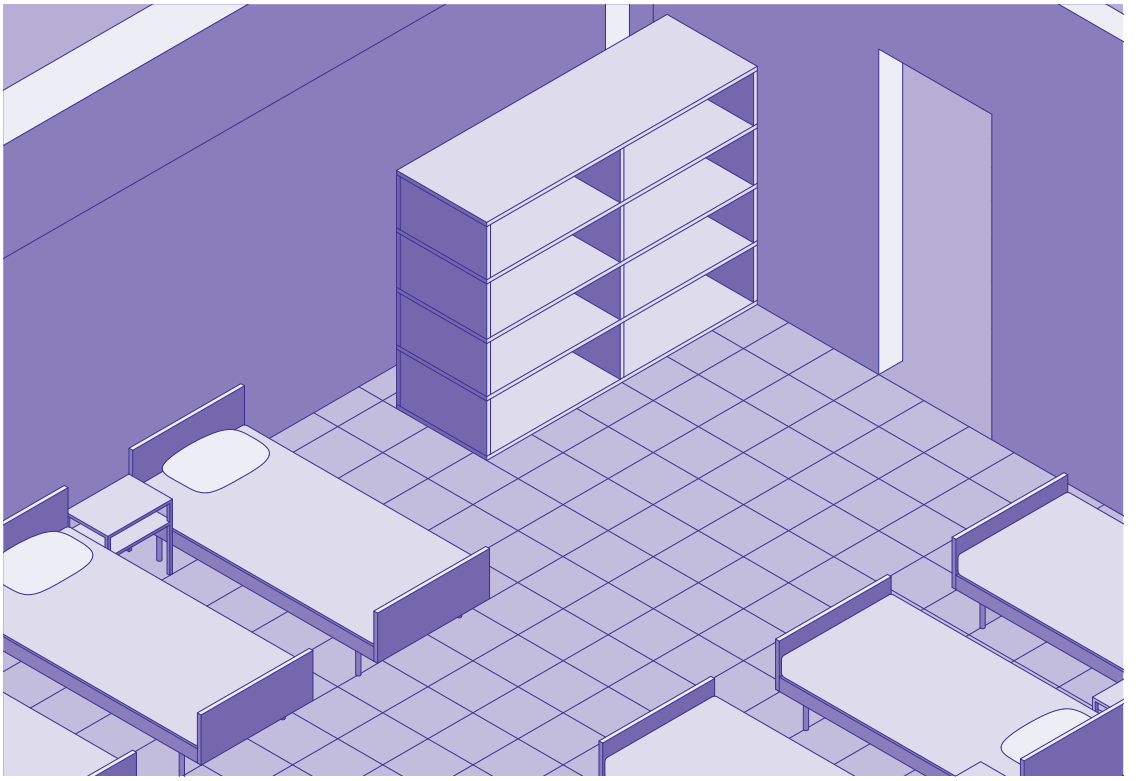
0 70m

Artek Pioneer Camp
Hursuf, Crimea

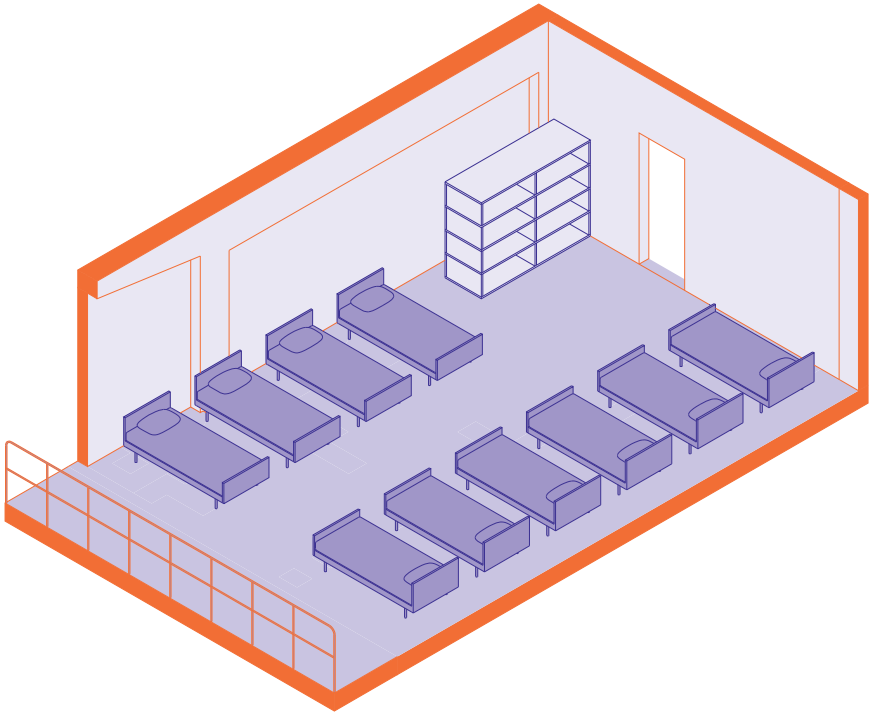
Summer Camp Dormitory
Anatolij Polianskij

Built 1957
50 m²
10 beds

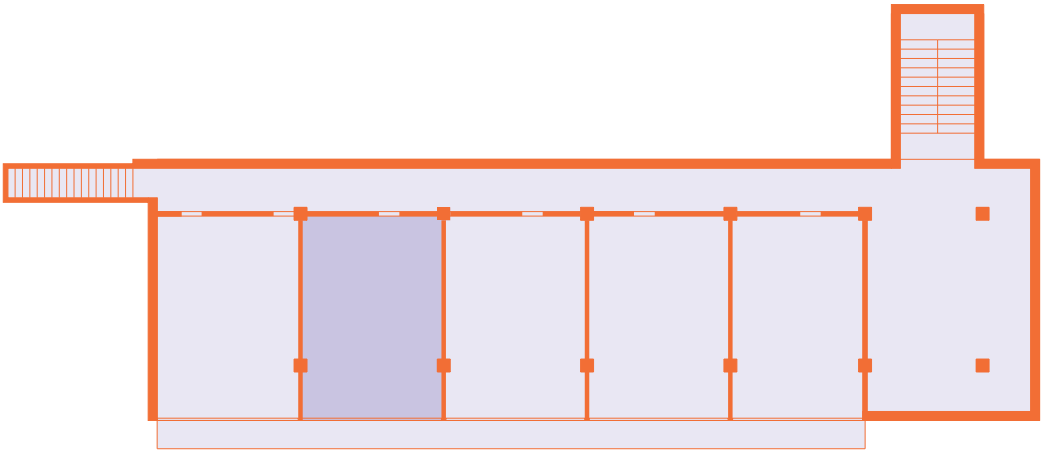
Artek was founded in 1925 as a recreation camp for children from all nations of the Soviet Union and was initially used as a convalescence camp for children who had contracted tuberculosis. During the Soviet period, it was considered a privilege for children from Russia and other communist countries to attend the camp. In the 1950s, under the direction of the architect Anatolij Polianskij, the Artek camp took on an avant-garde appearance. Several dormitory buildings were constructed of concrete and glass as an expression of the modern Soviet state that Khrushchev was eager to show the world. The sub-tropical resort could accommodate 4,000 children year-round who as Young Pioneers would also be trained in becoming model communist citizens. This is reflected in the architecture of the site, the organisation of the dormitories and the transparency of the buildings, all of which emphasise a sense of community.



0 3m



0 6m

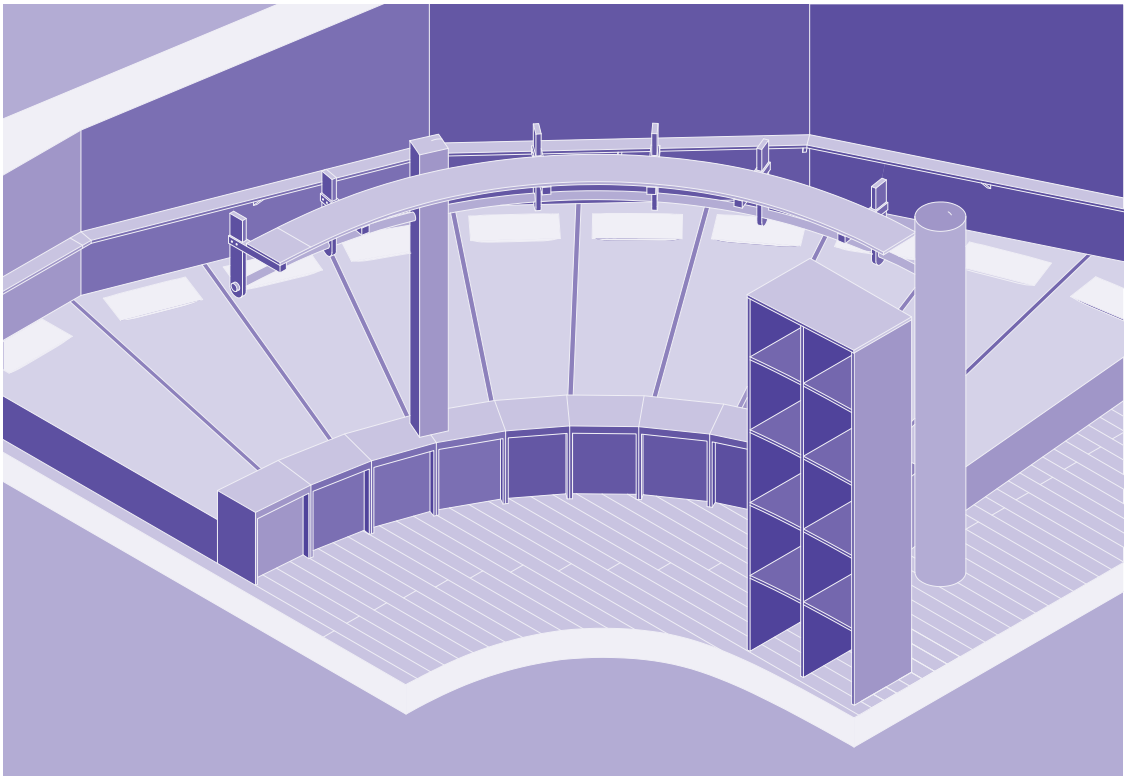


Coaz Hütte
Val Roseg, Samedan, Switzerland

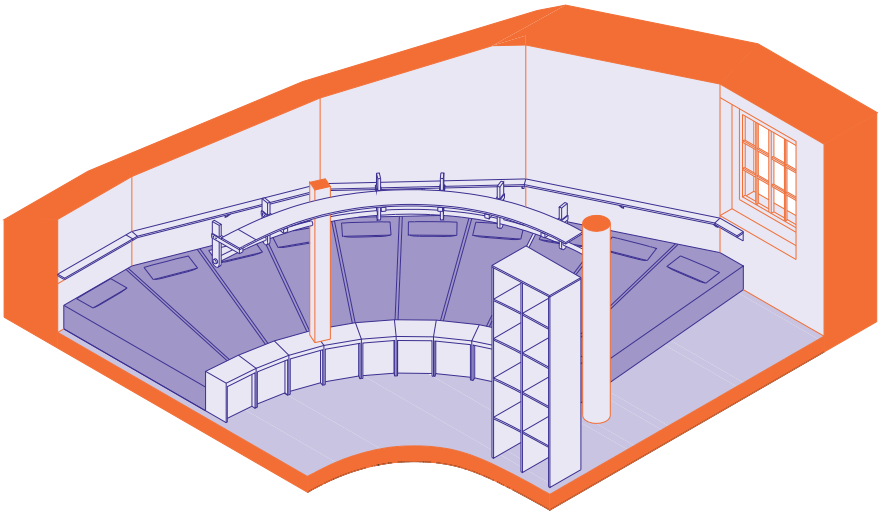
Cabin Dormitory
Jakob Eschenmoser

Built 1964
21 m²
10 beds

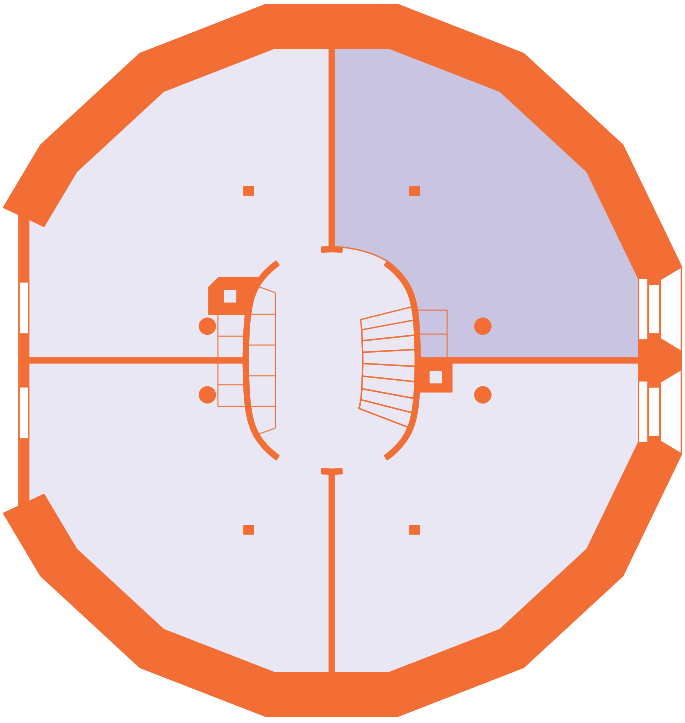
The project is one of 15 huts developed by the architect Eschenmoser for the Swiss Alpine Club. The name Coaz Hütte derives from Johann Coaz, the first person to climb Piz Bernina. Constructed using traditional quarry stone masonry, the compact squat building is perched on the mountainous landscape like a rocky outcrop. Its crystalline shape is a product of its polygonal ground plan. This also explains the unusual geometry of the roof, which covers the introverted building like a turtle shell. The floor plan spirals out from the centre of the plan, with the express intention of making optimal use of space. The rooms are arranged around the outside walls, reducing circulation to a minimum. The trapezoidal shape of the sleeping areas on the top floor exploits the form of the human anatomy where the body requires more space than the feet.



0 —— 2m



0 —— 3m

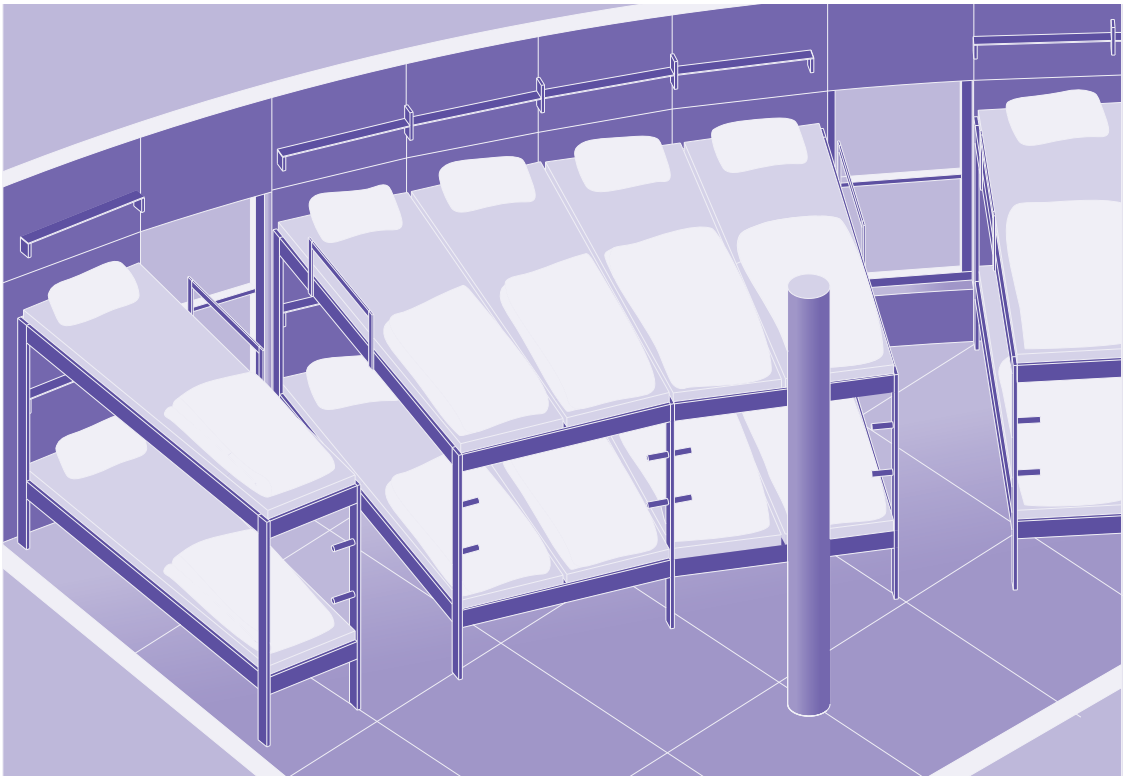


Cabane du Vélan
Bourg-Saint-Pierre, Switzerland

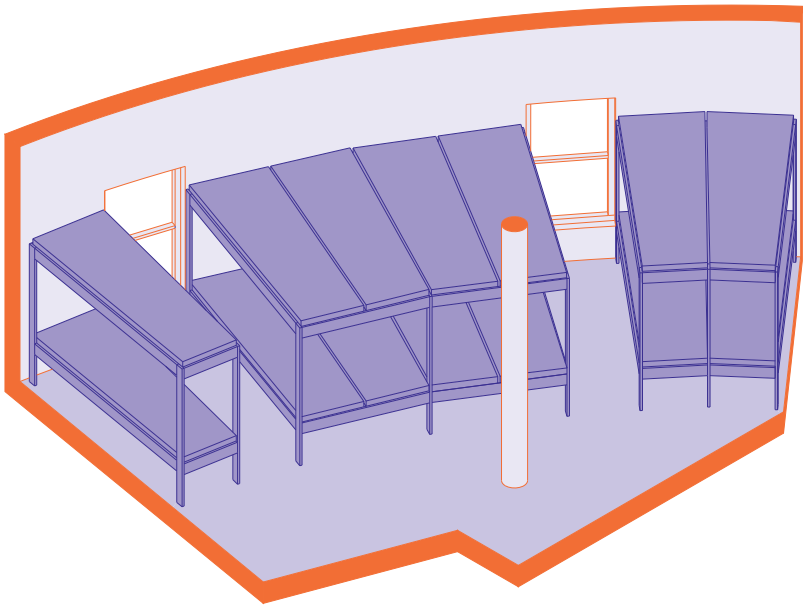
Cabin Dormitory
Michel Troillet

Built 1992
20 m²
14 beds

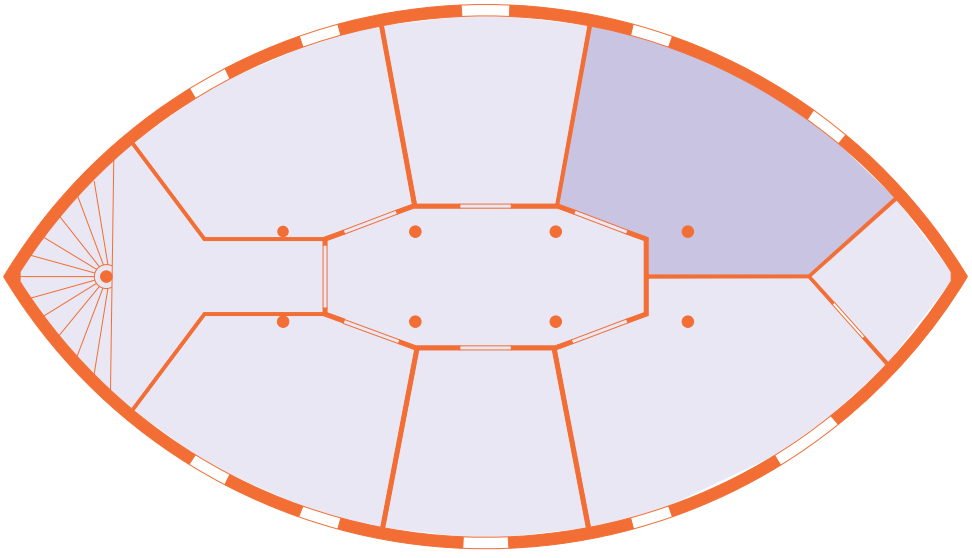
The building replaces an earlier hut built in 1944 which was destroyed by fire in 1991. The location has a beautiful view over Mont Vélan, which marks the border between Switzerland and Italy. Owned by the Swiss Alpine Club, the hut can accommodate up to 60 people. It is a timber structure clad with metal panels and comprises three levels: a basement with storage space and bathrooms; a middle floor with a lounge and kitchen and a top floor containing the dormitories. The “cocoon-like” shape of the hut is a product of the tapered form of the beds, which are a wider at the head end and narrower at the foot, corresponding to the proportions of the human body. This slight minimisation of the bed surface area makes it possible to increase the number of beds that the hut can accommodate within its slim shape.



0 ——— 1,5m



0 ——— 2,5m



Appendix

F

Image Sources

1, 24
Dictionnaire raisonné de l'architecture française du XIe au XVIe siècle – Tome 6, Hôtel-Dieu, accessed 17 January 2021 http://jaanmarss.planet.ee/juhendid/Fortifikatsioon/andmebaas/Dictio-Architecture_militaire/DictioArchitecture_Hotel-Dieu-seek.htm

2, 7, 8, 10, 12, 14, 15, 31, 33b
Dieter Jetter: Das europäische Hospital. Von der Spätantike bis 1800, Cologne: DuMont Buchverlag, 1986, p. 109, 89, 49, 94, 95, 96, 50, 63

3
British Library General Reference Collection, shelf-mark 7686.k.15

4
Ospedale Pammatone Genova, accessed 12 December 2020 https://architettura.unige.it

5, 6, 9
Ralph Quadflieg: Die oberitalienische Hospitalreform des 15. Jahrhunderts und ihre Bauten, p. 33. In: Sudhoffs Archiv, Franz Steiner Verlag, vol. 67, issue 1, 1983, p. 25 – 38

11
Simon Thurley: The Cardinal of King Henry VIII of England. Thomas Wolsey, Publications de l'Institut de recherches historiques du Septentrion, 2009, Frédérique Lemerle, Yves Pauwels et Gennaro Toscano (eds.) Les Cardinaux de la Renaissance et la modernité artistique, accessed 10 October 2021 https://books.openedition.org/irhis/213

13
Mario Adanero Mazario: Consideraciones en torno al surgimiento del hospital en el Renacimiento, accessed 4 April 2020 https://www.investigart.com/2020/03/31consideraciones-en-torno-al-surgimiento-del-hospital-en-el-renacimiento/#jp-carousel-209906

16, 25, 26, 26b
Dieter Jetter: Frankreichs Bemühen um bessere Hospitäler. p. 161. In: Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften, Franz Steiner Verlag, vol. 49, issue 2, 1965, pp. 147 – 169

17, 21
Pedro Fraile, Quim Bonastra: Sharing architectural models: Morphologies and surveillance from the seventeenth to the nineteenth centuries, p. 170. In: Asclepio, 69, 2017, pp. 167 – 192 accessed 12 October 2020 https://www.researchgate.net/publication/318010854

17b
Stadtbibliothek Ulm
Joseph Furttenbach, Hospitalls-Gebäw. Der Vierzehende Teil, Augsburg: Schultes, Johann 1655. Ulm, Stadtbibliothek, 27605, pasted on p. 13

18, 20, 36
Marten Kuilman: Hospitals. In Quadralectric Architecture. A Survey of Tetradic Testimonials in Architecture, 2013, accessed 9 August 2020 https://quadralectics.wordpress.com/3-contemplation/3-5-hospitals/

19, 22, 23, 27, 28, 29,
Michel Foucault, Blandine Barret Kriegel, Anne Thalamy, François Beguin, Bruno Fortier: Les machines à guérir. Aux origines de l'hôpital moderne, p. 83, 115, 107, 119, 81, Architecture + Archives / Pierre Mardaga, Editions Mardaga 1995

30, 33, 34, 43
Axel Hinrich Murken: Vom Armenhospital zum Großstadtklinikum. Die Geschichte des Krankenhauses vom 18. Jahrhundert bis zur Gegenwart. Cologne: DuMont Buchverlag, 1988, p. 146, 65, 193, 220

32
Hubertus Günther: Italian Hospitals in the early Renaissance. 2010, p. 392. In: Konrad Ottenheym (ed.): Public buildings in early modern Europe, Turnhout 2010, pp. 385 – 396

35, 38
Jonathan Hughes: The "Matchbox on a Muffin": The Design of Hospitals in the Early NHS, 2000, p. 25, 26. In: Medical History, 2000, 44, pp. 21 – 56

37, 37b, 40
Richard Schachner, Heinrich Schmieden, Hans Winterstein: Krankenhausbau, Berlin: Springer, 1930, p. 23, 176

39, 41, 42
Friedrich Karl Borck: Krankenhäuser zwischen den Weltkriegen. In: Architekten- und Ingenieur-Verein zu Berlin: Berlin und seine Bauten. Teil VII Band A Krankenhäuser. Ernst und Sohn, Berlin 1997, p. 72, 73, 71

44
DoCoMoMo France International register, code: 63100, Claudine Brun, June 2011, accessed 14 January 2021 https://www.docomomo.fr/sites/default/files/2018-10/sanatorium-sabourin.pdf

45 – 65
All illustrations taken from the archive Arne Winkelmann

66, 73
Archive of SAC UTO, Zurich

67 – 72, 74 – 83
Illustrations are drawn by Estelle Lépine

Bibliography

Beckel, Inge, *Hans Leuzinger 1887 – 1971 – pragmatisch modern*, Zurich, gta Verlag, 1993

Becker-Becker, Julius, *Les cabanes du Club Alpin Suisse*, Genève, Wyss and Duchêne, 1892 [translation: A. Bernoud]

Boldemann, Ruth, *Probleme und Möglichkeiten der Kollektiverziehung im Pionierlager*. Leipzig 1967

Diderot, Denis; d'Alembert, Jean Baptiste le Rond, *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, VII, 1765

Dosquet, Wilhelm, *Die offene Wundbehandlung und die Freiluftbehandlung*. Leipzig 1916

Duhamel du Monceau, Henri-Louis, *Moyens de conserver la santé aux équipages des vaisseaux, avec la manière de purifier l'air des salles des hôpitaux, et une courte description de l'hôpital Saint-Louis, à Paris*, 1759

Eschenmoser, Jakob, 'Die neue Domhütte des Schweizer Alpenclubs' in *Das Werk*, 1960

Eschenmoser, Jakob, *Von Bergsteigen und Hüttenbauen*, Zurich, Orell Füssli Verlag, 1973

ETH Zurich (ed.) *Nouvelle cabane du Mont Rose CAS. Un bâtiment en autarcie au cœur du massif alpin*, Zurich, gta Verlag, 2010

Fernau, Helga, *Zentrale Pionierlager. Richtlinien zur Planung und Projektierung*. Berlin 1985ff

Flückiger-Seiler, Roland, '150 ans d'implantation de cabanes dans les Alpes (1re partie). De l'abri de fortune à l'auberge solide' in *Les Alpes*, 7, 2009

Flückiger-Seiler, Roland, '150 ans d'implantation de cabanes dans les Alpes (2e partie). Eschenmoser et les nouvelles expérimentations' in *Les Alpes*, 8, 2009

Foucault, Michel; Kriegel, Blandine Barret; Thalamy, Anne; Beguin, François; Fortier, Bruno, *Les machines à guérir. Aux origines de l'hôpital moderne*. Editions Mardaga 1995

Furin, Stanislaw, *Orlyonok*. Moscow 1987

Grant, Nigel, *Schule und Erziehung in der SU*, Bern 1966

Grassi, Giorgio, *Escritos Escolhidos, 1965 – 2015*. 1st ed. Colecção Giorgio Grassi (opera omnia sic) 3. Porto: Fundação Instituto Arquitecto José Marques da Silva, Edições Afrontamento, 2018 (translated by the authors)

Ikonnikov, Andrej W., *Soviet Architecture of Today. 1960s – early 1970s*. Leningrad 1975

Jahn, Egbert, *Bürokratischer Sozialismus: Chancen der Demokratisierung? Einführung in die politischen Systeme kommunistischer Länder*. Frankfurt 1982

Jetter, Dieter, *Das europäische Hospital. Von der Spätantike bis 1800*. Cologne 1986

Krug, Gustav, *Die Klubhütten des Sektion UTO, S.A.C*, Zurich, Herausgegeben vor des Sektion UTO S.A.C., 1922

Lepine, Estelle, *Altitude, Architecture et environnement de haute montagne*, Thesis no. 7089, Lausanne, EPFL, 2016

Maret, Hugues-Bernard, *Mémoire sur la construction d'un hôpital dans lequel on détermine quel est le meilleur moyen à employer pour entretenir dans les infirmeries un air pur et salubre*. Académie des sciences, arts et belles-lettres. Nouveaux mémoires de l'académie de Dijon pour la partie des sciences et des arts, 1782 – 1785, 1er semestre 1782

Meuwissen, Joost, "Growth of Knowledge in Architecture." *OASE*, no. 6, 2003

Nightingale, Florence, *Notes on hospitals: Being two papers read before the national association for the promotion of social science with evidence given to the royal commissioners on the state of the army in 1857*. London: John Parker & Son, 1859

Ortelli, Luca, "Entre Ancien et Nouveau – Quelques Aspects de l'architecture de Giorgio Grassi." *Matières*, no. 15, 2019

Poljanskij, Anatolij T., *Artek*. Moscow 1966

Reichlin, Bruno, 'Quand les architectes modernes construisent en montagne' in Clivaz, Michel and Brusson, Jean-Paul (eds.), *Patrimoine rural, architectural et paysage de l'arc alpin*, Sion, Institut Universitaire Kurt Bösch, 1998 [translation of Reichlin, Bruno, 'Das Moderne bauen in den Bergen' in Mayr Fingerle, Christoph, *Neues Bauen in den Alpen: Architekturpreis 1995*, Basel, Birkhäuser, 1996]

Schachner, Richard; Schmieden, Heinrich; Winterstein, Hans, *Krankenhausbau*, Springer Berlin, 1930

Teyssot, Georges, *Die Krankheit des Domizils: Wohnen und Wohnbau 1800 – 1930*. Bauwelt Fundamente Vol. 87, Braunschweig / Wiesbaden 1989

Authors

Tiago P. Borges
is an architect and educator. He studied at the University of Coimbra and EPF Lausanne. In 2014 he joined Laboratory EAST. He is a contributing author for architecture publications and currently Tiago is conducting PhD research into typology and processes of collage in architecture.

Anja Fröhlich
is a professor at the Institute of Architecture at EPF Lausanne, where she heads Laboratory EAST together with Martin Fröhlich. Her research focuses on typologies in architecture and their adaptability. She is part of the team of AFF Architekten.

Estelle Lépine
graduated from EPF Lausanne with her research on “Altitude. Architecture et environment de haute montagne”, directed by Luca Ortelli at EPFL. She participates in academic conferences and supervises master’s projects, and is currently establishing an architecture office with her partner in the Vallée de Joux.

Vanessa Pointet
is an architect and founding partner of the architectural practice Sub with Thibaut Pierron. She joined Laboratory EAST at EPF Lausanne in 2018 as a teaching and research assistant.

Arne Winkelmann
is an architectural historian and publicist in Frankfurt/Main. He is a research associate at the IU International University of Applied Sciences in Frankfurt, conducting research into the architecture of Soviet modernism and the typology of children’s holiday camps. He works in the field of architectural education.

Acknowledgements

We would like to thank all authors, guest speakers, assistants and students for their research and insights that contributed to the intellectual rigour and substance of this publication.

EPF Lausanne
ENAC EAST
Institute of Architecture
Laboratory of Elementary Architecture and Studies of Types
Prof. Dr. Anja Fröhlich and
Prof. Martin Fröhlich

Team 2021–2022

Tiago P. Borges
Lara Monti
Vanessa Pointet
Maria Sivers
Clemens Waldhart

Conferences on Dormitories

Claudio Bassetti
Beatriz Colomina
Estelle Lépine
Michael Mönninger
Christina Sonderegger
Arne Winkelmann

Participating Students

Maena Asticher
Juliette Auer
Léo Bastianelli
Lily Blanchard
Noriyuki Buccellati
Arianna Charbon
Bertha Chen
Indiana Courarie-Delage
Léa De Piccoli
Tom Dinh
Saida Frey
Joakin Gebert
Tiffanie Genilloud
Eric Gozzi
Oliva Hagen
Léonardo Hatoum
Baya Imadalou
Wenyan Li
Elisa Nadas
Noémie Perregaux-Dielf
Raphaël Raccio
Abigal Riand
Angelica Sabatini
Zelal Sari
Sandrine Schneuwly
Nathan Schulte
Kyan Tami
Carla Treinen
Anthony Viola
Till Zerkaulen
Clara Zuber

Editor
Laboratory EAST

Graphic Layout of the Projects
Lara Monti

Graphic Adaptation of the Projects
Alice Fiorini

Copy Editing and Proofreading
Julian Reisenberger

Translations
Julian Reisenberger
(texts Anja Fröhlich, Arne Winkelmann, revision text Tiago P. Borges, Vanessa Pointet)
Fionn Petch (text Estelle Lépine)

Graphic Design
Omnigroup, Lausanne

Print
DZA Druckerei zu Altenburg GmbH
500 Copies

Lithography
Christian Ertel

Typeface
Integrale, Omnitype

Paper
Profibulk 135 g/m²
Surbalin glatt kalkgrau 115 g/m²

EPFL PRESS
EPFL PRESS is an imprint owned by the Presses polytechniques et universitaires romandes, a Swiss academic publishing company whose main purpose is to publish the teaching and research works of the Ecole polytechnique fédérale de Lausanne (EPFL).

PPUR, EPFL – Rolex Learning Center, CM - Station 10, CH-1015 Lausanne, info@epflpress.org,

Tel.: +41 21 693 21 30
Fax: +41 21 693 40 27
www.epflpress.org

ISBN 978-2-88915-506-4
E-ISBN 978-2-88914-952-0

Printed in Germany

DOI: 10.5075/EAST-296209

EPFL Press