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Translation

Andrea Deplazes (pages 10–17)
Translation from German: Michael Robinson

Wood: indifferent, synthetic, abstract – man-made

Current prefabrication technology in timber building, and a prognosis

The past ten years have seen the development of new systems and half-finished products that run counter to all previous tectonic principles in the theory and practice of timber building. In fact the "classical timber-frame building of the nineties", which was a model demonstration of the breakthrough to the "free", non-modular field of prefabricated timber building, is already starting to look anachronistic.

It is probably no coincidence that the most recent developments in timber construction methods have been in Central Europe and Scandinavia, in other words in countries that have to commit to commercial promotion of timber as a resource. They also need to innovate in such a way that they can acquire market shares from the massive-building industry (using stone, brick, concrete etc.) if they are to get over the stagnation of traditional timber construction.

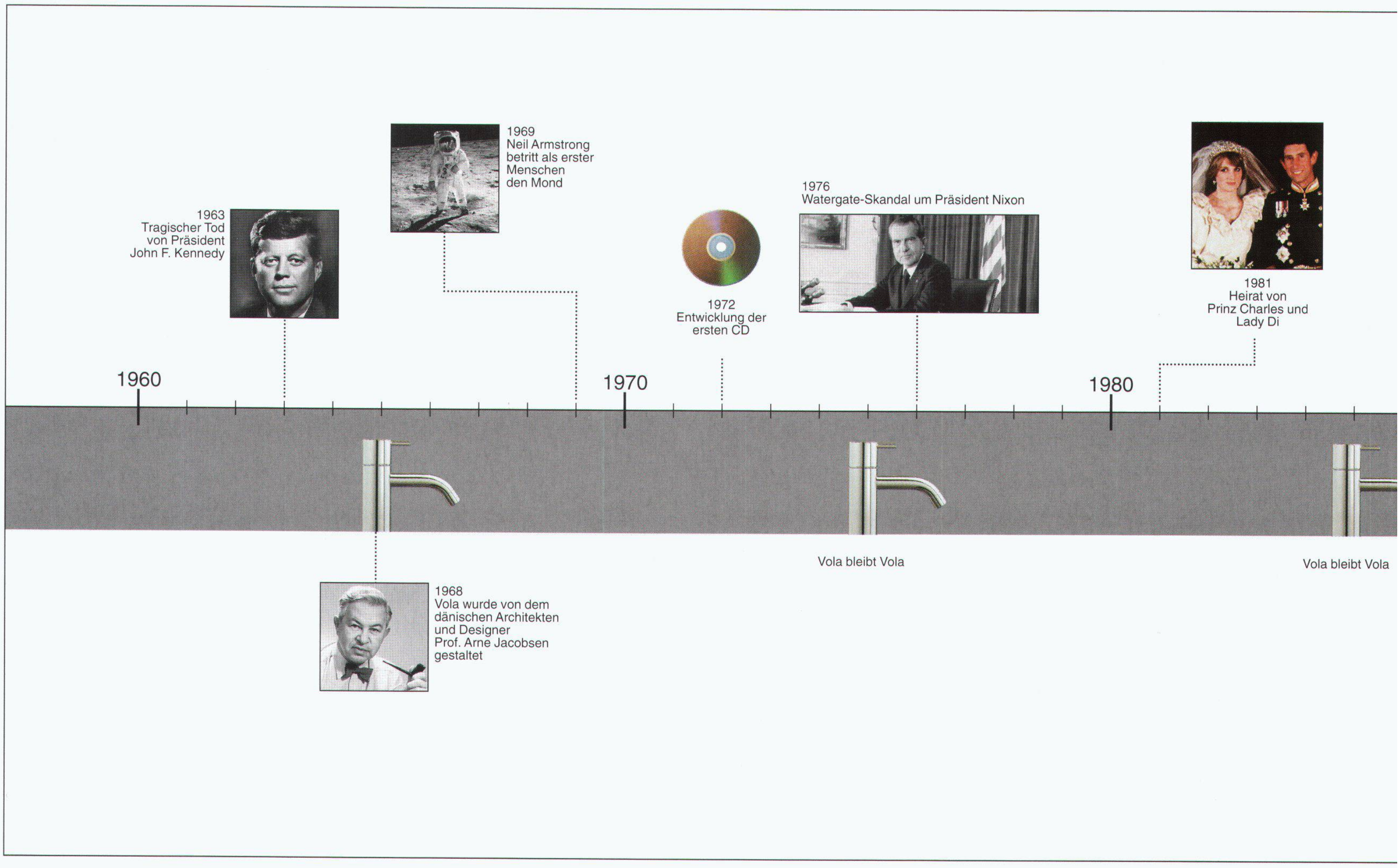
A whole series of old-style carpentry methods were still in use in nineties timber-frame building: squared timber was joined together to make a flat "frame" with an upper and a lower chord, or the frame was planked with boards or sheets, which was essential to give it the stability and rigidity of a structural element (wall or ceiling) and make it statically effective. An aperture in a section of this kind is always disruptive, and needs precise "compensation".

Construction in complementary layers in timber framework buildings

The tectonic intentions and the requirements imposed by building physics are in complete harmony: the squared timber frame bears the load, the inner planking reinforces, the outer planking closes the frame containing the heat insulation material, and thus holds the whole sandwich together. Finally the outer surface is covered with another shifted layer with rear ventilation in order to protect the sandwich against the weather, and inside the visible surface of the wall is brought up to the required quality in the same way. A cavity is left behind it to accommodate wiring, gas and plumbing. This layered construction of a façade element of this kind using the frame method is thus complementary, i.e. constructed in such a way that the layers complement each other, with every individual layer being essentially monofunctional. The contractor supplying these elements will define the composition and the material quality of the components. Architects or planners don't have to think themselves into the interior life of a sandwich of this kind any longer, and could no longer say in detail how it is made up. They simply determine the aesthetic quality of the external, visible surfaces.

A shaping deficit in new technologies

Increasing interest in new timber construction technologies means that it is possible to contend that, probably for the first time in the history of architecture, there is a tendency to move from massive construction to timber construction, which is in the filigree building category (tectonics). Take for example Gottfried Semper's so-called Stoffwechseltheorie (material mutation theory) which is concerned less with building technology itself than with its consequences for architectural formal expression at the moment of change from tectonics to stereotomy, essentially a means of applying timber construction to masonry construction (I define this conflict as "technological immanence versus cultural permanence"), or Hennebique's first reinforced concrete structures, which are still entirely committed to tectonic timber-building construction, with hierarchically arranged



posts, primary bearers and secondary framing: it was only after a certain period for getting used to the new methods had passed that Robert Maillart developed the inherent principles of reinforced concrete construction: mushroom supports that fuse atectonically with flat flooring and thus provide something like a hybrid, three-dimensional node at the support head into which the reinforcement, invisible later, is inserted. This leads to an inversion of "art form" into "core form" (Carl Boetticher), which now indicates the accumulation of forces only in the non-poured shuttering, through the thickening and concentration of the steel reinforcement. These observations lead to the following conclusion: the shaping criteria that are inherent in the system for new technologies cannot come into being until culturally permanent images (stereotypes) have been overcome.

Looking for appropriate structure and form

So if the classical prefabricated frame building with internal stays and planking on both sides represents an intermediate developmental form, clearly oriented towards traditional craft carpentry and the austere tectonic rules of timber construction, how does the inherent and appropriate structure and form of current timber construction technology look?

To investigate this question, we must first look at how timber is usually processed today. The processing stages of semi-finished manufacturing follow a downward path: the first stage involves producing high- and middle-quality sawn timber like boards, squared timber and planks for traditional use. Laminated boards are the most important half-finished product at this stage. The various off-cuts are then further reduced in size: the second stage produces beading, laths and other strips that are made into multi-layered sheets, stock lumber panels etc. The "waste" from this process is broken down even further: cut or stripped veneers are made into high-strength veneer strip or chipboard, for example. After this the fine waste, e.g. sawdust, is boiled down to a fibrous pulp in the final stage: the wood is divided into fibres and lignin, and pressed into sheets: hard fibre, medium dense fibre and soft fibre sheets round off the product range.

Every stage in this size reduction has a corresponding counter-stage of composition and reshaping, mainly in the form of sheets of various kinds. And each time gluing is the technology that determines the make-up and consistency of the product. This is why the material is so astonishingly supple in the later stages where the semi-finished products are used, in "finishing" and in further handling as part of a prefabricated package. In fact these products are almost totally susceptible to any attempt to shape them – a CNC controlled shaping head, or robot manufacture. The concept of modelling is entirely appropriate here: complex cut patterns are made, but three-dimensional shapes like reliefs and other custom-made pieces are also produced; their surface configuration can be defined and processed by computer.

How CAD programming affects design

This production process makes timber a material that can be freely modelled, and is thus indifferent. It is easy to imagine the possibilities that this affords: architects using the CAD production approach and contractors working with CAM and CNC-roboting can entirely realistically order a "uniquely manufactured" copy of a complicated craft structure – for example a Japanese Shinto shrine – even at a relatively moderate price. That would be the beginning of serially limited production of architectural rarities (as in fashion design or the car industry) that could be afforded by a select illustrious clientele.

These pipe-dreams bring us back to the starting-point of any project, the design: the use of CAD programs in project development is now standard practice in architects' offices. The data-line links up with this absolutely seamlessly, so that the way the plan is treated on the screen, independently of classical building techniques, in timber-building, for example, is bound to feed back to the production and tectonics of the building. Non-modular, object-specific building parts are produced. Or put in another way: the concrete architectural project is broken down into manageable elements (slabs, planes and shells), sent into production via the data-line and fitted together on-site to produce a building. This type of sheet tectonics, involving fitting layers of storeys together or accumulating elements, has long been everyday practice in massive building, and in timber construction it is triggering new construction and building processes. Furthermore, technological development is producing materials that are constantly more robust, enabling the individual parts to be thinner.

Cardboard model on the scale of a building

It thus follows that the "basic element" of current timber building is the sheet, not the rod. A sheet consists of three or more layers of cut timber, e.g. strips or leaves of relatively low quality wood (formerly off-cut or waste timber), glued on top of each other crosswise . This "criss-cross weaving" makes the sheet highly solid and rigid as an element, and thus statically it can function as a shear structure.Rather like a woven textile, the homogeneous sheet is without any recognizable internal hierarchy and in terms of production technology can be extended almost ad infinitum in the two surface dimensions (restrictions only being imposed by the size of the sheet presses and the capacity of the transport trucks). In the material dimension they can be layered (specific sheet thicknesses, according to load distribution and strain). Even the quality of the "threads" – laths in soft or hard wood, and of mixed consistencies – can be appropriately optimized to meet the intended requirements. The sheet is thus directionally neutral, or better, "indifferent to direction". Theoretically it can be produced to infinity in any desired direction, and practically in the maximum size that can still be transported. Both requirements have an effect on current timber construction: sheet tectonics and thin-walled sheets (e.g. stock lumber panels) behave on the scale of 1:1 like card, as though a cardboard model had been magnified to the dimensions of a building. This does not apply only to physical perceptions. This becomes rather more obvious in the treatment of openings: the incredible resistance shown by sheet tectonics in buildings is clear from the way in which openings can be punched into or cut out of the sheets, as if cut out of cardboard. We are familiar with a similarly inert response from the American "Balloon Frame", construction using a nail gun. Here it is possible to simply cut away an entire corner of a building retrospectively without the structure collapsing, as it is statically over-rigid by a very long way. (It would be impossible even to think of such a thing in the case of European frame building!) But in fact in comparison with current European sheet tectonics, the American Balloon Frame technique seems more or less antiquated, to say nothing of the apparently "stone-age" insulation and planking work, which has to be carried out subsequently on site.

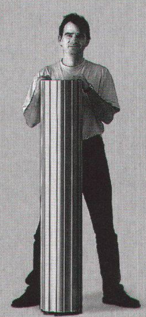
Prognosis: compact systems

The current state of European sheet tectonics suggests the following developments in future: the only systems that will be interesting are those that solve the problems of supporting framework, building physics and weather protection compactly (sandwich façade elements, so-called compact systems) and at the same time simplify the laminated structure of the element, that is to say reduce it. I call these complex synthetic systems made up of multi-functional components. Façades were completely splintered into countless layers in the seventies because of the increasing importance of building physics brought about by the oil crisis. Construction was broken down into individual functions that are now reduced to a small number of components because intelligent steps have been taken towards synthesis. There is a corresponding tendency in massive construction, where single-sheet materials than can bear loads and be insulated are used as a reaction to the requirements, complicated in planning terms and ever more demanding as far as guarantees are concerned, of multi-layered, monofunctional complementary systems (double-wall masonry etc.).

A synthetic façade element could then look like this: the basic element consists of a thin-walled ribbed sheet, e.g. a lumber panel with a layer thickness of 3.5 cm. The 20 cm deep transverse ribs in the same material that are glued on, with their gaps filled by the heat insulation material, act as an anti-buckling device. This basic element, with the flat side placed against the warmth, functions as a load-bearing sheet (load-bearing, bracing, stabilization), as an enclosure for the heat insulation and as a condensation brake (the internal gluing gives the lumber panel this quality). The homogeneous inner surface of the wall can be treated simply and directly afterwards, painted or wallpapered, for example. No interior offset planking is needed so long as no electrical installations are arranged along the inner façades. Simple timber boarding, applied to the ribs outside, closes the wall sandwich and becomes the support for the outer skin. In the case of the Bearth-Candinas House, which is described in detail below, these were larch shingles, which were nailed directly to the structure without rear ventilation.

Thin-walled rib sheets represent a mode of construction related to coachwork- building and aircraft construction, where thin-sheet membrane support frameworks in light metal and plastic and braced with ribs are subjected to strains at the highest level: maximum rigidity and stability with minimum material requirements. In aircraft construction the key factor is the weight of the structure, but in the sheet tectonics of current timber building it is compactness and a simultaneous ability to derive multiple functions from synthetic elements.

Comparison with the timber-frame construction explained at the beginning of the article sheds a clear light on the subtle "revaluation": if the inner planking of the frame is merely bracing and the frame post clearly load-bearing, then the image of the rib-sheet, which seems formally and structurally similar, is reversed: the sheet is only 3.5 cm thick, and braced with fine cross-ribs, yet it is load-bearing – but this analytical way of looking at things must be corrected at once: the two components, sheet and ribs, form an inalienable, compact, synthetic package (thanks to impact gluing), in which the support structure (load-bearing, bracing) and building physics (vapour diffusion), structural inner workings and visible surfaces fuse with each other, and every component takes on a multiple function, working in combination with all the other components. This is why the term compact systems is used in current timber construction.



When placed vertically as façade elements, it is clear that the supporting and insulating layers run through continuously without interruption, as the floors are simply supported on the 3.5 cm thick stock lumber panel. It is different in the case of frame construction with upper and lower chords, where the façade construction is completely interrupted by the floor and ceiling supports, or this can only be prevented by supports made up of protruding steel angles (Z profiles). I should like to use a concrete example to explain this:

For example: a stretch pullover covering sheet tectonics

The Bearth-Candinas House is a slender four-storey residential tower at the end of the village of Sumvitg. Its ground plan is based on a simple rectangle articulated longitudinally by a supporting centre wall. This produces two longitudinal spaces per storey, which are central in terms of usage, as they can be further divided according to need. The building has no cellars, as the mountain slope carries a lot of water.
On the ground floor you walk into an open, glazed hall (space for plants in winter, and a play area for children). This contains the actual entrance to the building, from which it is possible to reach the actual living accommodation above.
As all timber construction systems have little storage potential for heat or cold and thus tend to follow an insulation concept in order to keep the heating budget low, the window apertures in the rooms face in all façade directions, so that there is no overheating in summer. In winter the heat of the sun from the entrance hall rises through all storeys and is distributed into the living and sleeping areas.

The wall surfaces of the stock lumber panels – to return to our subject – are painted white and lemon-yellow to minimize the impact of the elements in the façade and supporting walls and make the rooms homogeneous. The impression of a "timber building" recedes, and we are left with a sense of a structure that is fragile, almost papery, whose rooms seem as though they are clad in wallpaper. (Seen from close up, a thousand fine, regular hairline cracks cover the walls: a true "cultivation of the crack" that clients will never again censure as a flaw!) Because the only shingle-maker in Grisons plies his trade in the village it seemed opportune to use shingles for the façade cladding. This clings to the building like a tight stretch pullover, making the structure look homogeneous from the outside as well, and helping us to forget the sheet tectonics. Thus high-tech production and tried-and-tested expertise come seamlessly together in this house.

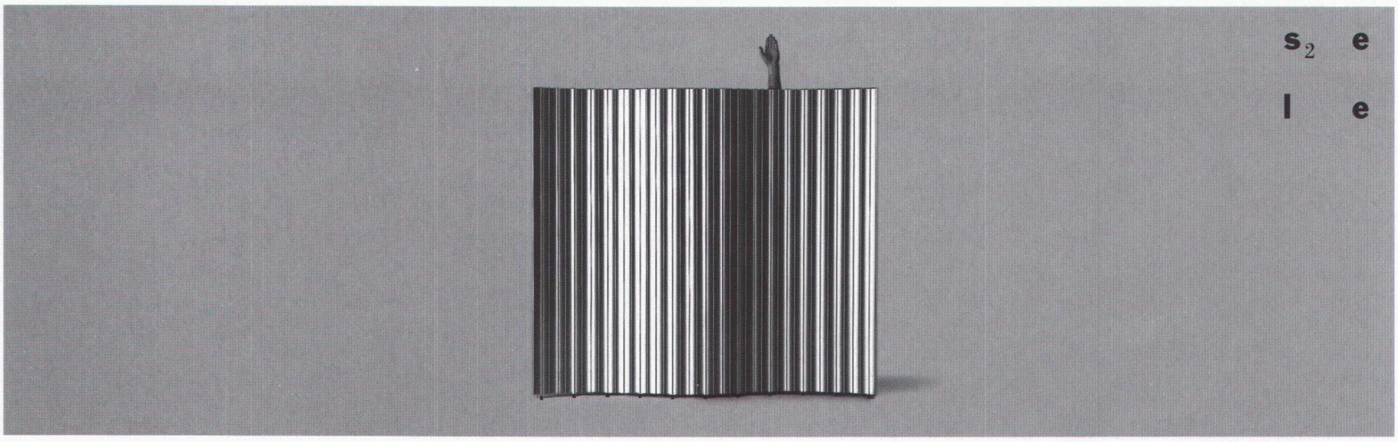
Away from the wooden model

If you pursue the sheet tectonics and the technology of a façade skin without rear ventilation further, you inevitably discover that modern timber building is detaching itself from its "wooden model" in two respects: today numerous kinds of façade planking that are a world away from wood are available, like flat sheeting, glass and plastic panels or even foils, plaster-base and fibre-concrete boards, as well as corrugated panels. The last put their stamp on the Icelandic architecture of Reykjavik, in an amazing fashion. What has happened is that the American-Icelandic "sheep for sheets" trade promotion plan meant that the "sheets" – of corrugated iron in this case – could be used instead of wooden cover-boarding with pointing to make the beading-like profiles on the colourfully painted façades – a fascinating transformation of material, completely in the spirit of Semper. Or a more general point: current building in wood hides behind other non-timber materials, which have the advantage of providing large, impervious surfaces with few joints, made of remarkably thin, light materials. Of course people are still playing with the possibility of replacing the load-bearing boarding of the protective planking directly with the latter, to achieve the most compact façade element structure possible. Although this would make the problems of obtrusive elements and a network of joints even more acute, as is all too well known from the massive slab construction approach taken by command economies in the former Eastern bloc states.

I think that the second tendency is even more interesting: the sheet tectonics of current timber building will be read exclusively structurally, and not materially, as is the case with traditional timber building. What has previously been defined as cardboard work, as a technologically driven process involving large panels made up of thin-walled rib-sheets in stock lumber, but also involving so-called thick-laminated sheets, will be seen as "man-made material" – above all when they are neutralized inside and out by coloured paint – and will take up a position similar to homogeneous concrete in massive building, which can occupy all the tectonic elements of a building structurally without ever being able to express itself as a material. (At most, we sense that certain spatial constellations and expanses of space could only have been realized with the aid of the "non-visible concrete".) In fact the architectural theme of abstraction is enriched through the cardboard-work concept by the phenomenon of "white spacelings" that will create the greatest possible sculptural potential with thin-walled elements (comparable with the work of Absalon in art).
On the other hand the simple technique of cutting sheets to size as if with a fret-saw, with apertures sawn out (almost) at random, and the model-like assembly of walls and ceilings, will require a do-it-yourself building method of the kind typical of American Balloon Frame architecture today; it has also been immortalized in building instructions written by the Dutch artist Joep van Lieshout as "high-grade bricolage".

Architectural professionalism

Timber building as practised today will contain to gain in importance because of the burgeoning interest in questions relating to energy, ecology and building biology. Certainly only compact, multi-functional solutions will be competitive, but skill in synthesizing a whole range of different requirements will not be restricted to developing and mastering technological expertise; such skill will be shown in the first place in intelligent and competent strategies in architectural design, which is the only guarantee of professional architecture, and thus of "durability".



Hermann Blumer talks to
Markus Peter and Irma Noseda (pages 24–29)
Translation from German: Michael Robinson

"My passion is seeking"

werk: There have been major changes in the field of timber technology and timber construction in the past ten years: moves away from traditional building with timber to new products, systems and combination techniques that have led in their turn to different processes and new models for co-operation, and thus also to new freedoms and risks. Hermann Blumer, you are an engineer who has specialized in timber construction and acknowledged as an important figure in the field in Switzerland. Do you agree with our assessment of the situation?

Hermann Blumer: It's true that a great deal has got under way in timber building, and at a hitherto unknown speed. This means that old values have been subject to some hard questioning. This is partly because of a spurt in industrialization, but also because architects are coming back to timber, and making considerable demands on it. Engineers often find this quite difficult, as timber is again very new to them.

werk: Markus Peter, you haven't committed yourself to wood, but as an architect you worked intensively with Hermann Blumer on the School for Wood Economy in Bienne. What effects have developments in timber technology had on architecture?

Markus Peter: I am sceptical about seeing technology with its new wood-composite materials and semi-finished products as the sole creator of a new architecture. And also, many of these developments are older than is generally known. For example, bonded beams working on Otto Hetzer's principle were first used in the St. Moritz riding arena as early as 1910. And Konrad Wachsmann went over from the old carpentry approach to a modular building method well before the middle of the century. Since then it has been possible to build practically everything in theory, even though it wasn't put into practice until recent years.

werk: Does this view apply to Hermann Blumer's work as well?

Markus Peter: No, he's a typical modern constructor, who is interested in how visions are realized and developed further. In his double role as engineer and contractor his interest moved away from the object and on to the process. There is no doubt that the key to his inventions lies in his efforts to link planning and production by using computer-controlled manufacturing techniques. Here the actual challenge lies more in adapting the means of production themselves than in the completed product. Central to this work was the invention of the BSB connecting systems ("Blumer-Binder") and the "Lignatur" box elements, both registered brands.This close tie-up between planning and workshop production breaks with traditional prefabrication forms, as described by Richard Senett, with its "logic for size, logic of metrical time and logic of the hierarchy". This kind of manufacture is the actual basis on which Hermann Blumer has co-operated with architects in a number of different ways.

Hermann Blumer: The most important thing for timber building is a change of social awareness. Many people have now acknowledged that it is possible to design something architecturally using wood and work on it as an engineer, and also that it is partially possible to relate it to questions of energy, health and raw material supply. This is more important than statics, dimensions and all the technical implications. It is this awareness that is driving change. It is the power that makes me reflect day and night about how things could be done even better. My chief concern is to find out what one can move with and how the world can be changed by wood as a building material that is undergoing a renaissance.

Markus Peter: For example, it is this awareness we have to thank for the fact that clients and institutions want to use wood and deliberately promote the exploration of new possibilities; this happened with the School for Wood Economy in Bienne. In parallel with this, wood is also being rediscovered in discussions among architects. New kinds of architecture have come into being because architects felt they had been robbed of the art of correct construction and were exposed to current urban developments. Wood is now being perceived differently, thanks to some recent key buildings like Herzog & de Meuron's residential building in Hebelstrasse or Peter Zumthor's Sumvitg Chapel – and this applies to urban contexts as well. This means that some of the things that have previously held timber back have fallen away, like traditional form and what is known as doing things right; since then people have found out a great deal and "learned" wood again.

werk: Wood's success is also a question of economy to a large extent. What constraints does this produce and what freedoms are to be gained, to balance things out, as it were?

Hermann Blumer: The economical aspects of construction are the basis in principle. It is possible to break away from this from time to time. But the business world has to be able to draw commercial strength from cost-covering projects from time to time. Yes, and this produces the first little freedom. I do not experience this as pressure to break out, but much more as being addicted to breaking out. At the moment I'm experiencing this addiction in my work with Norman Foster and with Herzog & de Meuron.

werk: Am I right in thinking that your use of the word "addiction" implies seeking and being driven?

Hermann Blumer: Yes, and in the most positive way! All this addictive seeking is about making something better. It works roughly like this: I have an idea that it would be possible to do something unusual with wood – usually copied from nature. The architect then wants to improve my suggestion from an architectural point of view. Pursuing his ideas requires tolerance, but it is a fascinating route to take.

werk: Many architects know how addictive it can be to push a material forward and thus do something new with it – whether that material be concrete, natural stone or wood. The things that emerge from this are often unique items that can only be built into systems and made generally useful on an individual basis.

Hermann Blumer: It is certainly exciting for an architect to create something unique. The engineer has to try to go along with this, and sometimes has difficulties because he's afraid that this individual work of art is getting too expensive. He has to bring the architect's aspirations down to earth and find people who can implement the ideas economically – perhaps in a slightly different form!

werk: Until recently Hermann Blumer did not just work in the construction field, but was also a timber construction contractor. This probably had great advantages in pushing new developments forwards. Did you lose an important platform by breaking away from production?

Hermann Blumer: As an engineer I do not have to have a factory in the background to be able to push new developments forward. If someone on the architectural side asks if something that is not usually done is possible I need to have people around me. I need researchers, engineers, building physicists, contractors and so on, and also the client company, all with me: "That must be possible. Give me such and such an amount of time to work it out!" But the factory often destroyed every possible vision by listing hundreds of constraints. In this respect I actually welcome the fact that my work is now detached from the "industrial crutch".

Markus Peter: It seems to me that Jean Prouvé's drama is repeating itself to a certain extent. Once released from the constraints of producing oneself, the direct link between design and manufacture that characterized Prouvé's first creative period is also removed. For example, in the "maison du peuple" (Clichy, Paris), Prouvé completely explored all the technical and formal possibilities offered by the seaming machine and submitted the entire building to this logic. In his later role as a design engineer and consultant it may be that he had considerably more opportunity to innovate, but his influence on the structure as an architectural whole was always very much under threat. I wonder how Hermann Blumer will act in future as a timber construction consultant without a production shop, as synergetic unity is a highly desirable inner goal

for his technical objects. Or to quote Gilbert Simondon: "The technical object to be developed is the one in which there is no secondary effect that impairs the function of the whole or remains outside that function."
Hermann Blumer: In fact this is a question that is put to me with unexpected severity. Of course it was easier to bring on production if it is your own business. I motivated people, and could also give orders if necessary. But as I do not want to stop co-operating with the manufacturing side under these new circumstances, I now seek allies among colleagues and specialists. This cannot just be taken for granted. You have to work harder to persuade people, and many things become less efficient. But I am still confident that a team will suddenly come together and continue the work effectively. And perhaps they will take the consolidated route that would have been better even twenty years ago.

werk: And so to this extent you believe in continuing with your specific way of looking for things and developing something new without being involved in production yourself.
Hermann Blumer: Yes, and I am actually pleased that I don't have to produce any longer. Other people do that now. They are work on the basis of economic viability. I don't mind the profits going somewhere else either. But you still have to work with architects, with highly creative minds who co-operate with you to produce a specific building that has to be ready at a certain time. That is the pleasing aspect of my work.

werk: Is researching and developing in the context of a concrete building project the ideal way of working for you – in other words being tied into a process as opposed to academic work in a research laboratory? Would it be right to say that your professional career is a development from one realized building to the next?
Hermann Blumer: Yes, definitely. This kind of link is ideal. I find there is far too little pressure in a research laboratory. If you only work in a lab it doesn't matter all that much if you miss a deadline. If you feel that something you want to do can be achieved then you just work steadily on step by step. In contrast with this the great pressures of the building process, the speed factor, is an advantage: in my experience it is only enormous pressure that brings something you have thought through in advance to a radical conclusion. Suddenly it is there!
Markus Peter: I wholeheartedly agree that ideas and pressure are the two poles of our work. But we do come across a phenomenon that we call "paradoxical research" amongst ourselves. This involves a deliberate attempt to transform the working conditions and requirements involved in our projects, which constantly become tighter and more restricting, into design freedoms and expressive possibilities by carrying out systematically subversive investigations, usually related to construction. Put more strongly: not every technical innovation has something to reveal.

werk: What part does speed play in this risky, pressurized working method? Does everything have to go too fast?
Hermann Blumer: On the contrary. Generally speed is a positive thing for me. The faster we move the greater the progress, and quality does not necessarily have to suffer. I do not believe that speed inevitably produces more errors. In my experience it leads to a completely different way of working together, because co-operation is made considerably more interesting by it; many errors can be anticipated. For example, the requirements of greater speed lead to new combinations of materials today. Hybrids are produced, forms are reinterpreted and used in a new way.
Markus Peter: And so it's quite normal for Hermann Blumer to be thinking for Foster and Herzog & de Meuron!

werk: But there have been timber construction failures in recent years, structural faults, the unacceptable face of innovation. What is your view of this?
Hermann Blumer: People wrongly talk about set-backs rather than missed opportunities. If you have a good team available you can convert a possible setback into an almost certain success. But that would need specific co-operation with scientists, planners and contractors. But we do not use these models in practice. Seen positively, a setback is always the starting-point for a new piece of progress. This has always been the case for me.

werk: That sounds like expedient optimism to me.
Hermann Blumer: No, it's not expedient optimism. Setbacks actually are part of any process of evolution. This also applies to "intelligent" structural faults. It is important that no one is killed. And it's also right to ask: what are structural faults in comparison with the evolutionary progress that could arise from them! Theoretically speaking, faults are an investment.

werk: So why do most structural faults not lead to success?
Hermann Blumer: The weak point is often that people try to get over the problem by using the traditional solution of allocating blame: expertise is used to establish who is the guilty party, and he has to pay. This approach does not work because theoretically there is no one person who is to blame. People have been working on a project together, a problem has come up. And now they have to carry on working together and move rapidly towards a solution. Lawyers tend to slow such processes down. Their abilities are exhausted in making the "guilty party" even more of an outcast. But they often have no idea how an evolutionary process is launched on a building site.

Markus Peter: When working with engineers, development is often surprisingly closely linked with the qualities of materials and the way they are combined. Much that we are developing with Jürg Conzett at the moment is not material-specific in the first place, and experience can be transferred to timber construction, for example prestressing techniques from concrete technology.
Hermann Blumer: It is usually possible to handle requirements theoretically, but there have not been sufficient experiments in practical realization. You solve the problem without making mistakes the next time!

werk: Are in-depth lab tests not adequate for implementation in larger buildings?
Hermann Blumer: I made calculations and tried things out in practice for the "Blumer-joint". But my father said: that can't work. And he was right. He was a carpenter, not an engineer. And I was wrong, for all my knowledge. Since then I have known: you need calculations and the lab, you need the building site, and you also need to know in advance whether something is going to work out or go wrong.
Markus Peter: The lab alone is definitely not enough. Ideas and new questions come from friction with reality, not from the lab.
Hermann Blumer: There are also certain components missing in the lab, certain elements are over- or under-valued, working conditions cannot always be properly considered, and so on.
Markus Peter: I am still convinced of the necessity of experimenting, and of working closely with product manufacturers. Nevertheless it is essential to tie all concerned in with validating the research results from the outset.

werk: I take it from what you say that it is only by trying things out in practice on the building site can provide the ultimate certainty. Would you dare to announce this in public? Surely experimenting on site must be something of a deterrent to client companies who think commercially?
Hermann Blumer: On the contrary, it acts as a spur because if you are reasonable you have to say to yourself: it will definitely work next time!

werk: I mention building with wood and you think of society as a whole. You grew up in a carpenter's shop. Am I right to feel that the random biographical fact of "wood" has become a passion that all your work and thinking circle around?
Hermann Blumer: That is only half true. From my earliest years I couldn't see enough in my father's carpentry business of what the men were doing and how they were doing it. Then an apprenticeship as a carpenter was a kind of duty. Later university forced itself upon me because the craft had brought me to a standstill. And so it is more true to say that my passion is seeking, and that wood was a happy chance for me.

I like making structures as an engineer. I used to seek in mathematics, and now I do it more in construction, and today I tend to create combinations through seeking.

Markus Peter: I assume that all the really new industrial developments in all aspects of timber are still to come, and will go in the direction of breaking down and re-assembling the components of this material or in the direction of transforming the molecular structure. Certainly we are sufficiently provoked by current questions about composite and hybrid combinations; but it is very difficult indeed for two materials not just to be associated, but to fit together as well.

Hermann Blumer: Statical calculations are not the engineer's basic task; what he really has to do is make sure that people can digest technology, that building materials are made environmentally viable or that raw materials are treated carefully. The express requirement that materials should be used frugally inevitably leads to hybrids and composites. And this question includes how we dispose of these materials so that they do not become hazardous waste.
Now that engineers have brought people closer to technology and this having almost degenerated into an evil they now have to show people that they can take responsibility in this field and know how they intend to do things tomorrow. And then do that. This is only related to building materials to the extent that we need to ask which is the right one at any particular moment. The day of wood has now dawned. It will last until we find man-made materials that are better than wood.

Markus Peter: Does the question of using other material apply primarily to the technology of composite materials?

Hermann Blumer: Yes, based on the functionality of the end product. We are looking for a wall that is well insulated against heat, cold and noise, that stores heat and cold, that repels or absorbs moisture and perhaps exudes exciting aromas. This combination has to become part of an engineer's mental stock-in-trade. The next step in a great timber-building evolution will be bringing the right materials together. This could possibly include sheep's wool and a steel sheet as well as wood, a fibre-optics data carrier, window-glass with built-in solar cells, paraffin wax as a heat storage material and so on.
In brief, all the materials that make it possible for a building element to have all the desired effects. This will all have to be worked out in close co-operation with partners, but in the case of system combinations all sorts of different craft skills and planning groups will have to be involved as well.

Markus Peter: That is how I got to know Hermann Blumer! It wasn't so much about designing a particular load-bearing system as a permanent question of everything a wall or a ceiling has to do and all the other problems you want to solve at the same time. He always challenges you to make synergetic links. So for example the extended side aperture in the lower chord of the box girder in Bienne led to a collapse in his system. This did not affect actual statical function, but came up against the changed fire safety requirements caused by the new cross-section. Changes in the dimensions of the webs and integrating sound absorption into the open cavity stabilized the system on a higher plane. This way of overlapping and charging parts is typical of work with Hermann Blumer.

werk: Are there any more things that you have been turning over in your mind for years, where you think: something has to happen there, it's just important that the time is ripe?

Hermann Blumer: Of course, and the spectrum is constantly getting wider. At the same time the questions are asked more consistently, and require even more comprehensive answers. I feel that there is something in the offing in terms of home health but I can't yet say what it is and I also don't know how it will happen. What will perhaps come in the near future is genuine interdisciplinary practice; it will be feasible and viable to address an issue in its entirety.

werk: ... and perhaps economically as well?

Hermann Blumer: That is one condition! Addressing a problem in its entirety leads to friction losses between the people involved. If you manage to motivate partners to a greater than average extent, if the working processes start to flow better, then you start to think together. Architecture can make a material perform more cost-effectively if people are linked together in the best possible way. Of course all this can just as well happen without involving wood.

werk: But you will continue to commit yourself to this Utopia in the field of wood?

Hermann Blumer: Yes, it would be nice if we could help wood to be more highly esteemed across the whole field in which it is used. It could be particularly interesting for young people if we could integrate their creativity and the great variety of nature into the processes of planning, building and change rather more effectively.

werk: What would you still like to experience in the context of wood?

Hermann Blumer: Let me think: – A kind of collective creativity involving "human wood" ... I have the following image in mind: a lot of people come together and use wood's many qualities in a totally creative way. I stand by and watch them doing it. – That would be my idea of bliss.

Interview edited by Irma Noseda