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Future Problems Facing the Designer

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Future problems facing the designer

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I am aware of, and grateful for, the honour you show me by asking me to address you on the subject of 'Future problems facing the designer'.

I am afraid, however, that you may have overestimated my powers. Like the Danish cartoonist Storm-Petersen I find it very difficult to prophesy – very difficult indeed – and especially about the future. But I can tell you straight away what I fear may happen: that designers in the future will even more than now be working under constraints which will make it impossible for them to give of their best. And I could add that even more than now their best may not be good enough because it is too narrowly based. This I think is by far the gravest problem facing designers, and it is a problem for all of us, unless present trends are reversed.

This is a somewhat pessimistic answer, and probably not what you expected. My opinion is of course based on my own experiences as a designer of sorts, and it is therefore a very personal one. Let us hope I am wrong.

The word 'design', used as a noun or verb, can mean many different things. Here we are concerned with design as a link in the process of building and construction. Incidentally I make no distinction between the two; such distinctions have become obsolete with growing mechanization and factory production.

It would not do, however, to limit the discussion to structural design only, using the word in its narrower sense, for whereas everything we build or make must have structure to keep its intended shape, the structure itself is only a means to an end, its merit cannot be judged without reference to the thing of which it forms part.

Designing – and we could add, planning, which is roughly the same thing, on a larger scale – plays a central and increasingly crucial role in technology; it is the key to everything which is made or built. For in modern construction, everything is thought out beforehand, no unauthorized action is allowed. So any feature of the finished job which is not purely accidental must be due to a decision by somebody. As a matter of convenience, I call these decisions design decisions, and the sum of them the *total design*. The total design is seldom recorded *in toto*, it is more an idea than a reality. But the idea of total design implies that sufficient decisions have been made and recorded to enable others skilled in organizing such work to carry it out. The total design must by definition be viable, i.e. it must be possible to carry it out as intended. And it completely defines the finished job.

This cannot be said of all so-called designs. These are often only preliminary designs, sketches, plans or architectural perspectives showing certain aspects of the intended total design, but one cannot always be sure that they are viable, or practical, before the details have been worked out and all the implications considered. This leads to the often lamented gap between vision and embodiment. It is a wise precaution to bring the design to a stage when you know for certain that it can be built and what it will cost, before embarking on work on the site or in the factory.

Our designs, as executed, make our environment, and this in turn makes *us*, partly at least. Designing therefore assumes an importance not far short of that which belongs to scientific inquiry. In fact the two are intimately intertwined, one of them would get nowhere without the other. The whole of our technology is based on scientific knowledge, and scientific observation, and research depend in turn on sophisticated hardware. Both are complex mental activities set in motion by a stated objective, and based on a stock in trade of knowledge and experience, augmented by fact-finding, classification, interpretation, analysis and synthesis in various proportions – a process where imagination, intuition and invention are of vital importance. However, the two differ in their objectives.

The *scientist* wants to *explore* nature, to find out how it works. He is looking for general laws. The motive may be pure curiosity – when we call it pure science – or he may hope that the acquired knowledge will help him to run the machinery himself. In this case it is not so pure, and approaches the kind of research which may form part of designs breaking new ground.

The *designer* wants to *change* nature to suit his convenience. He is trying to solve a practical problem here and now. But his problem is underdefined. There is not just one, but many solutions, good, bad and indifferent. He must choose. The bad solutions come easy to hand, the good he must search for, and work for. And *that is the designers' real metier*, that is his real problem, to find the *best* solution. Or, as you can never be sure that there is not a better solution, to find at least a good solution, a solution of quality. And this is a problem in more than one sense – for *what* is *quality*? What is goodness?

The 'goodness' of a total design must be the same as the goodness of the finished structure, for the total design completely defines the latter. And the goodness of a structure, using this term about any product of the building industry, must be related to its purpose, and the consequences flowing from its being constructed in this particular location. The structure must obviously be fit for its purpose to be good. But that is not all that is implied by quality, as I hope to explain. The purpose behind the whole undertaking does not emanate from the designer, and may not even be disclosed to him. As far as he is concerned, it takes the form of a brief given him by his client and telling him in more or less general terms what is wanted. The designer then digests this information and disgorges it again in a form which will enable the builder to construct what the client wants.

This is the highly simplified version of the building process which is generally used when writing or talking about the subject. The reality is infinitely more complicated and we will come to that later.

The brief, supplemented by reference to the client if necessary, is obviously a very important document. If it could really explain exactly what was wanted, the question of quality would be solved. The best design would simply be the cheapest of those satisfying the brief. The formula measuring efficiency or excellence would be $E = C/P$, where C stands for commodity as defined by the brief and P stands for price. And this is in fact what the whole of the modern obsession with cost-efficiency is based on. All possible factors, even such imponderables as a saving in time for busy executives, are evaluated in money terms, and optima are produced by the computer and used as a basis for what are in effect political decisions. This is very crude, and potentially very dangerous, for it entirely ignores the quality of the product, which we do at our peril. Even the best of briefs cannot begin to define quality. The brief can be satisfied both by good and bad designs. You can specify that you want an elegant structure or a friendly house, or a town hall which is the envy of neighbouring cities, but that does not help you much.

The client buys the cat in the bag. All he can do is to choose a good designer. That is why it is tempting to hold a competition for the best design, except that the submitted designs necessarily must be in the form of sketch-designs, which may not fulfil what they promise, and the assessors may not recognize nascent quality when they see it.

As the Danish author Piet Hein has said 'Art is solving problems that cannot be formulated before they have been solved. The shaping of the question is part of the answer.' And designing is essentially an artistic process. Of course collection of data, research, analysis, calculating, quantifying, costing, etc. and especially previous experience, play their important part, and in engineering structures perhaps the most important part – and some of these activities can be eased by computerized information processing, analysis and mathematical simulation. But the essence of designing is to effect a harmonious synthesis of partly conflicting aims and obstinate facts. It is largely to find the right spatial arrangement of parts. Designing can be likened to the solving of a gigantic three-dimensional jigsaw puzzle – except that there is not one, but many solutions and not one but many designers. And they have got to find or shape the parts themselves, keeping always the object in mind.

A designer has his own standards. He is a professional, a craftsman, and if he is good himself, he knows when he has done a good job. It must be all of a piece, have wholeness, clarity, it must not be too strong at one point and too weak at another – but, as I said, it is useless to try to define quality. All we can say is that its emergence results from the involvement of the designer, from his passion for perfection, from the fever which grips him when he sees the chance of producing a really good job, and which makes him sustain the effort involved. I believe, perhaps naïvely, that such enthusiasm is a pre-condition for creating a structure or an environment which is not as cold and inhuman as much of our modern environment, but in which we can feel at home.

But enthusiasm is not enough. It can even be dangerous if too narrowly based. Designers – besides knowing their metier – must have an understanding of what other people need, and not just of what they want to give them, and sometimes perhaps what they need is a chance to build their own shacks – disregarding aesthetics.

I am aware that all this must sound a bit highfalutin to you. What has all this to do with the client? He does not necessarily want an architectural or other kind of masterpiece. Maybe his object is to sell out quickly. Let's say a rural Council wants a water tower. They have not much money – but they are in a hurry – for the matter has been debated for several years. They know what they want: so they go to an engineer who has designed water towers before and say: One of these, please, so high, so many gallons, for so much money, or less. And we would like the tenders to go out in six weeks time.' It can be done. A sketch design, approximate quantities which can be modified later, the contractor starts digging. But he has not had the working drawings yet. And so on.

The water tower stands in this village for a long time. It is its most prominent feature. You cannot avoid seeing it. A pity – but we must have water.

This is, on a small scale, what happens most of the time, more or less. But it is not the way to get the environment we like.

Of course most designs *are* more or less routine designs. They must be, we cannot invent our technique afresh every time we build. But even if the bulk of what is built relies on previous experience slightly adapted to present circumstances, it is the fresh look at the evidence which initiates progress and improves quality. The natural instinct of a true designer is to ask

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himself: How can I do this thing better than it has been done before. Let us forget how it is normally done. By concentrating on the essence of what is needed and the most direct of all the ways of achieving it perhaps I can find a simpler, cheaper and a better solution, fitting into surroundings better, pleasing the people I am serving. If these aims clash – as they will – perhaps if I try harder some insight, some idea, will come to me in the middle of the night.

It may quite likely happen, of course, that the designer, after such an excursion, falls back on a traditional solution because it is in fact the best in the given context. He has wasted time and effort. But he has gained the satisfaction, valuable to any designer, of knowing that he has chosen rightly.

The brief, and the formula: $E = C/P$ cannot even settle the dispute between alternative solutions, if they happen to cost the same. For instance, if the brief can be satisfied by using either structural steel, reinforced concrete or aluminium as the basic structural material, the three schemes will differ in many respects which cannot be measured with the same yardstick. Durability, thermal conductivity, ease of effecting alterations, cost of upkeep, weathering, suitability for possible mass production, use of local resources and labour and many more, all will vary. Even the shape would be affected, and they would certainly *look* different. We would have to modify our formula to

$$E = \frac{C + EC + D}{P},$$

where EC stands for commodity in excess of that required, but still of some value, and D stands for delight, the artistic quality. EC and D cannot be objectively measured in money terms, yet they cannot be ignored either.

The brief cannot define quality. But it can prevent quality being produced by the designer, and often does, either by being so vague that the designer has not really understood the client's needs and therefore comes up with the wrong answer, or more often by being too detailed, thus pre-emptying design decisions which ought to be taken by the designer, or which at least ought to be integrated with the other design decisions and modified as a result

It is wrong to treat brief and design as separate documents. The brief and the basic design decisions should result from a collaboration between client and designer. You cannot decide what to build without finding out what can be built for the money available, what the options are. The client's job is to explain his situation and his needs as fully as possible to his professional advisers, but not to propose, or at least not to dictate the solution. Just as a patient should explain his symptoms to the doctor, but should not suggest the cure, far less prescribe it, the very thought is preposterous in this case. The relationship should be one of openness and trust in both cases.

The same intimate relationship should exist between design and execution. The designer must know where he is going, he cannot design unless he can judge whether his design *can* be built, *how* it can be built and roughly how much it costs, at least enough to enable him to compare the cost of alternative solutions. Otherwise he proceeds blindfold. To complicate the execution through ignorance or neglect of the ways and means of construction is bad design. True economy demands that the design indicates a practical way of building.

I hope I have explained the need for integration of brief, design and execution. But there is much more integration to be done.

If we look at the real situation we find that jobs are getting larger and more complex and that the total design is split between dozens of different professions, experts, manufacturers and

contractors, each at best pursuing his own particular kind of quality. Communication between them is inadequate, and not much concerned with a rational appraisal of the design. But although the quality of the overall planning services, the structural design, the architectural conception and detailing and the economic efficiency are all important, it is the synthesis of all these partly conflicting aims which constitutes the quality of the whole job. We need all-round or comprehensive quality, wholeness, which is really a closer adaptation to human needs.

But who is going to do the integration? The job is too big for one man. Team work is the answer, but is difficult when the members of the team so to speak live in different countries and speak different languages. It requires teamwork of a much higher order, whose members collectively embrace the experience needed for the job, understand each other and have the same desire to create what I elsewhere have called 'total architecture'. In such a team enthusiasm can survive, and can even spread and flourish.

'Total architecture' does not mean that cost is neglected. It only means that quality is not forgotten. The only hope I see of combining low cost with quality is to spend more time over the design. By more constructive forethought the time and money spent on the site can be reduced. Saving money is done by better design, better job organization, less waste, not by more accounting.

Post-design costing can be a useful check on a design before work is put in hand – but it comes too late – it means re-design if the design is too expensive. And in any case the present over-elaborate Bills of Quantities are a clumsy and time-wasting instrument for this purpose, as progressive Quantity Surveyors will admit.

But the present vogue and esteem for pre-design cost estimation, where definite sums are allocated to various parts of a non-existing design rests on a curious delusion. Where does the estimator obtain his superior knowledge of what the right design should cost? It is really an insult and an obstacle to designers, their work is dismissed as of no importance.

Of course, designers may not be good enough – if you are strict you can say that of most designers. But before you bring in somebody else to do their job for them, you had better be sure that these others are better designers, for it is better designs we need, not better costs. A feasibility study by designers is the way to get an idea of costs beforehand.

No, costing must be an integral part of designing. We need cost-conscious design. And that is in fact what all engineering design is or ought to be – to find the cheapest solution to a given problem. This can be said to be the definition of engineering, and everything we build is engineering of one kind or another.

Cost-conscious design is the way as I see it – but the situation is not propitious for its adoption. Spending *more* on design goes against the whole trend, against official policy. We are trying to reduce the cost of design by mechanizing it, applying cost-efficiency techniques, which cannot distinguish between good and bad design.

Naturally designers should work as efficiently as possible – but to prevent them from designing in the true sense is counter-productive, to put it mildly.

The 'client' has changed as well. He has lost his identity and accessibility, being replaced by a board of directors responsible to their shareholders, or by government departments administering directives from on high, both represented by agents who can only administer official policy, no matter how inappropriate to the situation. But are these the true clients? Do we not design for the people who use the structures and live in the environment? This view has certainly been gaining ground among designers; it was one of the planks in the programme of the

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Modern Movement in architecture. This means that the critical look at the brief, for which we felt the need in the interest of wholeness, must penetrate deeper. When the client is the public, the brief must defend public interests. That means that we must take into account the wastage of scarce resources, the cost of preventing pollution, the spoliation of our environment, the harm done to fauna and flora – in fact all the things people have warned us about, and which are the pet theme of our more serious publications. We cannot afford to neglect them, even if only partly well founded. The total design must be truly comprehensive. We must add to our formula another *factor*: *SP*, the social price we have to pay, if we execute this design, and we had better put it below the line this time:

$$E = \frac{C + EC + D}{P + SP}.$$

You may object that the formula gets less useful for every addition, and you are right, for it is very difficult to put a value on *EC*, *P* and *SP*. But we have to do it, or at least we have to make decisions which take account of these items, and the sooner the better, if we can believe the prophets.

This is a matter for politicians rather than designers, it directly affects only the brief, it affects the client's right to build what he wants. But, as I hope I have made clear, brief and design cannot be separated, and scientists and designers must be brought in as advisers, to decide why we build and *what* to build. This is a much more difficult and controversial question than how to build. To get strong and concerted action by independent national governments in this matter seems beyond the reach of man, at least not until disaster stares us in the face. But at least people and governments have begun talking.

But that we must stop glorying in waste seems obvious. Waste can be glorious – but it leads to waste-land. We must preserve our heritage, conserve our resources, build for permanence, not for scrap. We must reduce our production of unnecessary gadgets, simplify our lives where possible so that something is left over for those in need.

Does this invalidate the quest for quality in design? I do not think so. To do one's job well is good for one's self-respect and good for one's fellow beings, and it cannot do any harm as far as I can see even if it does not solve all the problems of mankind.

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