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Phil. Trans. R. Soc. Lond. A 1972 **272**, 497-502

doi: 10.1098/rsta.1972.0059

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The inherent problems of effecting change

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When I started work in the building industry in the middle '30s my mother, who having been married to a contractor for many years thought she knew a lot about the industry, advised me on the following lines: 'Maurice, you are going into an old-fashioned, dirty and hard industry, which as far as I can see has made no progress since the time of the Pharaohs when the children of Israel made bricks. Do your best to make it a modern and respected industry.'? There have been very considerable changes since that time, especially in the civil engineering field where in some spheres today, aided by massive amounts of machinery, we use only one-tenth of the site labour that we did when I was a boy. But, for a variety of reasons, on the building side of construction, the rate of change has been much less marked, and progress has been much slower than I would have hoped, and it is still a labour intensive industry.

At the end of the Second World War when I became seriously involved in the management of what was in the process of becoming one of the major construction companies of this country, I saw the possibilities of great change, and I have spent a large portion of the intervening quarter-century in endeavouring to effect that potential change; but it has been much slower than it could have been – indeed much slower than I think it should have been.

The problems of effecting change on the building side of the construction industry are not just those of Britain, but are virtually world wide. As confirmed by the words of H. B. Finger's summary where he says: '... the structure of the housing business, the existing institutions, the regulatory procedures and other factors have discouraged rather than encouraged modernization and improvement consistent with our overall technological, social, economic and political progress.'

Obviously the United States is at present making a great effort to effect a greater rate of change, but I believe the problems that have hindered the rate of change there, although different in detail, are basically the same as ours and the intensity of problems inhibiting change in the United States are in some respects even greater than those from which we suffer. From relatively superficial studies that I have personally made in many countries of the world, including U.S.S.R., and that have been made in much greater depth by our own research and development organization, I am sure that to a greater or lesser extent the problems we have in this country, are basically the same in almost every developed country of the world. We are by no means alone – it is not just a British phenomenon!

In Mr Bishop's paper we are going to hear about productivity, and he too is, I suspect, going to talk about the structural difficulties that impede change for he says: 'This paper will take as its starting-point the constraints imposed by the nature of the industry; the character of the market, fragmentation of the organizations controlling the industry's resources, difficulty of achieving high utilization of capital assets, and the problems of controlling the timing of projects and the deployment of resources.'

The level of efficiency of the construction industry is of vital importance to every country of the world. In almost all of the developed countries of the West, well over half of all capital

investment is spent on construction, and construction is taking an ever increasing proportion of the gross national product. Relative to other forms of capital investment the 'real terms' cost of construction is rising. My own experience is that it is extremely difficult to obtain really meaningful figures on this subject because methods of assessing productivity and the massive changes that have occurred in the field of subcontracting and specialist contracting in the industry in the last decade make it essential that what figures are available are interpreted carefully and in detail, otherwise they can be highly misleading. However, I in no way wish to steal Mr Bishop's thunder on this matter.

The somewhat discouraging remarks that I have so far made certainly do not mean that there have not been very considerable technological changes in the past. What I do mean is that the rate of change that has occurred in my working life of 35 years has been far too slow and should, in my opinion, have occurred in a matter of 10 to 15 years – and not 35! Later on we will hear much about technological advances that either have recently been made or that are in the process of being made, or that are 'just round the corner'. Having a very active research and development department ourselves, I am very well aware of the potential for change. However, I am concerned that the great potential for change, much of which has in the past been frustrated by the structure of the industry, shall not be equally frustrated in the ensuing decade. Unless there are certain major changes in the structure of the building industry, I see no reasonable hope that many of the great technological advances that could be made and need to be made will in fact materialize. It is the structure of the industry that is impeding progress – not any lack of inventiveness by architects, engineers, scientists and marketeers.

If we are to make further strides in increasing our standards of living (and there are of course some of us – and I am one of these – who question whether this is today such a prime objective as it was thought to be even a few years ago – but this is not the place to debate that point) it is essential that we markedly raise the efficiency of the building industry – and that of course means increasing productivity at a much greater rate. As I have already indicated, on the repetitive side of civil engineering, great strides have been made and great further strides can be made, but by and large in building this is not so, even on repetitive schemes such as housing. If my assumptions are correct, then it is basically not a lack of ability to produce the technological changes, but rather the inability, or lack of incentive, or desire of 'the industry' to use them. In using the words 'the industry', I of course mean all those who are engaged in it, be they architects, engineers, quantity surveyors, contractors or operatives. How are we to change this situation? Let us spend a few minutes trying to find out what is the present structure of the industry, and what changes need to be made.

It is a most fragmented industry. There are over 75 000 firms of contractors engaged in building, 90 % of whom employ less than 15 operatives. A large number of the men engaged in the industry are now either 'self employed' or employed by labour-only subcontractors and figures on this are not fully known, but may well amount to over 30 % of the total. Although the large sites are highly organized from a trade union point of view, under 40 % of the operatives in construction belong to the appropriate union. There are over 20 major unions involved in construction (although the position is beginning to alter). The top ten contractors carry out less than 20 % of new work, and not one contractor carries out as much as 4 %. By comparison it is quite normal in other major industries for one firm to have over 40 % of the market!

Designers are equally fragmented and, except in rare cases, their duties and functions are separated from those of contractors. There are approximately 20 000 qualified architects in

Britain, 3 % being engaged in teaching, 8 % in industry and the remaining 79 % being equally divided between private practice and the public sector. There are 2800 private practices, i.e. on average they only employ three qualified architects per practice, and a further 800 local authorities undertake design work. Whereas most buildings are designed by an architect, there are also consulting engineers, quantity surveyors and other specialized designers employed, and they are almost equally fragmented.

In the present stage of development in the construction industry (other than for private housing and certain property developments) the vast majority of building schemes are controlled by the architect. Except in very rare cases he does not ‘manage’ the scheme in the true sense of the word. By ‘manage’ I mean control the scheme from its very inception through to its completion, including the control of finances and costs. The architect in turn probably ‘sub-lets’ the design of the structure, the heating and ventilating and other specialized design work either to consultants or specialist subcontractors, and as I have already indicated, there is the quantity surveyor as well. On a moderately complicated ‘one off’ building the amount of work which the main contractor carries out himself is generally well under 40 % and of the remaining 60 % a very large portion is carried out by specialist firms many, or indeed sometimes all, of whom are nominated by the architect. Whereas under the contract these ‘nominated contractors’ become the responsibility of the main contractor, as the main contractor has little or nothing to do with their appointment, and indeed in many cases they are appointed before the main contract is let and their programme is agreed with the architect, the main contractor’s power to ‘control’ them efficiently and effectively is often by no means as great as it should be if the contract is to proceed really well. Although most buildings are designed by architects and the consultants are responsible to the architect, just for good measure, the quantity surveyors almost invariably are not, being responsible to the client direct.

The vast majority of clients are inexpert at controlling building projects, for – unless they be a mammoth industrial complex – the vast majority of them only build once or twice during the active business life of their senior executives. The ‘learning curve’ is such that if they do control a new building project more than twice they become expert at it – but they have a habit of retiring before passing the knowledge on to the next generation!

To ‘illustrate’ the confusion that fragmentation causes in practice, I recently went round a most involved and vast contract of many millions of pounds value where my company are the main contractors. After looking round this most complicated scheme I turned to our project manager and asked ‘Who is in charge of this building?’. He hummed and hawed, and in the end I did not get a precise answer – nor could anybody tell me because there was just not one person who was finally responsible to the client which was a public body. It certainly was not us, it was not the architect or the engineer, or the quantity surveyor, each of which was individually responsible to a committee, and it was in fact this large committee who was really responsible for the totality of that very large and most complex building – though I doubt if they were fully aware of this! This is not just an extreme example, for I can assure you this kind of situation is more normal than it is exceptional.

I am sorry to spend such an amount of time in defining the present structure of the building industry – but I can assure you I have only just touched on the subject. This is a vast industry which encompasses every range of building, from a simple house to a most involved hospital; and the differences in methods of management are inevitably just as wide. However, the more I know about the structure of the industry and the more I know about how other industries

work, the more am I amazed that this industry ever finishes *any* building on time, at anything like the original cost – and as you all know there are too many buildings on which neither of these conditions apply!

Having described what I consider to be the chaotic situation that exists in much of the building industry, how can we hope to really effect a massive change? Indeed in certain sections of the industry there may well be no need for change; for instance repairs and maintenance are generally far better carried out by small builders who are better equipped for this kind of work than are major contractors with their higher overheads. Nevertheless, I am sure that in the case of the large sector of the industry that deals with ‘new work’, some fairly radical changes are necessary, therefore let us examine how they might occur. First, like all meaningful change, I am sure it must be of an evolutionary nature, and not be brought about by revolution. Secondly, I suggest that there is little incentive for anyone who is at present engaged in the industry for his own benefit to endeavour to effect the necessary degree of change. Indeed, I wonder whether I am being wise in giving this lecture at all, because my own company appears to do ‘very nicely thank you’ out of the present system, and my presence here today may possibly put at risk the good will which we have engendered over a century with our professional friends, but I hasten to assure them that it is certainly not intended to do so; having I hope, made it clear that those engaged in the industry have little incentive to change under the circumstances! Not unnaturally, the industry is not ‘research orientated’, but rather ‘traditional orientated’. I hope I have clearly shown the need for change but how, in view of what I have said, do I think it is ever to be achieved? I believe it is the client who will have to demand that it be done in his interest, and when he does there will be plenty of able people who are knowledgeable about the industry who are prepared to ‘have a go’, perhaps along these lines:

For many years the relatively young oil industry and certain other youthful progressive high technology process industries, who are not encumbered by tradition, and in which time, cost and performance are of vital importance to any decision to proceed with a new project, use a highly skilled specialist as the ‘main contractor’. This main contractor takes total management responsibility for the scheme, though he rarely does any physical work on site. He controls the engineering design, which he generally, but not always, carries out himself hiring specialized designers for building civil and other engineering works. He divides the contract into parts, and lets out these parts to major contractors in that particular field, be it building, civil, mechanical or electrical engineering, but he as ‘main contractor’ is entirely responsible for the complete procurement, progressing and general management of the scheme including controlling of all costs. That means he takes full responsibility for producing the scheme on time, at the right cost and to the correct performance, so that the market for which the scheme is being constructed is truly ‘caught’ by the client and not missed due to delays, or over runs in cost. To enable the ‘main contractor’ to give the client his scheme at the right price, it is essential that all designs he uses incorporate the latest methods and techniques for, under this form of contract, both the design and the construction have to be fully competitive. The rate of technological change in these industries is extremely rapid, and both the client and the main contractor have to be very research orientated if they are to survive. As I have already tried to indicate this is in great contrast to the building industry, which is on the contrary very traditional in its approach.

Another example is that of private housing and property development. Before World

War I very few people owned their own house because the process of acquiring a private house was so difficult and costly they could not achieve it. After World War I, the 'speculative house builder' arose. Together with the simultaneous rise of building societies, they have together developed the present market in private housing. Similarly, the really successful property developers who have arisen only since World War II and who now play such a vital part in the growth of our infrastructure, control their schemes in their entirety. In both cases the organization sees the need, assesses the market, obtains the land, processes it, develops and builds, and arranges the finance for the customer, as well as selling the houses or the scheme. Many heads of such businesses are, by background, either builders or estate surveyors, but they need not be – they just need to be good sound businessmen, who see an opportunity, know how to manage it and take it.

As constructing 'one-off buildings' becomes ever-more complicated and involved, with more and more trades and specialized skills, and as costs rise at a greater rate than in other capital goods industries, the pressures that are being brought to bear by the client are beginning to show some signs of becoming effective. There are indications that the more sophisticated clients of the building industry who are not themselves developers, but who want a 'one-off building' are, in some countries, especially in the United States and to an increasing degree in Britain and Western Europe, beginning to recognize that the present method of building must alter if they are to achieve all their objectives. There is a move towards similar kinds of contracts that are used by the oil industry, which in building are commonly called the 'management contract'.

At this stage, may I put at rest the minds of my professional friends, who may be beginning to suspect that I am merely preaching another form of 'package deal' – for I am not! The 'package deal' which has a place (albeit I think a relatively small one) in the affairs of construction, is in my opinion, not a euphoria for curing all the ills of the industry. I am *not* suggesting that architects and engineers should be responsible to contractors, but I am suggesting that architects, engineers, quantity surveyors and contractors alike should all be responsible to the manager, whether the manager, be he the client himself (as in the case of a property developer) or in other cases a new breed of manager. This manager may well be from one of the existing building construction professions, i.e. an architect, engineer or quantity surveyor, or a contractor, but need be neither, but just an honest to goodness modern, well trained manager who really knows what management skill is all about, and can control every facet of the scheme including programming, finance, design, construction and costs. 'Management' in its widest sense is, I believe, the key to the development of improved technology.

It is possible that only when enough of our large projects are efficiently 'managed' (and there are a number of large schemes already being so managed) that we will be able to benefit to the full from the fruits of the inventors, architects, engineers, scientists and technologists. If I am correct, as I have already indicated, I do not expect to see a revolution, but an evolutionary change, that indeed may well have already begun, but which at first will only show its benefits slowly, and then evolve at an increasing rate.

Although I talk about 'management' contracts, I recognize that this may not be the answer, but I believe that over a relatively short period of time there must be an evolution towards a system of operating which positively encourages all of those engaged in the construction industry to look at their responsibilities in a much wider way than mostly occurs under the present form, and to positively encourage the embracing of technological change.

As I have tried to indicate, at the moment the opposite is almost – though not altogether – the case.

I end as I began, by saying that the problem is not lack of inventiveness, but lack of the structure of the industry which at the moment precludes inventiveness being fully effective. If the structure of the industry evolves satisfactorily, I believe that we will, in the next decade witness an explosion of new technologies and methods of construction – but only if the structure of the industry is radically altered.