THE ECONOMICS OF STATE HOUSING IN THE UK

by
Ken Dixon Dip Arch.

incorporating occasional paper no.40 presented to The Economic Research Council, May 1982

Edited by Paul Marsh Dip Arch RIBA

Systems Design Publications
41 North Road London N7 9DP
Telephone 01-607 2209

£1.50

PREFACE

This booklet evolved from an occasional paper I gave to the Economic Research Council in May 1982. It was the result of many years of thought on how best to achieve viable UK house building, capable of producing the quantity of homes without debasing the quality. It was also made against the horrific evidence of building failure, which is presently a major political issue and which demonstrates clearly our inability, during the last two and a half decades, to produce a workable solution.

In 1976 Gordon Wigglesworth, GLC housing architect, wrote in the **Architects' Journal** (AJ 11/8/76) of the failures that had resulted from the building innovation boom since the last war – the chief culprit being industrialised building. He entitled his article **Building Defects – who is guilty?**

Like many an official architect before him, he side-stepped his own question, saying in effect no one was to blame; research and development was just under-capitalised.

Today, even more than in 1976, we are aware of the enormity of the cost of the last 25 years of inept house building. As I pointed out in a reply to Wigglesworth's article: "We probably spend per capita more on R and D in building than any other country. Mr Wigglesworth's observation that local authorities appear not to be undertaking R and D in relation to the money expended in output, is quite an extraordinary invitation to local authority profligacy . . . Risk taking innovation and R and D belong to those doing the selling; architects are buyers and they should be careful not to buy their own innovations on behalf of their clients ".

The solution lies in placing the ultimate responsibility for paying for failure on the perpetrator. The following pages suggest how this could be done.

Ken Dixon

INTRODUCTION

Ken Dixon and I first met earlier this year when he invited me to open his Alutim window gallery. Although we never met before that we've mutually admired each other's writing from afar, which is generally the basis for a beautiful friendship.

Those of his views with which I particularly concur are that the worst way to bring housing to inner cities is for local authorities comprehensively to redevelop large sites, which then become areas of blight and of riot during the long years while they are awaiting redevelopment; and when they are redeveloped circa 2020 they will be in building forms (like yesterday's high-rise flats) which are more expensive and more faulty than others and also by then disliked by their inhabitants. This is what comprehensive redevelopment means; it's a name for a project by a nut who has managed to cut himself off from the ever-changing day-to-day signals from the market.

As has been shown all over the world outside Britain, the best and far the quickest way of rebuilding inner cities is for architects or other owners of copyrights of successful buildings to re-emerge as master-builders who are not content to hang around waiting for a client's brief. The most sensible financial arrangement is some version of that used in the sunbelt or other successful states of North America, in Sweden and triumphantly in successfully rebuilt Singapore where small builders build and let housing units at pre-determined rentals to people on the local authority list, becoming temporarily the landlord on behalf of the State, but in practice trying to transfer the mortgage as soon as possible.

As Ken Dixon says "building defects soon cease to be a growth industry when the builder becomes the landlord, if only temporarily". Also, you can then get small sites developed and yet begin to get something like a product line into the construction industry. The same designer will repeat the same design somewhere else, but each time introducing new refinements and processes.

The part of my own writings which Ken Dixon has been kind enough to agree with is that in the 1960's and 1970's I was making myself unpopular by saying that America and Europe were probably drawing to the end of the era dominated by very big business corporations, because it must soon be seen to be nonsense to have hierarchical managements sitting in sky-scraping offices trying to arrange how brainworkers (who in future will be most workers) can best use their imaginations. So in the period when governments were driving artificial conglomerates like British Leyland and British Steel irretrievably bust by making them inefficiently larger, I

was saying the main increases in employment were bound to come in smaller firms and that larger ones would have to rely more and more on subcontracting.

I think the figures now prove we were right and the advocates of giantism potty. In America since 1967 just over 9 million new jobs have been created in the private sector. During that period employment in the 1,000 biggest American companies has gone down. All of the 9m net jobs have been created in smaller firms, and over 70% of them in new firms, even though half of all new firms in America disappear within five years.

And, although the figures are fiddleable, broadly the same trend is shown in, I think, 23 of the 24 OECD countries. So our present business conjuncture is that the bigger and stabler firms are running down their employment, and more than the whole of the net increase in jobs comes in smaller firms which however frequently go bust. Ow! And some thought needs to be given to picking winners in this new conjuncture. Ken Dixon's ideas about combining design and sales as a single function appear interesting in this regard.

The small businesses that succeed are based on:

(a) tight quality control and

(b) giving the customer a choice.

The small businesses that fail are those where there is no quality control, and the big businesses that fail are those run hierarchically from the top down.

In the related field of furniture, the shares you were being invited to invest in during the giantist days of the 1960s were mass producers of furniture like Harris Lebus – oh dear, good-bye. Meanwhile, as Ken Dixon points out, Conran gave up his furniture manufacturing factory in the 1960s and concentrated in his Habitat shops on design and quality control and buying from the most efficient, because smaller, producers.

The views expressed in this publication are a welcome breath of fresh air in a subject that is heavily overlarded by political dogma.

Norman Macrae
Deputy editor of **The Economist**

THE ECONOMICS OF STATE HOUSING IN THE UK

Public and private sector housebuilding contrasted

Between 1960 and 1979 three million housing units were built in the public sector, and two million in the private sector. This presents a unique opportunity to compare the performance of both sectors because they finance the production of a similar product. J. K. Galbraith in his book **Economics and the Public Purpose** divide workers into those in the *planning system* and those in the *market system*. The public sector here corresponds with the planning system and the private sector with the market system. Costs in the planning system can more easily be passed on to the consumer; its growth, therefore, tends to be inflationary and thus not in the public interest.

Most of the theoretical work on housing is done by people with a concern for the under-privileged. They work almost exclusively in the planning system either as academics, civil servants or as local authority officers. The weight of academic work done is therefore sympathetic to the planning system. This paper hopes to show that the public interest would be better served by an extension of the market system.

A 1978 D.O.E. Report **Value for Money in Local Authority Housing** concluded that local authority housing was some 20% more expensive than private housing, comparing like with like. This should not come as a surprise. The decision takers in public housing are a many-faceted bureaucracy with a commitment to a given geographical area. The decision takers in the private sector consist of (usually) single product, simply structured managements with clearly defined goals and no territorial constraints. The private sector also gains in that repetition, the essence of cheap and reliable building, is its chief characteristic.

Local Authorities are concerned with many types of building; schools, old peoples homes, refuse depots and the like. The buildings are of necessity prototypes and there is a tendency to treat housing similarly, i.e. buildings purpose-designed for every site. Indeed when one is confined to a particular area it is difficult to do otherwise. The private sector can choose those sites which are suitable to its product.

Building failures and defects

Also important is the problem of building failure in the past 20 years, both in the fabric and in functional aspects. By far the biggest functional error (the fabric was not too good either) was the choice of high rise industrialised buildings for housing families. These high rise blocks were confined to the

public sector. No speculative builder put them up for resale for the simple reason that they were uneconomic.

Not only was local authority housing some 20% more expensive to build and functionally accident prone, it was also subject to building defects on a much greater scale than the private sector. (See *Appendix A*) The causes of this discrepancy raises issues of national importance. In particular I shall focus on the ill conceived Industrialised Building saga of the 60's. J. K. Galbraith's contention that society will adopt those attitudes that are favourable to the groups rather than individuals who control large and complex organisations (which he called the "Technostructure") even if these run counter to desirable economic and social goals, seems to account for this development.

Failure of industrialised building

In fact support for industrialised building was widespread, it was even encouraged by the Architects Journal[1] even though it was not in the interests of architects. Industrialised building was welcomed by the Technostructures of the left and the right – which may explain the paradox that a bourgeoisie state promoted a building form more expensive than others and disliked by its inhabitants.[2]

1. A leading article in the **Architects' Journal**, 8th March 1967, went so far as to infer that the Government should actually give John Laing a subsidy to carry on with its 12M Jespersen building system: "The news that John Laing has failed to make a profit on 12M Jespersen – a Danish system much used for army housing but also being used at Livingstone new town – is disturbing. Everyone knows there are far too many systems but the top ten should surely justify the investment made to produce them. The Government has given heavy support to IB but its exhortations must be followed through. Local government reform, which everyone hopes will produce larger administrative areas, is still years away: in the meantime housing orders in the public sector must be entrusted to authorities of at least large county size if IB is to survive.
   In areas where new towns are to be built or housing needs are particularly great, crash programmes should be launched to apply the industry's resources where they will be most needed. The administrative hurdles between thinking of a new town and building it are tediously obstructive: they must be swept away if we are to come anywhere near doubling our building stock within thirty-five years.
   The irony of Laing's loss is that industrial potential is being wasted when Cathy has no home: whatever the economic state of the country, this anomaly cannot be accepted."
   This leader appeared to be accepted without comment by the majority of the architectural profession. I, however, felt it could not go unchallenged.
   In the correspondence column of that magazine on 22nd March 1967 I commented at length. The nub of my reaction is contained in the following paragraph: "The final paragraph of your editorial is quite incredible. You suggest that society should amortise John Laing's investment, whatever the cost. What are things coming to when a journal published for the architectural profession recommends a course of action which would reduce its work load so that society could enjoy indifferent buildings (at best) and at excessive cost. Really the AJ must sort itself out a little better than that."
2. Robert MacCutheon **High Rise Flats in Britain** Political economy and the housing question 1975.

For the right, it held the promise of some form of monopoly for the larger companies. For the left, it fitted very well into orthodox Marxist predictions of Capital Accumulation. It was welcomed by the Unions as a countervailing force to the "Lump";[3] Labour-only sub-contractors who are virtually impossible to unionise. It was also popular with the elected local authority councillors and their officers who like to plan on a large scale and to be seen to be active.

The mirage of Industrialised Building was that these advanced techniques would so reduce building costs that two or three systems would emerge with sufficiently long order books to warrant the increased capital investment. The larger building contractors could then plan their production like self-respecting industrialists instead of having to tender from project to project on designs prepared by others. In other words the production of housing would be monopolised and planned.

One might have thought that by now the evidence against the vertically integrated system built methods of construction was so overwhelming that the argument was over. Surprisingly, the following conclusion was drawn at the 1980 Bartlett School of Architecture summer school, **Production of the Built Environment.**[4]

> "Architects . . . must move from their nineteenth century positions of maintaining defensive and exclusive codes for private practitioners to unions of technical/professional workers in close relationship to site and factory production".

Michael Ball a marxist economist elaborates on this in his paper in **Capital and Class** 1978 Bulletin of the Conference of socialist economics. M. Ball argues:

> "What is wrong is that there are fewer opportunities for capital accumulation in the building industry than in the other industries. Average percentage increase in productivity in industry since 1907 was 2.1, in building it was only 0.2. He concludes that "The contradiction between the process of production in the house building industry and the need of the capitalist mode of production in general is a major 'housing problem' for British Capitalism. British housing policy should be structured around this contradiction".

3. "The Lump". This phrase was coined to describe groups of workers who contracted to do a set amount of work for a "lump" sum. They arouse deep emotions from the unions as can be expected. Detractors would say that they are unreliable, produce shoddy work and avoid tax. People who employ them, it is claimed, neglect safety standards. However the tax problem has now been largely overcome and, because it is now so universal, it is not quite as casual as it may seem. Both sides prefer to keep an ongoing relationship.
4. Three summer schools on the **Production of the Built Environment** have been run by the Bartlett School of Architecture, 1979, 1980 and 1981. It has attracted participation on an international level and papers presented are of considerable academic weight.

(His figure of 0.2 appears to be arguable.[5])

It would seem that manufacturing capital and Marxist technostructures both have an interest in promoting monopoly capitalism. The motive for the former is to increase return on capital investment. The motive for the latter is that the resultant monopoly will be easier to take into public ownership. Both share a common interest in reducing competition.

Can the building industry be industrialised?

The fact is that the building never fitted comfortably into industrial society. It was always considered fragmented, old fashioned and resistant to change. However in recent years the importance of small businesses in solving (post-industrial) unemployment problems has been recognised. Governments could well learn from the building industry which depends on a large small business sector.

Barratt Developments has become the most successful and largest house building company in the U.K. It ascribes its success to the fact that its management is highly devolved with no less than 32 operating subsidiaries, each with its own finance directors and other staff normally found at group headquarters. In 1978 it took over as number one housebuilder with sales of 11,000 homes as against Wimpey's sales of 7,000 (Guardian report).

The inescapable fact is that labour only sub-contracting is more productive than more conventional employer employee relationships. P. S. Stone in his book on Building Economy points out that, where the principal is one of the operatives, as in independent labour gangs, productivity is some 15 – 20% higher than where gangs are made up of employees. Unmistakably, the emergent mode of production in free enterprise economies is a horizontally integrated building process based on most work being carried out by sub-contractors.[6]

Studies of gang labour in Denmark (see *Appendix B*) show the advantages of including this form of production into the mainstream of economic life. The Danish experience, where the unions co-operated with management, illustrated how independent gang labour resulted in higher productivity, less de-skilling, and less division of labour. Workers also felt that they had some influence on, and thus an interest in, building innovation.

If the building industry is going to be dominated by (labour intensive) sub-contractors, how are we to derive the fruits of innovation? One way is to encourage design innovators to act in an entrepreneurial role. A good example is the timber framed house with a brick (usually) outer skin. This innovation (for the UK) is now very popular. An early adopter of this method was James Riley who produced the "Riley form" timber frame housing system. It was not ordinarily an investment opportunity for a large firm because it did not generate much added value. It merely consisted of turning over materials, something in which self respecting industrialists do not like to invest. Its major investment lies in know-how (which then leads on to consultancy fees). In other words, there is a separation of design from production.

The separation of design from production is often attacked but it is in fact very respectable; for instance, it forms the basis of the Marks and Spencer philosophy. It could be said that M & S act for the consumer in much the same way as an architect does.

Another example of the benefits of separating design from production is from the furniture industry. Compare the fortunes of Conran's Habitat company to those of Harris Lebus, Grange furniture and recently even Schreiber furniture (part of GEC). Conran gave up his factory in the early 60's to concentrate on design and selling through the Habitat chain of shops. The public flotation of his company in 1981 was over-subscribed while those who sought to accumulate capital through mass production of furniture have fared very badly over the years. Furniture is another industry where it seems its products are more economically produced by smaller firms.

In a curious way we hear little about one successful attempt by the planning system to "standardise" the building process. This was applied initially to the schools programme, where public sector architects designed the system in detail and invited manufacturers to tender for components on the basis of performances specifications. Here the separation of design from production was so successful that the system (CLASP and SCOLA) were even licensed for production abroad.

What can be done?

How can we get better value for money in local authority housing and avoid the incidence of building failure that has dogged the public sector housing programme. Three actions are proposed:

(1) Encourage repetition

The owners of the copyright of the more successful buildings should be given greater opportunities to repeat their successes. Information on available sites could be aggregated and published. Proposals could then be

5. Peter Dickens (University of Sussex) in his paper **Corporate Capitalism and the Building Industry** indicates a 40% improvement in productivity between 1950 and 1970 in the UK.
6. A firm of architects, Moxley, Jenner & Partners, provided evidence of substantial savings in large scale refurbishment work by working directly with sub-contractors and omitting the main contractor altogether. The project architect set up his office on the site to supervise the sub-contractors. Based on this experience SAMM, The Society for Alternative Methods of Management, was formed to promote this method of working.

invited from copyright owners, usually architects. Repeating the same design would give the designer an opportunity to "value engineer" what will now have become his "Product Line". Architects specialising in housing would practise more like industrial designers (i.e. as in the Riley form system) constantly improving their product.

Eventually we could look forward to a situation where the same designs would be adopted in the private sector. In appearance the difference between public and private housing could disappear, which must be the most desirable end state. Normal architectural criteria could apply to ensure that repetition results in harmony rather than monotony and that only the best designs get repeated. This would also solve the problem of planners adjudicating on design matters.

(2) Encourage small business in the Construction Industry

In the 60's the full weight of government intervention was directed to encourage large vertically integrated construction companies. Subsidies were even given to high rise blocks built by industrialised methods. Support should now be given to research in "Gang labour" similar to that carried out in Denmark.

At present labour-only subcontracting is felt to be a necessary evil. It is time that this form of work practice be brought into the mainstream of economic life. Government could help by making this an aspect of their drive to encourage small businesses. There seems to be no fundamental reason why the unions should not adapt to protecting labour-only subcontractors rather than paid employees.

(3) Alter contractual arrangements so that building failures cease to be a drain on local authority finances

In many countries including the USA, Sweden and Hong Kong builders are financed directly, which avoids the problem of building defects liabilities. In the UK it could work as follows: The Local Authority would acquire the land it needs and thus take out land rent from the equation. From then on the *market system* would operate. Proposals would be put up from developers (who could be architects with their distinctive "products".) These would be based on tenders to let the housing units at a fixed rental. The Local Authority would then advance a mortgage sum to the builder to realise the project. If the building turns out well, the builder will find it easy to sell the flat or house to the tenant, the mortgage being transferred from the builder to the tenant or the new owner. If there are gross defects the builder will have to put them right before the "mortgage" can be transferred. The idea is to create a buyer-seller interface after the buildings have been occupied for a longer period of time than now obtains. The element of subsidy could come in on the terms of the mortgage as applied to individuals.

Conclusion

Government intervention in housing is an established fact. The manner of this intervention determines the nature and the relationships of the participants in the production process. The incidence of failure both functionally and in the fabric of Local Authority housing in the immediate past, suggests radical changes which favour an extension of the market system. However an examination of the published work on state housing shows that most of the informed people in the field have a personal commitment to the *planning system*. Also it is in the *planning system* that experts are relieved of the necessity to compete, and they cannot be expected to take initiatives to alter this state of affairs. Changes will, therefore, have to be imposed on the system by politicians based on alternative academic and research inputs. These inputs would well come from research work carried out in business schools which have experience of business practices in both the planning and the market systems. The establishment of a chair for Post-Industrial studies might be appropriate.

APPENDIX A:
Evidence of Building Failure

When new projects are launched PR experts are invited to spread the word, should they fail the participants keep as quiet as possible. There is little source material published on building failure except articles in the technical journals. The following are some of them:

Building Design

March 1976: Estimate of £20 million for repairs to council houses built in the 50's – 60's.
January 1979: A survey of 60 local authorities revealed a bill for some £200 million for building defects in LA housing.
November 1979: **Scandal of the Five Year Old Failures.** From a sample of less than 10% of local authorities, 40,000 people were effected by building failures. From the sample only one block of flats was in the private sector.
August 1981: **Post-war Housing is Failing Fast** Association of Metropolitan Authorities (AMA) survey. One LA outside London reported that 20% of all dwellings were affected.

Architects' Journal

11 August 1976: **Building defects – who is guilty** Article examining the causes of defects in public sector housing by Gordon Wigglesworth.

Around 1976 the National House Building Council were paying out only £3.5 million per annum on claims for faulty workmanship in private sectors. (P.23 **Building with Direct Labour** Conference of Socialist Economists)

The Association of Metropolitan Authorities survey singled out six concrete building systems as being particularly troublesome. From my own experience as a former company architect to a system builder, it would seem that suppliers had to cut corners to be competitive with traditional methods. Everyone wanted the systems to succeed which put pressure on those acting for the consumers to be less strict in their quality control. Systems generated work for technostructures, traditional methods do not. The government of the day created the National Building Agency to scrutinise the systems available. This immediately created a body of expertise (a technostructure) with a vested interest in building systems *acting for the consumer*.

The systems that proved defective were in the main of precast concrete. This is to be expected because concrete takes days to set. To prefabricate it one has to resort to fast setting devices which entail a higher order of quality control. One device is to use High Alumina Cement, a material which is now completely discredited. Britain was one of the last countries to ban its use. This indicates the hold the "Technostructure" has over us. A large number of experts are needed to prefabricate a slow setting material such as concrete within housing cost yardsticks. In Amsterdam the Technostructure only managed to build one UK style high rise comprehensive redevelopment (Dapperbuurt), before public protest put an end to it.

As Professor Reg Revans remarks "experts have the UK by the jugular".

APPENDIX B:
The gang system of semi-skilled labour in Denmark

Semi-skilled construction work in Denmark is largely carried out by gangs of between 6 and 20 operatives; these workers being paid according to a group incentive scheme, in which remuneration is more or less directly dependent on the productivity of the whole gang. All members of the gang receive the same pay and the gang is assigned an individual project or part of a project to undertake.

The gang is organised by a leader who is himself a member of the gang and is paid from the group piece rate.

The rate for the job tends to be established in a series of negotiations between the gang leader and the contracting organisation, based on an initial agreement on an approximate lump sum for the whole work and an approximate hourly rate. In broad terms the pay received by members of the gang is related quite evidently to productivity.

Also the gang has certain rights of self-management. It decides on the division of work between gang members, ways of co-operating within the gang, recruitment, dismissal and work methods employed.

The Danish gang method differs from the English 'lump' system in as much as under the Danish system workers are considered as employees of the contracting firm with full rights (sickness pay, accident insurance, holiday allowances etc).

The effect of the Danish system is to encourage flexibility of work within the gangs. It also transfers some of the interests of the employer to the workers, who become intensely concerned about increasing productivity even though it may result in an intensification of their own work. To a certain extent the traditional clash of interests between employer and worker is transferred to within the workers' gang.

This brings stress to bear upon the gang leader in his man-in-the-middle negotiating role. It also makes each member of the gang extremely aware of dependence on his fellows in the gang, often leading to critical recruitment to gang membership and, sometimes, difficulty for weaker or older members of the team to hold their place in the gang.

More information on this subject is contained in a paper presented by S. Goth et al at the 1981 Summer School of the Bartlett School of Architecture – **The production of the built environment.** The paper was entitled **Gang organisation and developments in the labour process in Danish semi-skilled construction work.**

POSTSCRIPT

The separation of design from production

I have mentioned the desirability of separating design from production in the building industry. It may be that this contention needs some small amplification.

A wooliness surrounds this subject because vital interests are at stake. No manufacturer relishes the thought of being a subcontractor to designs prepared by others and subject to their quality control. The only important thing is *what is best for the consumer?*

To unravel the truth one must look to how people spend their money rather than what they say. In the industrialised building days the large contractors were all in favour of high rise flats – for Local Authorities. They did not invest in them for their own property developments. By the same token, they do not use in-house architects for (say) their own city centre developments. I believe that many contractors would agree that for in-house architects to design a contracting company's prestigious headquarters would be inviting an unhappy building experience.

Two writers throw some light on why contractors can quite happily employ quantity surveyors or engineers, but have more difficulty with architects. Elliott Jacques in his book **A General Theory of Bureaucracy** describes the significance of differing levels of abstraction in various jobs. The work of a production line operative can have a time scale of a few minutes. A managing director planning a new product will have a time scale of many years. The latter's job involves a very high level of abstraction. High remuneration is 'felt fair' by society for jobs of high abstraction. The more senior the job; the higher the level of abstraction.

Two Bills of Quantities of the same building will be more or less the same. Reinforced concrete designs for the same building will be roughly the same. Give two architects the same brief for the same site and you are bound to get totally different schemes. The architect's work involves a level of abstraction much greater than that of other professions in the building trade. Architects are very difficult to incorporate into bureaucracies and bureaucracies are necessary for the economic division of labour.

William Kingston, lecturer in Innovation at the Dublin University School of Business goes into the problem of the management of innovation in bureaucracies. The wise bureaucrat, when confronted with having to take a decision on innovation, makes sure he has 'third party cover'. That is, someone higher up has agreed. If the new idea succeeds, his superior will in any event take the credit; but if it should fail, he will get the blame. And, it must be remembered, it is in the nature of things that most new ideas fail.

Where a contracting company specialises in one building type, there is little innovation and the design element has a much lower level of abstraction. In this case the contractor can get a reasonable value for money from the in-house design department of the construction company; all other things being equal.

The majority of buildings are prototypes and thus involve innovation. However this does not mean that every part of the design is experimental. (Except buildings like the Sainsbury Arts Centre which follow a different set of criteria altogether.) Subcontractors, for example, will be repeating the same method from one building to the next. The greater the repetition; the more reliable the building – and vice versa. I believe this is the lesson we can learn from the USA where building costs are dramatically lower than ours.

The architect for a building must act for the building owner, but if he wants to protect himself and his client under the Sale of Goods (Implied Terms) act he should be relying as far as possible on the expertise of the *seller, ie* the subcontractor or supplier. However the subcontractor can hardly be expected to give an objective opinion about the worth of his own product or service.

It is usual when contracts are drawn up, for lawyers to act for each party. I have believed for many years that the missing ingredient in the building business is the broker acting for suppliers and sub- contractors in relation to contracts into which they enter with builders and the building owner's architect. The industrialised building boom produced many architects who specialised in research and development. It is these specialists who could well become 'systems brokers' (every product is part of a system within the context of a complete building).

BIBLIOGRAPHY

P. A. Stone	**Building Economy** 1966 Pergamon
D.O.E. Report Oct. 78	**Value for money in local authority housebuilding programmes**
Merritt S. 1979	**State Housing in Britain** Routledge & Kegan Paul.
Goth et al 1980	**The Working Environment of Semi-skilled Construction workers in Denmark** Dept. of Construction Management
Proceedings of the Bartlett Summer School 1979, 1980	**Production of the Build Environment** University College, London
Jewkes, John	**A Return to Free Market Economics**
Jaques, Elliot	**A General Theory of Bureaucracy**
Galbraith, J. K.	**The New Industrial State**
Ravetz, Alison	**Model Estate** at Quarry Hill, Leeds
Bowley, M. 1966	**The British Building Industry** Cambridge University Press
Ball, M. 1978	**Capital and Class 4** British Housing Policy and the Housebuilding Industry.
Rogers, E. M.	**Communication of Innovations.** Collier – Macmillan.

Norman Macrae talking to Ken Dixon at the opening of the Alutim Window and Door Gallery.