AD

SIKORSKY SKYCRANE

Whatever happened to the systems approach?

FARRELL -

James Meller: Since the working title of this issue was 'Whatever happened to the systems approach ?'it seemed a good idea to start by describing what I thought was meant by 'System'. I take it that a 'Systems Approach' is a response to complexity characterised by particular emphasis on the whole. A systems approach describes a whole in terms of the relationship of its parts, the interactions of those parts with each other, and in the case of open systems, with their environment. The word in this context refers to two related ideas described very clearly by Chris Alexander in an earlier issue of AD (12/68). Firstly 'System' as a holistic way of looking at a 'thing', event, or process in context. Secondly 'System' as a set of rules determining the ways in which kits of parts can be put together.

Although you have some doubts about whether you have a 'Systems Approach' to architecture, a number of the things that you have done, and written about, could be filed under those kinds of headings. There are a number of quotes in an earlier issue of AD (2/73) that describe the process that you are involved in. There are such headings as 'Designing the Organisation', 'Service versus Product', 'Architectural style: one approach 1001 solutions'. All these suggest that there is a way that you go about it that is common to all, or many of the situations, yet out of which you produce a varied range of solutions.

Terry Farrell: I think a lot of people have a system, rather than a 'Systems Approach'. I think the second is the more interesting. There are ways of approaching problems which stem from an understanding of systems, as an aid, as a tool. They can lead to a building system like the service tower, or to sub-systems such as the cladding in the factories. But I think we have absorbed this, we don't think about it consciously anymore.

STUDENT THESIS '64
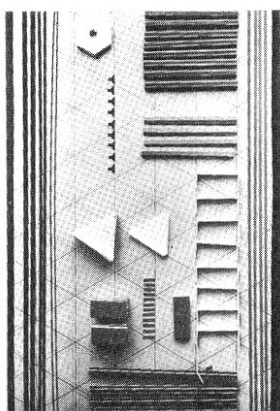
Several of the ideas and attitudes explored by the practise of Farrell and Grimshaw were already apparent in embryonic form in Nick's AA thesis for a university network in Covent Garden, e.g.: 'A university today is a dynamic and unpredictable organism. Any structure, environment or system which attempts to provide for this organism must be as flexible in response as present techniques allow.'
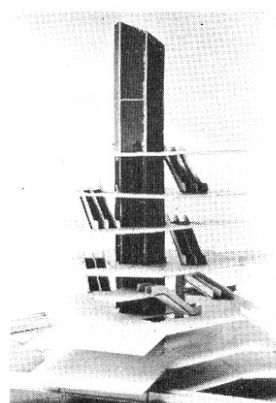
'An important principle concerning the servicing system is that goods, components and equipment can be introduced and removed from the system without disturbing the organism as a whole. This is done by means of service towers which feed into ducts at the rectilinear levels and into the open space at the movement level'.


SCALE 1" = 20' 0"
1 : 240

6. SECTION.
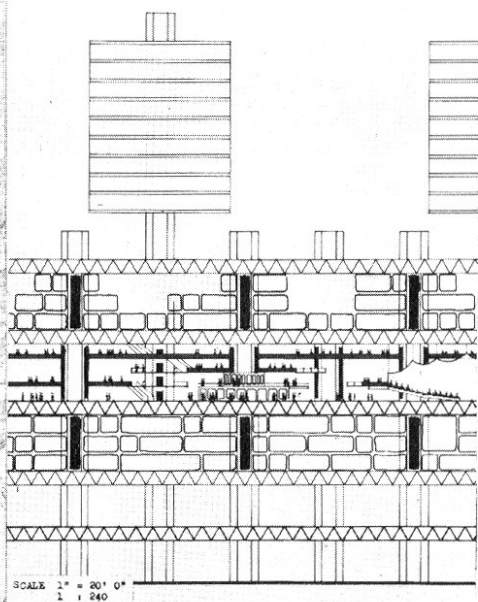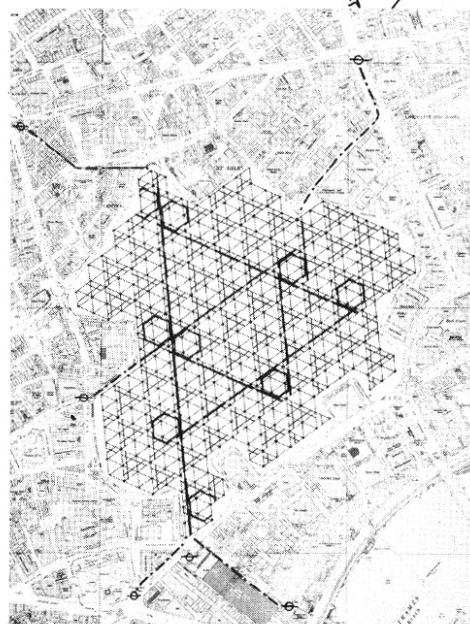
1. UPPER SURFACE:
Play decks and recreation areas but with large areas opening to instructional/workshop/reading spaces below.

2. UPPER UNIVERSITY LAYER.
University Departmental activities: Studio/Lab./workshop facilities for instruction and research. At this level proximity to natural environment would be made use of.

3. COMMUNICATIONS LAYER.
Pretelevision communications system/administration/lecture theatres/seminar rooms/service centres for food, medical, toilet facilities/all specialized equipment and information common to whole university.

4. LOWER UNIVERSITY LAYER.
As upper layer but proximity to entertainments layer would allow research in this field to have a live testing ground.
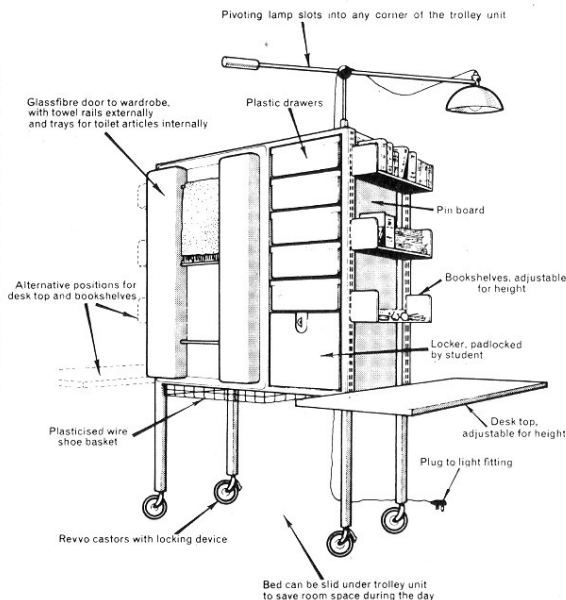
NICK GRIMSHAW
UNIVERSITY JUNE 1965

GRIMSHAW

JAMES MELLER

STUDENT FURNITURE '66
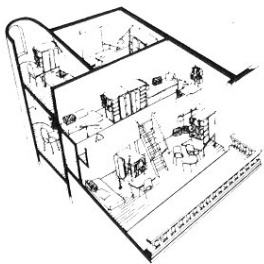
Architecture as shopping list. From the time of Nick's AA thesis onwards, Farrell and Grimshaw have distinguished between the architect as designer and architect as specifier, without having to compromise either. The furniture specification reads as a shopping list for a trip to Woolworths and the local hardware store, and yet assembled wouldn't have looked out of place in Milan.

Pivoting lamp slots into any corner of the trolley unit

Glassfibre door to wardrobe, with towel rails externally and trays for toilet articles internally

Plastic drawers

Pin board

Bookshelves, adjustable for height

Alternative positions for desk top and bookshelves

Locker, padlocked by student

Plasticised wire shoe basket

Desk top, adjustable for height

Plug to light fitting

Revvo castors with locking device

Bed can be slid under trolley unit to save room space during the day

Cost analysis of complete furniture for single room

A. TROLLEY UNIT	£	s.	d.
1. **Metal frame** and accessories, including hinge, hanging rail, fixing strap for pin-up board, large wire tray for shoes, pre-assembly of castors, fixing of "Spur" channel, and a security locker with door	18	17	6
2. **Castors.** 2 No. 3 in. diameter braking castors. 2 No. 3 in. diameter non-braking castors. Both with rubber-tyred wheels on cast-iron centre	1	2	11
3. **Pin-up Boards.** 3 No. 4 ft. 2 ft, including cutting and pre-assembly of fixing strap	3	14	3
4. **Lipped blockboard desk-top,** 2 ft. 6 in. 2 ft. 0 in. Ronseal finish and including pre-assembly of "Spur" cantilever brackets	2	2	0
5. **Shelves,** 4 No. softwood, 24 in. × 8 in. Ronseal finish and including pre-assembly of "Spur" bookshelf ends	2	13	6
6. **"Spur" shelving system.** Including 4 No. channels, 2 No. desk brackets and 8 No. bookshelf ends	5	0	6
7. **1 adjustable light** with 15 ft. 0 in. flex	3	0	0
8. **1 Fibreglass door,** including hanging rails, and fixing holes for mirror and tray fixing, and bar magnet catches	5	0	0
9. **Wire baskets,** 4 No. plastic coated ;; 7/– each	1	8	0
10. **Mirror** with fixing bolts and foam strip backing		19	10
11. **Polythene mug** from Woolworth's			7
12. **Mug holder**		1	7
13. **Tray/drawers.** 5 No. in heavy-duty polythene	6	5	0
	Sub-total £50	5	8
B. BED UNIT Sub-total £15	8	0
C. LOOSE ITEMS Sub-total £4 17	1
Plus: Assembly by students	1	0	0
Total for complete furniture package **£71 10**	9

bed unit / trolley unit / loose items
B / A / C

It was like the discovery of perspective in the Renaissance. For about 100 years everybody did the most exaggerated perspective paintings and everything was about perspective. Then they were no longer 'perspectivists', they were just doing what they were doing. The discovery of perspective was absorbed and that was it. Nobody was ever self-conscious about it again. That was really all that happened. I don't think anyone's abandoned the 'Systems Approach'. I just don't think it is necessary to be very self-conscious about it. I think it has also been shown that an exaggerated reliance upon it is false. It's taken a very short time for alternative technology to demonstrate that total dependence on high technology systems is not correct, nevertheless I think alternative technology is dependent upon a systematic approach.

James Meller: You are saying that at one time the whole notion of 'Systems' was identified with 'high technology'.

Terry Farrell: Yes I think that is true.

Nick Grimshaw: I think that the identification of 'Systems' with high technology was wrong. Building systems imply a fairly low level of technology, or at least a level which people manipulating them can understand — if it is not understood by the users it's useless.

James Meller: You said that a 'Systems Approach' is not exclusive to high technology, and suggested it might have to do with a low level technology, but it really doesn't have to do with a particular technology at all. It is quite independent of the technology. The 'Systems Approach' was mistakenly associated with high technology used in a way that denied the flexibility and responsiveness that should be inherent in a 'Systems Approach'.

TIMBER SHELL HOUSING
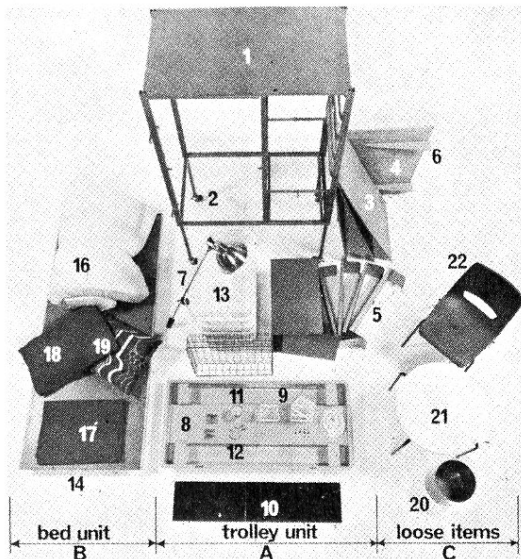
A HOUSING METHOD DEVELOPED BY FARRELL/ GRIMSHAW AND TIMBER SPECIALISTS FOR SMALL, SCATTERED SITES IN LOW AND MEDIUM DENSITY SUBURBAN AREAS.

THERE ARE 8 SITES UNDER WAY, TOTAL VALUE £1·5 MILLION.

CLIENTS :   FAMILY HOUSING ASSOCIATION
            MAUNSEL HOUSING SOCIETY
QUANTITY SURVEYORS : MONK AND DUNSTONE ASSOCIATES
TIMBER ENGINEERING : MARLOW & CO. LTD, BURY ST. EDMUNDS
DEVELOPMENT TEAM : RAY BRYANT   DAVE CLARKE
PROJECT ARCHITECTS : RAY BRYANT DAVE CLARKE
                      JOE FOGES DAVID POSTINS
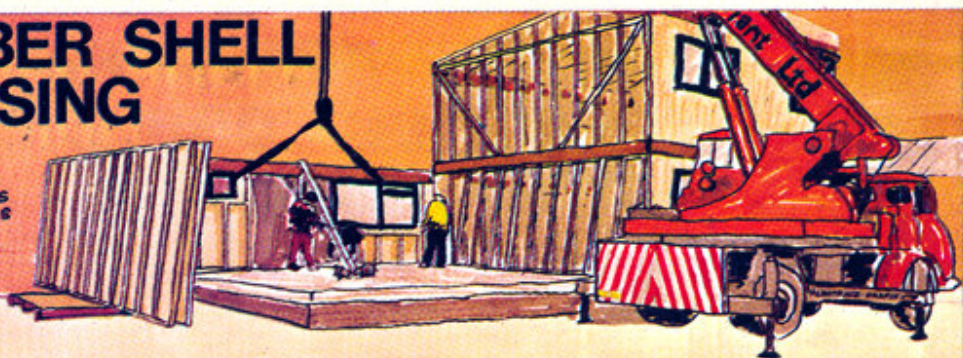
THE SHELLS ARE DELIVERED AS FACTORY MADE PANELS AND ASSEMBLED INTO A WEATHERPROOF STRUCTURE COMPLETE WITH DOORS AND WINDOWS. THE MAIN CONTRACTOR THEN ADDS SERVICES, INTERNAL AND EXTERNAL FINISHES.

THE SHELLS ARE ALL PLANNED ON 3·6 METRE BAY WIDTH ON 2 OR 3 STOREYS. CORE AND SERVICES ARE STANDARD DEPTH IS VARIED TO PROVIDE 4, 5, 6 OR 7 PERSON HOUSES TO PARKER MORRIS STANDARDS

THE COMBINATION OF STANDARD SHELLS VARIES TO MEET THE DENSITY AND HOUSING MIX REQUIREMENTS FOR EACH SITE. THE DESIGN CONFIGURATIONS ENSURE THAT EACH DWELLING HAS ITS OWN FRONT DOOR TO THE STREET AND PRIVATE OUTDOOR SPACE EVEN AT HIGHER DENSITIES

4B (7P) HOUSE

2B (4P) HOUSE
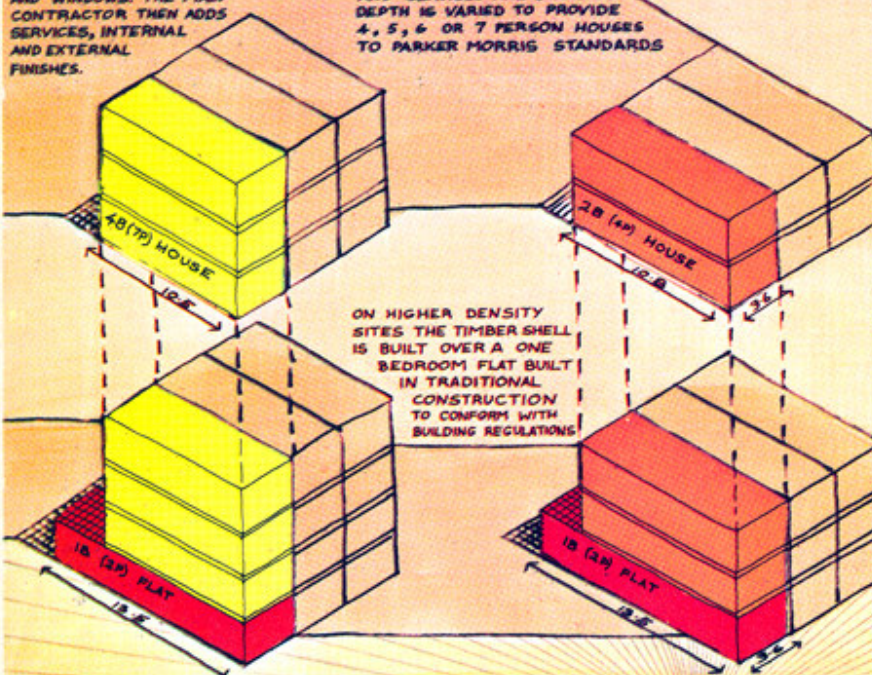
ON HIGHER DENSITY SITES THE TIMBER SHELL IS BUILT OVER A ONE BEDROOM FLAT BUILT IN TRADITIONAL CONSTRUCTION TO CONFORM WITH BUILDING REGULATIONS

1B (2P) PLAT

1B (2P) FLAT

YIEWSLEY: 3B HOUSES 203 PPH

LUTON: 2B HOUSES 145 PPH

WALLINGTON: 4B, 2B HOUSES 1B FLATS 484 PPH

LUTON: 2B HOUSES 1B FLATS 262 PPH

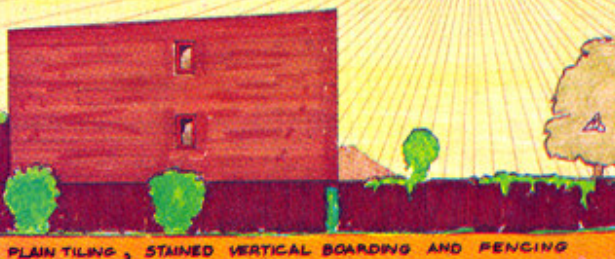VARIOUS CLADDINGS ARE USED TO SUIT LOCAL CONDITIONS

ALTERNATING TILE COLOURS, STAINED BOARDING

COLOURED MASONRY USED FOR SOUND INSULATION

STAINED HORIZONTAL BOARDING

PLAIN TILING, STAINED VERTICAL BOARDING AND FENCING

Nick Grimshaw: I was saying that it's the level of understanding which is important, not the technology. It does more or less imply that most people don't understand high technology. I think that these days people are anti-expert, which in a sense means anti-technology. They feel they ought to be able to demand things that they can understand and that it should not be dependent on technologists and experts acting as intermediaries all the time.

When they started off these building systems the people doing them were pretty bad inventors and technologists in their own right, but they saw some kind of myth which they wanted to develop. They set out very much with the view that architects were to become the new heroes of society.

Terry Farrell: I think these systems building people were overwhelmed by the sheer complexity of the world at that time. Other disciplines particularly at university level were outstripping architecture. 'Systems' was a defensive thing, rather than a feeling of certainty about the opening of new horizons and potential for architecture.

Nick Grimshaw: The Bartlett was a perfect example of the systems based Architecture School. Somebody would stand by the black board and say: 'You cannot sit in a room and read a book with the lighting level of less than so and so'. Then they would pass the meter around and somebody would realise that in fact the room they were sitting in was less than this figure than they were all reading!

Terry Farrell: Architects went quite mad in the 60's owing to this inferiority complex about other disciplines. They saw the sciences outstripping them and they just had to keep up with the Joneses. They turned architecture into pseudo science with BSc's instead of BA's, they got to the point where you had to have maths and physics to matriculate and they didn't recognise art as a matriculation subject. Along with that went an approach to architecture which was all to do with the measurable. They believed that you could treat it like a mathematical problem, feed in the variables, state a goal, and work through seventeen pages of calculations and end up with a statement that you then give to a draughtsman.

James Meller: It is ironic, that that model of the scientific process; Science as an inductive

process, was already discredited in science.

Terry Farrell: That's why I said it was an inferiority thing, because there was no real understanding of what they were trying to do. They totally misunderstood what they were trying to copy. And that's what copying is all about – you copy because you haven't got any ideas of your own.

James Meller: Nick, in your Architectural Association Diploma thesis in 1965, you wrote: 'It's my hope that it's not buildings we'll be designing in the

future, it's organisms, capable of variation and adaption within as large a range of technology as the minute permits . . .. and all the time we must be prepared to scrap, to adapt, to add to our environment with all the means at our disposal'. This could be characterised as a systems approach to the whole task.

Nick Grimshaw: What I was driving at in my thesis was quite different from the technological thing. What attracted me then was the situation where you had people designing electrical circuits with a light pencil on a TV screen – a cathode ray tube – after they got what they wanted

they could push a button and it would actually be produced the other end. That was the level of technology that interested me at that time, and I tried to do a building like an organic machine.

James Meller: It was the kind of technology that the user could interact with very easily.

Nick Grimshaw: Yes absolutely, and it was understandable to the people using it.

James Meller: You didn't necessarily have to understand how it worked, but you knew what it would do for you.

Before and after the idea of adaptation is fundamental to much of the Farrell Grimshaw Partnership's work. This old factory has been rehabilitated into a new office block with an adaptation of both the building's purpose and the firm's industrial building system.

Nick Grimshaw: That's right and that's a key issue really. That is where they all missed the boat, because it is not difficult to understand what complex technology will do *for* you. You can understand what your watch does for you, what your television does for you. You have a lot of knobs in the front of your television set and you know what they all do, you don't know *how* it changes the colour from blue to green, but you know it does it when you turn it. It means being able to tune your TV without having to call in a technician. What we are very much into now with the industrial buildings is designing and

putting a lot of technological work into systems, with the result that you can switch a panel for a sheet of glass, or a panel of louvres or put a door in – in much the same way as tuning a TV – without ringing up the architect. It's very simple, all you do is say 'You can do it' and give them a few tools.

James Meller: That is exemplified by the two buildings for Rotork, and subsequently by the building in France for Editions Van de Velde and the new building for Herman Miller, where you have the same kit of parts assembled in different places in different ways. The parts can subsequently be moved around by somebody else without your assistance.

Nick Grimshaw: Not only the people you designed it for, but the generations they pass it on to.

James Meller: So that is a kit of parts with very simple rules that are almost self-evident. What about the design process by which you arrive at those kinds of solutions, is there something fundamentally different about that?

Nick Grimshaw: I think the difference in the design process is that these days the emphasis is on understanding of the needs of the user. It has become socialised, it has drifted away from technologising things, the needs of the people that you are designing for are becoming very much more important.

James Meller: It doesn't exclude the use of High Technology?

Nick Grimshaw: No, not at all. It's just that strategic thinking comes first. For example, in our new building for Moog Controls we laid great emphasis on appointing consultants early – before buying the site – so as to be involved in the whole process. We are then involved in their thinking about why they want to be in a particular area, or on a particular site, even though it might have such disadvantages as bad ground conditions or risk of flooding. We get very involved in how a company sees itself as an existing working system. Very often the relationships are not as fixed as they see them. We can often demonstrate that the existing system is far more organic and changeable than they think. This is important because people resist change, they see it as disruptive because their buildings cannot easily respond. If they have a decently responsive building they tend to

think more creatively about change.

Terry Farrell: In a series of building designs like the factories, we learn a great deal and carry this learning from one situation to the next. We can therefore continously improve the technology and *also* the design approach. I think this is an important aspect of the design process.

James Meller: Earlier you expressed worries about '1001 solutions', worries that because all the solutions were different there was never time to develop detailed design improvements. I think you're suggesting now that you have had the chance with the factory buildings to do some of these things more than once.

Terry Farrell: I would also say that with the Rehab we have too. We have actually developed a way of looking at existing buildings and developed an attitude to buildings as a resource which has come of age and keeps improving. Our attitudes are quite well developed, they are more akin to another professional person like a doctor or barrister rather than to a scientist or technologist.

We have appraised a series of aspects of an existing building: whether it is spatially useful and has potential for change; whether it has structurally got all the elements that are going to be necessary to keep it alive consistent with the kind of investment that you have to put into existing buildings today to rehab them. In the back of our minds are all the grant systems are the planning benefits to be obtained from using existing buildings, that planning committees are all for you if it's rehab, and so on. We've found this amounts to a gain in time and that's a gain for the client. Possibly he can do more with an old building than he could have done with a new.

This is perhaps too intuitive to be called a system, but it has systematic elements threading their way through it. One of the things we are doing at the moment is low-cost housing, for housing societies on many different tiny sites where, right from the outset, we thought we had to get something constant going through these things. What is the constant element? It isn't the appearance of the buildings, because in England today every little local planning officer is a law unto himself. So we scrapped the appearance side of it and looked for other common threads. What we were able to

pin it down to, was the frame structure of the building and the internal finishes, but not the external finishes.

What we now have is a series of about twelve contracts running where there is one timber frame contractor who, on the basis of tendering for the first job, then has a serial contract to put up these timber framed blocks all round the south east of England.

The DoE will not allow serial contracts for housing schemes. In many ways they are right, you don't get any benefit from a large contractor doing lots of schemes over the country because all he is really doing is farming it out to individual organisations. He can't really use the benefits of scale, local conditions do vary.

So what we have done on the housing is to take the factory process of timber framed components, which can be a part of a serial contract and the DoE have agreed to that. So we got tenders in for the timber frame right at the beginning and the lowest tenderer then took his schedule of rates and applied these to the succeeding twelve jobs. There are variations, you are dealing with timber so you can miss windows out here, and you can have another storey on top there. But the original price levels apply, plus inflation and whatever, but it is all agreed at the outset. It's a system, I suppose, but it is not just a hardware system, we're also dealing with the DoE and how they approach problems, how the money is allocated to housing and many other factors.

James Meller: So the timber frame is produced in one place on this serial contract, and is then delivered to the sites.

Terry Farrell: The frame manufacturer also puts them up on a slab that is prepared by a local contractor, which has all the servicing, it has the drains, the wires, the pipes and so on. He puts the timber frame on to the prepared slab and completes the internal finishes, floors, anything to do with timber and the carcassing and then leaves. From there on the final plumbing fixtures, the bathrooms, the kitchens, the cupboards, the light fittings, the final roof covering and the cladding system is all done by a local contractor, who also then does the landscaping.

The buildings vary from site to site, on a narrow site we have a four-storey building, but on a wider site we sometimes have a two-storey building with the same accommodation. We have

got about seven different standards on the basic format, it is the same party wall width each time, but we stack them up differently.

James Meller: It is a kit of parts which you can put together in different ways.

Terry Farrell: We don't even design the kit of parts, we actually give the timber manufacturer a performance specification because we are not experts in timber designing. We can identify the spatial requirements, we can specify the thermal and acoustic levels and other performance aspects of the timber frame when it is finished.

James Meller: That gets us back to one of the earlier definitions of system which is: the set of rules which defines the way the parts go together. In the situation you have described, what you' are designing is the set of rules, you are not designing all the parts.

Nick Grimshaw: We only need to really design the bits that we can't get. We are designing the organisation, which is a design in itself.

James Meller: That approach goes right back to your first scheme with the furniture in the Student Hostel in Sussex Gardens. I can't remember how many individual component suppliers you had. You devised a set of rules which determined how all the components went together.

Terry Farrell: Some of the components were off the peg, we didn't design the drawers, they were Wall's pork pie trays, others were specially designed because they were connecting pieces that made it all fit together.

One of the characteristics of the 50's and 60's was the famous big firms like YRM which all grew and grew. Things have really changed and I can't think of any big new firms. Now we have a much more fluid situation. You don't need the clout of a big organisation behind you to be a good architect anymore. Contrast that with what the thinking in the 50's and 60's, where you got the invention of a technician class — SAAT (Society of Architectural and Associated Technicians). You got the idea of the standardised details that were adopted throughout the whole office.to get the office image carried right through to the draughtsman level. You had to have more than architects in the office, you

had to have engineers and the whole 'in house' bit.

Nick Grimshaw: We can actually handle any job that needs to be done in our office quite easily.

Terry Farrell: We have always resisted having 'in-house' engineers, quantity surveyors and the rest of it. We've resisted right from the outset, we thought the more fluid situation was us doing what we knew about, not running lots of other people doing jobs that we didn't really know about, only dealing with other principals. If someone sets up on his own as an engineer, he is going to be good, he's going to be a better chap than we could hire in our office, that was our argument.

Nick Grimshaw: Individual responsibility and blame. We believe in everybody taking responsibility for their own actions as a consultant or within our office.

James Meller: That's a quite different organisational model from the standard bureaucratic pyramid model adopted by the large offices you mentioned.

Terry Farrell: The Royal Institute of British Architects are still on that, they are still circulating great tomes, levels of expenditure are standardised throughout the country, they try to standardise education levels and all that kind of stuff. It is all bigness and standardisation. It's just wrong.

James Meller: You have adopted a much more flexible organisational model.

Terry Farrell: We've always been that way. We've always been very hand-to-mouth. It hasn't meant we haven't had continuity. We've actually been able to develop in many ways, which is really what continuity is. Many of these other people weren't systems people, they were house style people. They believed they had continuity simply because they never changed. That is not continuity, it's just being static. I think that if you are very light on your feet and keep changing and evolving as things change, then you do have genuine continuity. Because you are growing and learning. □

James Meller studied at Cambridge and the Department of Design, Southern Illinois University. He works as a designer and has taught at Hornsey School of Art, University College and the Architectural Association where he first met Nick Grimshaw in 1964. He also edited *The Buckminster Fuller reader*