King's Fund Hospital Centre

HOSPITAL PLANNING SEMINARS

1968

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Report of a series of seminars held at the Hospital Centre 17th - 21st June 1968, by the Centre for Advanced Studies in Environment and supported by the Ministry of Health* and the King's Fund.

Edited by Archie McNab, ARIBA AMTPI

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*Since this report was prepared the Ministry of Health has been amalgamated with the Ministry of Social Security to form the new Department of Health and Social Security.

The objectives of the seminars were to focus on:-

the current state of hospital planning knowledge;
priorities for investigation and development;
methods for resolving problems and taking decisions;
the type and form of planning information needed;
methods of collaboration and co-ordination in planning and research.

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COMMENT

The objectives of the hospital planning seminars were to provide an opportunity to discuss the process of hospital planning in the light of current knowledge and to anticipate in some measure future developments in the field. Much of the discussion however had to be geared to current policies and, despite frequent allusions to the future of the National Health Service, the main preoccupation of most participants was with the present situation and its procedural and planning structure. Indeed what appeared to be wanted in many cases was a set of ready-made answers to the assumed tactical problems inherent in the present administrative framework, and some guidance on implementation.

The intention of the organisers, however, was not to provide solutions, but to identify problems at various levels and stages of planning, focussing attention on such aspects as the priorities for future investigation, methods of solving problems and taking decisions, the importance of teamwork, the nature of planning information required and possible methods of collaboration and coordination in planning and research. The course was structured so that the level of interest diminished in scale during the week, from national to departmental considerations. The seminars were successful in that they provided the opportunity to highlight current problems and to exchange ideas and opinions from various professional viewpoints. The week's activities however hinted at other problems beyond the scope of the conference which would nevertheless be important for future consideration.

The participants themselves represented a number of disciplines and included architects, engineers, doctors, nurses and administrators. This should be an ideal mixture in principle since all such professions are involved in the planning process at one stage or another. In the event, however, mutual benefit appeared often to be sacrificed to individual professional interest and there was in some cases evidence of ignorance of the role and contribution of the other disciplines.

The seminars suffered by being too long. Many aspects were discussed early on in the week and repeated perhaps unnecessarily during the latter half. Part of the reason for repetition was probably due to the number of participants involved. The division of the conference into multi-disciplinary groups was an ideal way of discussing a number of subjects, but the group size (14 or 15) was too large to produce constructive argument.

There is room for some debate on the nature of the subjects discussed at the seminars (there was perhaps too much emphasis on the teaching hospital sector and the nature of plans rather than planning) but it was equally evident that some people attended with a view to learning rather than contributing creatively to what was supposed to be an exchange of ideas and opinion.

Despite these reservations, however, and the occasional semantic confusion which arose during the week (notably over the rights and wrongs of the various types and degrees of standardisation) a number of pointers (if not hard positive proposals), were made for further consideration, and were put to the Ministry panel at the last session as an expression of generally held views.

It was suggested that greater attention should be given, for example, to rationalisation and standardisation and it was noted that the Ministry was now setting up a coordinated programme of hospital planning, design and construction based on a combination of the knowledge and experience of both the Hospital Boards and the Ministry itself. The aim is, as it should be, not to produce standard hospitals (a policy many Boards seem ready to accept however) but to provide a limited range of solutions to a wide range of situations. This would in the end probably make for an improved product and for greater efficiency, speed and productivity.

Another conclusion from the conference was the vital need for greater feedback of experience from research and development projects, but it was acknowledged that a major difficulty was to find adequate resources for this in competition with other more urgent priorities.

Similar urgency was expressed about the need for reliable information and an adequate retrieval system if policies and decisions in hospital planning were to be rationally based. It would seem sensible in view of the evident shortcomings of existing sources to encourage the establishment of some form of information centre and data retrieval system, as well as to improve the quality of published guidance to hospital planners. At present far too much time is taken up simply by the search for appropriate information.

A coordinated programme of hospital planning could go a long way to exploiting the experience and knowledge of all the professions involved in planning. However its effectiveness is very much dependent on getting the best out of existing resources.

A number of pointers for action required in particular areas were put to the Ministry's panel at the final session. It was felt important, for example, that some improvements are made in communication between the Ministry and the Boards, the various professional disciplines involved and between official and private organisations. Similar urgency is necessary in the better coordination of research and the establishment of an information retrieval system. Their importance is becoming increasingly obvious to the improvement and development of comprehensive health services in this country.

Finally, it is felt that seminars of a similar kind should be repeated in future years. The Hospital Planning Seminars were regarded as a pilot exercise and a steering committee has since been set up to work out the areas of interest which might be appropriate for further discussion and action.

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DAY 1

INTRODUCTION

John Green and Raymond Moss

In his opening address at the RIBA hospital planning course in 1960, Lord Craigton, when Minister of Health, Scottish Office, said among other things that, as medical science was changing all the time, and as we must be able to meet changing needs, our information must be always up-to-date. He said he hoped that those attending the course would, by the end of it, know today's, now yesterday's problems, and where to lay their hands on the information they wanted about tomorrow's, now today's problems; this he said would point the way to further studies. Lord Craigton also mentioned that hospital planning was a field where it was necessary for architects to consult members of several other professions with traditions of independence equal to their own. I hope at least we have learned to do more than simply consult other professions by now.

Since 1960 there have been a number of courses and conferences aimed at improving the quality and quantity of hospital building. Some of these courses set out particularly to improve the quality of design through collaboration, initially between architects, engineers and quantity surveyors, but latterly between the design team and the client team as a whole (that is to say the medical, nursing and administrative members of the combined planning team as well as the architects, engineers and quantity surveyors). The development of these courses owed much to the inspiration and wisdom of the late D J Petty.

The RIBA management handbook plan of work for design team operations was published in 1964. This clearly indicates the role and responsibilities expected from the client. At the sametime there has been the parallel development of the Ministry's Planning Procedures, which Boards are now using for the majority of their current projects. Both these planning methods lay emphasis on a structure for collaboration, on a procedure for the acquisition and application of information, and on the responsibilities of the parties concerned, at each stage of the design process.

For a subject as complex and comprehensive as hospital planning, one cannot always see what the problems are, or solve them, without standing back periodically to see things as a whole. In doing this one usually tends to see those parts which are out of balance or which need particular attention.

I would suggest that we are now approaching a stage of planning experience in the hospital building programme when we can pause to stand back as individuals and as members of planning teams and consider what the main problems are, which ones we expect to meet, if history is anything to go by, and what actions we can take to get something done about them - the preparation perhaps of a plan of action which has some hope of realisation. If we can only see what is needed and agree that it is needed.

These seminars are therefore something of an innovation and an experiment in that they are concerned with trying to identify what the real problems are that we face collectively as hospital planners rather than with trying to provide ready-made solutions to known situations.

The factor that is new to many of us, and therefore unpredictable, is the experience of working as members of fully integrated user/designer teams. The purpose of these seminars is to create the opportunity to identify and discuss those problems encountered at various levels and stages by the planning team from particular professional

viewpoints; always bearing in mind that all members of the team will, or should, have the same ultimate objective in mind, namely, the creation of a situation in which health care can be effectively, economically and sympathetically provided for the community. It sometimes happens, I believe, that the idea of the building gets in the way of this aim.

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I would now like to consider briefly some points on the nature of planning as applied to hospitals, and also the more detailed objectives of the seminars.

Colin Buchanan, in the South Hampshire Study, says that "planning is becoming less and less a matter of precise propositions committed to paper, and more and more a matter of ideas and policies loosely assembled, but under constant review, within which every now and then some project is seen to be as ready for execution as human judgement can pronounce" - rather a chancy process it would seem from that analysis. However, one might say that one of the main tasks of the planning team is to reduce the element of chance in the end product, even though its precise purpose may not be all that clear just at the moment of committal.

Apart from the planning team and the data which they have to work with, the other factor of significance in producing a useful end result is the process by which the plans are produced. To that end, these seminars are not concerned with plans as such; we would suggest that an examination of our experience, or expectation, of the processes that bind us together may help to reveal those aspects of hospital planning which most merit active attention in the near future. These aspects may emerge from the thoughts of the speakers, or from the group and general discussions that follow, but there are a number of possible topics which may be useful in arriving at appropriate recommendations for the future.

These are:

1. Rationalisation and standardisation How much of what is known about hospital operation and design can be safely expanded upon for general application on a regional or national basis?

2. Research and Development What are the priorities for investigation and how can opportunities be created for using projects for answering questions, as well as satisfying their more normal needs?

3. Education and Experience How can the experience required by planning teams be harnessed most usefully for the benefit of other or subsequent projects, and for the education of new members of planning teams?

4. Decision taking and Policy making How can we ensure that decisions are taken and policies made using the best possible means in the circumstances, and what is the best form for their expression?

5. Information and Guidance Are the present forms of planning information and guidance effective, and if not, how can they be improved?

6. Collaboration and Co-ordination How can one get the best out of a multi-professional team and ensure that the results of their efforts are fully compatible, one with another?

7. The Effective Use of Resources Are we using valuable time, money and man-power in the best ways possible? If not, how can we improve the situation?

PLANNING FOR HEALTH

Dr H Yellowlees
Deputy Chief Medical Officer, Ministry of Health

Summary

Health planning must be comprehensive; the hospital is only a part, although one of the most important parts, of the general concept of planning for health. Dr Yellowlees outlines the development of health planning over the past hundred years and notes the recurring problems of assessing population need and the value of existing resources. He also discusses the current state of the NHS and the possible future nature of an integrated service. One of the major problems will be to decide on the contribution to be made by the hospitals to complement community care within the overall concept of comprehensive area planning. Although there will be an obvious need to assess the functions and uses of existing facilities, the main problems are likely to be the allocation of money and the distribution of manpower, both of which at the moment are very limited. Resource planning therefore will be as important as that relating to the health facilities themselves. The general practitioner is central to future development if a rational system of comprehensive medical care is to be properly established.

Hospital planning is a part, perhaps one of the most important parts, of the general concept of planning for health, but it is impossible to take one part of the Service and devote all our attention to it. Health planning involves looking at the whole, and the object of these seminars is to look at how the hospitals fit into the whole.

The history of health planning is a long one, but little of significance in a modern sense occurred until the 19th century when public health measures became important. The main public health measures were in fact framed in the early nineteen hundreds, culminating in the establishment of the National Health Service in 1948.

For a long time planning was largely piecemeal; it was 1872 before the first Public Health Act made it obligatory for all local authorities to have Medical Officers of Health and to give attention to public health planning. In 1875 the original Public Health Act was consolidated and new legislation was included; the Act in its revised form lasted until 1936. Until just before the Second World War public health then was based on a system devised around the 1870s.

One of the great difficulties in planning for anything, particularly on a national scale, is knowing what you have already got. The available data on which you are able to plan is generally not as sufficient for your purposes as you would wish, and in no field more so than in health. When the National Health Service was introduced in 1948, no one knew nearly enough about what existed or what ought to exist, and what ought to be done.

Population censuses, compulsory registration of births, marriages and deaths, the notification of infectious diseases, national insurance and so on had been introduced at intervals over the previous 150 years, but in 1948 comprehensive information from which to develop a national health service was lacking.

On the hospital side too, knowledge of the existing service was relatively scanty. The Regional Hospital Boards started in 1948 very much like Columbus setting out for the new world. When he set out, he didn't quite know where he was going; when he got there, he didn't know where he was; and when he got back he didn't

know where he had been. Whether we should say this about the Health Service today, I am not sure, but certainly there is some confusion.

HEALTH SERVICE REORGANISATION

The Health Service is of course only twenty years old and has found its feet to a large extent. But within the next three or four years some substantial replanning on the basis of what we have discovered has got to take place. The first moves have already been made and the Minister's Green Paper suggests a new structure for the Health Service. The objectives of the Service are set out in the 1948 Act and the Minister is responsible for providing the best possible health service for everybody. But the system has to be broken down to see what is implied for the hospital sector. It has to be decided whether in fact the hospital service is in future going to occupy the same position in relation to the other arms of the Service as it has hitherto. From a medical viewpoint can the Service continue to provide medical care in roughly the same way? Is the demand for inpatient service going to continue at the same relative value? Is the service from general practice going to continue at the same relative value? Is there going to be some shift and, if so, what kind of shift will it be?

The objectives have therefore to be more clearly defined than they are in the Health Act. We have got to decide what has to be provided and assess the nature of this provision. We have to decide what contribution to medical care the hospital service will have to make. There is already, of course, the subdivision into disease groups, treatment groups, or medical and nursing techniques, and this permits the development of norms of a kind for the provision of hospital services; for example so many beds per thousand of population for this or that speciality. But this kind of standard can only be developed once the nature of the Service which the future will demand has been decided. The definition of objectives must be clear so that at the beginning of any project the architect can be presented in clear terms with a statement of what is wanted. Architects should not be given a problem which involves their taking value judgements of what ought to be provided for a service in which they have no basic training or knowledge.

COMPREHENSIVE AREA PLANNING - HOSPITAL AND COMMUNITY CARE

There is also demand on a wider front. How many people and how large an area has the hospital to cater for now, and what is the expected increase or decrease in the future? We have got to decide the distribution and number of people for whom we are providing services; what the future number is likely to be and what the distribution of demand will be.

The fact of the matter is that advances in medicine and medical science are such that we can nowadays do more things, medically speaking, for more people than we can possibly ever pay for. Decisions may have to be made for example, that a certain kind of service which may be life-giving shall <u>not</u> be provided. This is becoming increasingly urgent because we can now do far more for more people than we have the resources to provide.

Some assessment is required of the existing facilities already available. I have already referred to the difficulties of doing this when the Health Service started. Today, of course, we are very much better off. We know where the hospitals are and what they provide. What perhaps is not quite so clearly worked out on an area basis - and this arises from the basic splitting of the Health Service into three parts - is the relationship of these existing facilities with the supporting facilities outside the hospital.

The Ministry is beginning to look at the future provision of medical care under two heads; hospital care and community care. The supporting services outside hospitals (general practice and the local authority services) are going to become increasingly co-ordinated and integrated with hospital care which will supply the increasingly specialised and complicated in-patient procedures.

The "Best Buy" project was concerned with seeing how the hospital service fitted in with the other two sides of the Service. It was only by adjusting hospital provision to the capacity of those other services dealing with patients outside hospital that a reduction in the demands on the hospital side could be secured. The experiment however took in transport and housing which also affect the nature and administration of the health services. The "Best Buy" hospitals are an illustration of a conscious attempt to shift the emphasis of medical care more to the community, with less, though more concentrated, care being provided on the hospital side.

FINANCE FOR BUILDING

The allocation of money is a major problem; generally speaking, all the available money we have is given out, and it is up to the Boards to decide on their priorities. But money on the larger scale of National Health Service planning is limited by what is nationally available. While the hospital authorities fight the Ministry all the time for extra money, the Ministry in turn makes its case to the economic department for a larger share of national resources. The health share of the gross national product has increased from 3.7% to 4.6% in the past ten years. This may not sound much, but it is in fact quite substantial. Although we have got an increased amount of money available, it would be foolish to suppose, from a planning point of view, that we should count on getting any substantial increase in the coming years. Planning must therefore be related to allocations of finance within set limits, and guidance on its use to the best advantage must be made available.

MANPOWER SHORTAGES

The other great limit on supply and resources is manpower. Medical manpower is probably the crucial element but shortages exist everywhere; there are not enough physiotherapists or radiographers or architects to meet the needs of the service and we have got to make do with what we have. It is no good producing a plan on a national or regional scale which simply assumes that something will be there. It is not very sensible that a national plan should be drawn up to provide so many new hospitals when the available estimates for trained manpower for ten years ahead make it virtually certain that we will be unable to man them. In the case of medical manpower, for example, at the moment the number of graduates from the medical schools every year barely enables us to stand still. Although we get an increasing number of doctors out every year, and although the University Grants Committee, which controls medical school building, has given us as much as it can, the number qualifying every year hardly keeps pace with the current rise in population which we expect will continue. Assuming we had all the teachers and all the medical school places we needed, it would still be six or seven years before students admitted tomorrow were qualified, and ten years before they were effective members of the Health Service. Whether we like it or not, we are short of doctors, certainly for the next ten years. Any plan that involves a large increase in staff without at the same time envisaging a decrease somewhere else is out on its neck before it starts.

USE OF RESOURCES

Finally, are planning resources adequate? Do enough private architects know enough about hospitals really to make a sensible contribution to hospital planning? We must consider a much wider application of resource planning. Let us consider heart transplants for instance. The first one required a team of eighteen people, and the use of two operating theatres, one of which was out of use for three weeks because other facilities were not available. The net cost of that particular operation can be measured in £ s d, but the real cost has to be measured in terms of the other things we failed to do because of this operation. A lot of open-heart surgery, which had become routine in that particular hospital could not be carried out and the people who could have had new valves at the time either had to be accommodated elsewhere or had to wait. I am not criticising this because I think that this kind of pioneer development may have to be done under less than ideal circumstances; I am really trying to look forward. Does such a situation mean that if they are to continue heart transplants, a large number of other people are to be denied treatment? This is the kind of decision which has to be taken. How many cases of this kind can we afford to do? Have we the manpower or the facilities to do them? It is impossible of course to tell the surgeons concerned to go and do an out-patient list of varicose veins instead. It would be unthinkable and they wouldn't do it, but the problem is clear.

We must start doing much more than we have done in the way of resource planning, or we must limit the demand in some way. At the moment the limit on the demand is the facilities we provide; we can therefore exercise a sort of negative restraint upon demand because the services are not optimal in any area. But the time has come when we have got to take more conscious decisions about the provision of various facilities.

FUTURE TRENDS

I have tried to set out the kind of problems that face the Ministry nationally and which must be taken account of in looking at the broad planning of the health service.

I would like to say a word about the future because this must be basic to all planning in the health service. The history of the last 20 or 30 years, in medicine, has seen the development of a large group of drugs, the anti-biotics which have had a very marked effect upon the care of patients and the demand for care. In the 1940s the sulphonamides were just coming in and had their dangers in use. Many diseases which then still occupied a great deal of time both in and outside hospitals were later vanquished by the development of sophisticated anti-biotics like penicillin and its successors. Medical care has therefore changed from an intensive preoccupation with conquering the active infectious diseases which existed at the end of the Second World War. Developments, particularly in anaesthesia, have made possible in surgery many procedures which were at one time unthinkable. The trend has therefore gone away from acute disease towards the screening and recognition of the later chronic diseases which develop in middle and old age, and the complicated and expensive services to deal with those which new techniques have now made remediable.

We try to forestall the wasteful use of highly sophisticated and expensive hospital resources by the detection of the early stages of chronic and degenerative diseases in people of middle age. If we can shift the emphasis to look more and more at monitoring the health of individuals, they may not ultimately become a charge on the hospital service.

The general practitioner is central in all this. The unrest among general practitioners over recent years stems in large measure from their feeling that, having been trained in a large modern hospital with all the investigatory procedures available, getting used to the consultant type of approach to medicine, with a large supporting staff, basic facilities are no longer available at the snap of a finger. They feel they are

debarred from diagnostic aids and that, when a diagnosis has to be made in hospital and the patient is kept there, much of the authority and interest they previously had in their work has gone.

The general practitioner must cease to operate as a member of what has been described as a cottage industry. The one-man general practice is disappearing and the future is likely to see an increase in group practices of as many as twelve or even twenty doctors. They will have modified diagnostic facilities available and will look to the hospitals for the more complicated procedures. They are increasingly likely to take over the after-care of hospital cases as well as pre-admission diagnostic care. The hospitals will become specialized 'factories' where sophisticated diagnosis and treatment is carried out.

There is a vital need for adequate information on current trends and for research based on that information. Many of us are extremely keen to see the development of hospital activity analysis and other record systems based on modern business machinery which can record vast quantities of information.

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Discussion on Dr Yellowlees' paper centred largely on the question of the relationship between community care and the function of hospital facilities, and the Ministry's stated aims for the close integration of all parts of the health service.

Some speakers were concerned about the dividing line between the functions of one or other part of the present tripartite system, as well as the effect of local political or medical interests and the degree of co-operation on the expansion of community care. It was suggested there were strategic and organisational problems at a national scale which might be inhibited at local level and so work against the idea of full integration of the Service. Dr Yellowlees thought that the Green Paper on "The Administrative Structure of the Medical and Related Services", together with the report of the Seebohm Committee and the Todd Report on Medical Education, would have important implications for the restructuring of the Health Service.

To the suggestion that the Ministry might hive off some of its responsibilities to local authorities, Dr Yellowlees replied that this depended to some extent on how far local authority services had developed. At the moment it was certain that, because of compartmentation, existing facilities were not being fully used. Although planning was hindered by the fact that it had often to be carried out in isolation (a case perhaps for setting up minimum standards or criteria for judgement), Dr Yellowlees thought that it would be extremely difficult to place patients in one category or the other. The only solution would be to bring the various interests and facilities together.

As far as design was concerned, the suggestion was made that it was more important to have a performance specification for medical facilities, leaving its interpretation to the designers, than to define problems in too much detail at local level.

A question was asked about the time taken between the design of hospital schemes, especially teaching hospitals, and the completion of the buildings. Both Dr Muir and Dr Yellowlees felt that by some degree of standardisation of parts current programmes could be shortened considerably. Dr Yellowlees added that the Regional Hospital Boards had greater experience of planning hospitals than the teaching hospitals which could of course benefit from this experience - on the idea, for example of flexibility in use rather than the acceptance of the particular preferences of

particular members of the teaching staff as the only planning criteria. This could be achieved by some measure of standardisation and rationalisation. It was ridiculous that small highly specialised hospitals should claim to provide every type of medical care that a student wished to experience if this was to be achieved at the expense of a district general hospital.

The suggestion was made that more advantage should be taken of the pilot schemes which existed throughout the country and which might profitably be evaluated in terms of medical function, cost standards, technical effectiveness, administrative efficiency, and staffing.

It was also said that there were problems in providing a precise brief for hospital building. It was argued that, bearing in mind the uncertainty about the effective life of structures and the possibility of rapid change in medical policy, space must be designed for reallocation, change and growth or contraction. The problem becomes evident at the time of briefing and it was thought necessary to assess the value of any facility over a period of years, including the capital, running and maintenance costs of the provision.

A final point was discussed regarding the implementation of policy intentions. Many of the problems which had been discussed could be overcome, it was suggested, if there was the will to build fast and efficiently. Some claimed that this objective was being inhibited in effect by over-elaborate bureaucratic procedures.

THE HOSPITAL PLANNING PROCESS

Dr J A Oddie, Senior Administrative Medical Officer,
Oxford Regional Hospital Board

Summary

The hospital cannot be planned in isolation. The make-do and mend developments of the past are now slowly being overcome. Regional Boards have recognised the need to create expert teams to undertake capital planning and the Ministry produced the Building Notes to fit into revised procedures designed to ensure that the public get value for money. Dr Oddie outlines the current procedures involved in hospital planning and emphasizes the importance of adequate consultation between various professional advisers and the users. He points out however that no one is yet clear about the function of the hospital in the future. There are positive trends towards a greater integration of local authority services, the hospital service and general practice, and towards the development of the hospital as a highly mechanised acute treatment unit. It is important however that whole hospital operational policies are determined as a first priority and that attention is focussed on the provision of facilities for patient care. One of the important questions which arises is whether or not the basic documentation which governs hospital and departmental operational policies is fully adequate. It is unlikely that Boards will readily accept standard designs for whole hospitals or departments, in view of the need for built-in flexibility, and more emphasis should be placed on the development of component systems. Flexibility is as important in the planning procedures which govern hospital design as in the buildings themselves.

During this week we are studying the Hospital Planning process. We must get it in the right perspective and remember that a hospital as a building is, in itself, not all that important in the provision of a service to the patient. The best kind of patient care and treatment has been carried out in a tent in the desert or at the bedside, in a home, in the slums. The hospital must create the best artificial environment in which modern specialist medicine and surgery can operate and it should be used only when patients cannot be adequately treated in their natural environment, their home or their community.

The hospital cannot properly be planned in isolation without taking account of its particular function in the total pattern of the Health Service. In the past hospitals were planned separately, and when the National Health Service came into operation the Hospital Boards inherited a haphazard array of hospitals which had been planned mainly as places where patients came to be nursed in bed. Although the Hospital Service is still operating very largely from the hospitals that were already established in 1948, their function and use has changed out of all recognition. No doubt the function of the hospitals we are now planning will again change during their life-times; in our planning decisions change is an ever accelerating process.

MAKE-DO AND MEND

During the early years of the Service there was little capital expenditure over the country as a whole. The total capital programme in 1950/51 accounted for £9m. compared with nearly £100m. during 1967/68. Initially most of the capital projects were concerned

with what was termed "make-do and mend" schemes which enabled dilapidated buildings to continue to function and which provided modest extensions such as an additional operating theatre or a new outpatient clinic.

In those days there were no recognised standards, no defined operational policies and no agreed cost limits. There were no recognised planning procedures, and agreement was reached over a period of time by exchanges of sketch plans and letters between Board and HMC and between Board and Ministry.

It was the Nuffield Provincial Hospitals Trust which produced the first authoritative publication on post-war hospital planning and design. In 1955 their report, "Studies in the Function and Design of Hospitals", made a most important contribution. It showed the necessity for a close study and definition of all kinds of hospital activity and was one of the best demonstrations of the place of work study and operational research in the hospital field. The book bears re-reading even after all the changes and developments that have taken place during the past fifteen years. It is interesting to note that, in the so-called 'best buy' hospital, we are returning to the figure of about two acute beds per 1,000 people, which was the estimate made by the Nuffield team in 1955.

DEVELOPMENT OF PROJECT TEAMS

Since then the Boards have recognised the need to develop expert teams to undertake capital planning. Project secretaries were appointed and the important role of the nurse in project team work was now accepted. The importance of the engineering content was realised when it was found that engineering costs accounted for between 1/3 and 1/2 of total expenditure. Other specialists, like quantity surveyors, work study officers, design consultants and finance officers, began to contribute to project team work.

It is difficult to realise that only ten years ago such things as CSSDs and day hospitals were all in the experimental stage and were regarded with suspicion, not only by some hospital staffs, but also by some of those who were responsible for forward thinking and planning. The Intensive Care Unit was beginning to appear in the US but was, for the most part, regarded in this country as a retrograde step, forced on the hospitals as an expedient to overcome a shortage of nurses.

Meanwhile, the Ministry of Health was working on the production of the Hospital Building Notes and when these first began to appear in 1961 they were accepted as the most important contribution so far made to assist the planning authorities. Since 1961 many thousands of copies of building notes and equipment notes have been issued and the Ministry deserves the greatest credit for the quality of the wide range of guidance material that it has produced, augmented by information and research by the King's Fund and the Nuffield Provincial Hospitals Trust. The Building Notes were designed to fit in with a new procedure for the control and implementation of the building programme and these were to be used for some six years. The Ministry at that time was no longer able to concern itself with the detailed design of each project, yet it had to satisfy itself that new buildings met an acceptable standard to ensure patient safety and adequate working conditions for staff.

NEW PLANNING PROCEDURES

The Procedures, introduced in 1962, called for formal approval at several stages and required agreement on both functional units and the detailed schedule of accommodation. The cost limit was based on the floor area of departments, plus an outline of engineering services and 'on-costs'. Under the more recent procedures introduced last

year, cost control is exercised at an earlier stage and is related to functional units irrespective of schedules of accommodation. Under the previous procedures the factor of 'on-costs' had not been clearly defined, whereas today it is the element of 'on-costs' which is most closely scrutinised for any individual scheme.

While one accepts that it is the Ministry's duty to ensure that the very best value is obtained for capital expenditure, the new procedures are still far from ideal. The paper work is even more complex than before and in some cases, to achieve an acceptable level of 'on-costs', the essential functional and clinical requirements tend to be overlooked.

Hospital Boards are now required to deal with two separate divisions of the Ministry when embarking on a major scheme. One division deals with the function and content of a scheme, and another is concerned with the siting of the building and how functional units are to be provided in terms of shape, departmental relationships and communications. When one is dealing with hospital developments in a particular area, it is impossible to separate what is to be provided from where it is to be provided, yet this is what the new procedures dictate. One must not assume, however, that the new procedures will be used indefinitely; they can be regarded as just one further step in the evolution of a policy for hospital planning. Just as there are many design solutions for any particular scheme, so there must be many different methods of procedure. No doubt the Ministry itself already has new ideas for improving still further the ways and means of achieving an acceleration in the building programme.

It would assist hospital planning authorities and give them a greater incentive to plan efficiently if cost allowances for building were related more to the function of the hospital than to its physical content. This would reflect the approach which planning teams are now making to the layout and design of new hospitals. We are getting away from the idea that a hospital is little more than a number of different departments put together in the right relationship. What we are now trying to achieve is to provide the best environment for varying patterns of patient care and treatment.

This really brings us to the core of the problem which is being considered during this series of seminars; to put it bluntly, should the hospital planning process be concerned with the provision of "patients' needs" or "staff wants"? A planning team can operate in two different ways. One method is for the project team to take the evidence from the various clinicians and heads of departments, determine their requirements and then mould the design to meet these; the second method is for the project team itself to determine the function and design of the hospital and ensure that within this design the clinicians and department can efficiently carry out their particular role in the overall working of the hospital.

PRINCIPLES AND POLICIES

The question of consultation is one of the most difficult problems which faces planning personnel. The new hospital or department, when it is completed, will not function efficiently or humanely unless the staff who operate it are fully committed to its design and function. This need not mean that local staff have made all the planning decisions, but they must know the reasons for the particular design and they must understand how the unit is meant to work. To achieve this, the Board's policy must be fully explained and the project team must demonstrate that their ideas have been based on sound principles. Staff whose main concern is treating patients or administering a day-to-day hospital service have not had the opportunity of acquiring planning expertise. The situation calls for planning personnel of the highest calibre who can exercise leadership in the project and inspire the confidence of the HMC and local staff. If planning teams are indefinite, and afraid to put forward constructive and

definite proposals, they will leave local staff faced with various options. If consultation means asking for opinions, then these options will be exercised and staff will make demands which are not based on sound planning principles. It is now certain that the future hospital service must be closely integrated with other branches of the Health Service. Whether or not Area Health Boards are to be the administrative structure of the future, the function of the hospitals must be co-ordinated with the domiciliary services. The hospital, so far as the buildings are concerned, is the most costly and static element and will, therefore, be the focal point for teaching, research and probably for administration. Any new hospital site should therefore be designed to enable it to function as the centre of gravity of the total health service for the area.

HOSPITAL BASED CARE IN THE FUTURE

Our problem is that we are not yet clear as to what the function of the hospital of the future is or what it will contain. Accident and emergency services, an intensive and acute care complex, investigation and treatment are all obvious functions of a central acute hospital, providing intensive treatment and patient care. It seems certain that everyone is now ready to accept a coordinated health service with a breakdown of the barriers at present separating the hospital, local authority and GP services. The "Best Buy" hospital goes some way towards meeting this change but is still somewhat tentative. But when we consider the future pattern of sub-acute care and of the whole provision of diagnostic and consultative accommodation, it is difficult to predict what changes may occur. With the knowledge we now have it is evident that efficient and economic services can be provided from a centralised comprehensive unit. At the same time, the more the service is centralised, the less convenient it is for access for patients and visitors. A second idea is the removal from the clinical environment of all industrial and processing activities.

If we are to concentrate the acute activities of a hospital then we will need a highly mechanised and fully equipped core of treatment departments and a smaller number of beds. This means that at the early stages of recovery, patients will have to be moved to a different environment designed for post-acute and pre-convalescent care.

These are problems concerned with basic functional planning which must be solved before a functional brief can be handed to a planning team for translation into operational policies and the determination of functional units. This preliminary work can only be undertaken by a Regional Planning Authority such as the Regional Hospital Boards.

Each Regional Hospital Board must therefore have personnel supported by the appropriate statistical and operational research departments, which can determine these overall policies. Consultation at this stage can only be undertaken between the Regional Hospital Board and the Ministry, and will not involve the HMC. Once the Board's strategic plan has been determined it can be presented to the HMC for comments.

The first task of the project team is to determine whole hospital operational policies; these can be simplified if attention can be focused on the provision of facilities for patient care. The idea is now generally accepted that activities traditionally associated with a hospital but which have no direct bearing on patient care should be accommodated elsewhere. The policy of removing from the clinical site all the industrial and processing departments such as CSSD, laundries, pharmacy, transport or catering removes much of the complexity of hospital planning and is likely to prove more economic if considered on an area or regional basis. Industrial elements could be dealt with by a separate project team, freeing the project team for the clinical side to concentrate on its main function.

Whole hospital operational policies will be concerned first with main circulation routes and the relationship of the main departments. Although efficient clinical function must be the main objective, it must in some cases give way to compromise to achieve economy in other aspects of planning, eg if the 'on-costs' are to be kept as low as possible, there must be a concentration of those departments and areas which need expensive engineering installations.

DOCUMENTATION AND STANDARDISATION

The stated objective of these seminars is to identify the most important problems which planners and users are faced with. The first question I would like to ask is whether we have got our basic documentation right. Whole hospital operational policies and departmental operational policies are used as the brief for the design team. If however we are going to design a hospital on flexible lines which can be readily adapted to changing methods of work, the initial brief must specify this flexibility and not describe in detail how the accommodation may initially be used.

This brings us to the whole question of standardisation. There is a great deal that Hospital Boards would accept and even welcome in national standardisation, but not necessarily in the fields in which it is at present being imposed. Would not the Ministry do better to concentrate still further on the standardisation of building components or elements rather than on standard designs of hospitals or departments? Provided adequate research and evaluation has been carried out, hospital authorities would accept standard rooms designed for standard use and standard modules for windows, doors, storage components, and sanitary fittings, but would not readily accept standard designs for whole hospitals or departments. This is largely because no hospital has yet been thoroughly evaluated. Evaluation should be directed to a study of the whole pattern of patient care to determine the cost of traditional in-patient care compared with early transfer to more simple types of hospital accommodation or to the patient's home with the support of a domiciliary team. Because of the time taken to design, build and commission a hospital, it is doubtful whether in this era of rapid change this will ever be achieved.

OBJECTIVES OF PLANNING PROCEDURES

So far as formal planning procedures are concerned, our real objectives are still confused. The Ministry is in the dilemma of having to exercise control of expenditure, and at the same time having to rely on the Boards to determine priorities for the development of hospitals and being responsible for individual design. When the new procedures were first mooted, the Boards welcomed the ideas then put forward. Implementation of these ideas has resulted in a complex system of procedure which has destroyed much of the original concept of accelerating the planning process and giving Boards greater freedom to get on with the job. Nevertheless, this is the procedure which we now have to work to and its success depends on everyone concerned being determined to make it work. The spirit behind the new procedures was excellent - we must not destroy it by slavish adherence to the letter of the procedures.

The chief reason which prompted the new procedures was the expectation of a much enlarged capital development programme and this has to be processed without a corresponding increase in the personnel involved. Thus within each planning organisation there is a need to re-examine methods. Are we not spending far too many man hours in planning meetings? Up and down the country there must be many project teams going over exactly the same ground discussing the same problems and working out the same details.

Although we must not lose the value of the team approach to planning, we must ensure that various professional members of the team do not have to spend long hours sitting in on discussions from which they will extract only a small amount of relevant information, or can contribute little.

All of us must avoid being rigid or dogmatic about our own ideas - it is too much to expect that in the late 1960s we can claim to know all the answers to problems which have perplexed planners for many years. We look forward to a future in which change is constant and normal. In the meantime let us retain the sense of humility.

Finally, although this seminar is concerned with the hospital planning process, this process must not be an end in itself. Our objective is to create an environment in which a human service can operate and it will be the people and staff who occupy the buildings that the patients will depend on for this human service.

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John Weeks, opening the discussion after Dr Oddie's paper, thought that the paper represented a combination of practical comment and thoughtful ideas. Dr Oddie had raised a number of questions ranging from the suggested failure of the new planning procedures at one end of the scale to a plea for humility on the part of doctors and designers at the other.

One of the first questions that was raised suggested that cost allowances were related too much to departments as opposed to hospitals as a whole. Dr Oddie felt that the question of cost went back to the definition of the use of functional units since, for example, the same cost allowances were granted for beds irrespective of whether twenty or forty patients were put through in one year; similarly cost allowances for accident centres depended on peak period use so that the more convincing the peak period, the greater the cost allowance. He believed that ideally cost would be better considered on the basis of the population served by hospitals or departments.

On the subject of standardisation, Dr Oddie did not see how a standard ward could be designed to meet many and variable needs and suggested that work on the standardisation of components was a more fruitful course of action. He agreed however with one suggestion that where activities were not too precisely defined or where environmental criteria were not critical there was perhaps a case for the standardisation of spaces. He thought that the opportunity certainly existed for greater use of a standard range of general room spaces. The comment was made that standard departments could inhibit changing function. On the other hand, generalised spaces do exist as well as highly specialised areas. They could in fact be regarded as "hard" and "soft" areas which could perhaps be explored as suitable categories of function.

The discussion continued on the subject of standardisation and the means by which it might be defined. It was said that the Ministry had the impression that the Regional Boards wanted standardisation and that there could be no question of its imposition by the Ministry itself. A point was raised regarding the avoidance of duplication or repetition in research and development work by various hospital authorities. It was suggested that although standard departmental plans might not be satisfactory, there was some argument for accepting standardisation of certain hospital activities; in other words, the establishment of standard content, but not necessarily standard design.

The discussion appeared to represent two clear schools of thought on the subject of standardisation and suggested that Dr Oddie's views on the dubious value of standard departmental plans were challenged by a number of people on the grounds that

standardisation, despite its deficiencies, must inevitably be better than what existed at present. It was felt that standardisation could contribute to a great extent to the reduction of the time taken from the outline of a brief to the completion of a building. One speaker suggested that greater stress could be laid on whole hospital operational policy decisions relating, for example, to the desirability of centralising or diversifying service functions like catering and laundries, and that standardised procedures might be of more value than other kinds of standardisation. But standardisation of operational policies could not be linked to specific design problems without limiting freedom of experiment. The possibility of change, in medical functions and relationships, had to be anticipated and could not be inhibited by premature over-standardisation.

DAY 2

WHOLE HOSPITAL PLANNING
Centralisation of Clinical Services

United Oxford Hospitals

Summary

An outline of the project from inception to design implementation. The existing hospitals, the Radcliffe Infirmary and the Churchill, are unsuitable for future expansion because of piecemeal development over the years, while the medical school is expanding and the need for new accommodation is urgent.

The new site is at Headington and the proposal is to build a teaching hospital of 1000 beds which will include obstetrics and gynaecology as well as accident and neurosurgical departments, and will be complementary to the Radcliffe Infirmary. The Planning Team represents the interests of the Board of Governors, the Oxford Regional Hospital Board and the University and has a large measure of autonomy. The hospital, which will provide the major part of the service needs of the central area of the Oxford Region, is being built in three phases.

The operation of the team has been consistently smooth from the establishment of design concepts relating to medical services and their inter-relationship and the size and nature of the educational function down to departmental planning.

The design team has actively participated throughout; its initial ideas represented the interpretation of functional units, related to each other by the needs of patient care or teaching and research, as form and space.

The main design principles establish a major axis of growth to allow the three major elements of the complex, ie care and cure, research and teaching, and processing and servicing, to develop flexibly in parallel.

The second day of the Symposium, under the chairmanship of Brian Langslow, was intended to demonstrate how planning and decision-making were carried out at whole hospital level. A team from the United Oxford Hospitals described how they had met planning problems at this level, and the design team outlined their interpretation of user needs in building terms.

Inception of the Project

J Lovett, Project Secretary, Planning Team, United Oxford Hospitals

Like many cities in the country, Oxford has had dreams of a new hospital for a very long time. The principal existing acute hospitals are the Radcliffe Infirmary, opened in 1770, and the Churchill Hospital, handed over by the American Services at the end of the second world war. Their sites have been effectively strangled for major development by a process of piece-meal expansion through the years, and

the population forecasts for the 1980s cannot be effectively catered for by the existing facilities. In addition the Medical School is expanding and urgently needs better accommodation.

There has been considerable activity through the years to implement the planning of a new hospital and extensive debate as to where it should be sited. This reached fulfilment in 1960 when the Board of Governors, after consultation with the University, the Regional Hospital Board and the local planning authority, reached agreement with the Ministry that the future development of acute services in Oxford should be on the Manor House site at Headington.

A committee was appointed to make recommendations on the division of service activities between the Radcliffe Infirmary and the new hospital which culminated in the following proposals: to build a hospital of approximately 900 beds to include obstetrics and gynaecology, the accident and neurosurgery departments, and facilities for some general medicine and surgery; the need to have the University represented on both sites, and the need in the development to allow for the provision of a further 500 beds to enable the teaching hospital to concentrate all its activities on one site; and the need to allow part of the site to remain fallow for long term development for future generations.

THE PLANNING TEAM

At the end of 1963 the Board appointed a Planning Officer, and later a planning team. It was stressed from the start that to be effective the team must remain small. In achieving this aim it should be noted how different interests are represented. Dr Pollock, who has now succeeded Dr Oddie following the latter's appointment as Senior Administrative Medical Officer, holds a joint appointment with the two Boards. Dr Badenoch is a member of the Board of Governors, a member of the Nuffield Committee of the University which determines major University policy in the field of clinical medicine, a Consultant Physician and, at the time of his appointment to the planning team, was Dean of Undergraduate Studies. Dr Hodgson is Consultant Anaesthetist and is able to watch the interests of the surgeons.

Next the Board appointed its consultants: Yorke Rosenberg Mardall as Architects, Sir Frederick Snow & Partners as Engineers and Davis Belfield & Everest as Quantity Surveyors.

Our channels of communication are simple; the planning officer is responsible directly to the Chairman of the Board of Governors and the planning team process information through the Board's Policy and Planning Sub-Committee. University information is channelled via the University Registry to the Nuffield Committee.

This structure allows the planning team a very large measure of autonomy. That there is no necessity to process detail points through an extensive committee structure has been to us a distinct advantage. Our method of procedure through the various planning stages has been to obtain information and as a team to assess the problem and prepare documents to put to the users for constructive criticism. All the decisions and recommendations made by the planning team have been by mutual consent. At no time has a vote been taken.

Unlike most teaching hospitals, the United Oxford Hospitals are responsible for the major part of the service needs of the central area of the region and it is of extreme importance that the Board in consultation with the Regional Hospital Board constantly review the overall facilities in relation to anticipated demand.

TERMS OF REFERENCE

The terms of reference to the planning team were to plan and bring into use a 1,000 bedded teaching hospital to be complementary to the existing Radcliffe Infirmary. Initially it was intended that the development would take place in two phases in order to bring into use additional facilities as quickly as possible to ease the burden on the present buildings.

The first phase now under construction is a maternity department costing approximately £2m. which will be completed by April 1971.

The second phase was to have been the balance of the total to 1,000 beds with supporting departments. But teaching hospitals are expensive and the rate of availability of financial resources to achieve the second phase would have meant a considerable lapse of time before any further facilities were brought into use. For this reason it was decided to split the second phase into two parts, the first of which will be constructed on completion of Phase I and will contain the accident service, outpatient facilities, 450 beds and the majority of teaching facilities. This additional phasing also allows a greater length of time for decisions to be made on the overall content but at the same time it creates problems for the designer in construction and in ultimate integration.

Operational Policies

Dr J Badenoch, Consultant Physician, The United Oxford Hospitals

The Planning Team was successful largely due to its small size, its unanimity in decision making and its freedom of action under an experienced chairman. Nevertheless it operated to a rigid timetable for its task. At each stage in the exercise, such as the preparation of the first report on the outlines of function of the new hospital and later documents, a full presentation was made to the Board of Governors and the University. Free discussion took place and we were then given permission to proceed to the next stage.

In presenting these reports we were helped by the fact that apart from Phase I of the new hospital, which is the new Maternity Department, and with the exception of Paediatrics in Phase 2A, we refused to provide a tailor-made accommodation for anybody. As a result we could not be challenged by colleagues who might have said, for example, that the plans for the Department of Neurosurgery are out of date and quite unrealistic. From the outset we tried to develop a rational overall scheme leaving the decisions about who was to use the new accommodation to the Board of Governors itself.

There were of course difficulties at times in communication. Unfortunately our Planning Team Office was outside the hospital in the early days, and it was not always easy for our staff colleagues to know what was going on. We had to prove to them that our methods of planning produced results that were fair and forward looking, and that, although we were immovable on certain things (overall size for example) we were responsive and interested when they wanted to talk to us.

As the momentum increased, and we made rapid progress, we had the comfort of having the Chairman of the Board of Governors and his senior officers at regular informal monthly meetings, so that we felt that we had official understanding of the stage we had reached, even if we were further on than the Board of Governors realised.

Right from the start we got on very well with our architects; and I think it says much for them that although they are based on London and we on Oxford, a senior member of their team has regularly attended our meetings whatever his other commitments have been. This is important because much of the feeling for a project, and the background to a plan, can be gained only by sitting and listening to the arguments that are tossed about around the table. The architects have always resisted any suggestion that they should open an Oxford office and we can now see the wisdom of this. The fact that, as a routine, we met them only once a week forced us to conclude arguments and come to decisions which could have been left in the air if day to day informal contact had been possible between us.

COLLABORATION

How then did this group of people, with such widely different backgrounds, manage to reach agreement in so many fields and ultimately produce an architect's brief? Perhaps it was important that we had no chalk lines between us; we all felt quite free to comment on anything from boiler houses to bed curtains. We were a planning team, not a collection of specialists, and we have never had to take a vote on anything since we began. In this context we have often been asked why we thought it necessary to have a full time nurse planning officer in the team; we have never doubted the value of this. We have tried to plan this hospital with the interests of the patients very much in mind, and not, as is more usual, to design it for the convenience of the staff. In this, as in so many other matters, we have been helped by the presence of a nurse. We feel that we have gained much from sharing our ideas with a succession of first class nursing officers, with a good deal of practical experience in the wards and in the casualty department.

In retrospect I believe that another important factor was that the architects themselves refused to let us design anything, they would even retrieve the rough sketches and scribbled diagrams that were produced whenever we met. Much of the talk was about ideas, with the architects listening at first, and playing an increasing part as time went on. But always about function, never design. I began to see the project like an inverted fan, broad principles at the apex leading in turn to a discussion of more detailed functions and relationships, and finally the flow patterns of individual departments and services.

DESIGN CONCEPTS

We considered first the broad concepts. What sort of medical services did the area require? How large did they have to be? How should the various parts be related? What sort of Medical School did we want? Could the likely growing points over the next ten years be defined? How were we going to plan for the maximum flexibility of use, to allow for the expansion of one department and the contraction of another? What was going to be the relationship between the research laboratories and the hospital? We started with the concept of separate research buildings, but as we considered their function it became clear that some, at least, of the research space would have to be embedded in the hospital itself for the convenience of the patients who were to be studied. This in turn led to a closer association between the various parts of the project with shorter lines of communication and a much improved overall plan.

Then there were concepts in the middle range, such as the desirability of a Medical School in the established sense as opposed to a combined School of Medicine and Nursing. Could we really afford to have acute wards all over the hospital? The

statistics suggested that skilled staff would be in even more short supply than at present, and that it might be better to plan an acute floor with the maximum concentration of skilled personnel, and the rest of the hospital as semi-self-care, or at least much less acute. To what degree was the emphasis going to shift from in-patient care to out-patient diagnosis, and day treatment? What would be the place of automation and computers in the new hospital? What were the advantages of a proper polyclinic with cross consultations on the same day between different specialities? We could handle the transport problem by computer (the airlines do, why shouldn't we?) and avoid the usual problems of the appointment system. With automation we could have the results of blood tests and biochemistry available between the time the patient entered the doors and the time that he sat down at the consultant's desk. Fast, efficient, economical of time and skilled personnel.

And so it went on. All the time we were probing our own thoughts and ideas, relating functions to each other while the architects listened, and, I am sure, pondered on the difficulty of creating something as complex as a battleship and almost as costly.

DEPARTMENTAL PLANNING

Finally we came to the individual departments, the wards, and the laboratory modules themselves. Here too, the architects were equally ruthless. They insisted on being told exactly what would happen to the patients in this department, exactly what each member of the staff would do, and every detail of all the fixed equipment. This is a fierce discipline. When we began I had no idea how little I knew about what went on in a hospital. At this stage it was clear that we had to involve our colleagues; there was nobody in the team, for example, who could design an X-Ray department, although by now we knew where the X-Ray Department was going to be in relation to other departments. We knew, within broad limits, its overall size, because this in turn had been based on an estimated service load and we had obtained general agreement to an allocation of University space to be associated with it. Our colleagues could however help us to define the flow pattern within the department itself, and we and the architects could do our best to see that they got what they wanted. By proceeding this way the Planning Team kept a firm hand on the overall size of each part of the hospital, while at the same time making use of the experts in the field under discussion.

Gradually it became clear that while we in the Planning Team were concentrating more and more on details of function, the architects and their design teams were moving the other way. Their building blocks were our functional units related to one another by the threads of patient care or the needs of teaching and research; function had become form and space.

Design Brief

F Woodhead, Yorke Rosenberg Mardall

The basis of our initial brief was "the overall operational policies" written in December 1966 by Dr Oddie. This document described in conceptual terms the medical and nursing intentions. The broad idea for the hospital was then discussed by the planning team for a considerable time and draft departmental policies were developed as written descriptions of the kind of hospital organisation the doctors and nurses wanted. These discussions occurred very frequently and were lengthy but always very informal.

During this period, we made no drawings but our understanding of the planning team's concept became clear. We began to think of ourselves not only as design consultants to the planning team but as active and participating members. The greatest value of these early discussions was the development of a co-ordinated attitude and understanding within the team.

Very early in the design stage it was suggested that we should establish a branch office in Oxford in close working proximity with the planning office. This we were not keen to do because we believe there are considerable advantages in the architectural and technical feedback available in a large central architects office. We are now even more sure that this was a good decision.

Although we sometimes attend the planning team meetings in Oxford as often as twice a week, the fact that we are only there for the team meetings tends to emphasize the team's role as a decision-making group.

PRINCIPLES OF THE BRIEF

The Manor House site is on the south-eastern side of Oxford, approximately 2 miles from the Radcliffe Infirmary and 1/6 mile from the main London road. The area is approximately 69 acres (although this is reduced by a restrictive covenant over $3\frac{1}{2}$ acres) and has a very irregular shape. There are many existing buildings including the Olser and Sunnyside hospitals, some houses belonging to United Oxford Hospitals and a 17th Century Manor House which has to be preserved for its architectural and historical interest. All these buildings have to remain during the construction of Phase 1 of the development.

The site falls steeply to the north-west approximately 100 feet. None of the existing entrances to the site was considered adequate for the large volume of traffic anticipated in phase 2A so a major new entrance is being constructed in the north-western part of the site connected directly to the adjacent major road, Headley Way.

Our brief was to devise a development control plan which allowed for phased growth of the hospital up to 1,500 beds. The concept was to establish a major axis of growth so that each successive phase could be built progressively from the south-west to the north-west.

The three major elements of the complex develop in parallel:

i Care and cure - hospital accommodation
ii Research and teaching - mainly University accommodation
iii Processing and servicing

Because of the difference and unpredictable growth requirements of the University, provision has been made for some intermediate and independent growth along the research and teaching axis.

One of the fundamental principles in our brief was that Phase 2A should be planned on broad and flexible lines. Having established a sound system of supply and communications, clinical accommodation will be planned around the main diagnostic departments and the acute floor. Services and goods distribution from the industrial area are to be at a non-patient level.

FUNCTIONAL BREAKDOWN

The idea behind the acute floor concept (level 1) has been to set up the clearest and safest lines of communication for acutely ill patients and thus to concentrate the area of specialised staff activities. The important planning principle within all clinical and diagnostic departments has been the centralisation of staff working areas which are so arranged as to separate areas of high activity from patient areas which require privacy and quiet. The intensive care unit is in two standard units, each of three suites of 8 beds, with one suite used as a 4 bed sterile unit. There are 8 standard theatres; but the endoscopy and plaster rooms are planned as theatres so that there are effectively 10 theatres.

The general entrance level and out-patients service are on level 2. The out-patients department is planned to have a main waiting space, a central measuring and testing area and 8 standard clinic suites with 4 consultant/examination rooms and 4 examination rooms each. Level 2 also includes the rehabilitation department, the pharmacy, and the records department.

The social and academic floor (level 3), contains the central staff dining rooms, common rooms, staff changing accommodation and cloakrooms, and hospital, group and medical school administration. The academic street links up with Phase 1 and provides the major communication with the subsequent phases. The medical school and the schools for the professions supplementary to medicine relate directly to the street.

Level 4 is the first of four standardized nursing floors. The laboratory and research accommodation which is part of a total hospital service and planned on a standard module is integrated very closely with the nursing accommodation. Each standard nursing floor (levels 4, 5, 6 and 7) contains 120 beds which can be arranged as 6 x 20-bed nursing units with a centralised nursing administrative organisation, stores and finishing kitchen. Within this pattern no specific organisation for the various specialities has been prescribed.

* * * * *

The short discussion which followed the description of the work of the United Oxford Hospitals team highlighted a number of important points. Among these was the question of achieving flexibility by developing the idea of common user spaces. The overriding importance of the areas for acute patient care was stressed by the team but they pointed out that the units on the intensive treatment floors were designed for a variety of uses including recovery and short stay care. Another important feature was the definition of the relationship between patient care and teaching, professional and laboratory facilities.

Specific questions were raised concerning the methods of evaluating the building shape, the extent of cost evaluation in the formulation of operational policies, the method of determining departmental areas, and the role of the engineers. The team pointed out that the major design constraints were cost and the need to provide 120 beds per ward floor. As little as possible was spent on the wards and the maximum was allocated to areas for acute patient care. Area requirements generally were based on Ministry standards but were relatively flexible in application.

The team indicated that the operational policies were developed as the design brief but had been subject to amendments from time to time. The original policies had not been fully met, but the final development plan had not changed very much from the initial ideas and represented good medical concepts.

DISCUSSION: OPERATIONAL POLICIES

Chairman: John Dunn

John Dunn, introducing the general discussion at the end of the second day suggested that six topics formed a suitable basis for comments on whole hospital planning policies:

1. The need for a more systematic framework within which operational policies could be developed.

2. Methods of evaluating operational policies.

3. The need to anticipate running costs at an earlier stage than is currently the practice.

4. The extent of responsibility within the planning team for the development of operational policies.

5. The structure and organisation of the planning team and ways of making the best use of its members.

6. The way in which research is organised and coordinated, and the extent to which the Ministry should involve itself in this work.

On the first issue it was agreed that there was a need to establish the relevance and the extent of interaction of the whole range of operational policies, and to survey the information which was currently available. It was also thought that a more systematic framework might be helped by model operational policy formats and that management techniques and clear organisation were essential. The present confusion over the functions of planning policies, design policies and procedural policies, which created unnecessary duplication, could be avoided if the objectives of each were made clear. It was also important, if such categories were to be accepted, to establish who was going to use them and how they were to be operated. Research into the use and function of operational policies would, it was suggested, be valuable.

Methods for evaluating operational policies had hitherto been relatively pragmatic since time was usually against any efficient means of establishing a suitable framework. Most evaluation exercises were based simply on personal and professional experience. Many decisions, such as that of the Oxford team to separate service and patient traffic (which was largely ad hoc), required more thorough and positive evaluation. Work study and operational research techniques might be more extensively used; and what operational research work had been done could be disseminated more widely. It was suggested that more research direction was required into methods of evaluation and more projects could be used to obtain comparative data.

On the question of running costs, here again, methods of making any useful assessment were largely non-existent (apart from engineering costs) although the Ministry was at present attempting to establish suitable criteria. Proper techniques were needed to interpret the effect of planning solutions on revenue; for example, their influence on the economic use of staff which in fact constituted the main revenue cost, and which required more precise assessment of their value as a proportion of hospital running costs.

As far as the division of responsibility in the planning team was concerned, it was suggested that for various reasons, largely economic, the contribution of the private architect to the formulation of planning policies would not now be as great as it had once been. The responsibility devolved more than ever on the client body itself, although the Board's liaising architect had a major role. It was thought that standardisation of procedures would assist in clarifying individual responsibility and help to shorten the planning process.

The discussion groups had earlier discussed the structure and organisation of the planning team and were largely agreed on the various contributions which could be made to its efficient functioning. It had generally been felt that all disciplines concerned in hospital design, especially architects, should be included at an early stage; that an experienced chairman was important; and that the planning team must have a suitable degree of autonomy without constant interference from boards of governors, while keeping them fully informed of their decisions. It was suggested that equal firmness was necessary with consultants and departmental heads. A major conclusion of this part of the discussion was the importance of using the knowledge and experience of planning teams on other similar projects which would accordingly benefit. The plea was made for the use of up-to-date management techniques, better use of manpower and research and closer attention to cost.

The way in which research is at present organised was criticised for various reasons, and the meeting felt that while the Ministry was too remote to be effective, the regional boards themselves were not financially or professionally structured to carry out adequate research. There was also evidence of a considerable failure in communications. The suggestion was made that perhaps another body, such as a central research centre, might be set up with exclusive responsibility for research and coordinated by the Regional Hospital Boards.

DAY 3

PLANNING PRINCIPLES AND POLICIES

The Administrator's Contribution

Robert Jefford, Deputy House Governor, Addenbrooke's Hospital, Cambridge

SUMMARY

The administrator's role is to coordinate the various, sometimes conflicting, user interests and present them to the designers in the form of an integrated brief, first in broad terms, then in some detail as the design develops.

Traffic and supplies distribution are seen as a key to whole hospital operational policies as they radically affect layout and offer most scope for improvement in economy and efficiency.

My experience as a hospital administrator and planner has led me to the view that the hospital is not an organisation that lends itself, as some industrial concerns do to management by a single chief executive. The prime aim of the hospital is patient care, and for this a number of consultants are responsible. They are represented on the hospital authority, and may have a medical committee chairman with a powerful voice; but their first concern is with clinical matters. The doctor is not monarch of all he surveys. The nursing staff have a direct responsibility for patient care under medical supervision. The hospital administrator is a layman in the matter of patient care, but he is the professional when it comes to the coordination of all the activities which support patient care, including the implementing of policy decisions on the conduct of the hospital as an organisation. Who, then, runs the show under the aegis of the hospital authority? Surely it is the team representing a range of professional skills.

This awareness of the interdependence of the people involved in running a hospital is one of the most useful qualities the administrator can bring to a planning team. He is in a position to hold the ring when one of the specialist users of the hospital presses a planning claim which may, unless it is weighed against other considerations, distort the design team's understanding of the project. The administrator cannot substitute for the specialist user in the briefing process but he should have sufficient knowledge of all the hospital's users to be able to set the specialist's evidence in a wider context. He should be able to tell the designers how that part of the hospital described by the specialist fits in with the total activity.

The users of a hospital are broadly of two kinds. They are either staff or patients. In his daily work the hospital administrator, although he is only indirectly concerned with patient care, often encounters the patient, who, as a consumer of services, may have praise or blame for the people and experiences he meets in hospital. Patients are only rarely in a position to challenge the technical competence of their treatment, but they can make meaningful comments about the hospital environment, its comforts and its administrative efficiency. The administration therefore has responsibilities for public relations and for staff relations, and should bring to the planning team an awareness of the human problems generated in and by hospitals.

I seem to have suggested that the administrator's role in the planning team is that of an Everyman, balancing the needs of all other users. I certainly think he must be close enough to hospital working to know how all the specialist services must

dovetail in and how they affect the consumers. The administrator also represents the clients for the building in a more direct sense than the other members of a planning team, since he is normally the executive link between the authorities concerned and the project group.

DEFINITION OF THE BRIEF

The administrator plays a vital role in determining, not so much the shape of the briefing process as the form in which the brief is expressed. The project brief is directed to the designers; it is the body of information on which the design is based. Hence the administrator, in recording the minutes of meetings and in using all other appropriate forms of data collection and presentation, must put down what is relevant and meaningful to the designers. This means that the administrator should have regular contact with architects and engineers from the outset of a project, so that he can interpret between them and the planning team. It is essential for the administrator to appreciate that the brief should follow the logic of the planning process, so that the amount of detail in minutes and reports is strictly controlled. It is all too easy to produce, even at an early stage in planning, vast documents stuffed with unsubstantiated detail which distract the planners from formulating clearly the broad principles of the project, and give the designers an indigestible and confusing mass of material to cope with. It is useful to produce a summary of all the briefing material just before a broad design solution in the form of a development plan is postulated. The exercise of producing a summary document falls largely on the administrator, but it makes all the planners realise what they have decided and provides a bird's-eye view of the project just at the point when function is being translated into design.

I have written one such brief for the new teaching hospital at Leeds. Following discussion between planners and designers, the first step when it came to summarising the brief was to go through 200 planning files, listing all the main papers and noting the cross-references between them. The material had then to be set in order: the summary brief in its final form had nine chapters, and it may be helpful to comment briefly on them.

Chapter 1, The Introduction, described the historical background to the project and defined the nature of the summary brief.

Chapter 2, The Project as a Whole, set out the aim of the project and the policy for implementing it, and described the main features of the scheme.

The remaining seven chapters described the various elements making up the project. For instance, Chapter 3 dealt with Patient Accommodation, while Chapter 4, Treatment and Diagnosis, covered such services as operating theatres, rehabilitation, X-ray, pathology. Each of the later chapters described a number of elements in the hospital/medical school complex which for briefing purposes could be grouped together because they were concerned with the same broad range of function. The planners' concern was to convey an understanding of the physiology of the hospital and its associated medical school: it was for the designers to embody all the functions in an appropriate anatomy.

FACTORS IN OPERATIONAL POLICY

Some features of the hospital's organisation have to be broadly delineated at an early stage in the project. The administrator, with his general knowledge of all the functions of the hospital and his professional interest in the co-ordination

of activity, has a special contribution to make here. Before the layout problem is resolved the broad operational policies must be considered. At this stage we are concerned with those policies which affect the total design, particularly those features of the organisation of the hospital which involve the movement of people, objects and information. They may be placed under two heads: traffic between the hospital and the outside world, and traffic within the hospital.

In dealing with traffic to and from the outside world decisions must be taken firstly on access to the hospital: the aim here is to keep the number of entrances to a minimum, in order to avoid confusion and to concentrate certain types of traffic; and, secondly, the parking of vehicles.

Traffic within the hospital is a very complex matter. It is important first to establish general principles of movement routes, like the separation of traffic types into 'dirty' and 'clean', and how this can be achieved. Again, movement systems for the hospital must relate to the reception and circulation of patients, staff and visitors inside the building; the distribution of supplies and diagnostic materials, and information; and returns after use and the disposal of refuse. Under each of these heads the opportunity exists for establishing systems which are more efficient and economic than conventional methods.

ONE AREA FOR IMPROVEMENT

One of the most fruitful areas for improvement is that of supplies distribution. Hospitals are still being planned where a separate distributive system is envisaged for each of the major supplies - pharmaceuticals, medical equipment, linen, food, etc. This is clearly uneconomic in terms of staff and equipment, and lessons can be learned from the experience of some American hospitals - and from experiments now in progress in Britain - on the development of an integrated system to deal with the 'commerce' of the whole hospital. The opportunity which exists here has not been seized with sufficient enthusiasm. The approach should surely be to determine the work load and handling characteristics for each commodity, to establish which distributive methods are most effective, and to amalgamate and standardise these methods as far as possible.

I have advocated a study of operational policies before individual hospital departments are considered; but there will inevitably be an overlap, because where any major supply service is concerned a decision on the system of distribution will determine the main features of the supplying department. Moreover, some of the planning of movement systems will remain incomplete not only when departmental studies have been done but until a preliminary staffing assessment has been undertaken. This is the case for example with catering services, where the overall number of meals required is not known until a staffing estimate is available. The broad operational policies must at every stage remain flexible enough to permit later adaptation because the general organisational features of hospitals are subject to rapid change. A structure which will only work in a particular way is bad planning. Good planning involves a constant awareness of the goal to aim for, and if broad operational policies are sketched in early, departmental requirements can be tested against them so that any exceptions allowed to general rules are recognised exceptions which can be adequately supported.

The problem of exceptions to the rule is apt to become intense when the general layout of the hospital is being considered. It is common enough to find that one specialist user after another, when giving evidence to the planning team, asserts that his department must be placed centrally in the new hospital. The rule that

departments should be disposed functionally is threatened by so many exceptions that the disconcerting prospect looms of building a hospital which is all centre and has no periphery.

CO-ORDINATION OF ACTIVITIES

The administrator is the planner best fitted to co-ordinate the exercise of extrapolating, from the scale of activity laid down for each department, the pattern of inter-departmental movement, in the light of the policy assumptions established by the earlier work on broad operational policies. The building up of a traffic matrix will inevitably and quite properly involve the use of qualitative as well as quantitative data, not only because operational policies are taken into account but because it is likely that certain weighting factors related to the basic aims of the hospital will be introduced. Since the hospital exists for patient care, it seems logical (for instance) to weight the movement of patients so that this ranks higher than other types of traffic. However, no matter what considerations go into the build-up of traffic information, it is desirable that the matrix as finally presented to the designers should give the strengths of the relationship between departments in numerical terms. It will still be the designers' task to convert the traffic information into spatial terms.

The Ministry of Health's own study on 'Traffic Movements and the Interrelation of Departments' has reached the stage where a computer can 'solve' a matrix and produce a layout; but I believe it will still be necessary for planning teams to produce their own formulations of traffic information, even if some of the hard work is taken out of the exercise. Certainly over the next few years, local studies will be required to supplement what is done nationally, and matrices will have to be built up for special cases like psychiatric hospitals.

I hope I have not implied that the administrator is anything more than one member of the planning team. But he has certain skills and attitudes which lead him into particular problem areas of planning. I have concentrated on the tasks of presenting briefing information, and establishing broad operational policies. In these areas I feel that a good deal of exploratory work remains to be done.

Outpatient Services and the Collection of Information

Dr R Y Forbes, Principal Assistant Medical Officer, Wessex Regional Hospital Board

Summary

The problems of planning to meet demand for outpatient services are due to indefinite or overlapping catchment areas, poor information on existing patterns of referral, uncertainty of the potentialities of GPs in diagnosis and treatment, and the difficulty of predicting the effects on people of changes in the services provided.

We should aim to concentrate on raising the general standard of care within limited resources rather than attempt to define accurately the level of care needed.

The value of having GPs at future hospital planning seminars was stressed.

To illustrate the problem of collecting reliable information on the health services I should like to describe an actual survey undertaken four years ago and the possible implications for the planning process.

The area map of Aylesbury reflects the first problem of planning. Such Hospital Management Committee areas were laid down probably twenty or thirty years ago at least, and do not necessarily bear any relationship to the actual distribution of patients in the area, and certainly no relationship to the actual work of general practitioners. These are artificial boundaries which can inhibit our thinking.

The tables at the end of this paper represent a standard traditional record and opinion type survey. Much of the material collected, usually by general practitioners, was highly suspect, because it was incomplete for various reasons.

In our particular survey, we analysed the record cards of new outpatients attending the main hospital of the area over a period of about eleven years, then followed up a selected group of outpatients, questioning the general practitioner at the point of initial consultation, directing another set of questions to the consultants at the outpatient clinic and trying to match up the information produced to see what sort of system was operating at present. We hoped to assess what sort of outpatient service we should be producing, by analysing the present situation.

One of the difficulties was to define the population catchment area on which the whole thing rested. Table 1 indicates a scattering of outpatient referrals, which arose perhaps for historical reasons or because of the artificiality of the boundaries and changes in population distribution. One suspects there is a good hospital service in Luton and Dunstable which GPs have made use of, and which for various reasons were preferred to facilities in the Aylesbury area.

Many people have said that patients prefer to go to other hospitals and that this was a patient initiated process, but we did not find this as a result of our questions. (See Table 2). The main reason for travel was probably because there

Area of Aylesbury

were services available to them in an adjoining hospital group. If you accept that the boundaries are uncertain and the way that patients move to hospitals is uncertain, it is debatable whether the examination of current experience is a valid way of predicting the sort of service we want in the future. There is a danger in examining a local situation that the overall movement and distribution of patients is missed. There may be too intensive a concentration on producing too much investment in the hospital services on too close a geographical point, eg, outside London, there are three new district hospitals in a straight line: Headington, Wexham and High Wycombe with a maximum mileage between them of twelve miles. The different authorities which planned these hospitals no doubt concentrated on the hospital needs of the particular area. They are not in a position to look at the planning of the hospital services from a more central point of view. Are we allocating resources based on accurate estimates of population needs and movements?

LEVEL OF OUTPATIENT SERVICE

Diagnosis was probably our most formidable task. (See table 3). A lot of work has been done on the classification of diseases in relation to computer processing etc but a significant number of referrals does not lend itself to such definition; half are straight forward diagnoses, others are symptomatic. How are the results interpreted in terms of physical services required? There is in fact a broad similarity between the diagnoses of the general practitioners and those of the highly-paid hospital consultants. With the increased amount of postgraduate education and training the general practitioner might be said to be able to play a greater part in the service provided. This immediately raises the question as to whether we need to provide the present level of outpatient services generally. In other words the distribution of these services is pretty arbitrary. Because of the variety of ways in which general practitioners use hospitals and the diversity of existing hospitals, we ought perhaps to re-examine the way in which we allocate our services. I suspect that in about ten or fifteen years time we shall be reproducing the same sort of service that we have today if we continue to predict from present experience and methods.

VARIETY OF DEMAND

Looking at the question of the validity of collecting such information for planning purposes, we thought we were doing very well until we found out that we had only collected information on patients from a few specialities. (See table 4). The psychiatric people, for example, would not provide records because they were confidential. Some GPs cooperated, some didn't.

As an example, the use of major hospital facilities by general practitioners was highly variable. (See tables 5 and 6). We tried to analyse the causes for this, like the background of the general practitioners, the distance from hospital, etc, but there is in fact a basic and individual variation of requirements among doctors which controls the demand for outpatient services. Again, we have no control at present, although the executive councils are coming pretty close to it, over the way general practitioners are distributed. I wonder in fact whether the people who are concerned with the distribution of general practitioners are close enough in thinking to the people who are concerned with the distribution of hospital services.

We also considered, in our survey, why people were referred to hospitals and how they were affected by the fact that they might have to wait. (See table 7). This also raised the question of waiting lists for surgical operations and the desirability of having a second opinion prior to admission to hospitals. "Direct Admission" could be supported from this table.

It is evident that the variables in this sort of situation when it comes to planning these services are diffuse and difficult to interpret. If we are going to plan for a regional situation, taking into account all the health care services, we are going to have a mammoth task in assessing the importance of a vast number of unrelated factors. We should define the critical factors.

A fairly meagre number of examinations are undertaken at general practitioner level prior to outpatient referral. (See table 8). We may reflect on the fact that the general practitioner, with only a very little improvement in his surgery facilities or in the organisation required for access to X-ray and ECG, could do a greater proportion of the present consultative work referred to hospital.

There is a much wider range of direct reference facilities required than we first thought. (See table 9). We found a whole range of ancillary departments and treatment departments which could have been used by the general practitioner without any need for the consultant service to come in. I would not dare say this at the Royal Colleges because it is still the practice nowadays that straightforward treatment for your sore back or whatever it is cannot be provided until the consultant physician has been seen. If we are going to plan for the right level of services, we cannot afford to duplicate the amount of medical care received for relatively straightforward conditions.

Although this was four years ago, a substantial number of patients even in this day and age do not have routine blood-tests. (See table 10). We found also that the level of blood for obstetric patients was not particularly good. About a quarter of them were under 80 per cent haemoglobin. It may be that we do not want outpatient clinics so much as an investigation into the diets of the patients and the way they live in the community. "Clinical research" into outpatient conditions is the exception rather than the rule in the NHS. "Controlled trials" are even more exceptional.

PATTERNS OF USE

A major planning difficulty is how to measure the outcome of an outpatient's attendance and the validity of what happens to this or that patient. (See table 11). The vast majority of outpatients either go back to their GP or become inpatients or continue at the outpatient clinic. The reattendance pattern for outpatients is phenomenal but there is no built-in system to prevent a continuing outpatient referral process and an excessive number of reattendances. How much can we afford to give a high level of care to any one individual? - there are no limits, eg transplants. How then do we define an outpatient service? For example, what perhaps is important is to determine the right level of X-ray or pathology services that patients need. (See table 12). From our survey of the incidence, use and value of X-ray services, it would seem that we should concentrate on X-rays producing positive rather than negative diagnosis. Our findings highlighted the problem of making the best use of resources, which must evidently be more closely scrutinised. What in fact are we trying to do? Perhaps we should try to produce a service which provides for the vast number of untreated less glamorous disabilities, (like the millions of rheumatic cases and minor surgical cases) rather than emphasise the intensive elements such as heart transplants.

I have tried to illustrate the difficulty of defining medical needs and applying these needs to a suitable population area. Implicit in all this is the fact that we really want to give more attention to getting the right sort of information in order to plan. Because present medical care organisation is so complex we cannot

assess patient need with existing staff and methods. We should place a definite limit on the level of medical care and resources in any particular area. The resource allocation problem is at the heart of it all.

It would, incidentally, have been invaluable to have had general practitioners and local authority representatives present at these seminars. "Hospital" planning cannot be seen in isolation and the survey at Aylesbury surely indicates that new thinking on outpatient referral systems is required before allocating more resources to existing type departments in major hospital developments. We need to identify and classify, as a first step, the critical factors in basic planning thought which require investigation before a decision on future allocation of resources is made.

* * * * *

AYLESBURY OUT-PATIENT SURVEY

TABLE 1

Variety of hospitals used by General Practitioners for referrals outside hospital group area.

Hospital	Number
Royal Buckinghamshire	2
Stoke Mandeville	3
Luton & Dunstable	198
Children's Annexe, Luton	27
Luton & Dunstable Maternity	18
St. Mary's, Luton	34
Princess Mary's, Halton	46
West Herts. Hospital	45
Amersham General	43
Northampton General	26
Radcliffe Infirmary	25
High Wycombe W.M.	20
London Hospital	15
Oxford Eye	7
Barrett, Northampton	7
St. Paul's, Hemel Hempstead	7
Westbury Maternity	5
Wright Fleming	6
Nuffield Orthopaedic Centre	4
Middlesex Hospital	4
North Herts. Hospital	4
Churchill	2
Warneford	1
Manor House	2
St. John's	1
St. Bartholomew	3
Thame Cottage Hospital	1
Victoria Hospital, Thame	1
Bedford General	3
Manchester Royal	1
U.C.H., London	3
Whittington	3
Moorfields	3
St. Mary's, Paddington	2
Charing Cross Hospital	2
Guy's Hospital	2
St. Albans City	3
Others	12
Not stated	1
TOTAL	592

TABLE 2

General Practitioner Reasons for Referral outside hospital group area

Reason	Number
Special Facilities or Units	22
Referrals to particular Specialist	52
Quicker Appointment	5
Easier Hospital Admission	6
Better Treatment Expected	4
Patient's Preference	58
Other	357 *
Multiple reasons	88
TOTAL	592

*Reasons

Geographical	141
Bedfordshire Patients	190
Previous treatments at Hospital	14
Nearest available unit	9
Change of consultant	1
Referred by M.M.R.	1
At request of R.B.H.	1
	357

TABLE 3

G.P. Presenting Condition and Main Provisional Hospital Diagnosis by Major Diagnostic Group

Diagnostic Groups	General Practitioners		Main Provisional Hospital Diagnosis	
	Number	%	Number	%
Communicable Diseases	9	0.2	18	0.5
Neoplasms	82	2.2	154	4.2
Allergic Endocrine Syst.	69	1.9	110	3.0
Disease of Blood etc.	10	0.3	15	0.4
Mental Psycho etc.	24	0.7	61	1.7
Nervous System	201	5.4	112	3.0
Diseases of Eyes	294	8.0	275	7.5
Diseases of Ears	136	3.7	113	3.1
" Circulatory System	197	5.4	163	4.4
" Respiratory "	381	10.3	367	9.9
" Digestive "	398	10.8	288	7.8
" Genito Urinary "	391	10.6	328	8.9
Complications, Pregnancy	8	0.2	17	0.5
Diseases Skin	283	7.7	250	6.8
" Bones etc.	815	22.1	688	18.7
Congenital Malformation	54	1.5	46	1.2
Diseases early infancy	19	0.5	8	0.2
Ill-defined conditions	18	0.5	3	0.1
Accidents, poisoning etc.	257	7.0	240	6.5
Prophylactic Procedures	20	0.5	34	0.9
Admin: Procedures	-	-	-	-
N.A.D.	19	0.5	395	10.7
TOTAL	3685	100%	3685	100%

TABLE 4

% Extracted (Royal Bucks & Tindal Hospitals only

Code No.	Specialty	No.	S.H.3	% Extracted
01	Medicine	286	351	81.5
02	Paediatric	114	128	89.1
04	Chest	67	271	24.7
05	Skin	226	297	76.1
06	Neurology	79	121	65.3
08	Physical Medicine	220	247	89.1
13	Surgical	604	804	75.1
14	E.N.T.	543	800	67.9
16	Orthopaedic	708	910	77.8
17	Eye	344	506	68.0
24	Gynaecology	300	374	80.2
30	Psychiatric	2	64	3.1
33	Rheumatology	190	191	99.5
	N/S	2	-	-
	TOTAL	3685	5064	72.8%

TABLE 5

Annual Out-Patient Referral Rates : Single-handed G.P.s excluding those who referred less than 30 patients

Code No. of G.P.	Total Patients on List	Total Referrals in sample 73% 4 mths.	Estimated Annual No. of Referrals	Annual Referral Rate per 1000 Patients on List
14	2096	62	255	122
16	2715	51	210	77
36	2570	59	242	94
69	1902	62	258	136
80	3096	73	300	97

TABLE 6

Annual O.P. Referral Rate : Partnership G.P.s excluding those who referred less than 30 Patients

Code No. of G.P.	Total Patients on List	Total Referrals in sample 73% 4 mths.	Estimated Annual No. of Referrals	Annual Referral Rate per 1000 Patients on List
13	3920	49	201	51
10	4267	150	616	144
12	1570	38	156	99
21	4076	47	193	47
01	3532	56	230	65
75	2203	42	173	79
04	2960	65	267	90
24	2374	90	370	156
25	3169	52	214	68
28	2233	56	230	103
35	2493	68	279	112
30	3350	66	271	81
81	3484	129	530	152
53	3295	78	320	97
193	3145	79	325	103
43	2402	61	251	104
57	2491	40	164	66
58	4469	105	431	96
54	3082	71	292	95
55	3026	62	255	84
17	3098	50	205	66
64	2881	75	308	107
51	2422	45	185	76
67	2543	39	160	63
76	3606	71	292	81
40	2681	43	177	66
72	3039	38	156	51
82	2719	83	341	125
19	3069	92	378	123
70	1290	50	205	159

TABLE 7

Length of time under G.P. care and Reasons for Referral

Reasons for Referral	Length of time under G.P. care before referral				
	Less than 3 months	4 - 6 months	6 months and over	N/S	Total
For Consultant opinion and advice only	568	95	175	-	838
For Out-patient investigation and treatment	639	75	135	5	854
To be placed on waiting list for surgical operation	261	33	75	-	369
For Ante-Natal supervision	80	9	-	1	90
For reassurance of the patient	13	6	11	1	31
Other	69	7	21	4	101
TOTAL	1630	225	417	11	2283

TABLE 8

Preliminary Investigation of new out-patient referrals by General Practitioners

	Number
X-Ray Examination	128
Pathology	143
E.C.G.	3
None	1888
Other	2
X-Ray Examination and Pathology	44
X-Ray Examination and E.C.G	3
X-Ray Examination, Pathology and E.C.G.	6
X-Ray Examination, Pathology and Other	2
Pathology and E.C.G.	1
N/S	63
TOTAL	2283

TABLE 9

Prevention of Out-Patient Referral by use of "direct access" facilities

		Number
a)	Could have been prevented	326
	Could not have been prevented	1924
	N/S	23
	TOTAL	2283

b) "Direct access" facility required to prevent referral

X-Ray facilities	157
Pathology Laboratory	2
E.C.G. Service	13
Minor Operating Theatre	28
Physiotherapy department	35
Surgical Appliance Centre	26
Other	21
X-Ray facilities and Pathology Laboratory	3
X-Ray facilities and E.C.G. Service	6
X-Ray facilities and Minor Operating Theatre	7
X-Ray facilities and Physiotherapy department	15
X-Ray facilities and Surgical Appliance Centre	2
X-Ray facilities and Other	1
X-Ray facilities, Pathology Laboratory & Physiotherapy	2
X-Ray facilities, Physiotherapy Department & Surgical Appliance Centre	1
X-Ray facilities, Pathology Laboratory & E.C.G. Service	7
TOTAL	326

TABLE 10

Obstetrics : Blood Examinations

Blood Examination	Number	% of Total
Yes	121	87.1
No	18	12.9
Total	139	100

Obstetrics H.B. % first Examination

Haemoglobin	Number	% of Total
Under 80%	36	25.9
Over 80%	85	61.2
N/S	18	12.9
Total	139	100

TABLE 11

Outcome by Provisional Hospital Diagnosis

Diagnostic Group	G.P. Care	In-Patient Treatment	Out-Patient Treatment	N/S
Communicable Diseases	6	2	10	-
Neoplasms	12	99	35	8
Allergic Endocrine	16	31	62	1
Diseases of Blood etc.	1	5	9	-
Mental Psycho. etc.	27	2	31	1
Nervous System	22	19	69	2
Diseases of Eyes	72	19	177	7
Diseases of Ears	23	7	80	3
" Circulatory System	30	58	73	2
" Respiratory "	40	232	94	1
" Digestive "	49	149	82	8
" Genito Urinary"	74	149	103	2
Complications, Pregnancy	6	4	7	-
Diseases Skin	58	36	147	9
" Bones etc.	117	76	486	9
Congenital Malformation	10	10	26	-
Diseases early infancy	3	1	4	-
Ill-defined conditions	1	1	1	-
Accident, Poisoning, etc.	39	11	187	3
Prophylactic Procedures	17	-	14	3
Admin. Procedures	-	-	-	-
N.A.D.	201	10	169	15
Total Patients (3685)	824	921	1866	74
= 100%	22.4	25.0	50.6	2.0

TABLE 12

AYLESBURY OUT-PATIENT SURVEY

SINGLE X-RAYS

Nature of Request	Number	% Single X-Rays	% Positive No.	%
I.V.P.	53	7.0	17	32.1
Chest	154	20.5	51	33.1
Barium Meal/Barium En.	86	11.5	46	53.5
Abdomen	8	1.1	3	37.5
Spine	148	19.7	97	65.5
Limbs	16	2.1	11	68.8
Hands and Feet	34	4.5	18	52.9
Cholycystogram	18	2.4	10	55.6
Joints	123	16.4	80	65.0
Pelvis	2	0.3	1	50.0
Others	45	6.0	16	35.6
Sinuses	64	8.5	31	48.4
TOTAL	751	100	381	50.7

ALL X-RAY FINDINGS

	No.	% of Total
Negative	466	43.5
Positive	596	55.7
N/S	9	0.8
TOTAL	1071	100

The Nurse's Role in Patient Care & Welfare Aspects of Planning

Miss M McCutcheon, Nurse (Planning), Leeds General Infirmary

Summary

The nurse planner's task is to help formulate policies on nursing organisation and education, and on patients and staff facilities. She will also help build up a realistic staffing establishment and ensure that adequate provision is made in design for flexibility in use and for staff changing, recreation and residence, particularly in relation to their effect on staff recruitment and job satisfaction.

Problems of communication with designers can be helped by the use of check lists, and users must be made aware of the operational implications of design decisions by means of operational manuals.

The nurse's particular responsibilities as a member of the planning team are concerned with the various aspects of the nursing service and its organisation. These come under two main headings, namely, the patient's needs and the nurse's needs. It is important that they are considered not only in relation to each other but also in relation to the total hospital organisation. It is in this context that one considers the needs of the patient and the nurse.

THE PATIENT'S NEEDS

A careful study of the patient's needs is required to determine the best way in which to meet them, that is to say, what services he requires and who should provide them. His needs will differ according to the nature of his illness and his progress through the various stages of that illness. Consideration must be given to every area of the hospital concerned with the care of the patient, whether as an inpatient, an outpatient or a day patient.

By looking at the patient's needs in all the areas concerned, it should be possible to build up an organisation to meet them. Such an organisation should make use of nursing skills wherever they are required and should include the use of other grades of staff who possess different skills. The theoretical question of what are "nursing" and "non-nursing" duties has yet to be resolved. But whoever else is brought into the team caring for the patient must be there because he or she has a particular skill to offer.

By looking at the patient's needs, by looking at the total organisation required to meet them and by identifying the nursing element in this, the demands on the nursing staff emerge and a nursing service can be developed. Alongside this the educational needs of student nurses must be considered. The requirements of the syllabus for a specified period to be spent in gaining experience in the various specialities, the time spent in the classroom and the need for adequate support from trained staff have to be balanced against the service demands of the hospital. A planned programme of training showing the allocation of the total

student and pupil nurse population of the hospital is of value not only as an aid to organising the nursing service but also in giving the student a sense of purpose and security.

It should be possible from this kind of information to build up a realistic nursing establishment - realistic because it is based on true need and because it has been considered in the context of a total hospital establishment.

What effect do such decisions on nursing organisation have on physical planning? Briefly they may be summarised as follows: firstly, if a policy of progressive patient care is to be adopted, the design of the bed areas must be sufficiently flexible to make this feasible; secondly, there should be ease of access to diagnostic and treatment areas for both inpatients and outpatients; thirdly, it must be possible for supplies to reach the areas of use without undue interference with the work of those areas; and lastly, staffing figures are an important piece of planning information which is required to determine the scale of many departments and services, like catering, residence, car parking.

THE NURSE'S NEEDS

The requirements of nursing staff include the provision of residences, changing rooms and recreational facilities, and professional needs in education and training. The demand for residential recreational and changing accommodation varies according to the area in which the hospital is situated as well as the catchment areas for staff recruitment. If there is no housing shortage in the area or if most staff are recruited locally, the need for the hospital to provide residences diminishes. Recreational facilities should only be provided where none exist in the locality; as far as possible, nurses and other hospital staff should be encouraged to participate in the life of the community and not to remain apart from it.

As the proportion of resident staff diminishes so the demand for non-resident accommodation increases. The calculation of the provision of changing rooms for non-resident staff is complicated by the increasing proportion of part-time staff. Careful organisation and siting is necessary if adequate accommodation is to be provided without undue waste of space.

The care of nurses' health should form part of an occupational health service for all hospital staff. This concept, so long established in industry, is relatively new to the hospital service but already several experimental schemes have been started. Such a service, when fully developed, would encompass all aspects of preventive health care concerned with work and the working environment - hygiene in kitchens, control of infection and accident prevention.

The educational needs of the nurse will be related to the type of training undertaken and the way in which this is programmed. In view of the need to make the best use of resources (accommodation, equipment and teaching staff), links with training in other disciplines, such as physiotherapy or radiography, and with nurse training in other hospitals, should be considered. At the same time, the need for coordination of theory and practice must not be overlooked.

SPECIAL PROBLEMS IN PLANNING

Many problems in planning have stemmed from difficulties in communication with the user. The planner and the designer to some extent speak the same language or at any rate think along the same lines. The user often has difficulty in making his meaning clear and it is the planner's task to help him to do this. A system of check lists or

questionnaires is most helpful in obtaining the necessary information in clear and concise form, although it often takes time to convince the user of their value. Similar difficulties of communication are experienced at the time of commissioning and the need to prepare detailed operational manuals cannot be emphasized too greatly.

The nurse's task as a planner is to provide information about the nursing organisation in the context of the total hospital organisation. This information has first to be obtained, secondly conveyed to the designer and thirdly re-channelled to the user in the form of operational manuals.

* * * * *

One or two points were raised in connection with the papers given by Mr Jefford, Dr Forbes and Miss McCutcheon. Mr Jefford had suggested that the administrator was best fitted for the role of coordinating the planning team's decisions with design interpretation. This was taken up by one speaker who said that he also had the task of running the building afterwards and was by this token alone an important figure throughout the development of a project; he had a significant function as legal coordinator and negotiator, and as representative of the client.

Dr Forbes was asked about the effectiveness of health centres, in terms of improved accessibility for GPs, compared with the outpatients departments of district general hospitals. Dr Forbes said that health centres could provide many appropriate facilities but that the structure of general practice could itself be radically improved.

Miss McCutcheon, in answer to a question about the training of nurses as project planners, said that they were often unprepared for the task apart from a slight knowledge of work study, but that courses in planning were now in operation.

Design Interpretation

H L Smith, Watkins Gray Group 2, Architects, London

Summary

The ultimate responsibility for the design of a hospital building rests with the architect; therefore he has to ensure that the requirements and policies are correctly interpreted and translated into readily understood and verifiable design proposals. Systematic analysis of activities and their inter-relationships is necessary in obtaining economy in design and operation.

By designing assemblies of fittings and equipment to suit particular activities the chance of error is reduced. The use of mock-ups of rooms can lead to further economies and improvements in layout. Even where detailed enquiry is not possible, the design team must continually question the implications of operational policies and user requirements.

The average project team, during its often lengthy life, produces a vast amount of paperwork. My talk will attempt to assess its value in terms of interpreting the user's requirements.

It is of course vital that all decisions emerging from the assessment of the brief should be recorded in the main to provide data for the architect and engineer to allow them to consider the total requirement of the project. Only by giving them this opportunity for overall assessment of policy and detail can plans be prepared with any degree of realism.

As the average project team proceeds the policies are drafted and the schedules are prepared, leading to the day when the architect produces a series of usually rather long elaborate room data sheets which he requires the client to complete for each and every space, including details of equipment and environment. All too frequently this labour produces inadequate data.

Figure 1 shows a sheet taken from a project within the last three years and is typical of many others in use. It gives virtually no usable information to allow the designer to plan or equip his spaces.

Figure 2 shows the way many design teams co-ordinate the stated requirements of the Client on to a drawing. In most examples the assemblies of components as drawn bear little relationship to the actual dimensions of the items.

An additional refinement of the process at this stage is the preparation of elevations of every wall of every room which often illustrate little more than the position of a single power point or even a blank wall. The end product of this data inevitably results in rooms which simply do not work.

The rooms illustrated in figure 3 are taken from a hospital with generally high design standards completed in 1965 and shows the chaos that can be the end product of woolly thinking and data collection in the planning stages.

Something seems to go wrong with the team's visions when translated into fact. Perhaps the whole team is at fault, the administration for being superficial and the architect and engineer for accepting the situation. The basic weakness is an unwillingness to think out the policies thoroughly enough and an inability to think rationally about what people really do in buildings.

The architect and engineer have the greatest need to probe and push continually; to question until they satisfy themselves that the brief has been thought through to the end of the line. It is their responsibility for the physical form of the building, and they alone give the final instructions for the location of all the bits and pieces with which the spaces will ultimately be filled.

NEED FOR REASSESSMENT OF BRIEFING

It is obvious that a fundamental reassessment of this type of briefing and data assembly is required. I should like to describe the results of a project team study of a building-type for which very little real thinking had previously taken place. Not a hospital building but an ambulance station, which is nevertheless a health service building.

One of the largest local authorities in the country had an extensive redevelopment programme for the ambulance service. It had clearly thought out its overall control and communication policies and had defined a need for approximately 35 small 2 or 3 vehicle local stations. The schedule of accommodation for these stations had been prepared by the administration and handed to the architects' department who were instructed to build them. The schedule, see figure 4, covers approximately 14 separate rooms of varying sizes.

The clients' instruction to proceed coincided with my appointment as development architect and I suggested it might provide an opportunity to look afresh at the activities carried out in these stations. The ambulance service agreed to the setting up of a working party consisting of the Chief Officer and his executive colleagues.

Once the relationship of the station to the main operational system had been established a detailed study was carried out of exactly what people did and what equipment they needed to do it, see figure 5. These minor activity spaces were then assessed to establish their relationship one to another, and the degree of separation and enclosure each required. Figure 6 shows an example of a data sheet. Only on completion of the study was any form of plan produced, and this then bore little relationship to the original schedule.

But because the project had been developed and recorded in a logical and systematic way, the client, who by the end of the exercise was as enthusiastic as we were, accepted without any alteration the final plan. Figure 7 shows the plan of a standard 3 vehicle station. The basic units of crew accommodation and garage area may be arranged in many different ways to suit site conditions and equally are capable of expansion to suit greater vehicle requirements both at the planning stage and after the building has been commissioned. Not only was this building-type more easily manageable, but it was 25 per cent less in total floor area than the original schedule. The work of the team was completed in about nine meetings, and this prototype is to be extensively built throughout the area. Figure 8 shows a model of the prototype station.

DEFINITION OF USER REQUIREMENTS

A fundamental reassessment of what people really do is the basis upon which the Ministry of Health User Requirement Study Group has worked. It took as its starting point the activities which were common to many departments of the hospital, such as disposal, testing of specimens, bed pans, treatment procedures, etc. The questions were: what do people do? what do they do it with? how much space do they need to perform the activity? where should the equipment be placed? Figure 9 shows an example of an activity sheet from the dirty utility areas study.

The same sort of result was found - that the established order of room labelling was not necessarily valid. For example, the activities associated with disposal, bed pans and routine specimen testing could be carried out more economically in one room rather than the traditional three separate rooms.

The report covering common rooms was completed by the Ministry of Health in 1966 and circulated for comment. It is now being printed in its final form. Information on many other departments is now being prepared by the Ministry of Health for issue shortly.

COORDINATION TECHNIQUES

Having once established a systematic method of defining user requirements one can go much further with the provision of accurate data. Space diagrams would be more realistic if the compiler had a real kit of parts from which to develop the diagrams. In many cases the drawn information is based on inspired guesswork; the sizes of fittings, like basins or laboratory equipment, are rarely determined at the design stage, with the result that space allocation within the room has to be altered at the production drawing stage. Small-scale drawings used to illustrate room layouts would be simpler if codes and symbols were used to indicate equipment location; the codes in turn referring back to larger-scale detail drawings to enabling the client really to see what he is getting in two dimensions.

Many activities like washing hands are repeated time and again throughout the building. It would seem logical therefore to rationalise the equipment and components required by this activity into standard assemblies which could then be keyed back to the drawings by one single code or symbol representing the complete assembly.

In our own organisation we have carried out extensive rationalisation studies in the three large teaching hospitals with which we are currently involved and have developed a catalogue of fittings and equipment which will cover almost all items in the hospital; wherever possible the fittings and components are complete assemblies. Figure 10 shows an example of one of the component catalogue sheets for sanitary fittings. Figure 11 shows a similar approach to laboratory fittings. Basic data collection sheets are still required for client approval and equipment ordering, but in most cases their completion becomes a simple matter of inserting the coded reference from the standard catalogue. Figure 12 shows an example of our present room data sheet in use generally in the office.

The advantages of this sort of approach are numerous: accuracy, in that the precise physical shape of each assembly and element is accurate at the design stage; drawings are clear and easy to read, and they eliminate, except in very complex rooms, the need to draw the elevation of the walls since all heights and vertical relationships are shown on the detailed assembly drawings. Figure 13 shows a coded design drawing of a medium sized project used to co-ordinate all information and to obtain the Client's final approval.

MOCK-UPS

If rationalisation and standardisation are to be carried out to any degree it is desirable that the final conclusions shown on the data sheets should be proved in physical form. Mock-ups help in assessing the use of space and generally result in some area reduction. The construction of a mock-up, to be effective need not be elaborate; at Greenwich, for example, a simple slotted angle and fibreboard was used to construct walls and storage fixtures, softwood slats to create doors and polystyrene blocks to construct objects with more complex shapes.

The degree of data collection and recording carried out in the Ministry of Health Studies and in the Ambulance Service Study may not always be possible, but if it becomes second nature for all members of the team to question continually throughout all stages of the project and to think clearly about the implications of policy-making the result must be more adequate user requirement data and, ultimately, better buildings. The maxims must always be what do people do? what do they need to do it with? what is the relationship of both in terms of space?

INTERMITTENT DIALYSIS UNIT — ROOM DATA SHEET — DEPARTMENT — ROOM NAME — ROOM NUMBER

PLANNING

USE OF SPACE
- Main activity: Communication
- Critical room dimensions
- Access for portable equipment: Yes
- Special risks—fire, explosion, theft
- Other hazards

TIMES OF OCCUPATION: Anytime

POPULATION
- Staff
- Patients: 0-30!
- Students

RELATIONSHIP TO OTHER SPACES

SIZE

FLOOR LOADING

ENVIRONMENT

LIGHTING
- Special requirements: None
- Drug cupboards
- Illuminated signs
- Special switching
- Emergency

POWER
- Sockets, 13 amp. single: 2 → [1-24, 1-25]
- Sockets, 13 amp. double
- 3 phase—state H.P.
- D.C.—state voltage and current
- L.V.—state voltage and current
- Socket for portable x-ray apparatus
- Earthing
- Screening
- Flashproof
- Emergency

HEATING AND VENTILATION
- Temperature °F.
- Temperature differential ± °F.
- Humidity—state percentage relative humidity
- Air changes per hour
- Air filtration—is 99% efficiency down to 5 microns adequate?
- Inflammable gases present
- Corrosive fumes present
- Sterile area—location
- Special ventilation requirements

FACILITIES

TELEPHONES
- Internal
- G.P.O.
- Coin box G.P.O.
- Jack point for G.P.O.

CALL SYSTEMS
- Staff
- Patient to Nurse

RADIO AND TELEVISION
- Radio
- T.V. Sound
- T.V. Aerial point

CLOSED CIRCUIT TELEVISION
- Camera positions
- Receiver positions

ELECTRIC CLOCKS
- Sweep second hand required?

AUTOMATIC DICTATION

PNEUMATIC TUBE

MEDICAL GASES (state outlet required—wall, ceiling, boom)
- Oxygen
- Nitrous Oxide
- Carbon Dioxide
- Other gases

TOWN GAS

MEDICAL SUCTION
- Capacity in litres per minute
- Working pressure in cms. of vacuum

VACUUM CLEANING

COMPRESSED AIR
- Working pressure in lb. sq. in.
- Maximum and minimum pressures

PATIENT MONITORING

SECURITY

WARNING SYSTEM

HOIST, LIFT, CONVEYOR
- State purpose and maximum load

SPECIAL REQUIREMENTS

BUILDING ELEMENTS

WALLS
- Radiation protection
- Other finishes: Washable

SKIRTINGS

FLOOR
- Type of traffic: ① Foot ② Equipment
- Finish—non-slip
- radiation protection
- chemical resistance
- anti-static
- drainage gulley or channel

CEILING
- Radiation protection
- Special equipment hung from ceiling—state weight

WINDOWS
- Blackout—partial/complete
- Privacy—curtains if authorised
- Radiation protection
- Sun protection
- Clear or obscure glass

BLINDS
- Blackout
- Venetian
- Motorized

DOORS (state location and size if critical)
- Radiation protection
- Protection against damage
- Vision panel—shuttered?—size
- Special ironmongery
- Hinged or sliding
- Self closing
- To stand open
- Locks only if essential—suiting arrangements
- Sign for room name

WALL OPENINGS (state location and size)
- Hatches
- Observation panels
- Radiation protection

INSULATION
- Acoustic
- Vibration
- Other

COLOUR
- Medical limitations (e.g. ophthalmic dept.)

Compiled by	Date
Approved by	Date

FIG 1

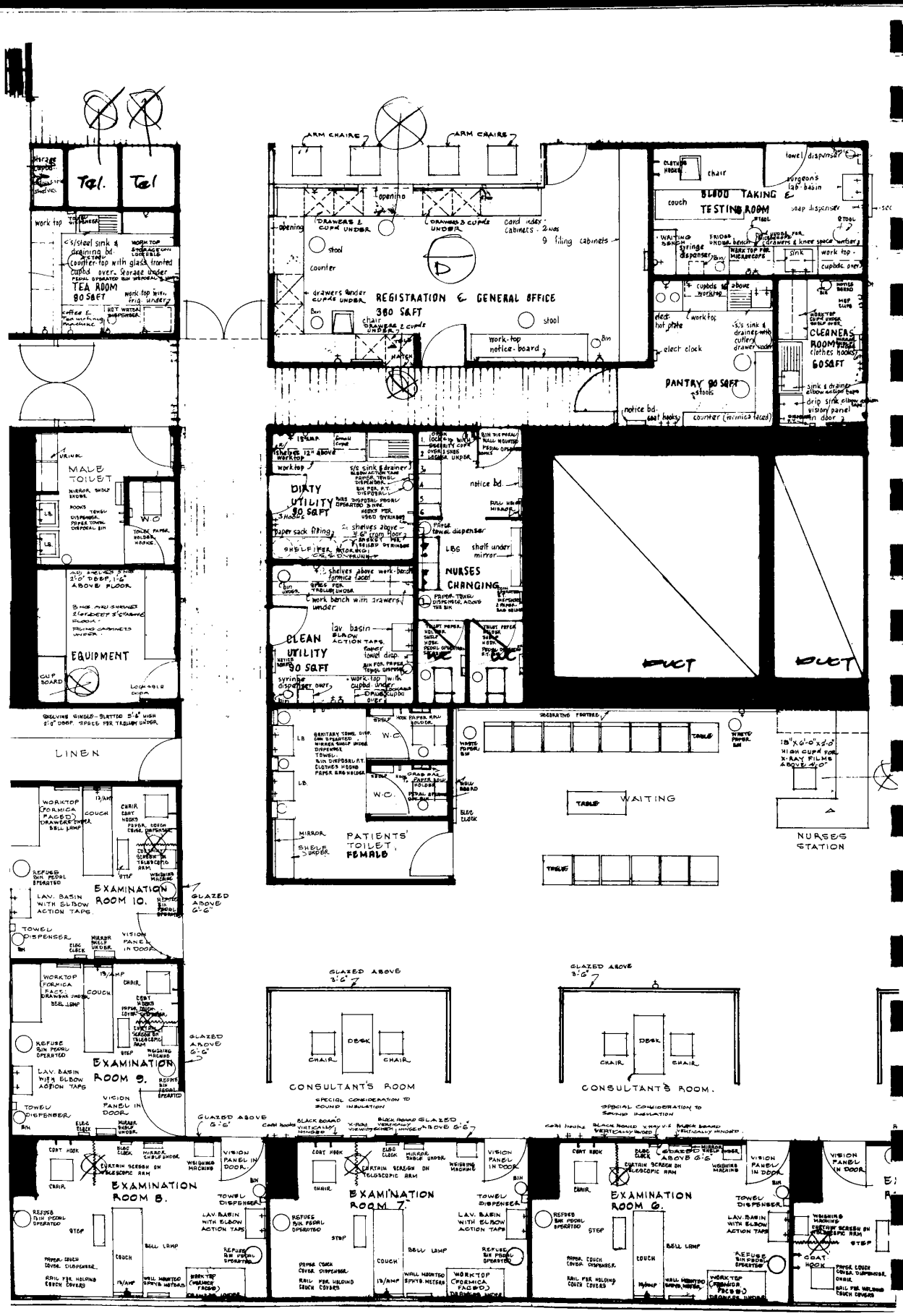

TEA ROOM 80 S&FT
REGISTRATION & GENERAL OFFICE 360 S&FT
BLOOD TAKING & TESTING ROOM
CLEANERS ROOM 60 S&FT
PANTRY 90 S&FT
MALE TOILET
EQUIPMENT
LINEN
DIRTY UTILITY 80 S&FT
CLEAN UTILITY 90 S&FT
NURSES CHANGING
PATIENTS' TOILET FEMALE
WAITING
NURSES STATION
DUCT
DUCT
EXAMINATION ROOM 10.
EXAMINATION ROOM 9.
EXAMINATION ROOM 8.
EXAMINATION ROOM 7.
EXAMINATION ROOM 6.
CONSULTANT'S ROOM
CONSULTANT'S ROOM.

FIG 2

FIG 3

preliminary small ambulance station schedule

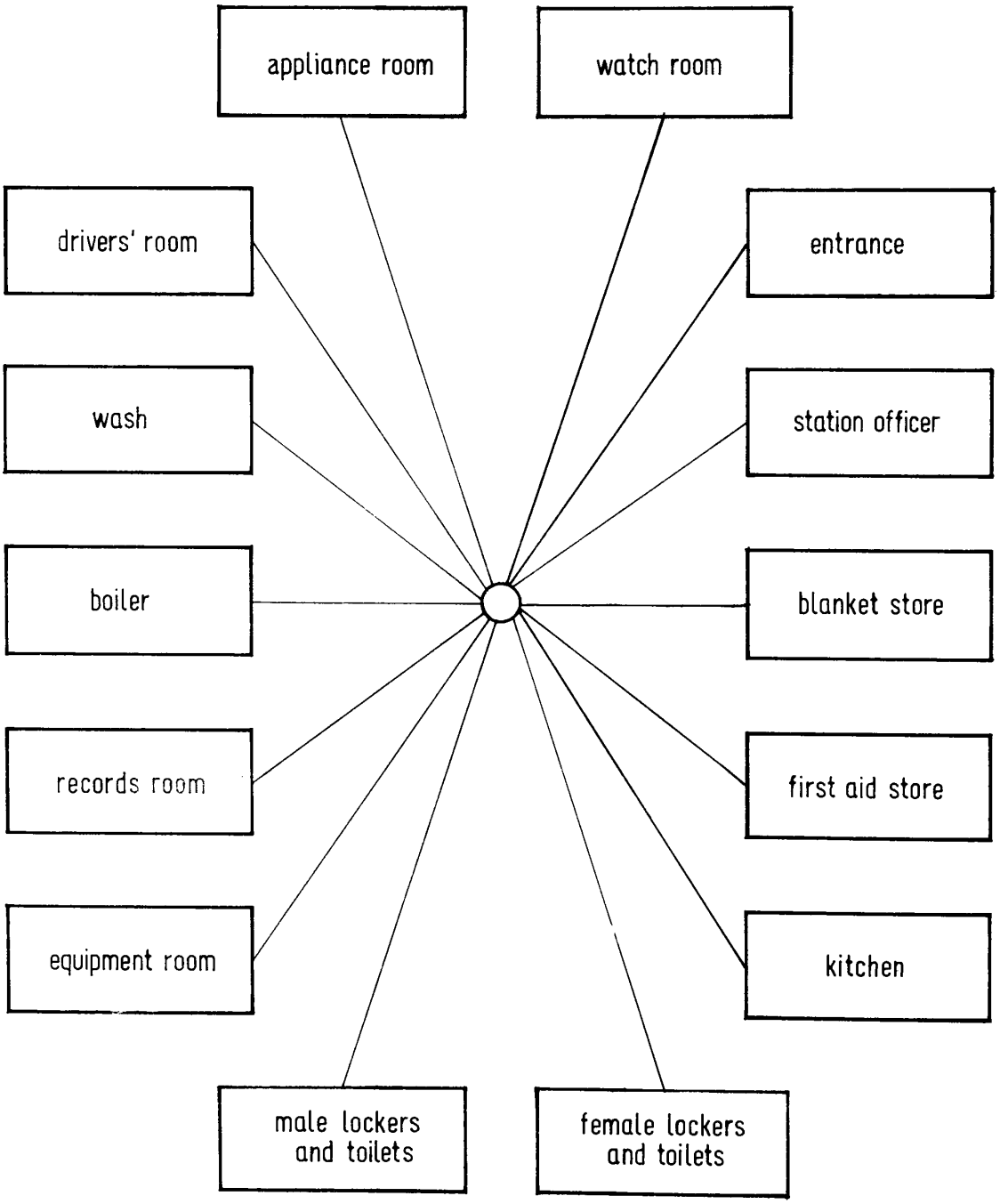


FIG 4

Activities and area association

The chart below lists the activities which occur in the normal daily routine of ambulance personnel on a small station. Each activity is associated with one of the four primary zones shown.

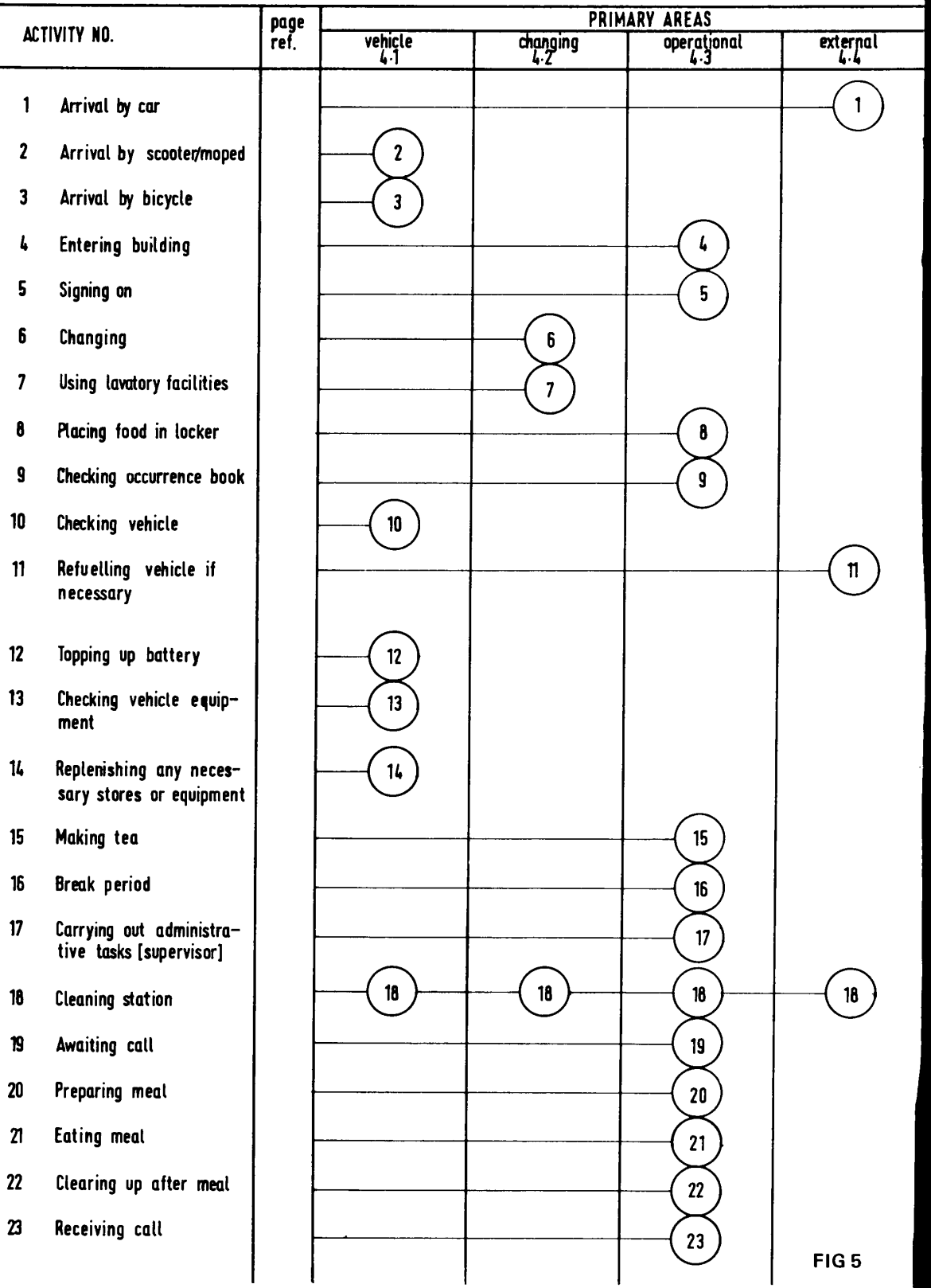


FIG 5

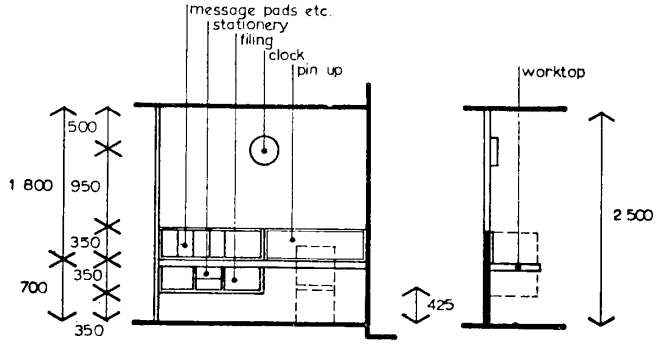
ACTIVITY STUDY

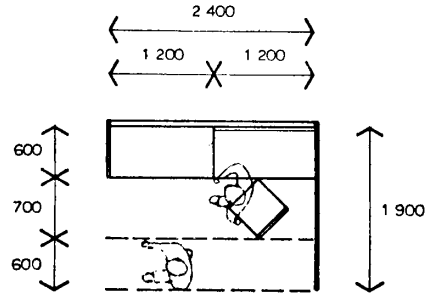
ACTIVITY NO.		EQUIPMENT	DIAGRAM
4	Enters building, checks time of arrival and signs time sheet.	Desk/worktop Clock, digital Occurrence book Time sheets Telephone Message pads Letter box	11
9	Checks occurrence book.		
23	Answering telephone, writing message on form, checking time.		11
17	Carrying out office tasks by visiting supervisor : (a) vehicle fuel returns (b) checking records of journeys (c) vehicle accident reports (d) loss of equipment roster (e) duty roster Mail is delivered by hand; no mail is sent out from the station. Returns, etc, are collected by hand. Pay is direct to individuals but if they are on leave cash may be held on the station until they return.	Desk, normal height Chair, desk Storage for stationery (see separate list) In and Out baskets Storage for files Waste paper basket Small wall safe	11
8	Opening food locker and placing food inside, re-locking locker. Placing milk in refrigerator.	9 lockers, internally 300mm. cube. Insect proof. All locks differing. Refrigerator 1.5 cubic capacity Socket outlet 13 amp.	15

NB. Personnel bring food for their own meals with them each day apart from minor items : tea, sugar etc.
Storage may be shared by each vehicle crew.
Common refrigerated storage is required for milk.

FIG 6

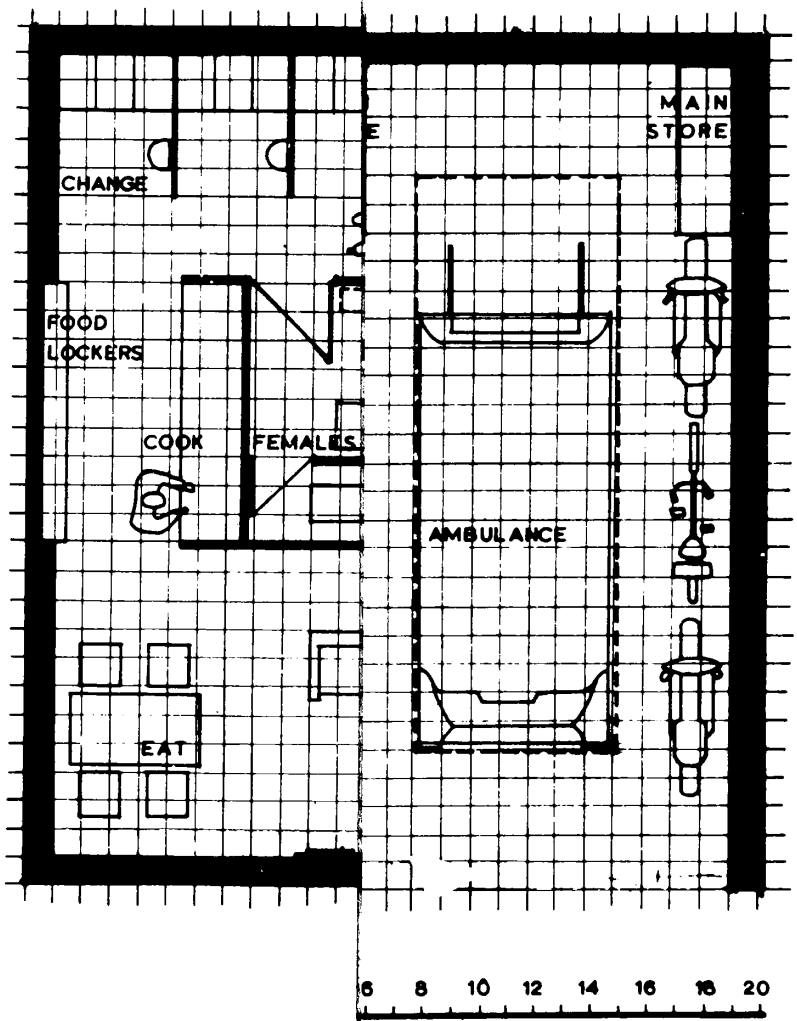
diagram 11





Office area

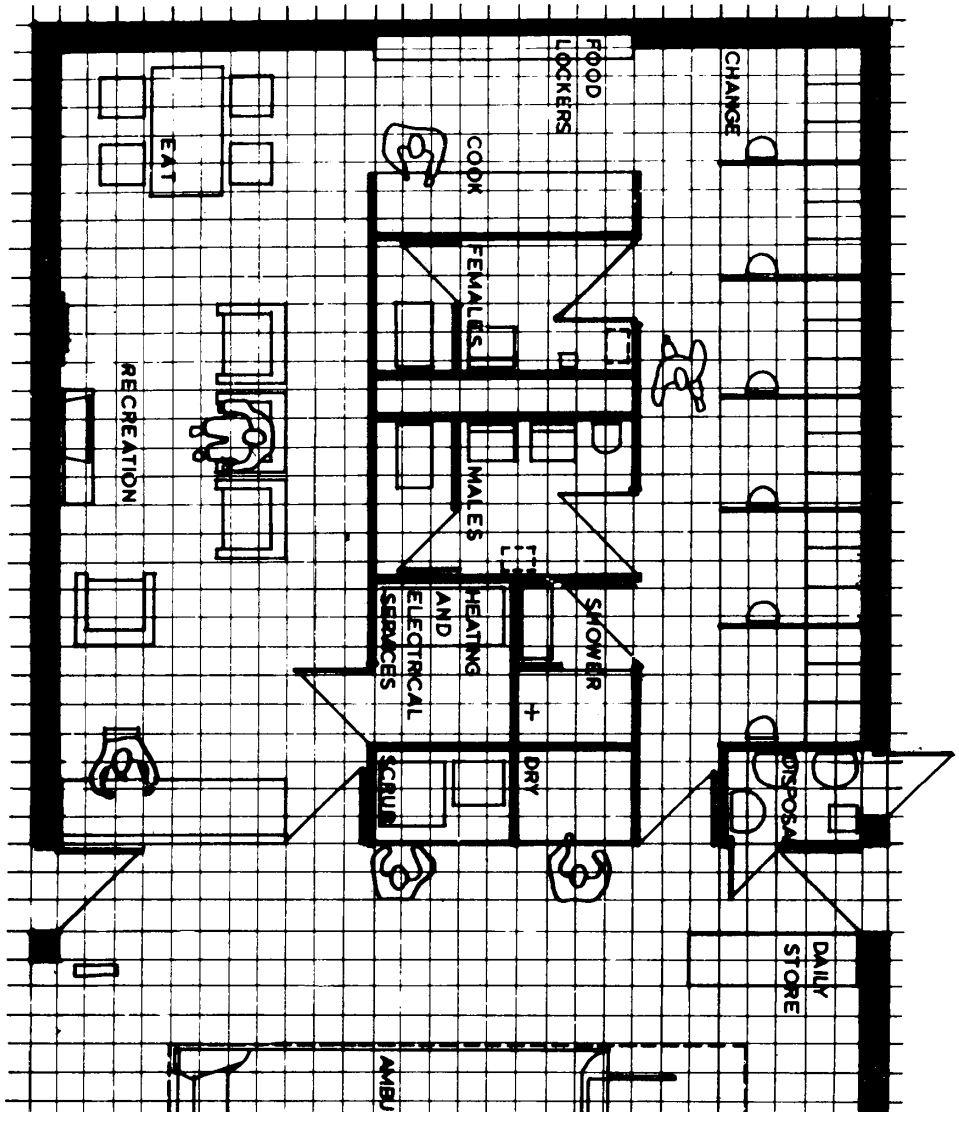
diagram plan 34

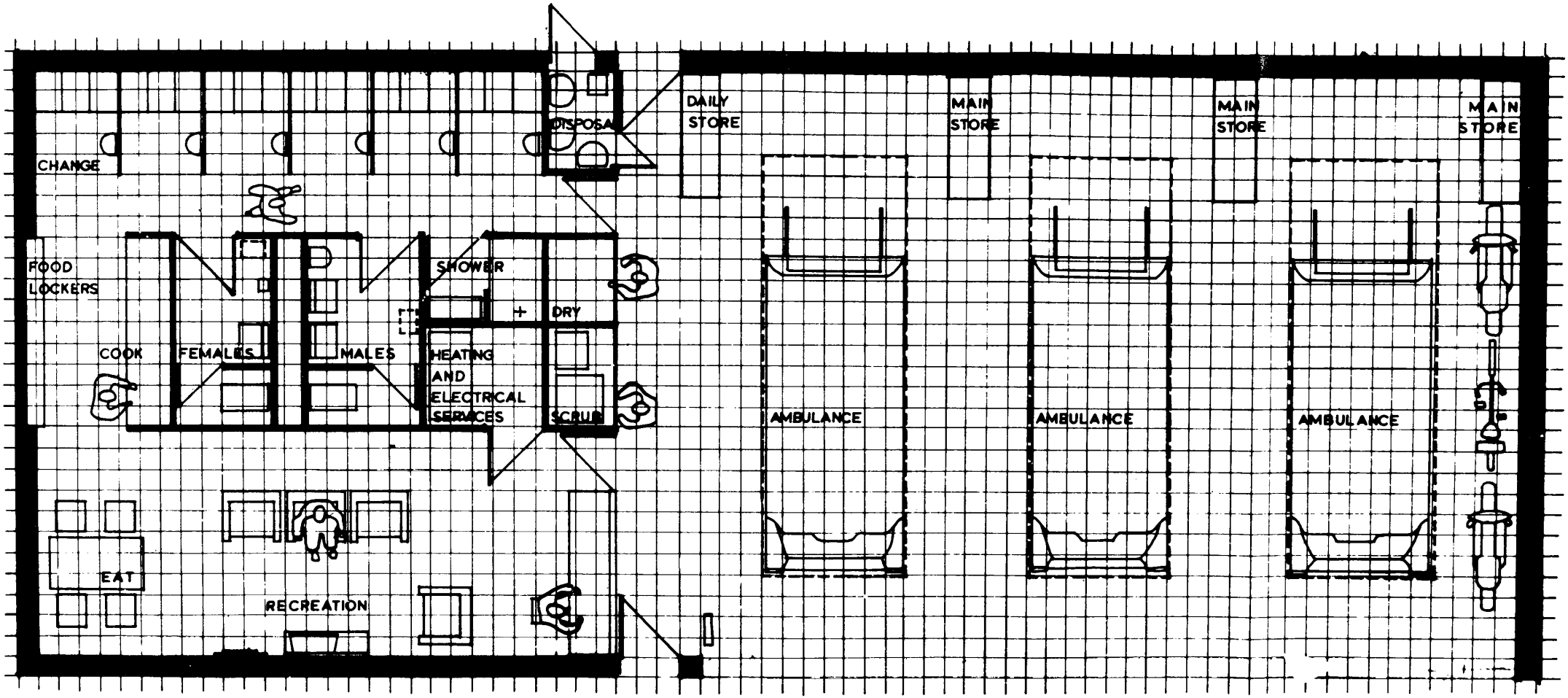


Three Bay Station

FIG 7

vehicle crew.
Common refrigerated storage
is required for milk.

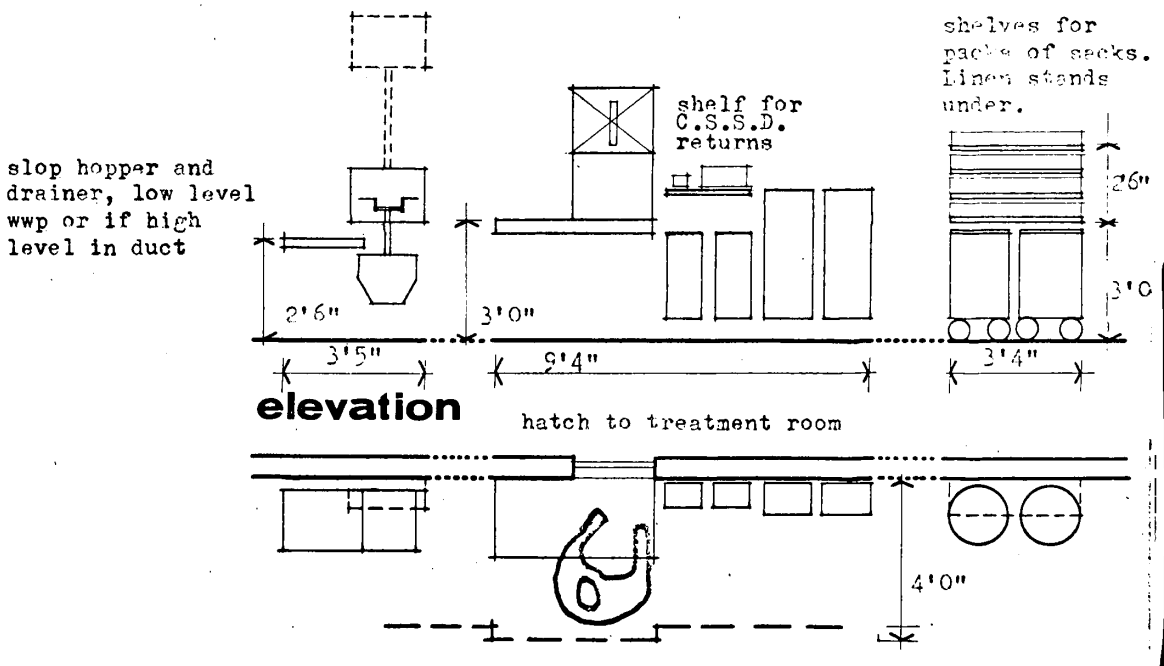




Three Bay Station

FIG 8

2.3.6.	Removing filled paper sacks from wall frames, stapling together with hand-held machine and placing bags in holding area. Taking new sacks from adjacent storage and placing in frames. Wet strength sacks required for fouled and infected linen, and dressings.	: Hand-held stapling machine, to be kept on shelf. : Storage shelves for 4 No. pack of disposal sacks approx. size 39" x 14" x 6" high for the large, and 24" x 11" x 6" for the small.
2.3.7.	Holding area for sealed paper sacks awaiting disposal to service areas either by lift or collection by porters.	: Holding area for up to 6 No. paper sacks.



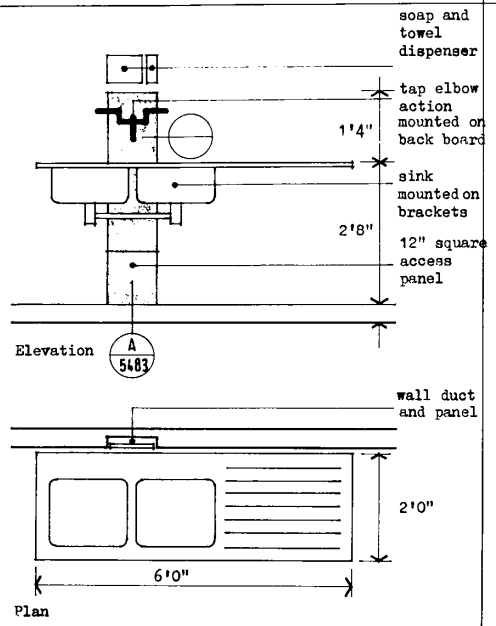
Study 2

FIG 9

FIG 10

sink general

Stainless steel double sink and single drainer 5'3" x 1'9"; services in wall duct with panel over — **Se1**



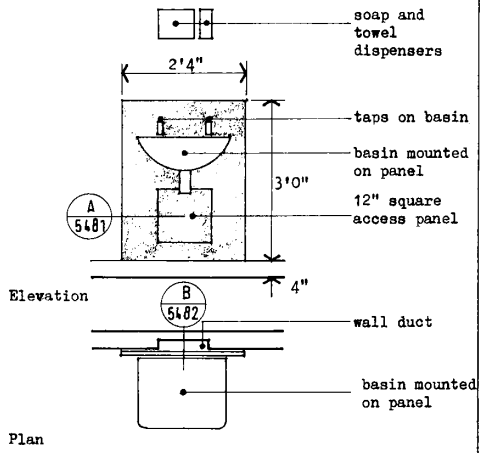
Sink as above but with cupboard below and no lower panel to wall duct. — **Se2**

Sink as above but with services from laboratory services duct at rear: no wall duct or panel — **Se3**

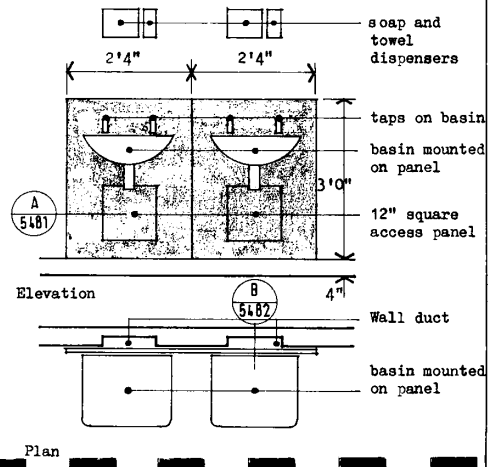
Sink as above but with cupboard below: all services from laboratory, services duct at rear. — **Se4**

basin general

Single basin mounted on panel over wall duct with taps mounted on basin: services dropping vertically — **Bg1**



Basins on wall panels over wall ducts; two panels side by side: services dropping vertically — **Bg2**



laboratory assemblies

general assembly principles

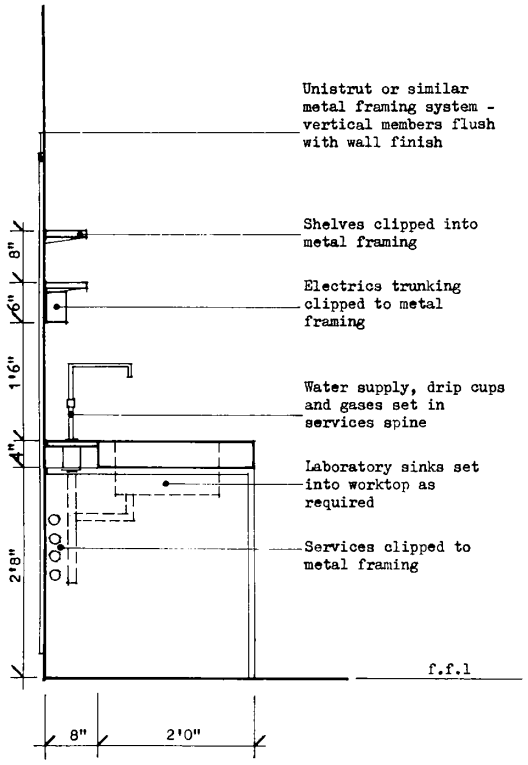


FIG 11

laboratory service spines

15. piped gases

nitrous oxide oxygen	15.1	
2 way town gas oxygen oxygen/carbon dioxide vacuum	15.2	
oxygen oxygen/carbon dioxide vacuum	15.3	

16. drip cups

drip cup with cold supply	16.1	
drip cup with hot supply	16.2	
drip cup with hot and cold supply	16.3	

17. water supplies

cold water supply	17.1	
distilled water supply	17.2	
cold and hot water supply	17.3	

WATKINS GRAY GROUP 2 76 JERMYN STREET ST. JAMES'S LONDON SW1 TEL 01-930 0981

ST. GEORGE'S HOSPITAL TOOTING

ROOM DATA SHEET No. S • 7

DEPARTMENT Standard Room 7 DEPT No.

ROOM/AREA Treatment Room FLOOR ROOM No.

COMPILED BY DATE

CODE GROUP
Supplied and fixed by Main Contractor: 1 Hospital; 1·1 U.S.C. departmental equipment; 1·2 U.S.C. fittings
Supplied by Client · fixed by Main Contractor or Sub Contractor: 2A Hospital; 2A·1 U.S.C. departmental equipment
Unfixed: Supplied and put in position by Client: 2B Hospital; 2B·1 U.S.C. departmental equipment; 2B·2 U.S.C. fittings

PLANNING · use of space

describe main activity Minor surgical procedures

times of use 24 area 180 critical dims.

relationship to other spaces adjacent to clean utility

population – max. 6 min. 2 type staff & patients

PLANNING LIMITATIONS

special loads – state load on – floor wall ceiling yes

special risks – fire explosion infection radiation

limitations – theft antistatic hosedown earthing

decontamination shower

other hazards or limitations

ENVIRONMENTAL CONTROL

LIGHTING – NATURAL – state essential or not

daylight no

blackout – partial complete

sun control privacy (obscuration, curtains etc.) obscured

LIGHTING – ARTIFICIAL

general – state lumens 20 lumens per sq. ft.

emergency yes night

special – state what operating light

warning lights

signs

cupds. – state which

switches – state any special control reqd.

switches – special type – sparkproof hoseproof watertight

pullcord other

bedhead unit (see also communications)

colour (state only medical limitations)

HEATING, COOLING, VENTILATION

natural ventilation no

mech. inlet yes mech. extract yes

extract of – corrosive fumes inflammable gases

heavy gases other

air changes per hour 6 re-circulation

cooling R.H. control 60 - 65%

filtration – state degree of filtration

heating – room temp. °F. 70° limits if any not higher than 75°

emergency heating or ventilation

sources of heat gain operating light

source of R.H. gain

NOISE VIBRATION CONTROL

noise reduction N.C. revel

vibration reduction why reqd.

COMMUNICATIONS

telephone – state no. of instruments

coin box – static trolley

call system – ~~push button~~ yes speech

radio tv

tv closed circuit – receiver camera

automatic dictation clocks 1 second hand yes

alarm systems – state for what

signs – state information to be displayed name of room on door.

SERVICE FACILITIES

state – total no. of outlets reqd. in each case
– pressures where applicable
– quantity demand where applicable

pressure or demand	total no.	service key
PIPED SERVICES		A
hot water	1	1
cold water	1	2
drinking water		3
chilled water		4
de-ionised water		5
distilled water		6
town gas		7
oxygen	1	8
nitrous oxide		9
carbon dioxide		10
steam		11
vacuum		12
medical suction	1	13
compressed air		14
other		15
		16
		17
WASTE		B
water only	1	1
chemical		2
radio-active		3
drip cup		4
soil		5
floor outlet		6
other		7
		8
ELECTRICITY		C
single phase outlets		
13 amp	2	1
30 amp		2
other	3	3
3 phase – state load		4
L.V.A.C. – state V & A		5
D.C. – state V & A		6
x-ray socket	1	7
emergency supply		8
shaver socket		9
other		10
SPECIAL REQUIREMENTS		D
restricted access		1
watertight		2
master control – Electric		3
Water		4
Gas		5
other		6
		7

BULK SUPPLY – local or central

receive from clean utility

disposal to dirty utility

type of goods CSSD packs

size of pieces

quantity per day

EQUIPMENT AND FITTINGS

ITEMS CONNECTED TO SERVICES – state – code group
– services required for each item using key
– total no. and size of each item

item	size	code group	total no.	services required key	key	key
1.1		1	1	A1	A2	B1
36.2		2A	2	C3		
Ceiling boom		2A	1	C3	A8	A13
Examination Light		2A	1	C3		

SPECIMEN

BUILDING ELEMENTS

FLOOR

type of traffic trolley & pedestrians

finish – no special requirements chemical resistant

non-slip other

WALLS

finish – state any special requirements

WINDOWS – state any special requirements (see environmental control)

WALL OPENINGS

DOORS – min. size 1½ leafs governed by

no special requirements

vision panel – large small shuttered

special control – self closing trolley opening

to stay open locks suited

state other controls (eg. safety switches etc.)

protection against damage – state cause

hatches to where

purpose

size glazed

observation panel adjustable to where outside corridor & C.U.

size shuttered

EQUIPMENT AND FITTINGS

ITEMS NOT CONNECTED TO SERVICES

state – total no. and size of each item
– code group

item	size	code group	total no.
4.1		1	1
8.6		1	1
12.6		1	1
12.2		1	1
12.4		1	1
12.8		1	1
15.1		1	3
29.22		1	1
29.7		1	1

FURNITURE AND FITTINGS · items kept in space

state total no., size and code group of each item

item	size	code group	total no.
7.2		2B	1
28.6		2B	1
28.2		2B	1
32.5		2B	1
14.2		2B	1
14.1		2B	1

FURNITURE AND FITTINGS · items brought into space

state total no., size and code group of each item

item	size	code group	total no.
32.12		2B	1

FIG 12

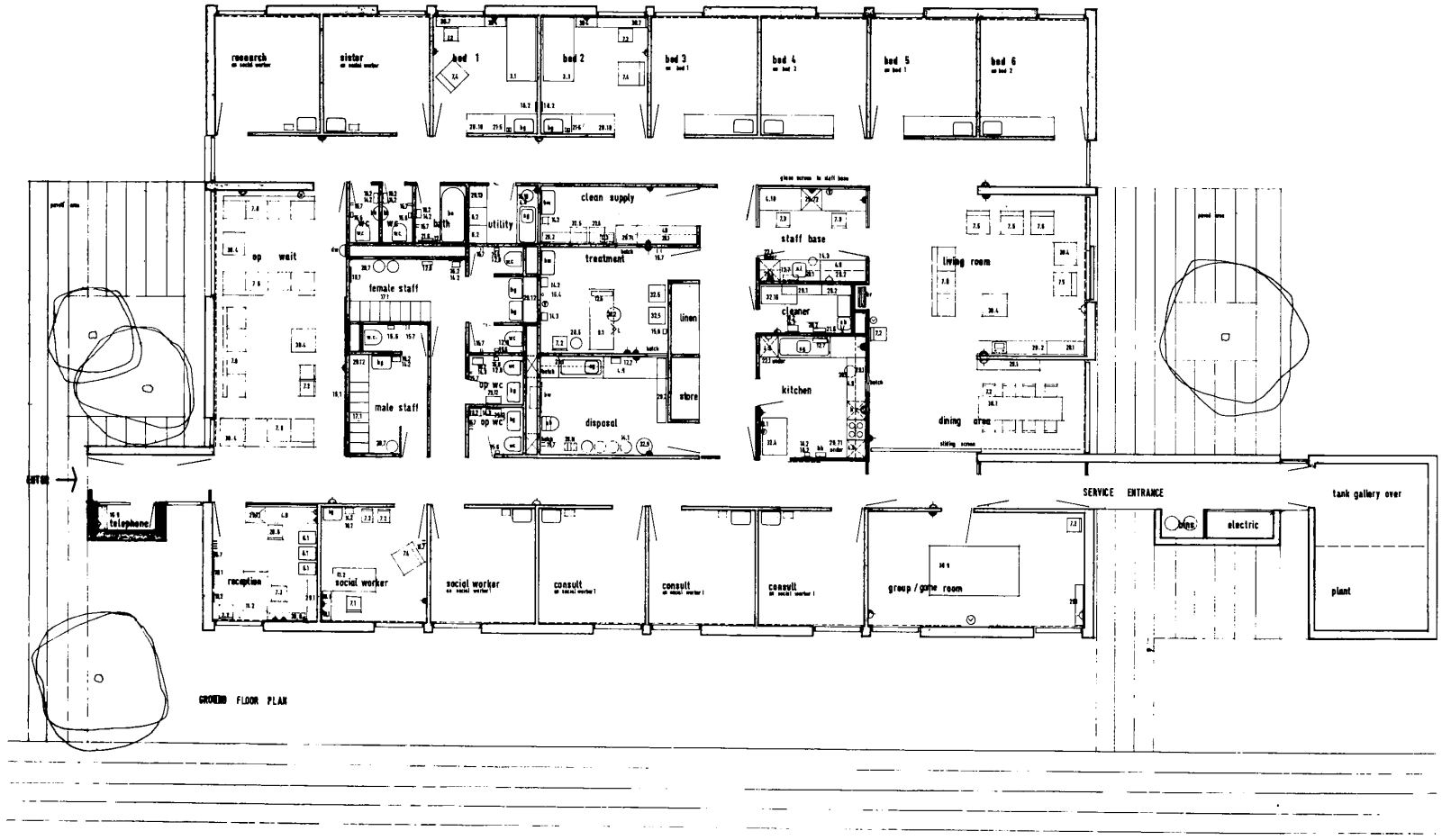

research
sister
bed 1
bed 2
bed 3
bed 4
bed 5
bed 6
clean supply
utility
bath
treatment
op wait
female staff
male staff
linen
store
disposal
op wc
staff base
cleaner
kitchen
living room
dining area
SERVICE ENTRANCE
tank gallery over
electric
plant
telephone
reception
social worker
social worker
consult
consult
consult
group / game room
GROUND FLOOR PLAN

FIG 13

The Engineer's Role in Hospital Planning

Col A P Smith, Regional Engineer, Newcastle Regional Hospital Board

Summary

Good engineering solutions to planning problems can be best achieved by close collaboration between users and designers. More research and guidance is needed on such subjects as control of infection, sterilisation methods and ventilation, so that efficient planning solutions can be developed. The early involvement of the engineer in the planning process can help to achieve economy in the use of space and in communication and environmental control systems design. Good design is dependent on a common sense attitude and the avoidance of pre-conceptions or over-standardisation.

I see planning as the process leading up to the finalisation of the technical brief to the architect and engineer who are going to build the hospital and to the user team who are going to commission it. There should be no antithesis whatever between the user team and the design team. At a regional hospital board like mine, we have been planning and building hospitals with much the same sort of staff and continuity for twenty years and we have a very close relationship between board staff and hospital members. I am quite certain that planning by the users without the benefit of technical advice from their architects and engineers and other necessary specialists is rather like a wedding without the benefit of clergy: you may regret the result for the rest of your life.

Indeed, we have got to get together to make certain that the users do not jump to a conclusion which might produce a bad engineering solution which in turn produces bad planning, bad design and unnecessary expense. The great enemies I find in project teams are those who pontificate on inadequate data. Take, for example, the ventilation of operating theatres and the piston effect. It was developed in our region from inadequate experiments; it was suggested that there is a piston effect blowing air down through the whole ceiling, so that the air moves down and goes out through flaps at the bottom. Further research by the Heating and Ventilation Research Association proved it does not happen that way at all. The air streams down the walls and out through the flaps, the heat generated by the team round the operating theatre table and by the operating lamp produces an up-current in the centre. There is then a pocket of stagnant air across the table. Of course when you ask anybody if they can suggest a better system, they cannot. We are stuck with something that produces maximum discomfort to the users and does not act the way it is supposed to. I believe in fact that cross infection in a theatre is not a matter of ventilation at all, but of the discipline of the theatre staff and of the surgeon.

Another example of lack of thought and inadequate knowledge is related to milk kitchens. In one hospital the matron wants to sterilise the bottles with Milton and in another she must autoclave them. Now there must be a right answer to this. One method must be more efficient in terms of bacteriological infection than the other. If they are the same in terms of results, then the Milton method is a lot cheaper than autoclaving the bottles, and a lot easier. The dogmas of cross-infection can produce splendid statements 'ex cathedra'. Engineers were hit when the rule came out that a laundry had to be regarded as a sterile process with a barrier between the washroom and the finishing room.

NEED FOR WORK STUDIES

All this really reflects a lack of thought and a lack of knowledge on the part of planners. We cannot blame the hospital people for not knowing; it is up to the professional planners and the Ministry to provide the answers. In a way the building procedure notes are a block to thought. The standards of accommodation laid down in the building notes are maximum standards which inevitably become minimum standards. Everyone tries to think of some special reason why he should get a bit more than the building note standards instead of asking whether the accommodation standards as such are really necessary. We need to put a great deal of effort into work study, design-in-use studies and statistics as well as much critical common sense into reviewing the hospitals that have already been built. There have been quite a few built in the past five years, but I have not seen any thorough design surveys to establish whether or not we are providing too much. Why for example do we provide such wide corridors? So that two hospital beds can pass each other. How often do you see these sorts of bumping races of beds with patients in them up and down the hospital? An even if you did, there is a waiting space every 50' or so which can be used as a passing bay. Cut the corridors down to about 6'6" instead of 8' or 9' and an enormous amount of space and cost can be saved. Can we do it? No; the building notes say the corridors shall be 7' clear minimum width because beds must be able to pass. The 'Best Buy' hospital represents a preliminary exercise in the reassessment of these standards. We must also try to calculate the present value of the running costs of a hospital, rather than merely accepting what is the cheapest solution even if it costs twice as much to run. I believe that when we can really use cost benefit analysis we ought to be able to quantify this.

In the planning team the engineer, responsible for the operation and maintenance of services, represents some of the user's requirements. Communications are the key to a good plan framework because they involve the movement of people and goods and ideas. The engineers come into this because they provide the lifts, telephone services, staff location services, TV and radio, dictation, conveyors and so on. But how often are engineering services used to solve the difficulties produced by a bad or a weak block plan? A little more thought on communications might produce better solutions; external communications like water, power, gas or drains and then the problem of distributing energy within the hospital itself.

ECONOMY

Lastly I am going to say a word about economy. An engineer is a chap who can do for fourpence what any damn fool can do for ninepence, but he must of course make his case early enough to be able to do it. It is the decisions taken at block plan stage and preliminary sketch plan stage that are vital to engineering economy. (I like the 'Best Buy' hospital with two floors and a minimum number of lifts, since the scheme facilitates the horizontal distribution of engineering services.) In the installation stage, engineers have to remember that easy work for the contractors is cheap work for the clients. This means that the engineer must persuade the architects to provide enough space in plant rooms and in vertical and horizontal ducts. The point about duct siting is that the building is probably going to last at least fifty or sixty years and a bit of spare space may be required for modernizing the services as well as moving the partitions to modify the rooms.

Some improvements in economy could be achieved by more off-site fabrication of, for example, electrical wiring (notwithstanding building note requirements for screwed conduit). Manufacturing off-site is obviously much cheaper than fiddling about on site. Standardisation of design should lead to the possibility of encouraging off-site fabrication.

We must also avoid shibbolet's. I was very interested in the mock-up of the basins mentioned earlier. But I want to break away from the British Standard which says that the hot tap must be on the right and the cold tap on the left, etc; you have to cross all the pipes in the partition to maintain this so I intend to give up the British Standard in this instance. The British Standard has laid down a shibboleth. I believe that everybody looks at a tap to see whether it is 'hot' or 'cold'. Can anyone say whether or not all the basins in their own home obey the British Standard? Mine don't.

The need, if economy in operation is to be achieved, is for a well-defined operational policy, because it enables you to plan a building, a service, a department, for easy operation; but a second need is to make the users operate the department in accordance with the operational policy.

The running of project teams must be a joint exercise; we have all got to think. We have got to find out what the users, the doctors and the nurses want to do, how they do it and with what. We have got to be careful that we do not inhibit our thinking by accepting shibboleths, rules, customs. If we are going to get the best results it is the broad strategic decisions in the early stages of planning that make for economy in building cost, economy in operating cost, and convenience to the user.

Cost Control in the Hospital Building Programme

R T V Amery, Deputy Chief Quantity Surveyor, Ministry of Health

(Mr Reed, presenting Mr Amery's paper apologised for Mr Amery's unavoidable absence, and mentioned that the time restriction would necessitate a very brief presentation)

Summary

The quantity surveyor's problem is how to control costs over the whole range of hospital planning policy decisions. The size, shape and location of hospital sites and buildings, in particular their effect on the extent of mechanical ventilation and supplementary lighting, are important design factors affecting costs. In addition, decisions on the priorities of provision and their effects on phasing, and the degree of centralisation and standardisation adopted, will affect the pattern of expenditure as between capital and running costs.

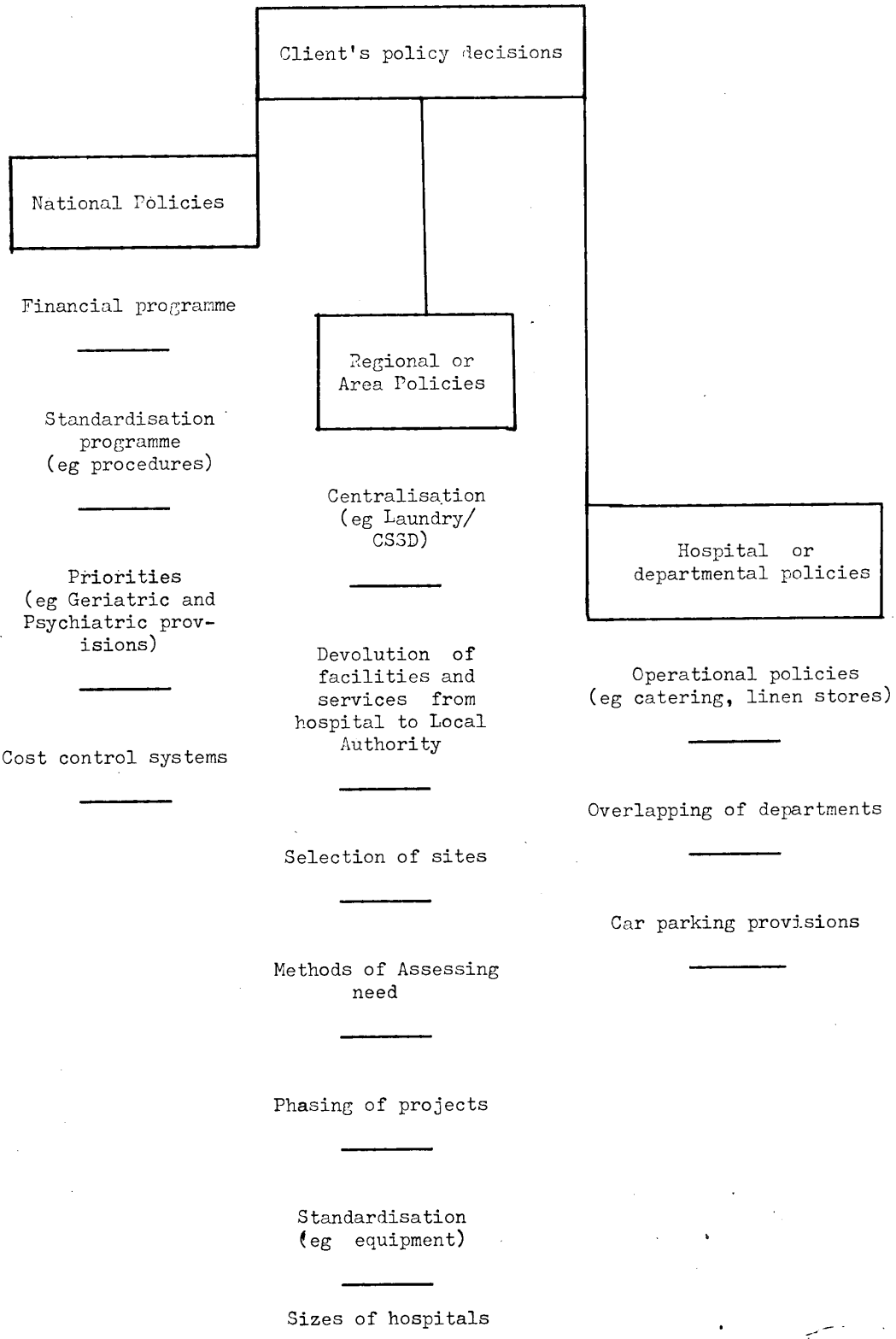
Economies can be made by following logical and integrated decision making processes, but design for ease of building maintenance, extension and modification can help to prolong the life of the hospital and hence may provide the cheapest answer in the long run.

Until fairly recently cost control in hospital building was related mainly to the design process, that is the cost planning of designs to cost limits.

Over the last year or so the Ministry and thoughtful designers have realised that cost control of the design stage was not sufficient if the best use was to be made of the limited resources - particularly financial resources - available for hospital building. Cost control in its generic sense is applicable to the whole process of carrying out a building programme and a considerable amount of thought and research has been put into examining the factors of cost throughout all stages. Thus, the Ministry's current procedures are designed to ensure that the same degree of consideration of cost is applied to the selection and use of sites for building projects as is now applied to the design process, and that account is taken of running costs at all stages.

Let us consider the various factors that influence the cost of a hospital project. Those factors which have cost implications for a project are of two kinds; firstly, clients' policy decisions, and secondly, designers' decisions.

In the case of the clients' national policy decisions it could be said that these do not seem nowadays to affect hospital planning very much. Naturally, it can be argued that the effects are restrictive on project teams and design teams (eg complying with procedures) but the modern procedures are very similar to those recommended in the RIBA Management Handbook.


Client's policy decisions
National Policies
Financial programme
Standardisation programme (eg procedures)
Priorities (eg Geriatric and Psychiatric provisions)
Cost control systems
Regional or Area Policies
Centralisation (eg Laundry/ CSSD)
Devolution of facilities and services from hospital to Local Authority
Selection of sites
Methods of Assessing need
Phasing of projects
Standardisation (eg equipment)
Sizes of hospitals
Hospital or departmental policies
Operational policies (eg catering, linen stores)
Overlapping of departments
Car parking provisions

Clients' regional or area policies obviously affect the content of individual projects as we have seen in the Ministry's projects at Bury St Edmunds and Frimley. The adoption of lower norms for assessing the number of beds, more efficient use of out-patient, treatment and diagnostic services and the centralisation of industrial or semi-industrial facilities and services, perhaps "off-site", permit the use of constructional methods and specification standards no more than adequate for their purpose; factory type buildings for manufacturing and industrial processes, office buildings for office use, housing standards for residential staff - thus freeing money for diagnostic and treatment facilities.

Planning teams usually have little say in the selection of sites and the selection of a site from purely locational criteria can present designers and planning teams with additional problems. Bad ground conditions, awkwardly contoured or shaped sites (sometimes accompanied by the need to maintain existing facilities on the site) all complicate the planning of new hospitals and imply time and cost consequences for the project. Generally, outside the large cities we have far more land in health or government ownership than we can conceivably require for the hospital building programme, but I think it fair to say that the majority of sites today are chosen for local medical or local social reasons. In these days of modern transport and high building costs are we really making the best use of our limited resources?

The size of a hospital affects its cost in terms of function. The limited studies which we have carried out suggest that within reasonable limits (say up to 1000 beds) a large hospital will be cheaper both in capital and running costs than a small one. Certainly, one consequence of building in larger units would be to encourage the adoption of more automation, which seems to be the only way to make any substantial effect on staff costs which generally account for 65% of running costs.

DESIGN TEAM DECISIONS

DESIGN DECISIONS

Shapes and layouts of buildings

(eg compact or extended - cohesive or fragmented)

Methods of dealing with site factors

(eg contours, ground conditions, nuisances)

Structural methods

Specification standards

Degree of standardisation of spaces, finishes and components

Contracting methods

Project Management arrangements

Maintenance consequences

Provision for extensions

Built-in adaptability

If we now consider design decisions we must accept that all the points listed obviously affect costs. The order probably represents their order of cost importance. Most of the bottom half of the list is well known to you and need little comment in the limited time available. I therefore propose to deal with the most important factors for which in the present state of our knowledge - which admittedly is limited - there appear to be certain basic design principles emerging.

Firstly, the most economical layouts seem to be t'ose which are low or medium in height, cohesive and semi-compact in layout. This criterion is expressed in the open courtyard type of layout which avoids the use of excessively deep planning (either horizontally or vertically). The obvious corollary is that we should try to avoid concentrated types of buildings (high or low) which require artificial ventilation and permanent supplementary artificial lighting which are expensive both in capital and running costs.

Secondly, we can only achieve the first principle if sites of adequate area and shape are used. Plot ratios of between .25 : 1 to .75 : 1, with site cover ranging between 20% and 30% will normally allow for economical building shapes with adequate space for extension, car parking and amenities.

Thirdly, if the best use is to be made of the available money it is essential for building and engineering design and cost to be fully integrated. That is, with the experience we have gained in the past few years, it is unnecessary and even restrictive to arbitrarily divide cost limits into two sums for building and engineering. When we introduced the building notes and cost allowances it was probably desirable that guide percentages for engineering should be given. I suggest that these percentages should be used in formulating notional cost plans as a point of reference only and that engineers should be permitted and willing to play a bigger part in the early design decisions. Recent enquiries suggest that up to 10% can be saved with a fully integrated design.

Finally, a word about maintenance. At a recent conference it was suggested that the economic life of a building was determined more by its potential for adaptation to meet changes in use rather than in the longevity of the construction. I think this is true of hospital buildings (it is a byword that every hospital is out of date by the time it is built) and everybody concerned with planning hospitals should keep the requirements of adaptability and extendability in the forefront of their minds.

I have dealt very briefly with only a few of the major issues which affect the cost of hospitals. Some of the points made are provocative but they are intended to stimulate discussion and thought as it is only in this way that we can improve on our present performance.

* * * * *

DISCUSSION: WHOLE HOSPITAL PLANNING

Chairman: Brian Brookes

Discussion centred round the reports of the seminar groups and many of the points echoed those made the previous day.

Group 1 felt that the average planner was not of adequate calibre to meet Mr Jefford's criteria. But despite the strictures expressed about the building notes they were the only anchors to which hospital planning could be attached. Dr Forbes' talk had raised interesting questions about the basic criteria for hospitals and their relationship with community care which, though outside the scope of the symposium, deserved further study. The idea of the study of activities as opposed to rooms or equipment data was one which could be incorporated in the planning brief.

The important point as far as Group 3 was concerned was the evident imprecisions of the planning brief, which should be clarified in plain terms, and the need for national standards for the planning team and central resources of information. Group 3 also believed that while planning knowledge was extensive it was largely uncoordinated, often chaotic and repetitive. The Health Service itself, in its tripartite form revealed some uncertainty about its priorities, and some investigation into its potential as a whole should be initiated. Group 3 asked for evaluation on a design/use/economic basis. They thought that planning teams could be drawn together according to the type of building, even to the extent of inter-regional groupings, and that more use could be made of information already available if there were an immediately accessible source of such information.

The problem of duplication and the lack of a coordinated central store of information was also stated by Group 4 which thought equally that operational procedures could be improved.

General discussion again brought out a considerable measure of agreement on the subjects of unnecessary duplication of effort, standardisation of problem definition, better use of computerisation and data processing, and the development of adequate resources for the dissemination of information.

DAY 4

DEPARTMENTAL PLANNING - ST GEORGE'S HOSPITAL PROJECT

Summary

The overall conception of the scheme, in three self-contained phases for financial, siting and medical reasons, is for a 10-storey high building, $\frac{1}{4}$ mile long with three blocks of naturally ventilated wards and laboratories over a mechanically ventilated podium of outpatient, diagnostic and treatment departments with an engineering services and mechanical distribution sandwich floor between. The total scheme, including medical school, is to cost about £18m.

The planning method was to work through small committees to develop and approve the proposals for each department. Adaptability, ease of nursing administration and the need to get the best use from space and staff have influenced the decision to have 144 beds per floor, each arranged in 4 sections of 30 beds plus, two 12-bed sections for intensive care, and 4 small centralised intensive therapy units to provide for severely injured post-operative cases. The need for patient privacy and amenity, convenience of access and movement for supplies, patients and staff, good nurse/patient supervision and suitability for teaching have led to a courtyard ward layout with 20% of beds in single rooms, the remainder being in 4-bed bays.

Alternative planning solutions were rejected on grounds of cost, difficulties of expansion, phasing & flexibility, and the belief that mechanical distribution systems could solve the problems of decentralisation.

Wards & Nursing Services,
Outline of the Project
R F Fairweather, Development Officer

We are quite often asked how long it has taken us to plan this project. Perhaps I should start by saying that we at St George's have been planning a new hospital since 1903, so that at the moment we have spent sixty-five years on it. The present edition is the fifth, I think; we started on that in 1962 with the publication of the command paper which told us we should expect to start building in the quinquennium, 1970-75. We therefore started off knowing that we had at least eight years to plan. We have tried to speed this up and in fact have achieved quite a considerable momentum by now.

The first building, the Student Centre, was completed at Christmas. This is being followed by our first residential unit, a fourteen-storey block of flats. Next month we start the clinical research laboratories, and in 1969, the laundry and boiler house. The first main ward block is scheduled for 1971-72 in accordance with the original programme. I think we have been able to demonstrate to the Ministry that we can move faster than they envisaged and that, provided the money is available, the planning time can be shortened considerably.

PHASING

The building is a 1,314-bed hospital to be built in three phases as follows:

PHASE I - on the Fountain Hospital site which is now ready for major construction to begin.

(i) 302 beds - obstetrics (including special care baby unit), paediatrics, gynaecology, together with associated professorial units, theatres, diagnostic and outpatient areas, and sick staff ward.

(ii) Boiler House

(iii) Kitchens/dining rooms

(iv) Central Supply Departments

(v) Laundry

(vi) Hospital residential accommodation (part)

(vii) Students Union (Medical & Dental School) (completed)

(viii) Administration

(ix) School of Nursing & Midwifery

PHASE II

(i) Dental Hospital and School

(ii) Emergency and Accident Service

(iii) Outpatients Department

(iv) Diagnostic X-ray Department

(v) Main Operating Theatre Suite

(vi) Pathology and Research Laboratories

(vii) Main Ward Block

(viii) Residential Accommodation (part)

(ix) Pre-Clinical Medical and Dental School

(x) Students Residential Accommodation

PHASE III

(i) Hospital Residential Accommodation (completed)

(ii) Ward Block - Geriatric, Psychiatric, Neurological and Neurosurgical beds

(iii) Final Landscape and Civil Engineering Works

The need to phase was due to several reasons. First the availability of money; second, the availability of a free site on which to build; and third, since the proposed building is spread right across the site, the need to establish an appropriate sequence of building. The bed complement takes care of the medical needs of a population of

214,000 and we have additional teaching beds and regional responsibilities for departments such as neurosurgery. The budget is calculated at £18,315,000 for both hospital and school accommodation.

PLANNING PROCEDURE

We have always worked at St George's through small committees. The main source of information for the planning team is obtained from the liaison officers drawn from medical staff who have been appointed by the Medical Advisory Committee to assist in planning, in preparing schedules, agreeing room layouts and so forth. This of course allows committee time to be cut very considerably.

After the command paper came out in 1962, we set about planning first by preparing outline schedules of requirements based largely on the building notes, with the liaison officers coming in and advising us on where the building notes needed amendment, where additional accommodation was required and where any special teaching facilities were necessary. These were then set out in a preliminary draft and discussed with representatives of the Ministry of Health. Finally a budget cost was arrived at.

DEVELOPMENT CONTROL PLAN

At the same time as agreeing the budget cost, we built up the development control plan. We then prepared a network analysis of our planning programme, allocating time to our professional advisers and the planning team to complete the various aspects of planning. The first thing the architects were required to do was to prepare an outline sketch plan of each floor included in the first stage so that we could get the room relationships correct. Having got this right we set about filling in the room data sheets for each individual room.

We found it was absolutely essential to have the senior nursing representatives of the departments we were discussing sitting in with us and they spent many hours with us going through the room data sheets. We had a nurse co-ordinator on the planning team and Dame Muriel Powell or her deputy took part whenever they wished.

Meetings were programmed for a period of six months in advance so that our medical staff and senior nursing staff knew when we would require them to be available, since we were determined to meet our target date. They have accepted this extremely well, and have been most co-operative; we are in fact at the moment ahead of schedule.

We have now reached the stage where we are working on the floor plans; the first has been agreed and we are now moving on to the second and third floors.

Wards and Nursing Services
Nursing Requirements
Dame Muriel Powell: Chief Nursing Officer

The nursing requirements were worked out through meetings of the nursing staff in which all grades of staff participated. Nursing staff also played a major part in the planning of an experimental ward which enabled the planners to test certain assumptions with regard to design, layout and equipment. The ward was evaluated by patients and staff over a period of one year when it was used as a surgical and a medical ward successively. We were influenced by visits undertaken to new hospitals and particularly the Falkirk ward in Scotland, which was very much in line with our own thinking.

The first and perhaps most important requirement was flexibility. Looking ahead it is extremely difficult, if not impossible, to decide what our needs will be. We do know however that the rapid changes which are taking place in medical science at the present time are likely to continue and that in all our planning we must take account of this as well as the need to use all our resources - manpower and beds - in the most efficient and economical manner.

To achieve these aims it was felt necessary to discard the traditional concept of a ward in favour of a unit which would combine a number of bed areas (together with the necessary ancillary rooms) and which could be varied in size and function according to changing needs and circumstances.

SIZE OF UNIT

In determining the size of the unit we were influenced by the Salmon Report which proposed nursing units controlled by a nursing officer, the size of the unit varying between 90 - 180 beds or, taking 30 beds as the norm set by Salmon, between 3 - 6 charge nurses or sisters.

Having settled on the unit as the module it was not necessary to spend a great deal of time in considering the optimum size of a ward. Under present conditions it was thought that 30 beds was a suitable size of command for a ward sister provided these did not include intensive care beds. Obviously, however, from the nursing point of view, in the majority of units some beds should be set aside for intensive care. These would need to be grouped together and should be capable of being used for patients in an intermediate stage of recovery if necessary. It was estimated that between 8 and 24 beds would be needed in a standard medical or surgical unit of 144 beds. Thus if our requirements were to be met, it seemed likely that in a standard ward of 144 beds we would finish up with a unit divided into six sections, that is 4 x 30-bed areas and 2 x 12-bed areas. Another important requirement was of course privacy and isolation.

ANCILLARY FACILITIES

At unit level we had to consider the other rooms which would be needed, such as offices for consultant, nursing officers, unit housekeeper and secretary. In addition there are reception, a room for relatives to wait and stay the night, cloakrooms for visitors, stores for equipment and supplies, trolley and supply bays, cloakrooms for staff, and a peripheral dining room and kitchen.

In the bed area the questions we had to ask were, for example, what provision should be made for WC and washing facilities and where they should be sited; the siting of preparation, clean and dirty utility, and treatment rooms; the size and siting of the ward kitchen which would be determined by the policy for meal service, as well as the times of use and the nature of meals provided, etc; the importance, as a focal point for the bed area, of the nurses' station, where records would be made and kept, telephone calls made and received (in a standard unit there would be six stations); the provision of offices for doctor and charge nurses and their relationship to the nurses' station.

For obvious reasons standardisation was considered important, particularly at unit level. We believed it would be even more important when we reached the stage of planning for the storage of equipment.

Finally, having suffered in the past from the disadvantage of having a number of wards which could only be reached by going through other wards, we were anxious to ensure that this would not be a feature of our new hospital. So separate access to each ward was requested.

HOUSEKEEPING

The housekeeping policy at unit level aims at an organisation related to the needs of the nursing unit and parallel to the structure recommended by the Salmon Committee. The aim will be to remove from the nursing staff all duties for which nursing skill and knowledge are not required and to integrate the distribution/dispatch system with the housekeeping organisation. At unit level the housekeeping services would be organised and supervised by a unit housekeeper who would allocate a housekeeping team of housekeepers, assistant and trainee housekeepers to the bed areas. The unit housekeep would co-operate with the secretary/receptionist to the unit who would assume many of the functions undertaken by individual charge nurses (and ward clerks where they are employed), such as arranging transport, dealing with mail and the reception of visitors, etc. In the unit, housekeeping staff would undertake the bedside service of meals, preparation of beds and lockers after discharge, general ward cleaning, requisitioning of stores, maintenance of supplies of linen, materials, CSSD, cleaning materials, etc.

The unit housekeeper will be working in co-operation with the unit nursing officer, the hospital administration and the catering service represented at unit level.

Wards and Nursing Services
Medical and Teaching Requirements
Dr John Batten, Physician

In planning a nursing unit, nursing considerations take priority, but the medical requirements of such a unit in a teaching hospital are of course inseparable.

Progressive patient care is an old concept, but has acquired a new impetus now that we attach such importance to privacy and amenity for the patient and have to consider the most economic use of staff and complex new methods of observation and treatment. Furthermore, the rapid development of new techniques and the changing patterns of disease demand the utmost flexibility of design.

We have to consider four components of medical activity:

1. Patient care in the ward
2. Medical administration
3. Teaching
4. Research

PATIENT CARE

Medical care of the patient may require continuous medical supervision in, for example, an 'intensive therapy' unit. We include patients here who are immediately post-operative or who are severely injured. It is convenient to bring together the staff and special facilities necessary for intensive therapy.

The medical staff feel very strongly, however, that patients who require close observation and supervision, whether medical or nursing, should otherwise be admitted to, nursed in, and discharged from the same ward area. This allows continuity of medical and nursing care, ease of movement to and from the intensive care area and is so much more satisfactory from the patient's point of view. There is evidence to show that at no time would more than 15% of ward beds be required for intensive care - very often much less. There are patients in need of occasional medical supervision, such as those recovered from the acute process or those under investigation. The chronic sick and geriatric require only rare medical activity and pose mainly nursing problems.

Single rooms must be provided for the dying, the noisy or restless, and the infected. In the standard unit 20% of the beds will be in single wards: special units such as those concerned with infectious disease will clearly need a much higher proportion. Private patients from home and abroad must be considered. Such patients in need of intensive therapy or care should share the general facilities, if only for economy of staff and equipment. Special single or double room accommodation should be provided otherwise in a separate area.

Finally, whatever the category of care, it is of course vital to ensure that care is continuous, that observation of the patient is clear and that movement of patients whether in bed or not is unhindered within the unit and between units.

MEDICAL ADMINISTRATION, TEACHING AND RESEARCH

Space should be provided close to the ward area for consultants and junior staff to write and to interview relatives, and for medical secretaries. We anticipate that most of our staff will be geographically whole-time so that the room allocated to them should be adequate for examination of and consultation with patients, and for case discussion with colleagues. X-Ray viewing facilities should be available.

Student teaching will continue round the bed, but greater use will be made of case demonstration in a specially designed room in the ward area with easy access to beds. Larger space, for case demonstration and seminars, will be adjacent to, say, four or more ward units on the same floor.

We need to provide laboratories next to the ward area for clinical research requiring the presence of a patient. For research not requiring the presence of a patient, for example chemical, microbiological, immunological research, laboratories will be sited together so that technical resources can be shared.

In regional hospitals without an undergraduate medical school attached or embedded, but with increasing postgraduate teaching commitments, some of the space here allotted to teaching and research might well be used for such facilities as the library.

Wards & Nursing Services
Supporting Services
R F Fairweather: Development Officer.

The overall plan has presented a number of problems which we have had to resolve. The planning solution in fact provides three separate hospitals, largely because of the need to phase construction and to keep cost down to the minimum level. This has been achieved by refraining from building too high but has resulted in a 10-storey form of construction approximately ¼ mile in length. The problems of distribution of

stores, particularly food, have had to be investigated very thoroughly, and if high revenue costs are to be avoided we believe that mechanical distribution is the only satisfactory solution. The design, with the service floor between wards and podium, lends itself to this system and has the added advantage that the whole of the traffic load is taken away from the patient, visitors and staff corridors.

From the start it was felt that in a hospital as large as this the conventional forms of cooking and food distribution would need to be modified if food was to be served to patients in an acceptable form, and peripheral finishing kitchens were the obvious solution. With the ward plan, providing up to 144 beds on a floor, this solution most easily met the need. On closer examination of how these peripheral kitchens could best be serviced from the main catering department, bearing in mind the distribution problems, we considered a 'frozen food' system, and a research project to investigate this fully is now being set up. The broad principle would be to bring in raw materials, cook, blast-freeze and store in a central processing kitchen all those items which lend themselves to satisfactory freezing, and then to distribute to the peripheral kitchens for re-constitution and service to the patient. Those patients able to do so will use the dining room while a tray service will operate from the peripheral kitchen to cater for the needs of bedfast patients.

Other problems arise out of the division of bed areas into three blocks. Probably the most important is the distribution of operating theatres. It was hoped that the 19 theatres could be zoned together in one area, but with the distances involved this was thought to be impracticable even though an intensive therapy unit and a post-anaesthetic recovery area is provided. The ultimate plan therefore is to provide in each block the appropriate number of theatres with their own supporting sterile supply area.

Wards & Nursing Services
Design Solution
Ivor Berresford, Architect, Watkins Gray Group 2

Following the description of the basic medical, nursing and administrative policy requirements that were established at the outset by the planning team, I am going to describe the plan which has resulted from these requirements, and outline the broad principles we have adopted.

Before dealing with the design of the wards it is necessary to consider the development control plan, since certain overall policy decisions which relate to the whole development have had a considerable effect on the subsequent ward floors.

The phasing of the project was the outcome of the medical requirements and was strongly affected by the site area that was available at each stage; it was essential to maintain the existing hospital service while rebuilding. This latter factor coupled with the medical requirements and the availability of finance for the project resulted in a concept of three closely related and linked hospitals. We have adopted a principle of decentralisation, coupled with concentration of services when it was necessary.

DESIGN FACTORS

At the outset of planning it was decided to allow for a high degree of expansion and flexibility for future changes of use. In fact 25% expansion is possible on the present site. Further expansion could only be achieved by extending the site, as the density limit would have been reached that was acceptable to the local planning authority.

Another important factor was the decision at the outset to reduce mechanically ventilated areas to the minimum in order to keep within the Ministry of Health 'on cost' figure of 50%. In fact we have achieved an 'on cost' figure of 51%.

These factors, coupled with the amount of accommodation required in each phase and the limitations in site available, resulted in the decision to divide the scheme into two types of zone. First, an area at low level for outpatient departments, X-Ray and operating theatres, mainly deep planned and mechanically ventilated, which can be easily adjusted and extended.

The second zone comprises an area of naturally ventilated accommodation containing the wards and laboratories over the diagnostic and treatment areas. Although this zone cannot be extended it has been designed for future changes of use. Between the two zones is the plant and distribution floor, containing service mains and plant for the ventilated accommodation below, as well as the mechanical distribution system.

Studies were made during the preparation of the development control plan to achieve a solution with the wards at the same level as the diagnostic and treatment accommodation, but this was rejected as it used up all the site space for future expansion and meant complete mechanical ventilation.

Studies and an evaluation of six alternatives of the ward floor were made during Stage 'A' of Ministry of Health's procedure and this established that the running cost of mechanical ventilation and air conditioning could not be afforded if we were to comply with Ministry requirements. Hence a plan shape was developed which incorporated courtyards, and mainly natural ventilation.

The operational policies require 144 beds to a floor to be planned as four 30-bed units with 12-bed intensive observation units between the nurses' station and ancillary accommodation. Central shared teaching facilities are provided as well as a dining room and peripheral kitchen. Toilets are provided between the bed bays. The main passenger lifts are separated from the supply paternosters which are located adjacent to a house-keeping zone. Four separate points of access are provided to the ward areas.

The plan is for a simple standard unit and the particular access system was developed to allow different types and numbers of beds to be provided for different specialities.

Knowing that different accommodation would be needed on various floors and to meet future changes of use, a structural and servicing system was developed which would allow for future flexibility. A series of studies were undertaken to prove that the ward floor could be adapted in the future for other functions.

* * * * *

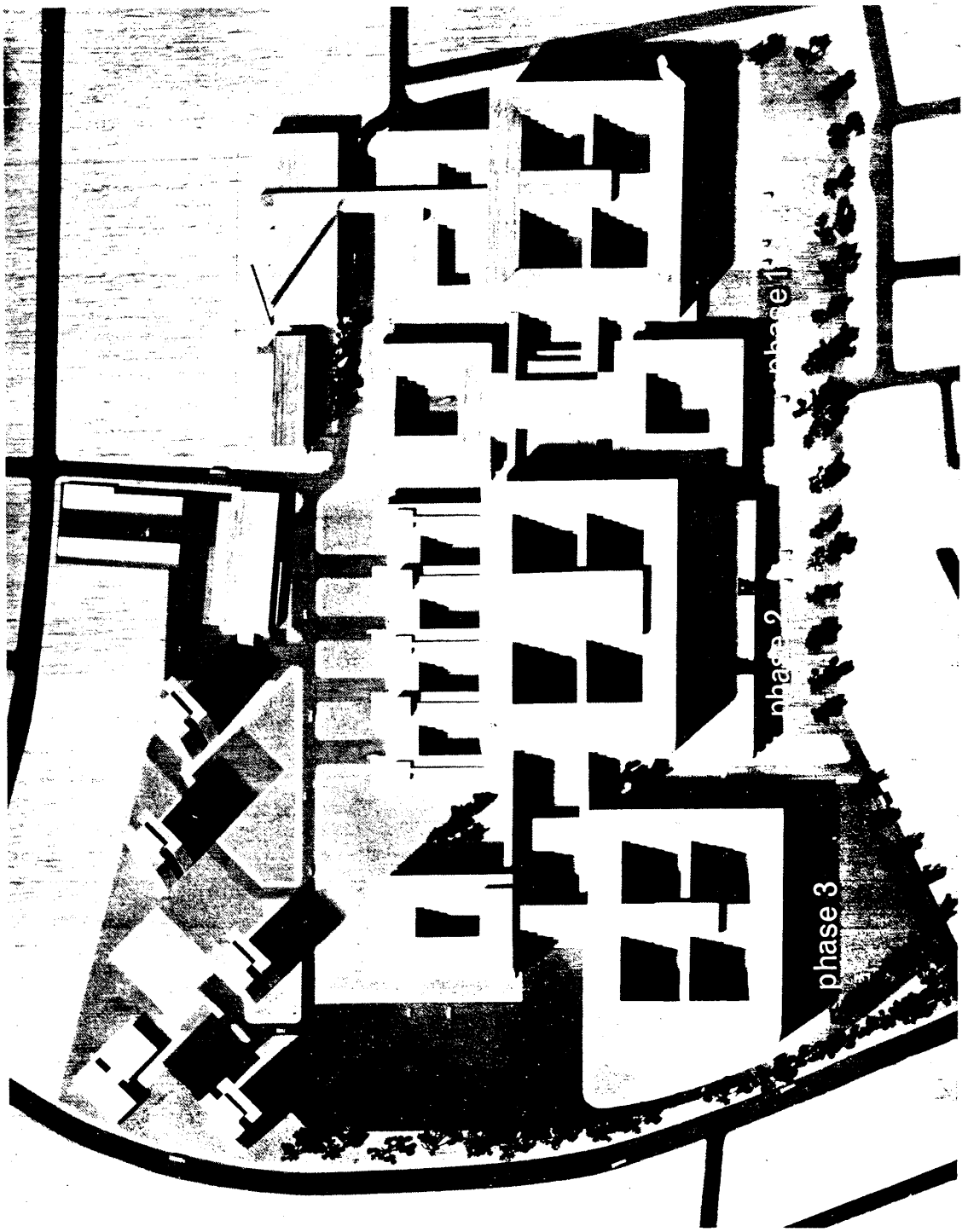


FIG 1 Model of complete development showing phases

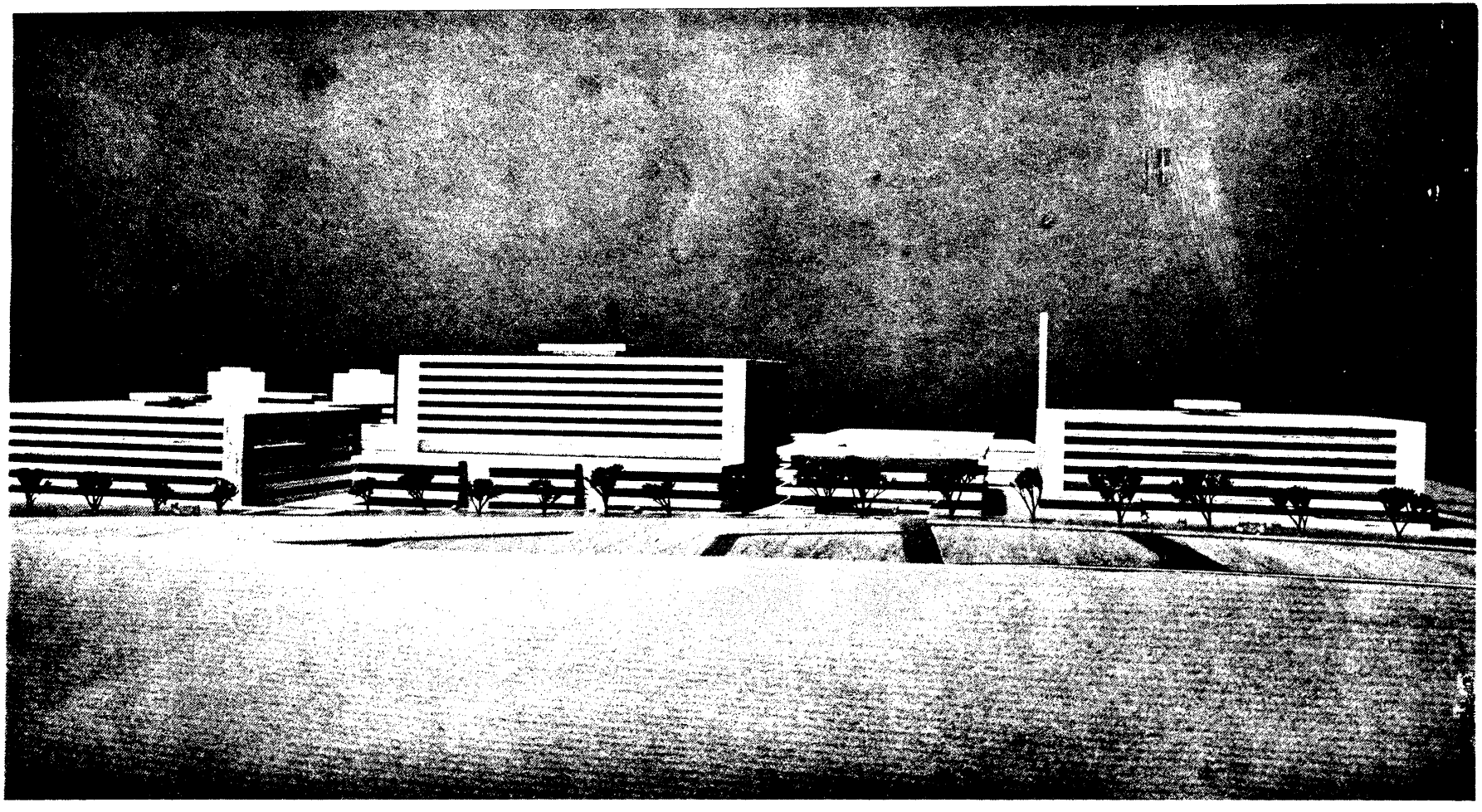


FIG 2 Model showing principle of decentralisation with three closely related hospitals

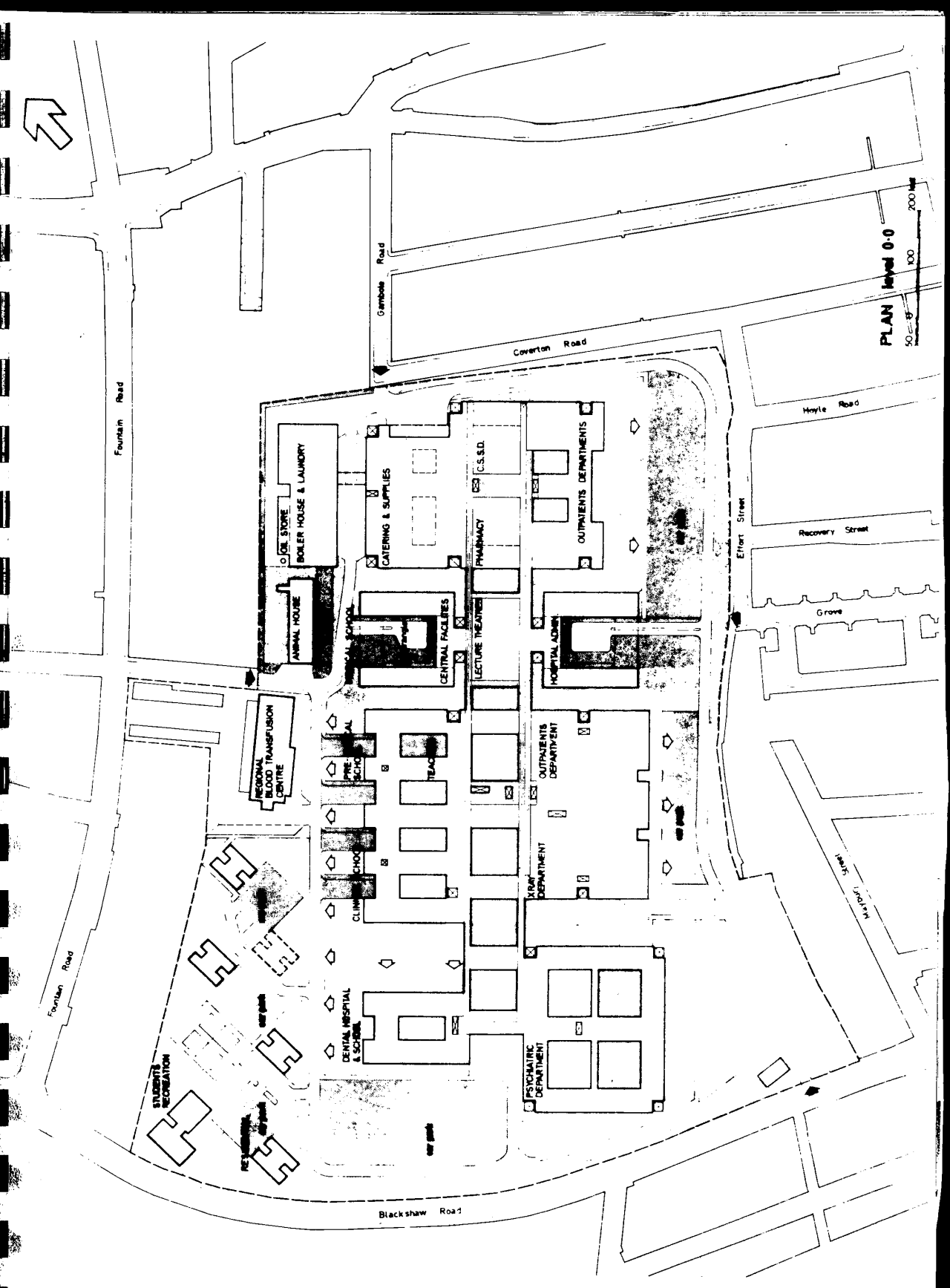
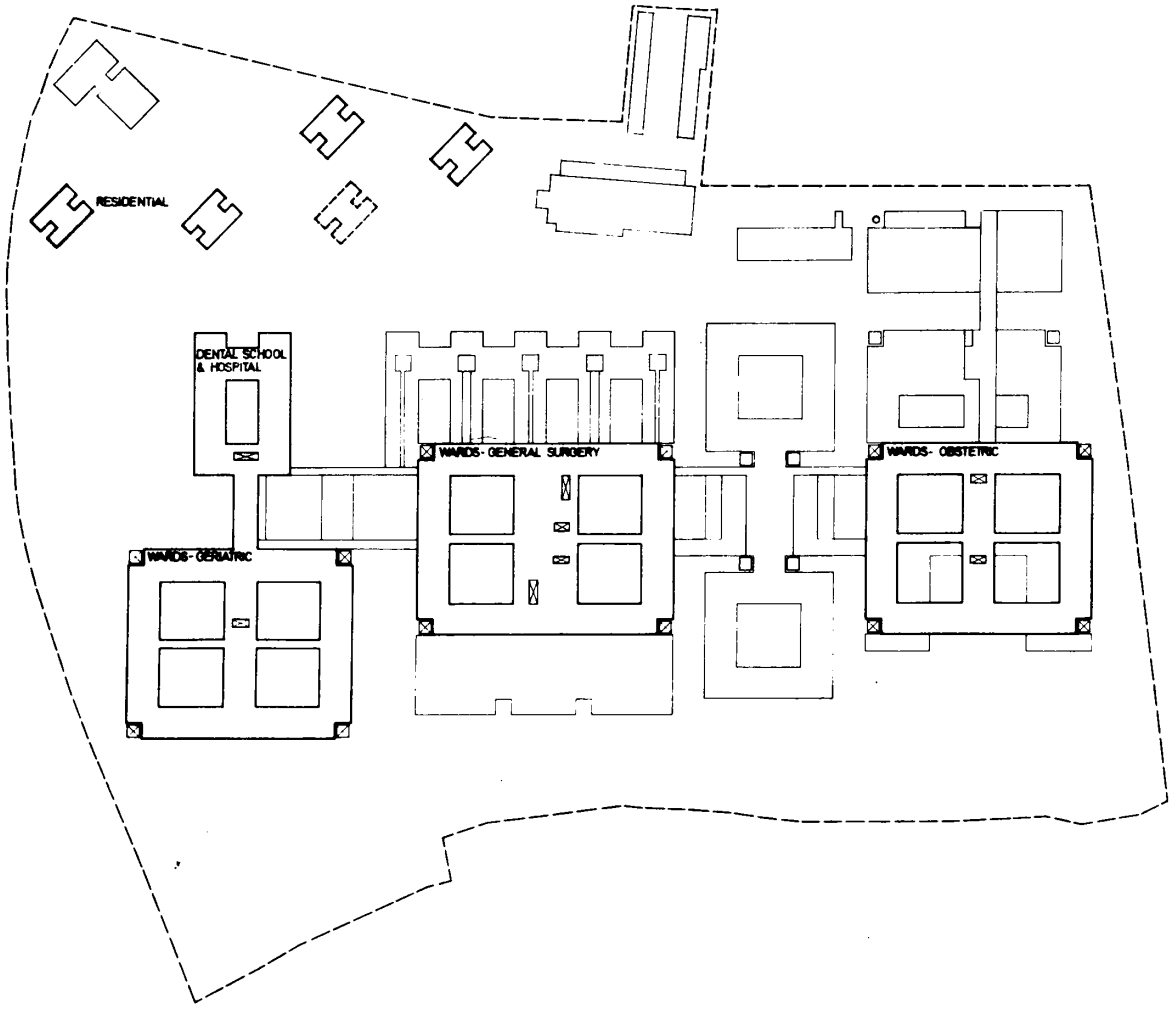


FIG 3 Typical lower floor plan diagnostic and treatment facilities



PLAN level 4-0

50 0 100 200 feet

FIG 4 Typical ward floor plan

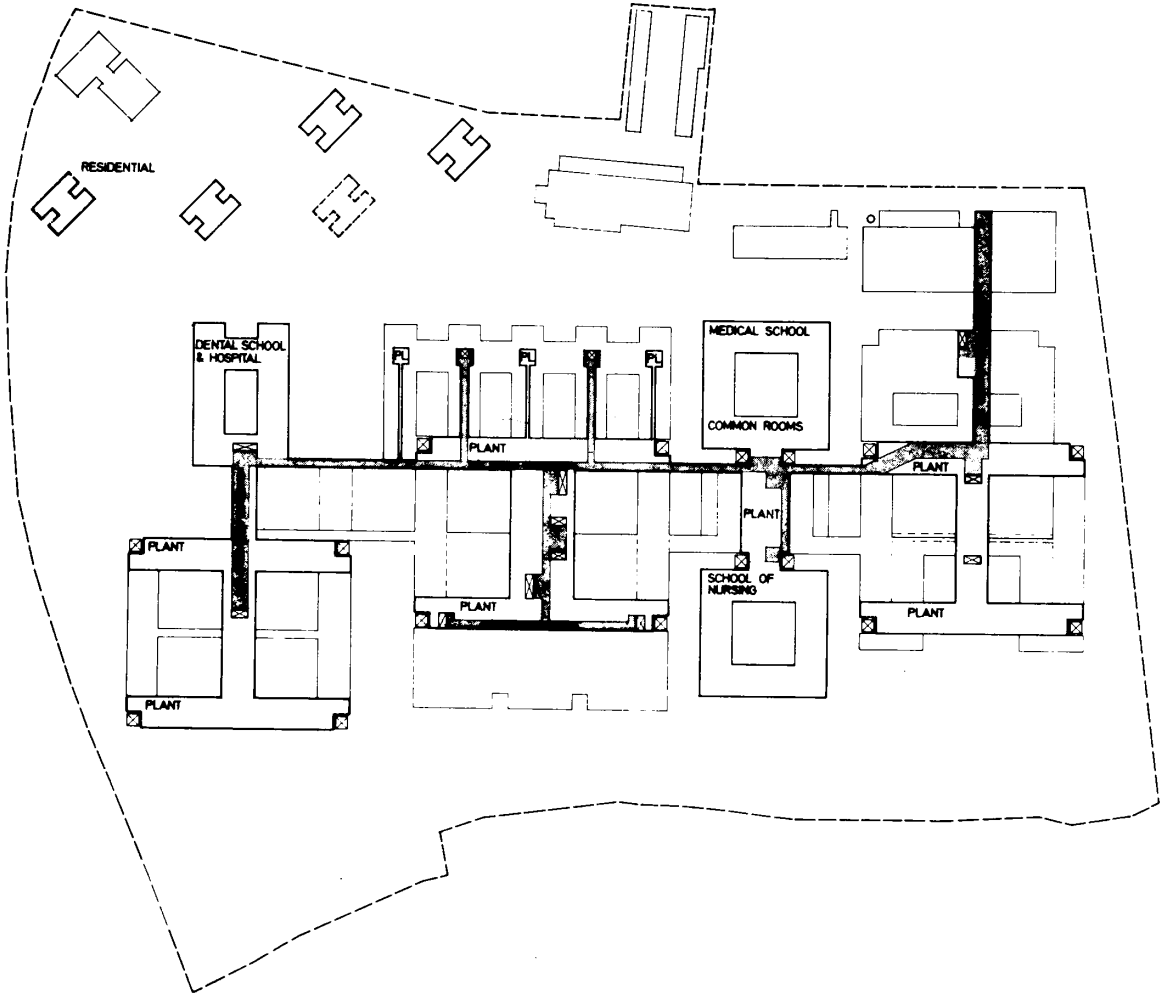


FIG 5 Plan at plant level

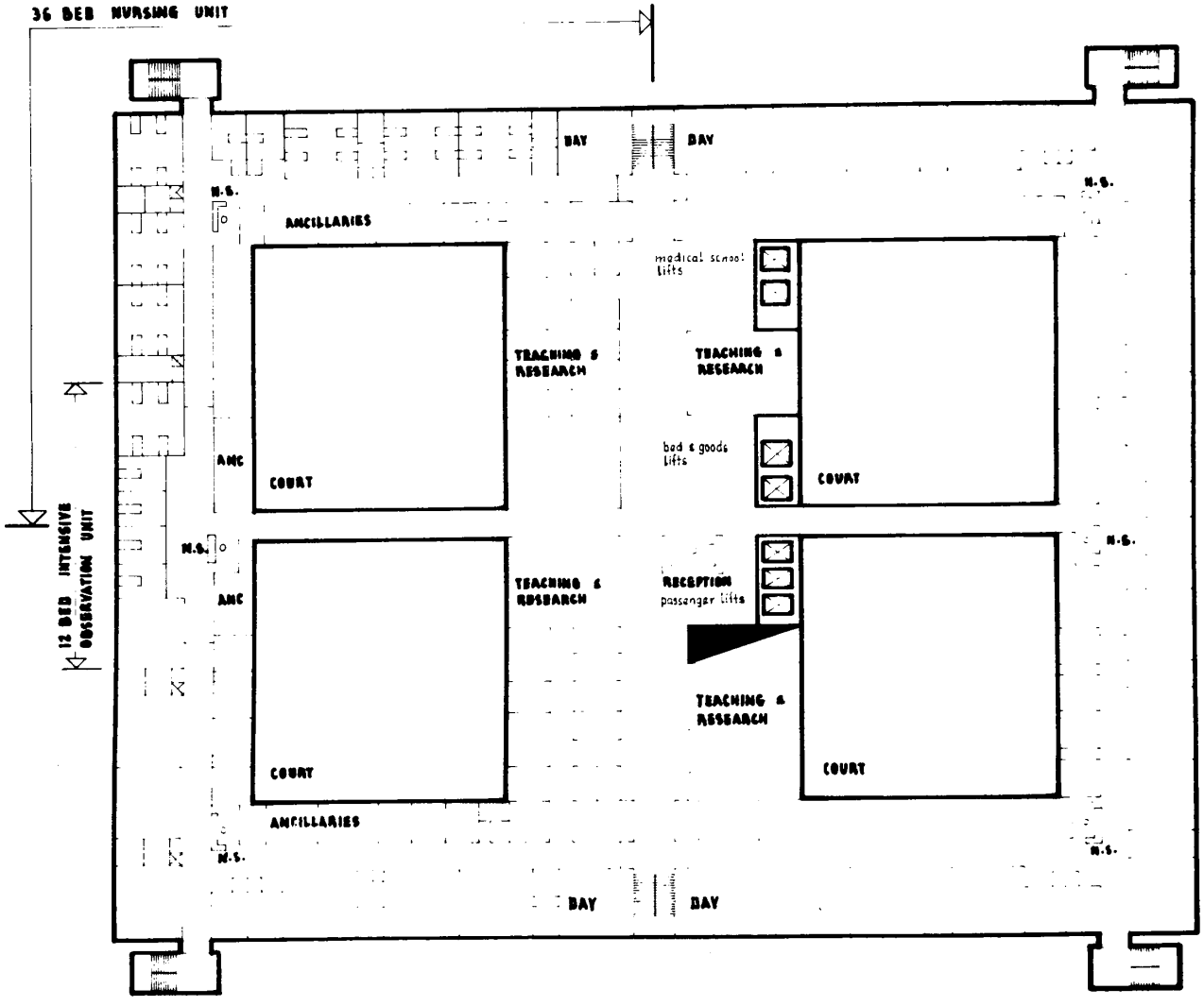


FIG 6

Typical 144 bed ward floor (early study)

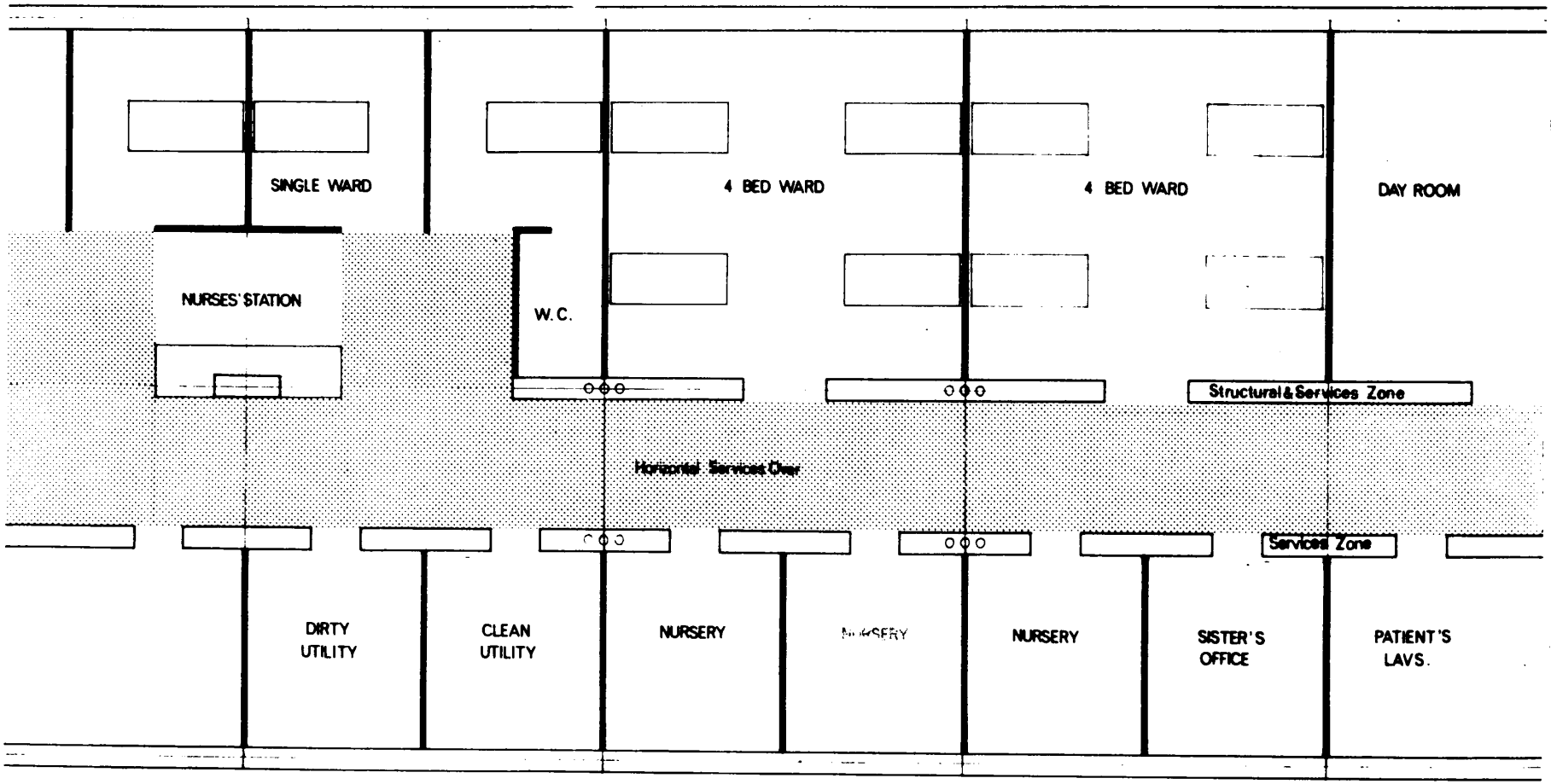


FIG 7 Ward study showing use of standard rooms and service and structural zones

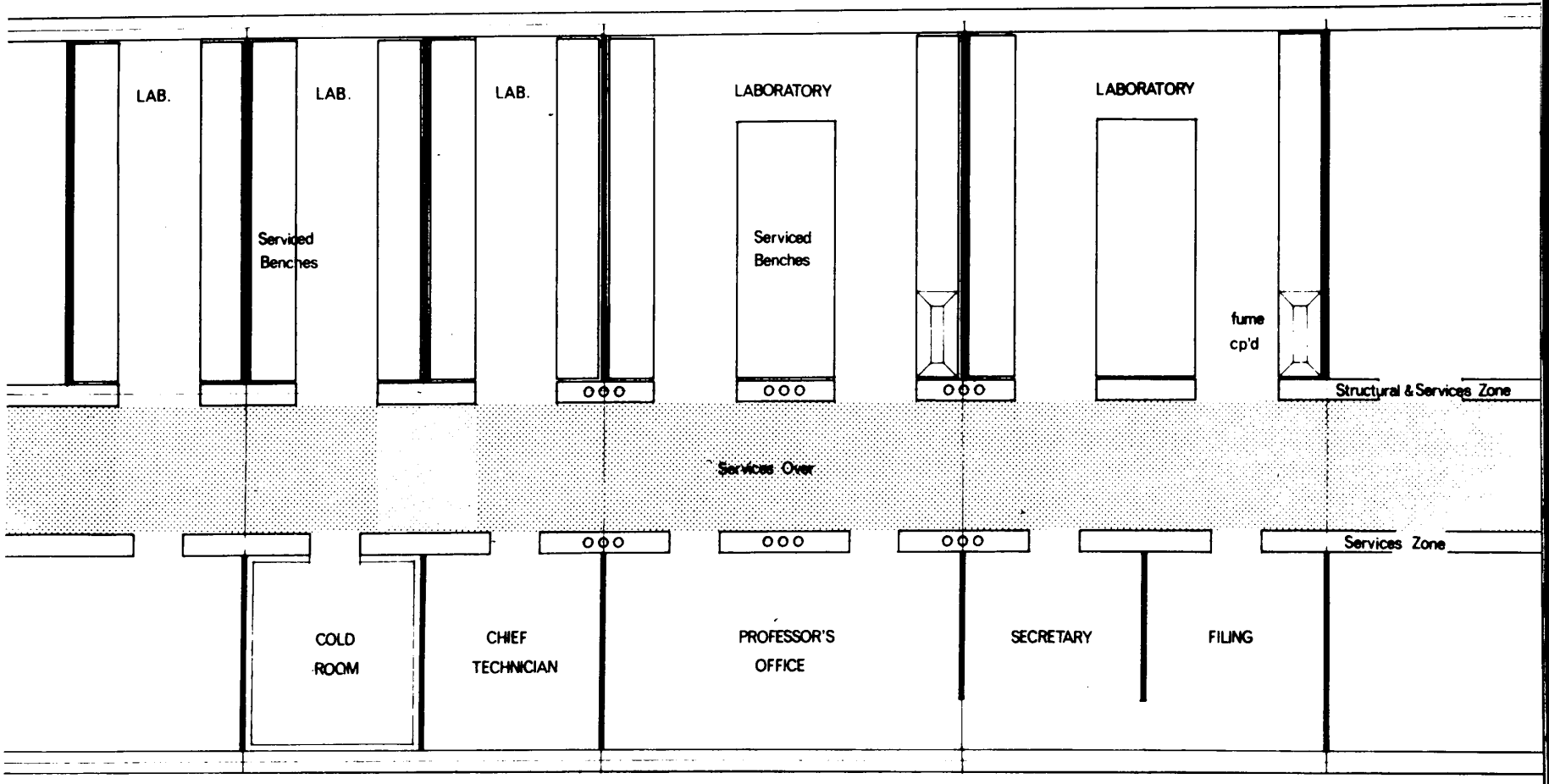


FIG 8 Study showing use of ward space for laboratory purposes

A brief discussion followed the demonstration by the St George's planning team. The team was asked about the extent of the evaluation carried out to establish the criteria for 4-bed ward bays and the provision of diagnostic facilities. The philosophy behind the 30-bed unit module and the size of the intensive nursing unit was also queried. It was pointed out, in reply, that the most significant factors in arriving at these decisions were the need to avoid deep planning and the importance of ensuring the flexible deployment of the nursing team.

The team was also asked what investigations were carried out into mechanical handling and distribution systems. So far, they said, such systems were still being studied but it had been realised that distribution had to be considered in some depth. Discussion also took place on the programming of the project, the nature of particular medical specialities, and the importance of policy in connection with patient care.

DISCUSSION: DEPARTMENTAL POLICY MAKING

Chairman: John Stringer

The afternoon session was devoted to group exercises relating to two specific departments in a hospital; one, an education centre, and two, outpatient departments.

The two groups considering outpatient departments attempted to evaluate departmental function and size as well as the relationship with other departments. A basic conclusion was that there was no real need to provide specialised clinics except for ophthalmology. It was considered that one of the most important factors in the outpatient system was an efficient follow-through of patient progress from the first request for an appointment to the end of treatment sessions. It was important that points of difficulty arising in the procedure should be identified and it was suggested that the appointments system should be related to room use and activity. Bearing in mind that there was an evident increase in diagnostic and treatment facilities and some reduction in consultation because of the increased specialisation, it was suggested that more consideration should be given to standardised equipment than to standardised departments.

In the general discussion which followed, John Stringer said that there appeared to be some vagueness about what the groups were attempting to consider in connection with the outpatient department and that there was no evidence of a clear approach in group discussion. He thought that it should be possible to arrive at an optimum design for a range of clinical activities. This once again raised the issue of flexibility; for example, it might be possible to satisfy clinical requirements with one basic type of room or alternatively with a range of two rooms. And it might be convenient to group rooms in different ways to meet varying demands in different clinical sessions.

The emphasis given to follow-through procedure was generally agreed to be important, but it was also suggested that this might lead to underestimating the relationship of outpatient facilities with other hospital departments.

A further point was raised in connection with the use of an outpatient department by GPs and the use of such departments as part of the community care programme, since many of the sessions currently carried out at outpatient departments could very well be handled by the GP before any admission or appointment was considered.

As far as the education centre was concerned, the groups considered a number of factors which would be important in departmental evaluation and planning. For example, the number and type of student and the relationship with the professional bodies governing their training, numbers in relation to intake, the type of training and work done, activity analysis, staffing, location, etc. Consideration would also have to be given to the appropriate accommodation according to the type of training visualised and importance was attached to the use of audio-visual aids.

In general discussion it appeared that there were very few facilities common to all the educational requirements, since each professional body is likely to have different requirements, often incompatible with one another. The main problem which might arise would be the possible under-use of space if accurate timetabling could not be achieved and this had to be seen in relation to the need to provide for diversity of use.

It was evident from the discussion of this particular departmental type that very few conclusions could be drawn from the groups' discussions.

DAY 5

EVALUATION OF PLANNING PROPOSALS AND HOSPITALS IN USE

Building Appraisal

Brian Langslow, Associate Partner, Llewelyn-Davies Weeks Forestier-Walker and Bor

Summary

The objective of design-in-use studies is defined as being twofold; first, to provide feedback for the future design of similar buildings and, second, to assist the users of buildings to operate them more efficiently. The purpose of hospital design is established and the four main aspects of a comprehensive evaluation are stated as being capital cost, revenue cost, function and environment.

Previously published evaluation studies are discussed and the Scottish Home and Health Department publication, "Hospital Planning - The Importance of Detail" is recommended.

The difficulties of establishing an evaluation yardstick are enumerated and two types of design-in-use assessments are suggested for the future, one for the benefit of the user, but simpler in approach than earlier efforts, and the other to provide feedback on selected topics.

The importance of a standardised approach to data collection and a central point for analysis and dissemination is emphasised.

Evaluation must involve the collection of data so that judgement can be factually based and set against explicit criteria. The object in such studies is first to provide feedback for the future design of similar facilities and second, to assist the users of the buildings to operate them more efficiently. As a by-product there is no doubt that evaluation studies provide valuable experience to the members of the teams undertaking them and it can be argued that participation in such a study should be compulsory training for all engaged in the planning of hospitals.

OBJECTIVES IN EVALUATION

In considering design-in-use studies it may be helpful first to consider the objects of hospital design itself.

The purpose of hospital design might be defined as: "to achieve, within a predetermined capital budget, a building which will function efficiently and economically and provide a proper and acceptable environment for its occupants". The four main aspects involved in any comprehensive evaluation are capital cost, revenue cost, function and environment. But it is an imperfect definition. Efficiency and economy are comparative terms and the criteria by which to compare them have to be defined. There must also be an element of subjectivity in their assessment as indeed there certainly is in any review of environment.

Evaluation studies must be aimed at finding out whether the design is suitable for its purpose, whether the operational policies were well conceived, and whether the staff are using the building according to those policies. They should also establish whether the materials and finish of the structure are satisfactory and whether any special problems of maintenance of the structure have arisen.

It might be suggested that since the main elements of design evaluation can be separately identified, ie cost, function and environment, they should be separately investigated. A valid evaluation should bring all the relevant factors together and provide one set of conclusions. If this is accepted, it may be questioned whether it is possible to achieve a comprehensive evaluation of a whole hospital or whether it would be better to concentrate on evaluation of selected aspects.

CASE STUDIES

A number of design-in-use studies have been published which raise points of interest regarding their stated objects and the methods used.

The first study was published by the Nuffield Provincial Hospitals Trust in 1962. This was "The Case History of a New Hospital Building", - an account of the planning and evaluation of Musgrave Park Hospital. The objects were stated to be (1) that the information should prove of practical help to those at present engaged in the commissioning and planning of hospitals, and (2) that it would encourage the publication of comparable information for other hospitals. The team made a selection of particular aspects which they considered to be most deserving of study.

In 1963 the King's Fund looked at New Guys House and in this exercise the object was to establish as accurately as possible the extent to which the building was fulfilling the intentions of those who planned it and meeting the needs of patients and staff in the surgical block. It was also designed to provide guidance to other authorities who might benefit from previous mistakes as well as successful innovations. An evaluation committee was set up to see how effectively the new guides provided for medical and nursing requirements, teaching and patients' comforts and to test evaluating methods to provide experience for any subsequent evaluation of new hospital buildings. The evaluation committee set up a working party to undertake the detailed studies required to assess the building. An outline programme was prepared and various selected departments were visited, staff interviewed, and preliminary evaluation reports prepared for discussion and revision. Questionnaires were used to find out the opinions of patients. The full working party met on six occasions to discuss the sub-committee reports and meet with representatives from the various grades of medical, nursing and other hospital staff to answer questions arising.

Also in 1963 the Scottish Home and Health Department published the design-in-use study on the Vale of Leven Hospital. The object here was"to find out in practice how the hospital served the purposes for which it was designed and to draw any conclusions which might have a bearing on the planning of other new buildings". The brief was not regarded as the sole criterion and it was noted that "the whole survey would have been facilitated by the existence of a detailed architect's brief". The team looked into the relevant records concerning planning back to 1950 and met twice before approaching the hospital. It also prepared a pro forma to assist in obtaining a complete set of observations during visits to the hospital, but this did not fulfil its intended purpose. Pro formas have often seemed to prove a dissapointment in evaluation studies. The first visit to the hospital was for general discussion with senior officers and to put the staff in the picture about the objects of the review. The team then looked at the main sections of the hospital which were listed and studied during succeeding visits.

In 1966 an interesting study was published by the South Western Board following the evaluation of a new maternity unit. Here the objects were the classic ones of 'feedback' and to assist the staff in correcting procedures which were not in accordance with the original planning assumptions. The method was a meeting of the evaluation team with the consulting architect concerned at which the plans and policies of the

unit were thoroughly discussed. The team visited the unit and spent 2½ days in assessing it, using the information from questionnaires sent to nursing staff and selected patients to assist them. They assessed each room using a check list which covered the location and relationships of rooms, entrances and accessibility, room area and its adequacy or inadequacy for its function, and the layout of equipment. The report identified a number of matters to the benefit of the users but did not include much that could be described as useful planning 'feedback'.

The King's Fund undertook two evaluations in 1966 where the objects were similar to earlier studies with the additional aim of learning more about the evaluation method itself. In the first study, an industrial psychologist carried out an attitude survey and a total of 112 patients and staff were interviewed and their comments recorded, analysed and circulated to the evaluation team. The leader of the team spent two weeks at the hospital talking to patients and staff, watching procedures and observing movements. A report of this visit was also circulated to the team to form part of the preparatory material. The main evaluation survey was carried out during a concentrated period of seventeen days by a team which consisted of a doctor, nurse, an administrator, architect and engineer. Work study officers were made available and more observers were recruited locally for the collection of quantitative information. The second study was approached in a similar way.

IMPORTANCE OF EVALUATION AND FUTURE METHODS

Looking back over these evaluations, I think it is true to say that they were of more value to those who evaluated and those who were evaluated than to planners in general. In other words they mostly failed to meet the primary object of 'feedback'. A little booklet of eighteen pages from the Scottish Home and Health Department called "Hospital Planning - The Improtance of Detail" contains more 'red meat' for a project team than most of the weighty evaluation reports. It catalogues unsatisfactor features observed in a number of recently completed hospital buildings and it does it briskly in three columns: defects, recommendations, references.

The Scottish Home and Health Department's paper suggests, for example, that if multi-bed rooms contained six instead of four beds this would save about £300 a bed. This has to be considered in relation to a reduction in amenity for patients and a loss of flexibility in use. Similarly, it is estimated that the provision of toilet and washing accommodation adjacent to each bed area might cost between £70 and £80 a bed, but the exclusion of this item would have an adverse effect on early ambulation, convenience for the patient and the general level of amenities. Provision on a ward floor of a separate intensive nursing care area with its own nurse working rooms costs about £40 a bed but this was regarded by medical and nursing staff as the most important feature of modern planning for acute ward units. The provision of rooms instead of bays costs about £20 a bed but here important questions about privacy and noise control are involved. Greater account should be taken of costs-in-use which have hitherto been regarded as a subject on their own.

One of the main problems is to determine the proper yardstick for evaluation. It has been generally assumed in the past that this should be the brief for the building; many evaluations have thus been crippled at the outset because there was no written brief for the building they were measuring. In any case the brief is an inadequate standard because it may be the result of bad reasoning or may inadequately or incompletely embody unspoken assumptions.

An alternative would be to evaluate on the basis of the designer's interpretation of the client's opinions, but this too is an inadequate standard because, for a variety of reasons, the designer may not have properly articulated the future user's unspoken

assumptions. If the standard of measurement is the brief plus the designer's articulation plus background it allows the possibility of relating this particular project with others of the same type and a consideration of all the processes of design made from the start.

Another complication arises from the fact that there is a relationship between the effects of good and bad points of design and the efficiency of management.

DESIGN-IN-USE ASSESSMENTS

I should like to be able to present proposals for a fully worked out method for future design-in-use studies, simple to use and universal in application, but I regret that I cannot. Research into some of the problems involved is going on now in several places in Britain and also in the United States. I believe it is possible to identify the need for two types of design-in-use assessments; one for the benefit of the user to check whether the detailed working of the building is in line with the brief and the planning assumptions, and to identify areas where adjustments are needed. This is what most of the reports produced thus far have tended to do but I think that the approach should be simpler than it has been in the past. Any study that cannot be taken to the completion of the first draft in three weeks should be subdivided. It should not be forgotten that continuing evaluation is a proper responsibility of management.

The second type of study should be specifically designed to provide feedback on selected topics. For this purpose, the need is for an opportunity to make valid comparisons between a number of projects. What is required, therefore, is an appropriate scoring system which, when applied to key questions for the topic under review, will produce a profile of relative success which is easily read, easily compared and from which conclusions of value to planners can be directly drawn.

This involves a standardised approach to the collection of data and a central point for analysis and dissemination. Much will always depend on the quality of the people who do the measuring, but there seem to be possibilities for providing them in the future with better tools than they have had in the past.

Evaluation of Design Proposals

Tony Howard, Architect, Ministry of Health

Summary

Architects have tended to be divergent thinkers because of the inadequacy of design method and the lack of operational design criteria. More important still is the impossibility of achieving optimum conditions with regard to all criteria: daylighting, thermal comfort and artificial lighting costs, for example, tend to be incompatible. Alternative proposals give different values for a large number of criteria and we have to face the problem of optimizing between them. There is a need, therefore, inherent in the design process, for techniques of evaluation of proposals which will enable us to use both the skill and judgement of the planning team members, and the hard data available, in a systematic way. The use of mathematical techniques in the evaluation of a simple planning problem is illustrated.

The design process has been described in many ways; perhaps most effectively as a helix moving, through analysis, synthesis evaluation and production, to feedback and so on to a second level of the same sequence.

The need for techniques of evaluation for design proposals stems largely from the type of thinking which a planner has to adopt in solving design problems: in this context, thinking has been usefully described as being of two types. Convergent thinking attempts to reduce the problem to such a form that one solution becomes apparent - the convergent thinker makes the implicit assumption that one solution will emerge which will be the 'correct' solution, other solutions being 'incorrect'.

Clearly, no thinking really approaches perfect convergence except perhaps in the very simplest physical and mathematical problems. Why is it generally agreed, nevertheless, that we as planners need an even more divergent approach to the solution of our problems than other classes of problem-solvers do to theirs? The reasons for our present reliance upon divergent thinking and the multiple solutions of design problems are threefold.

Firstly, design method is still very far from being a systematic process and there are no validated techniques for ensuring that the designer's reasoning and creative thinking will lead him to a solution which will answer all of the needs embodied in the original problem. More specifically, no attempt has been made to replace the actual process of synthesis - 'the creative leap' - by any more systematic procedure.

Secondly, there are very few accepted criteria or standards for building design. We may sometimes feel that we are swamped by standards but these are almost entirely regulations governing building construction or environmental standards covering heat, light and sound: operational criteria are practically non-existent.

There is a third reason for which we usually need to produce a number of solutions to one design problem, and this touches on the question in which I am particularly interested today. Even where an environmental or operational criterion does exist, it is often not at all clear to what extent the criterion has been satisfied until

the proposal, or a model of the proposal, has been subjected to quite complicated tests. Then, when we know the extent to which this criterion has been satisfied, there is usually at least one other criterion which has to be considered. A particular design solution may satisfy the first criterion well but the second criterion rather poorly.

If we then evaluate a second design solution we may well find an improved correspondence between this solution and the second criterion but a deterioration in the correspondence between it and the first criterion. Neither solution is obviously dominant and we are left with the problem of choosing between them.

CRITERIA FOR DECISION

As a simple example, consider the design of a multi-bed room. In order to achieve a compact ward plan which is structurally cheaper than a long thin one and which involves less walking for the staff, we increase the depth of the multi-bed room from 16 feet to 24 feet, to 26 feet, and even more. As the depth increases so the area of glass needed to maintain the minimum daylight factor on the innermost bed increases. As the area of glass increases so the amount of heat lost during the winter and gained during the summer also increases. We can do one of four things: instal double glazing to prevent heat loss and a cooling system to counteract heat gain; or reduce the window size and accept the use of supplementary artificial lighting at the back of the room; or allow the patient to freeze and fry in turns; or stick to shallow ward plans.

The design situation is further complicated by our being unable continuously and smoothly to modify a design solution. Apart from minor adjustments, the changes tend to go in jumps and, whichever way we look at it, we are faced with what are virtually different design solutions, satisfying different criteria to different extents. How do we go about choosing the best solution? As a recurrent incident at all stages of the design process, the client and designer together have to choose between a number of design proposals which means, in effect, that they have to evaluate each proposal and optimize between them.

The term evaluation can be taken to mean a simple measurement of the value of something in known units - such as the length of an object in metres - or it can refer to a comparison of values: it is in this latter sense that the evaluation of design proposals is usually undertaken. The comparison can be made either with some accepted standard or with other proposals.

Where a standard exists of course we can carry out both types of comparison. We do this because many of our standards represent minimum acceptable levels of provision and there is rarely any objection to providing more than a minimum acceptable level.

But what of the case in which a ready-made standard does not exist, such as the spatial qualities of a room? In this case, not only is there no specified norm for these qualities but we do not know how to measure the characteristics upon which spatial qualities are dependent and we do not even know how people describe spatial qualities. We are relying almost entirely upon our subjective responses and we can simulate these responses by means of representational drawings and iconic models.

We are a very long way from subjecting this type of problem to any sort of meaningful analysis; but I would like to suggest that between these two varieties of evaluation there lies an extensive range of evaluation problems which, because of lack of data and technique, are handled in a way which approaches the subjective or intuitive type of evaluation rather than the first.

It is fairly obvious that the more data we have and the more reliable it is the better we can carry out the evaluation. What does not seem to be so well recognised is that the techniques used in evaluation are in many ways even more important than the data.

TECHNIQUES OF EVALUATION

One can often make assumptions about data where it is lacking but, faced with a heap of the most reliable and comprehensive data, if we do not know how to interpret it we still have to resort to a calibre of decision-making which is part bargaining, part table-thumping, part tenacity and part precedent.

There is a need, inherent in the design process, for techniques of evaluation of proposals which will enable us to utilize both the skill and judgement of the planning team members, and what hard data is available, in a systematic and rational way. This is particularly true in the field of hospital planning because here we find two characteristics which are peculiar to the modern situation.

One is the development of the multi-disciplinary planning team in which the interests of the different members often come into conflict and yet which have to be reconciled in the design solution.

The other characteristic is the information explosion. How we are to cope with the general problem of storage and retrieval of information is a fascinating subject on its own, but what we need to note here is that the information available to us when we come to evaluate a design proposal is increasing all the time. There is an increasing number of criteria to which we would like proposals to conform. We must therefore start developing systematic techniques for measuring our multiple solutions against the criteria.

EXAMPLE OF EVALUATION

With some diffidence, I am going to demonstrate very briefly a problem recently attempted in evaluation. The real situation has been modified and my intention is to persuade you that the line of approach described is a fruitful one to follow.

One question which has been asked at regular intervals since the publication of the Nuffield Investigations book in 1955 is "What is the optimum width for a multi-bed bay?" As far as can be ascertained, multi-bed bays have been designed in widths ranging from about 19 feet up to about 22 feet; and although hospitals have been in operation for many years incorporating this wide range of rooms widths, we still cannot point to a single study which conclusively demonstrates either that 19 feet is too little or that 22 feet is too great. Since about 25% of a general hospital consists of bed spaces, it seemed worthwhile treating this as a problem of design proposal evaluation. The hope is that this kind of approach may lead in the long run to the development of techniques with wider application.

The example is a multi-bed bay with a central gangway flanked by two bed spaces around which curtains can be drawn. It had been suggested that there were three variations one could play on the curtain track arrangement at the foot of the bed: each arrangement has different implications on the use of the gangway, and different costs. The first arrangement is the traditional one where the track is so positioned that the curtain falls outside the end of the bedstripper when it is in use.

In the second arrangement the track is so positioned that the curtain falls just outside the foot of the bed itself when the bedstripper is in use, the curtain tents over the bedstripper. This arrangement could be undesirable on a number of counts such as awkwardness in piling clothes on the bedstripper and the possibility of increasing the dispersal of airborne organisms from the bedclothes due to friction with the curtain. On the other hand from the gangway, you can see what is going on behind the curtain and are therefore less likely to blunder into something solid; and, of course, when the curtain is pulled round the bed when the bedstripper is not in use an extra 18 inches of unobstructed gangway space is available.

The third proposal is even more ingenious. This is for a double curtain track at the foot of the bed. A curtain drawn down one side of the bed runs onto the inner track and falls just outside the bedstripper. Which curtain the nurse chooses to pull round the foot of the bed depends on whether or not she is using the bedstripper. This proposal appears to have the advantage of the second in its economic use of space, without the disadvantages of inconvenience and possible danger. It would, of course, cost more than the other two because a greater length of both track and curtain would be required.

In fact, this proposal has recently been rejected in mock-up trials because it was realised that, whether or not the bedstripper was in use, the nurse behind the curtain simply could not be asked not to use the additional space available to her by pulling the right curtain. However, the exercise has not been modified in this respect, as it provides an otherwise viable alternative for evaluation.

CONTROL VARIABLES

The curtain track arrangement is one of the control variables: in other words it is under the control of the decision makers in this context - members of the project team. If the results of this study were, say, published in the form of guidance one of the recommendations would refer to the type of curtain track to be employed because this would be integral with the recommendation on bed bay width.

The bed bay width, of course, is the other control variable. Since we are thinking in terms of 1-foot increments, the possible nominal widths are taken to be 20, 21 and 22 feet, each less the partition thickness.

We have, therefore, a total of 3 x 3 or 9 possible sets of control variables. Each set has to be evaluated in terms of efficiency and in terms of cost.

There are of course other variables involved such as

The length of the bed: This is assumed to be the King's Fund bed, the length of which we know.

The length of the bedstripper, which may be one of two dimensions

The distance of the bed from the wall, which has a minimum value for the King's Fund bed

The content of the multi-bed room: This can vary from 4 to 8 beds, 5-bed and 7-bed rooms having their own day-space, which gives a total of 5 types.

All these are the environmental variables: that is, they are not under our control, any combination of them may occur, and we have to make a separate evaluation for each combination or set. There is a total of 1 x 2 x 1 x 5, that is 10 sets of environmental variables.

We must not be put off by the fact that we have to evaluate each of 9 sets of control variables against each of the 10 sets of environmental variables - a total of 90 evaluations - because there will only be slight differences in the calculations for each one.

For the purposes of this exercise, we will concentrate on the most important single factor, that is, the efficiency of gangway provision. For each of the 90 evaluations we want to know how efficiently the gangway copes with the traffic load it has to carry, in order to select the set of control variables best suited to a particular set of environmental variables.

How do we set about finding our efficiency of gangway provision? The first question we need to ask is: How much traffic is the gangway capable of taking? Efficiency of gangway load: $E = \frac{\text{Gangway capacity}}{\text{Gangway load}} \times 100\%$ The less the gangway capacity relative to the load, then the more crowded the gangway will be or the more awkward it will be in use, and the less will be its efficiency of provision.

The activities taking place in the gangway have to be assessed in terms of their importance. The importance of an activity is some function of such characteristics as frequency and urgency. Obviously, the more frequent, or the more urgent, an activity is, the more important it is that it be accommodated in the gangway. We do not have data on which to base a value for the frequency of an activity, and we do not know how to measure urgency. But nursing experience gives some indication of their relative value.

Dealing first with urgency, the nursing adviser can rank the activities in simple order of frequency. A, C, D, E, G, B, F, K, H where A represents a person walking unaided, B represents a nurse wheeling a treatment trolley, and so on (Table 1). We can then work up the scale, starting with the value 1 and giving estimates of the ratios relating the frequency of one activity to that of the activity below. This gives us the ratio scale shown in the second column of Table 1.

TABLE 1 - QUASI-PROBABILITY SCALE

Activity	Ratio Scale	Frequency Weighting
H	1.0	0.025
K	1.5	0.037
F	2.0	0.050
B	2.5	0.063
G	3.0	0.075
E	4.0	0.100
D	5.0	0.125
C	9.0	0.225
A	12.0	0.300
	40.0	1.000

The total of the values in this hypothetical ratio scale is 40, so that if we divide each value by 40 and place it in the third column, then the total of that column becomes unity. We now have a scale which has the characteristics of a probability scale - we will therefore call it a quasi-probability scale - which will give us the frequency weightings for that range of activities.

The values can be checked for consistency by asking questions about pairs of activities. For example: Do you think the frequency of activities C and D together would be greater than that for A? As we can see, the answer to this should be yes. By means of these kinds of techniques we can extract data which may not be as reliable as that from a tape-measure but which have a degree of consistency - and are certainly better than what we had before.

One useful aspect of the quasi-probability scale is that we can multiply the value for one activity characteristic by another and still maintain internal consistency. For example, activity A has afrequency weighting of 0.3: if its urgency weighting is 0.4 then the total activity weighting will be 0.12.

The only other factor we need to establish in calculating gangway load is the intensity of the traffic in the gangway for that particular bed bay type. For the purposes of this exercise I have assumed that traffic generated by each bed is the same despite the fact that this is patently untrue for most types of ward management systems.

The traffic intensity in each gangway location is affected first by the number of beds in the room (compare C and D in Figure 2); secondly by the presence of a day space in the room (compare B and D); and thirdly by the side of the bed which the patient is presumed to use (compare A and C). The first two were included in the original list of environmental variables; the third was not, and we will assume that it will be possible to establish the side of the bed most likely to be used.

If we study plan B of Figure 2, which includes a day space, we see that the traffic intensity in a gangway location consists of two elements: the dotted line, representing the proportion of the activity load from each bed which is directed towards the corridor: and the dashes, representing that directed towards the day space. The average traffic intensity per location is calculated in terms of these elements. Where the day space is outside the room (in A, C and D) then the activity load directed towards the day space is included in that directed towards the corridor. In the case of plan B, however, we have to separate these elements, which means that, in order to use these values in conjunction with the activity weightings, we have to go back and estimate the probability of each activity being directed towards the corridor and towards the day space.

We now have all the information we need for calculating the gangway load. The weighting for each activity (taken to be the product of the weightings of its component characteristics) is given by:

$$W = w_f \, w_u \qquad \ldots\ldots\ldots\ldots \quad (1)$$

We can then calculate for each activity the weighting for the proportions of that activity which will be directed towards the corridor and towards the day space:

$$WP_c, WP_d \qquad \ldots\ldots\ldots\ldots \quad (2)$$

In the case of a bed bay without its own day space, all activities are directed towards the corridor, so $P_c = 1$ and $P_d = 0$. The first term in (2) is then the same as the activity weighting W while the second term is zero.

We then calculate the sum of all activity weightings, generated by each bed, which will have these goal probabilities. That is:

$$\sum_{i=A}^{K} W_i P_{ci}, \sum_{i=A}^{K} W_i P_{di} \qquad \ldots\ldots\ldots\ldots \quad (3)$$

Since an activity is either corridor-directed or day space-directed, $P_c + P_d = 1$ and the sum of the two terms in (3) therefore represents the total traffic generated by each bed.

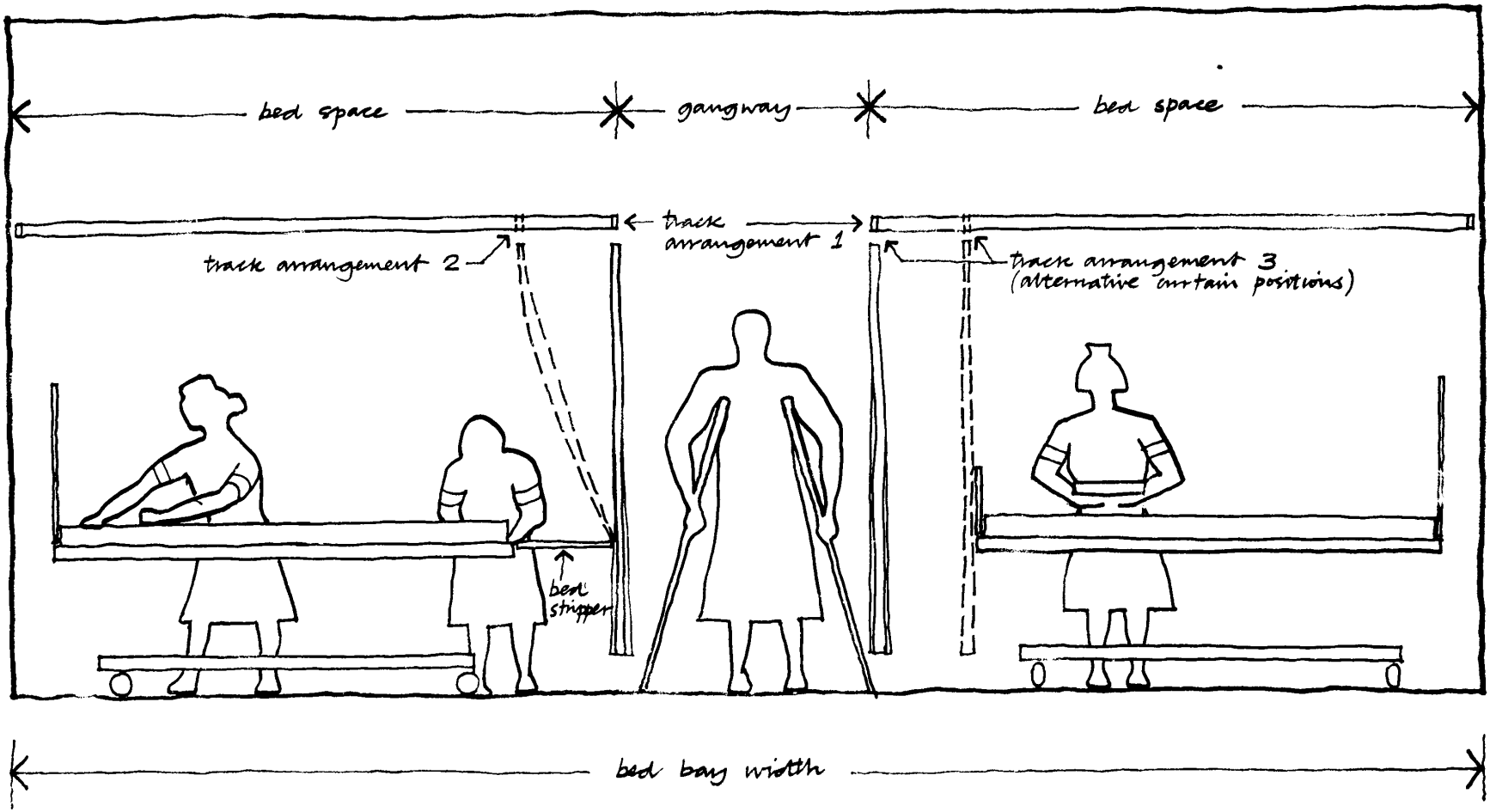
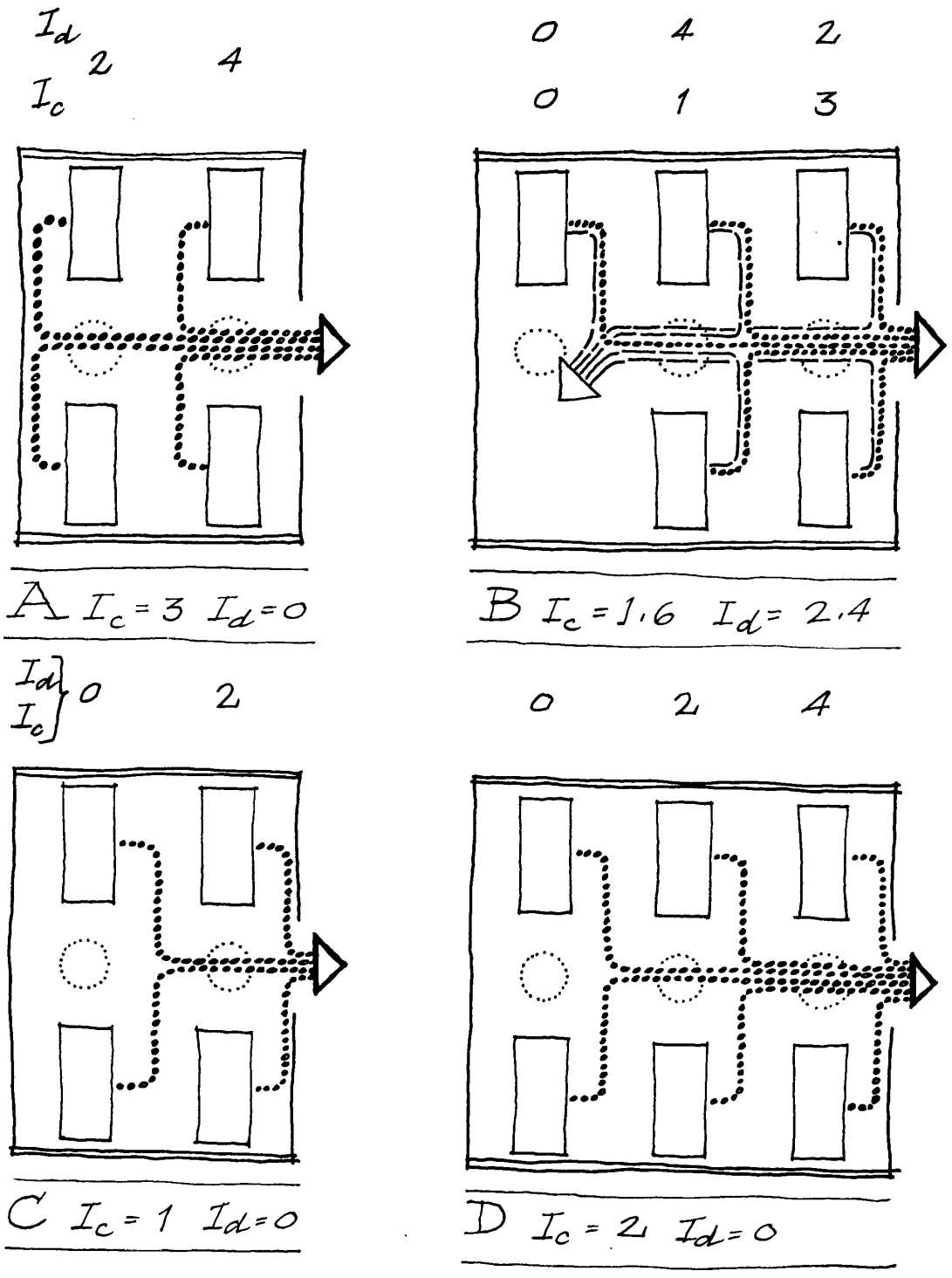


FIG 1 Section through multi-bed bay



Intensity of activities in central gangway
Each dotted circle represents a gangway location

FIG 2

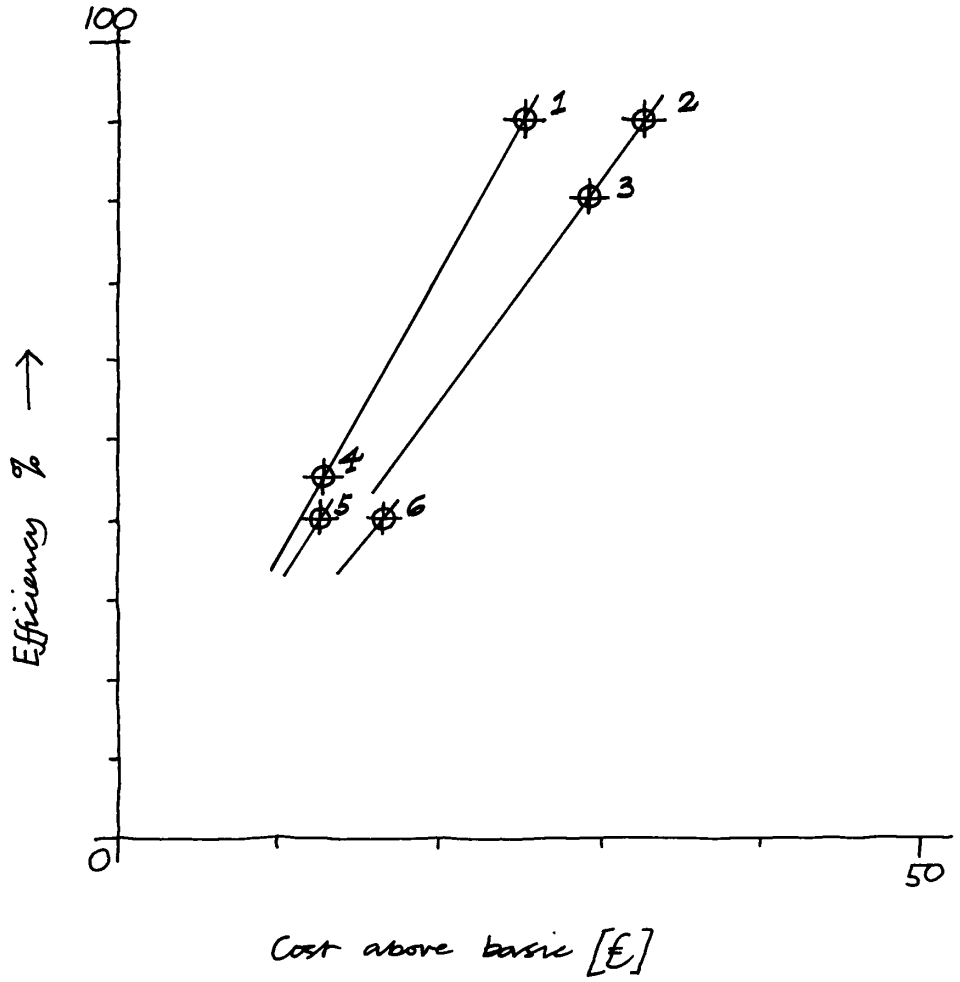


FIG 3 Cost benefit graph

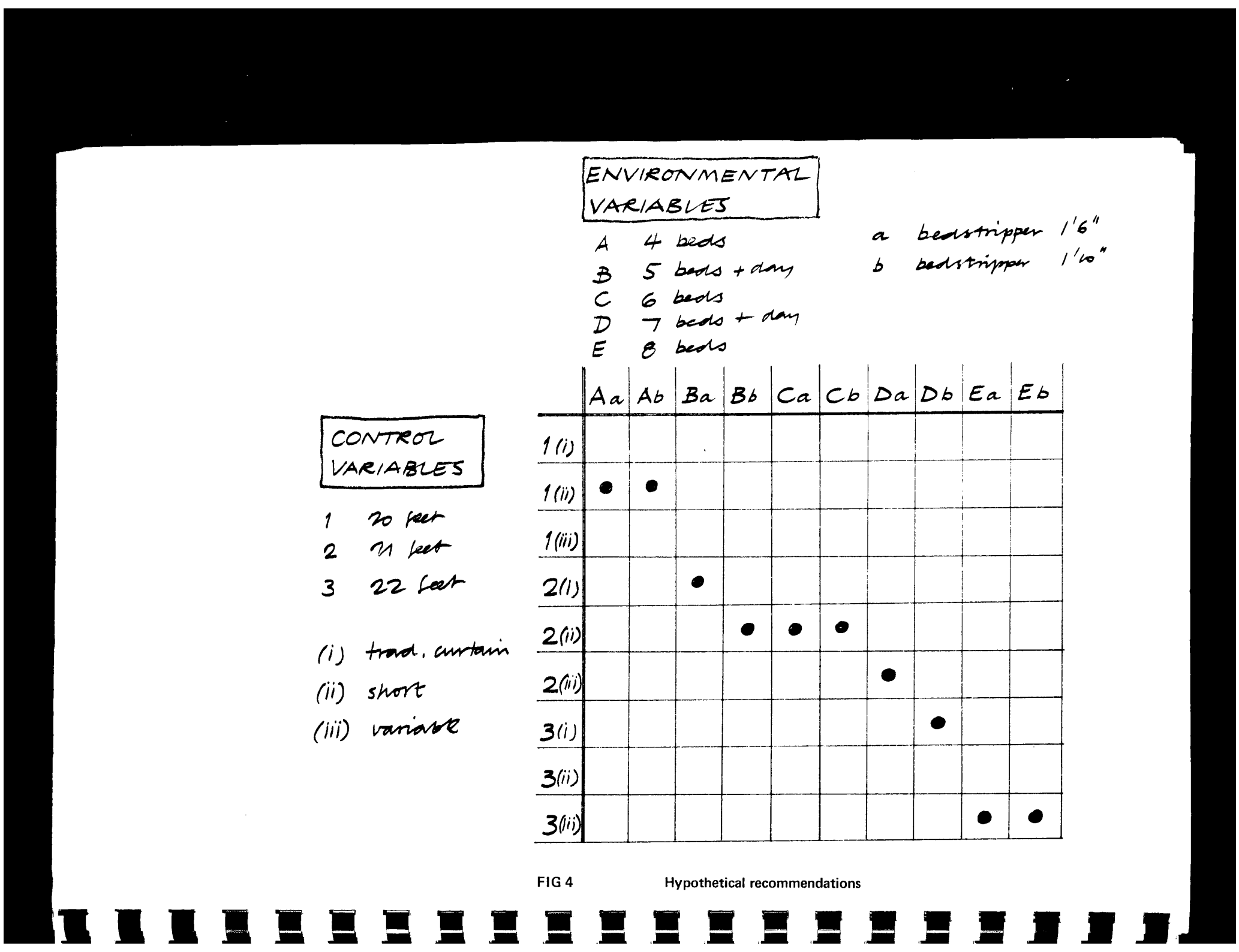


FIG 4 Hypothetical recommendations

The average traffic intensity per location in each bed bay type can now be calculated from the plans shown above:

$$I_c \, . \, I_d \qquad \ldots\ldots\ldots\ldots \quad (4)$$

Finally we multiply each traffic intensity (4) by its respective total activity weighting (3); the sum of the two terms gives us the average gangway load for each bed bay type:

$$\text{Gangway Load} = I_c \sum_{i=A}^{k} W_i P_{ci} + I_d \sum_{i=A}^{k} W_i P_{di} \qquad \ldots\ldots\ldots\ldots \quad (5)$$

By means of a number of similar techniques and with the aid of a little statistics we can calculate the gangway capacity and thus, as has already been explained, the efficiency of gangway provision which can be compared with the cost of provision (figures 3 and 4). We had no need to provide actual traffic flows or actual frequencies because in the equation for efficiency we only needed to express the numerator (gangway capacity) in the same terms as the denominator (gangway load).

This attempt at evaluation is very elementary, unsophisticated and some way from direct practical application. Nevertheless, bearing in mind the already well-developed resources on which we could draw, particularly in the fields of operational research and decision-making, I am convinced that this sort of approach - that is, the building of models which can be used to predict the behaviour of alternative design solutions under operational conditions - can lead to the development of techniques which could have a significant influence on our planning methods.

* * * * *

DISCUSSION

Chairman : C.P. Goodale, Assistant Secretary, Ministry of Health

In the discussion which followed the papers presented by Brian Langslow and Tony Howard, many speakers were concerned with the value of the evaluation studies which had been described. Among the points raised were the need for establishing suitable methods of evaluating hospital buildings, the importance of feedback and the time element involved in carrying out the studies themselves. Mr Langslow was asked what value he saw generally in the evaluation of buildings, and how important it was to consider the many different factors governing the commissioning and design of hospitals. In reply he said that it was evident from the studies which had been carried out so far that it was important to establish the key factors in the design of hospitals and to consider them not in isolation but as interacting elements in design. Both design-in-use studies and evaluation exercises were important if anything approaching a satisfactory design solution was to be achieved. It was important also that those factors which were to be studied should be more precisely defined than had often been the case hitherto.

In answer to a question about the responsibility for evaluation studies, Mr Langslow suggested that they should be contained within the hospital service, although Mr Howard thought that evaluation was of sufficient importance to warrant the drafting in of professional consultants for this purpose. Although both speakers agreed with the view that a certain amount of valuable knowledge and experience was already available through the work of individual hospital boards, etc., evaluation required considerable sophistication of techniques and management if it was to be effective. They also felt that building evaluation was important at the design stage. It was suggested by one questioner that the idea of evaluation could not be divorced entirely from the need for standardisation. As in earlier discussions, there was some controversy over the degree to which standardisation should be universally adopted. Mr Howard did not endorse the idea of standardised hospital units but said that building evaluation could only be effective if some degree of standardisation was adopted and that this in itself implied that evaluation and design-in-use studies would become more and more relevant.

A number of contributors felt that the time taken to produce definitive reports of evaluation studies was too long and that if they were to be of any value for future projects the processing of information would have to be speeded up. Mr Langslow agreed that the process was occasionally lengthy but felt that the results were still of considerable value in planning hospitals. He reiterated his view that it would be worthwhile selecting significant aspects of hospital design so that not only would the processing of information be faster but would also be capable of consideration in greater depth. It was also said that the experience and knowledge available in other building types could very well apply to the hospital sector and that such information as was currently available should be more extensively used. At the same time it was agreed that there were certain aspects of hospital design which were unique and which were in themselves worthy of detailed consideration.

Most speakers agreed that the effectiveness of evaluation studies depended to a considerable extent on the skill, knowledge and professional expertise of those engaged in carrying them out.

PRESENTATION OF DISCUSSION GROUP REPORTS

Chairman : Dr H Yellowlees

The reports were presented under seven headings:-

1. Rationalisation and Standardisation
2. Education and Experience
3. Research and Development
4. Decision-taking and Policy-making
5. Information and Guidance
6. Collaboration and Coordination
7. Effective Use of Resources

Rationalisation and Standardisation

The groups felt that there was now a wealth of information on many subjects but that it was diffuse, uncoordinated and unevaluated. The main deficiency was in fact the lack of coordination, except in specific fields, and it was suggested that a more rationalised approach should be developed on the basis of adequate investigation so that operational procedures could be rationalised and developed in a form which allowed wider application of their use than hitherto. It was suggested that there were several areas where obvious gaps occurred, e.g. in the assessment of running costs and their implications, from the early stages of design, on such items as staffing assessment.

Two of the groups were concerned with the overall problem of standardisation and thought that there were many constituent aspects which were capable of reconsideration in this way, although it would be impossible to standardise in the overall sense. One group felt it was essential to rationalise operational procedures in medical and administrative practice and felt that this would inevitably mean a degree of standardisation of design. They agreed however that conditions and requirements varied so much that a standard hospital to meet all situations was neither possible nor desirable. They pointed out however that similar situations did exist and could be catered for by standardisation. This implied a process of evolution, commencing with rooms of similar functions, then departments, and finally whole hospitals. The process, they felt, was already operating to some extent within the regions and could be achieved on a wider scale. Standardisation could be implemented from the apex if rationalisation was achieved at the base. Since the needs of patients and the medical requirements to deal with them were continually changing, standards must equally change to keep pace.

Education and Experience

All the groups were concerned with the importance of maintaining some continuity of planning team experience and discussed the methods whereby this could be most profitably harnessed for the benefit of other projects and for the education of new members of planning teams. There was some discussion as to the best methods for achieving these objectives. First, on the assumption that the effectiveness of a planning team is greater than that of the individual members, it was suggested that for certain projects the nucleus of the planning team might be kept together. Secondly, it was suggested that the individual experienced planner might be better used by including him in any newly formed team. A further solution might be the grouping of similar projects under one team which dealt exclusively with a particular type of building.

Most of the groups believed that education and experience could be exploited successfully if the work which teams had carried out and descriptions of the results they achieved could be published and made available to other hospital planners; it was thought that such general statements might act as vehicles for transmitting comparable information in order to reduce the amount of preliminary work which was often involved. Examples of such written documentation included those of the Scottish Boards and the South West Regional Hospital Board. Such papers would initially represent a consensus of the best available opinion but might also point the way in cases where further research might be necessary.

Another point which concerned the groups was the present lack of any structure for the education of hospital planners and their reliance upon purely practical experience. The groups considered it necessary to establish a satisfactory career structure for all the professions engaged in planning, namely, medical, nursing, administrative, engineering and architectural disciplines.

Research and Development

The groups felt that although information about hospital planning was available and expensive it was generally speaking chaotic, ill-coordinated, and largely unpublished. They expressed a unanimous view that a central controlling agency was required, either to finance research carried out by various interested bodies and ensure the publication of research, or to undertake research itself. The interested organisations might include boards of governors, regional hospital boards, as well as such organisations as the Hospital Centre, the Nuffield Centre for Health Studies at Leeds University, and the professional institutes. Such a central agency could in addition evaluate the results of research studies and act as the single channel responsible for assembling and disseminating information. It might also provide a register of evaluated planning information obtainable on request by hospital planning authorities with the objective of reducing the mass of documents which at present have to be assimilated. The centre would ensure the systematic deposit of existing data and research information and acquire early knowledge of new developments.

The groups thought that the priorities for research and development included the critical evaluation in depth of operational policy concepts in relation to efficiency, staff economies and running costs, as well as capital costs. Particular examples included the improvement of community services and their relationship with the hospital contribution in the future (i.e. the rationalisation of the present tripartite structure of the health service), policies on the nature and location of the industrial and supply elements of hospitals, and more detailed items like centralised staff changing facilities, etc.

The groups also suggested that evaluation and design-in-use studies of recent projects and pilot schemes would be valuable. They suggested that appropriate examples were the current experiments in catering, pathological investigation machines, CSSD, mechanical handling and communications systems generally.

Decision-taking and Policy-making

The groups were concerned mainly with the importance of appropriate information being made available to planning and project teams. They considered that such information could be standardised and would obviously help in speedy decision-taking. They thought that there was an urgent need to standardise planning terminology and notation and to include in this operational policy procedures, data sheets and schedules. Recognised management techniques might be adopted for planning control, such as network analysis, activity data methods, cost control and evaluation techniques. The use of such techniques would supplement the experience and expertise of team members. It was thought that it was important that planning teams were provided with a clear brief and a precise programme, but at the same time to guarantee them sufficient power and autonomy to make appropriate decisions during the planning process.

Information and Guidance

The present forms of planning information and guidance were thought to be effective as far as they went but could be vastly improved. Due to the time taken to produce them and the even greater length of time needed for their amendment, most information publications became out of date very quickly due to changes in medical policy.

It was suggested that new methods of information presentation could be investigated, and activity data methods and the wider use of computers were quoted. The groups also thought that it was desirable that the artificial barriers to information flow between professional consultants and the administrative and medical authorities at the regional hospital boards and the Ministry should be eliminated.

Collaboration and Coordination

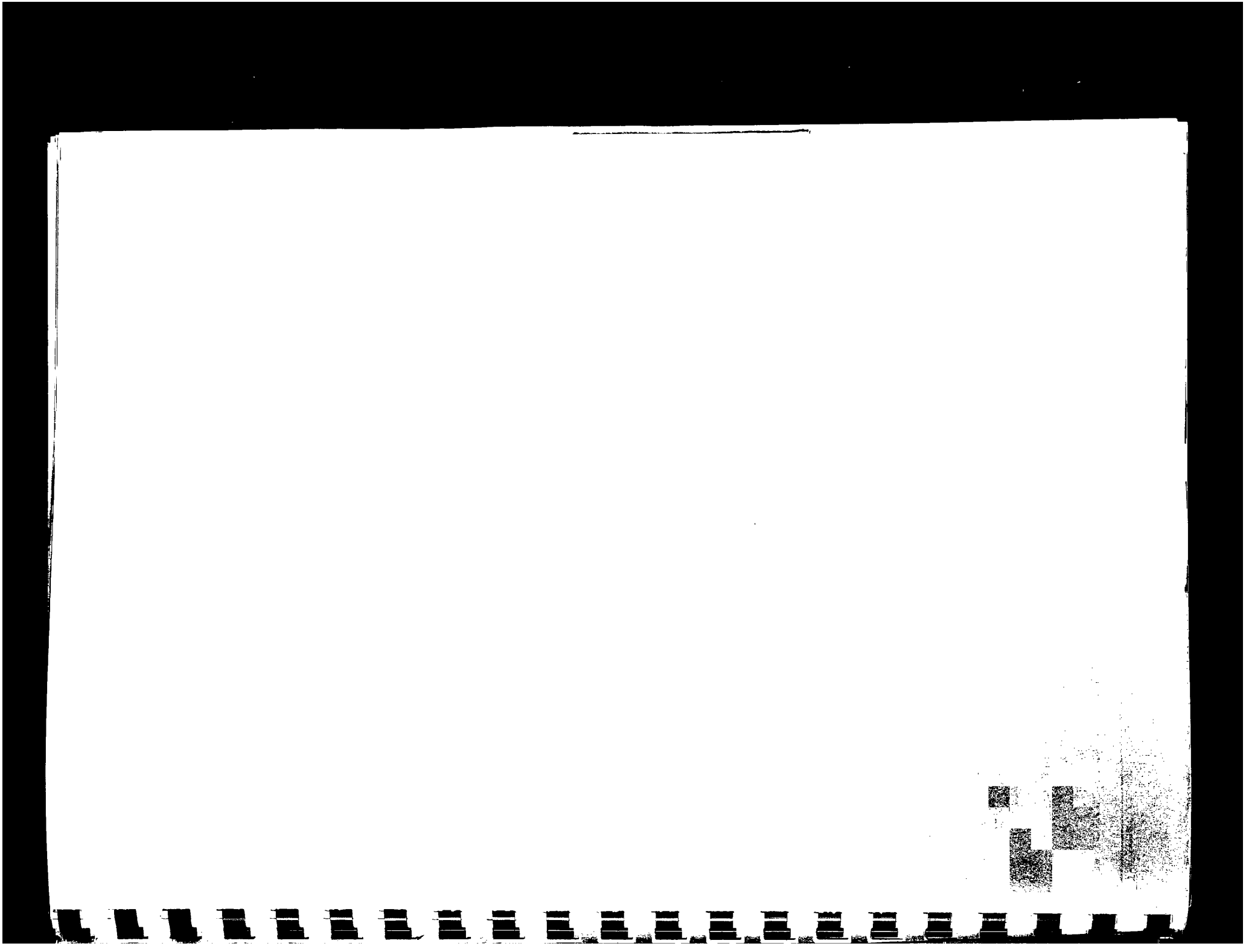
The consensus of opinion was that members of planning teams must have the authority and the knowledge to speak for the people and the interests they represented and to act essentially as a unified body.

The problem of the inadequacy of the present career structure of planning teams was again emphasized in this connection, particularly since members of the team were expected to coordinate the expertise of various different disciplines and to ensure their cooperation and participation from the inception of a project. The groups felt there was a need for the client to develop a degree of management control over the planning, design, constructional and administrative processes.

Effective Use of Resources

The groups generally thought that if the suggestions made under the previous heads were implemented, resources in time, manpower, experience and money would be more effectively used and less likely to be wasted.

In addition it was emphasized that there was apparently much unnecessary duplication of effort in the field of research and in the planning process itself. Other points such as the importance of considering capital and revenue together (the freedom, for example, to spend capital in order to save revenue), the greater use of standardised procedures and the exploitation of industralised methods of building were mentioned as positive contributory factors to this end.



was also made that management control techniques could make a significant difference to the speed and efficiency of planning procedure. Miles Hardie, director of the Hospital Centre, was asked by Dr Yellowlees to comment on the suggestion which had been made throughout the course that some central place for the dissemination of information, etc. should be set up, bearing in mind the valuable contribution already made by the Hospital Centre.

Mr Hardie felt that, since the Hospital Centre was a relatively small organisation without much prospect of more money or space to expand, it was necessary to limit its activities severely. In the long term it was unlikely that the Centre could be the sole provider of information on hospital planning despite its current role in operating a hospital information service. Mr Hardie felt that the obvious sources of information were the Regional Boards themselves and said that the Centre had been sponsoring an experiment with some of the Boards to develop an information service for the purpose of hospital planning. He hoped that one of the results of these experiments would be the establishment of a full working party prepared to get down to questioning the fundamental criteria governing the establishment of an information retrieval network. The Centre would be very glad to continue to work with hospital authorities and the Ministry if it felt sure that a network of this kind would ultimately be established.

He turned next to the question of establishing a common terminology and pointed out that the Centre itself had been working for the past eighteen months on a glossary of hospital planning terms. It was hoped that the glossary would be published in 1970.

On the subject of research, only a very small proportion of the Fund's money was used for research purposes. Ten years ago, the Nuffield Provincial Hospitals Trust and the Fund provided about 75 per cent of the funds for research into hospital planning and management. At the present time the Fund allocated only about £50,000 a year for research purposes compared with the £$\frac{1}{2}$ million that was allotted to the Ministry of Health. Mr Hardie said that the Centre thus could not quantitatively make a particularly large contribution to research and suggested that one of the Centre's chief roles was to see what could be done to implement the results of research.

Mr Hardie did not feel that the King's Fund could act as the main focal point for the collection and dissemination of information about research. He did however touch on the Ministry's role in this connection, pointing out that at one time the Ministry of Health had produced a list of studies which were being carried out in various centres throughout the country, but which had now been discontinued. The responsibility for the drawing up of such a list was now in the hands of the Social Science Research Council. He believed that much of the available information was now lost in four volumes published by the Council. He felt that it would be worthwhile if the Ministry could be persuaded to resurrect its list of studies of research programmes, particularly in the field of management and planning, and also to produce progress reports of hospital building at six-monthly intervals as they had once done. This had been a very valuable source of information which had also been discontinued.

In reply to Mr Hardie's point about the publication of progress reports, Mr Carswell pointed out that there was a list of all the major projects which was published every year in the estimates. The demand for lists of projects of a research nature had been too small to be continued. Dr Yellowlees however did agree that it would be very valuable if a group of people could get together to decide on the nature and value of information which could be disseminated by a central organisation.

It was thought by a number of people that some proper evaluation of planning information and planning policy-making would be useful to everyone concerned with hospital projects and that a rationalisation of procedure would make a valuable contribution to the organisation of the whole hospital planning process. It was suggested that much of the discussion at the seminars hitherto had resulted in a confusion of ends and means and that standardisation might well be effectively directed to the rationalisation of policy at national, regional and whole hospital level. It was thought that this really was the basic justification of a seminar of this kind; unless the discussion took place at this fundamental level the present session was doing no more than reiterating many of the points that had been discussed at similar sessions in previous years.

The participants at the conference felt that very often they were working without support from above and that an increase in this support would help a great deal. Dr Yellowlees in replying to some of the criticisms said that it was useful to know what the current consensus of opinion meant from the point of view of the Ministry. He believed nevertheless that there were a number of radical changes taking place in the concepts of what a health service should be and many useful developments were about to start. The general feeling of the meeting, following Dr Yellowlees' remarks, was that some rationalisation and standardisation of policies, both medical and administrative, was highly desirable without necessarily getting involved with discussions about the rights and wrongs of standardized plans, etc. Provided the policies were generally agreed, it seemed reasonable to assume that the technical interpretation could be left to the people who were trained and qualified to do so. The main point of discussion concerned largely the importance of coherence and consistency in assessing medical needs and defining an appropriate brief from which such requirements could be technically interpreted.

A final point was made at the end of the afternoon session regarding the education of planners and it was suggested that a career structure specifically related to planning and management would be of value. At the present it tended to involve people professionally qualified in specific disciplines, such as nursing, medicine, architecture, engineering and so on, but very rarely was it regarded as sufficiently important to absorb, in addition to these disciplines, that of management and administration. It was suggested that more positive steps should be taken to ensure that planning and policy decision making could be more positively handled in the future.