HOSPITAL ENGINEERING

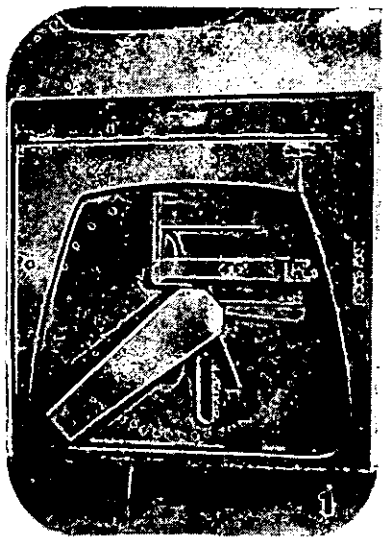
December 1977

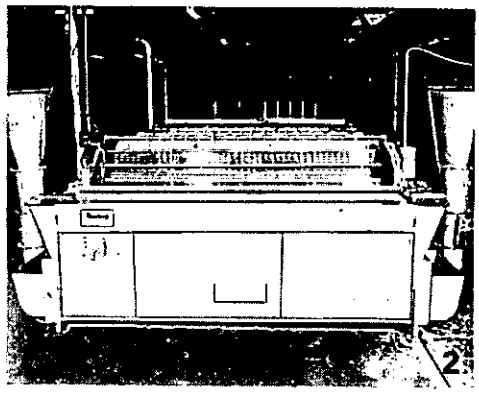
International Federation Issue

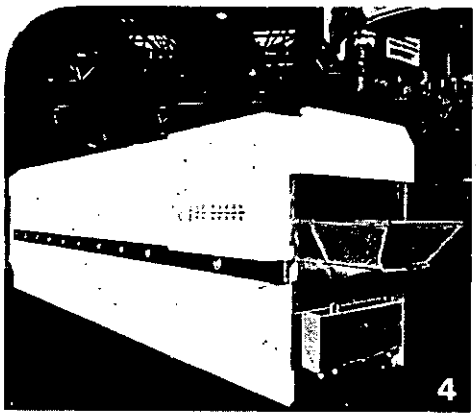
The Journal of the Institute of Hospital Engineering

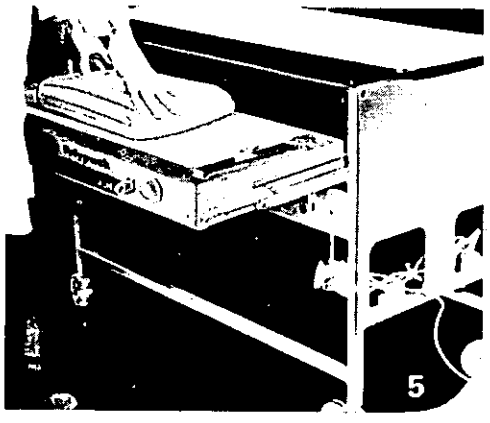
I.F.H.E.

Your Training Centre

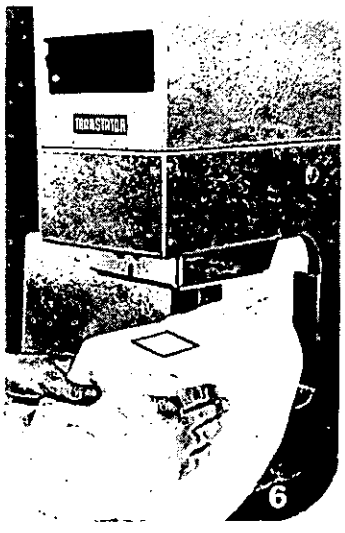








What's new from Polymark?



1. **STAPHGUARD** Milnor Staphguard Washer Extractors. The purpose-built fully interlocked barrier type washer extractor range of capacities from 135 lbs. – 600 lbs.
2. **FEEDKING MARK VII** High Speed Flatwork Feeding machine with two-lane feeding for table linen.
3. **CLASSOMAT.** Improved airflow conveying and classifying system with automatic classification and total article count.
4. **TRANS-EF** Dual Drum Continuous Batch Washer. Output rates from 1300 to 3850 lbs. per hour.
5. **POLYPACK** Heat Seal Packing machine for simple, fast and hygienic packing of Laundry bundles.
6. **TRANSTAT** labelling and Polypatch Heat Seal repairs for Linen Hire and Hospital applications.

For further information contact:–

POLYMARK LTD., Jeddo Road, London W12 9EE. Phone: 01-743 1001 (10 lines) Telex: 267504

'Hospital Engineering' is published monthly, except in January and July, by Earlsport Publications

Printed by JB Offset Printers (Marks Tey) Ltd.
Station Approach, North Lane,
Marks Tey, Colchester, Essex

Individual copies cost
£1.70 UK postage paid

The annual subscription is UK: £14.50
Overseas: £17.50 Americas: $40

Average circulation per issue
(January-December 1976): 2,228

ABC

Editor
Christopher Tanous

Art Editor
Bob Rixon

Advertisement Manager
Janet Rich

All correspondence relating to the Journal should be addressed to:

'Hospital Engineering',
Earlsport Publications,
17 St. Swithin's Lane,
London EC4, England
Telephone: 01-623 2235

UK ISSN 0309-7498

The Institute of Hospital Engineering,
20 Landport Terrace,
Southsea, Hants. PO1 2RG, England
Telephone:
Portsmouth 23186 (STD 0705 23186)

Secretary
J. E. Furness, VRD*

The International Federation of Hospital Engineering,
126 Albert Street,
London NW1 7NF, England

HOSPITAL ENGINEERING

Vol. 31 No. 10

The Journal of the Institute of Hospital Engineering

International Federation Issue No. 24

December 1977

Contents

Institute News

International Federation

Council Meeting — Barcelona

A successful Council Meeting of IFHE was held in Barcelona, at which members from France, Italy, USA, Spain, Holland, Portugal and the UK attended. During the course of the two days, in addition to normal Council business, visits were made to several hospitals in Barcelona, recently completed or in course of construction.

We are grateful to the Spanish Association of Hospital Engineering and Architecture for the excellent organisation and hospitality afforded us.

A full review of the Council business will be published with the next issue.

Netherlands Association of Hospital Engineers

The Association now comprises more than 500 members and is active in many aspects of technical development in hospital engineering. The present Board of the Association is as follows:

President:	**A. M. Vertegaal**
Vice-President:	**N. Snel**
Secretary:	**P. de Haan**
Treasurer:	**H. M. Brandjes**
Members:	**B. J. G. van Eldik**
	J. G. M. Schmeitz
	J. van de Kerkhof
	C. P. J. M. Meijne
	A. D. F. van Zanten

It is noted with regret that Mr. Jan Beier has found it necessary to resign his membership of the Board due to pressure of work. Mr. Beier was also the Association's representative to the IFHE Council. His place on the Board and as Council Member to IFHE has been taken over by Mr. Niko Snel.

The Nederlands Association participation in the work of many committees of the Nederlands Electrical Council to determine standards of safety and specification for hospital equipment, installation and practice, eg:

a. Safety of Electro-Medical equipment;
b. Specifications and standards for electrical and mechanical installations;
c. Conservation and economic use of water;
d. Legal standards for installation and application of medical gases;
e. Study of heart stimulation and associated technical problems (in association with Cardiologists and Physicists).

Spanish Association

On October 19 the 'Asociación Espanola de Ingenierie y Arquitectura Hospitalaria', held an Extraordinary General Assembly, mainly in order to elect its Board and decide its application for membership of the International Federation of Hospital Engineering.

The elected Board is as follows: President, Professor D. Antonia Bonnin Vila; 1st Vice-President, Professor D. Leopoldo Gil Nebot; 2nd Vice-President, Dña. Maria Pérez Sheriff; General Secretary, D. Sebastian Sánchez Pagá; Treasurer, D. Juan Gallostra Pedemonte; Board Members, D. Francisco Castellá Gimenez, D. Eduardo Ferré Nunell, D. Miguel Martorell Oller, D. Esteve Rovira Mestre.

The Assembly approved unanimously to seek the admission of AEDIAH to the IFHE which the new Board has done immediately.

The Assembly discussed and approved the celebration in March 1978 of AEDIAH's 'Jornadas Tecnicas'.

Asociación Española

El día 19 de octurbre pasado, la 'Asociación Española de Ingeniería y Arquitectura Hospitalaria' celebró Asamblea General Extraordinaria con el fín de elegir se Junta Directiva y trarar del ingreso de la misma en IFHE, principalmente.

La Junta elegida es la siguiente: Presidente, Prof. D. Antonio Bonnin Vila; Vicepresidente 1°, Prof. D. Leopoldo Gil Nebot; Vicepresidente 2°, Da María Pérez Sheriff; Secretario General, D. Sebastian Sanchez Paqa; Tesorero, D. Juan Gallostra Pedemonte; Vocales, D. Francisco Castella Giménez, D. Eduardo Ferrê Nunell, D. Miguel Martorell Oller, D. Esteve Rovira Mestre.

La Asamblea aprobó por unanimidad solicitar formalmente el ingre so de AEDIAH en IFHE, cosa que la neuve Junta ha llevado a cabo seguidamente.

La Asamblea asimismo trató y aprobô la celebración en Marzo, de las 'Las Jornadas Técnicas' de AEDIAH.

Institute of Hospital Engineering

Bursary Competition

Council of the Institute is most pleased to announce the establishment of an Institute Bursary Award.

The Institute is indebted, and would like to express its appreciation, to the Board of the King Edward's Hospital Fund for the financial support that makes this Bursary scheme possible.

The aims of the Institute of Hospital Engineering are the advancement, development and application of engineering science in health care and the management of engineering and allied staff employed in this work in Great Britain and abroad.

To achieve its aims the Institute co-operates with the Department of Health and Social Security and with industry in the promotion and organisation of training courses, symposia and seminars.

Papers are read at meetings of branches during the year and visits to health-care buildings and industrial establishments are arranged to broaden the knowledge of those working in hospital engineering.

The Institute is a Founder Member of the International Federation of Hospital Engineering, which was formed in Rome in 1970, and has expanded to take in Institutes or Associations right across the world from New Zealand to the United States of America. It is this involvement which has prompted the Institute to find means of promoting schemes whereby financial aid could be given to engineers to study hospital engineering in the United Kingdom and abroad and to encourage the younger members of the profession to widen their knowledge.

Details of membership and any other information about the Institute can be obtained from the Secretary.

Bursaries

The Council of the Institute of Hospital Engineering intend to make an offer of Bursaries to aid young British people in Great Britain and Northern Ireland who are engaged in health-care engineering. The Council's purpose in providing this Bursary is to enable successful candidates to broaden their knowledge and experience by overseas travel in order to study health-care engineering in other countries at first hand or, in certain cases, by obtaining training or industrial experience in this country at an approved college, institution or industrial establishment, and in these ways to equip themselves the better to improve their effectiveness and promotion potential in health-care engineering.

The conditions of entry to the Competition are given below. Further copies of these can be obtained from the Secretary of the Institute of Hospital Engineering.

A Certificate will be awarded to the successful candidates on completion of a satisfactory report of their tours or training taken through the aid of this Bursary.

The Council wishes to express its gratitude for the financial support the Competition will receive from King Edward's Fund for London which provides most of the Bursary, and for the co-operation of the candidates' employing authorities for permitting the candidates to enter the competition and to take up the Bursary. Thanks are also due to those authorities, companies and colleges who agree to co-operate to permit the successful candidate to follow the chosen study.

Conditions of Entry to the Bursary Competition

1. The Bursary is open to any British person practising or training to practice as an engineer in the fields of design, maintenance or manufacture of equipment or installations used in health-care establishments, who is over 17 years of age and under 35 years of age at the closing date of the competition. Candidates must demonstrate that they are seriously pursuing a career in health-care engineering.
2. Candidates must have studied, as full-time, part-time or evening students, for not less than one full term, before the closing date of the competition, at a university, college or technical school approved by the Institute for this purpose.
3. Entry will be by a paper submitted in accordance with conditions, and on a subject, set by the Institute.
4. Candidates should submit four copies of their entry which should be double-spaced and on one side of A4 paper only, the entry being signed and dated. Photographs and/or drawings of any size may be included in, or in support of, an entry.
5. The entry must deal adequately with the subject offered by the Institute. Only one entry will be accepted from each candidate.
6. The entry must be received by the Secretary of the Institute of Hospital Engineering, 20 Landport Terrace, Southsea, Hampshire PO1 2RG, not later than the date stated in the subject brief. Any entries received after this date may be disqualified.
7. Each candidate, when submitting an entry, must accompany it with evidence that, if successful, the requisite leave of absence will be granted by his employer.
8. The Institute reserves the right to:
a. require candidates to attend for interview;
b. publish entries, or reports submitted subsequent to a Bursary, without charge, in the Institute's Journal, retaining the copyright thereof;
c. withhold, or divide, the Award;
d. examine an applicant's birth certificate.
9. Whilst taking every reasonable precaution to safeguard entries and accompanying documents / materials submitted, the Institute accepts no responsibility for loss of, or damage to, material either on its premises, in transit, or elsewhere.
10. The subject of the study which the candidate wishes to pursue need not be related to the subject of the Bursary competition, but must be confined to the field of health-care engineering.
11. When considering to where they wish to travel in order to study their required subject, candidates should bear in mind the possibility that the Institute may choose to divide the Bursary. Candidates may, however, take into account any other financial contribution that may be available to them when estimating the cost of their studies.
12. Candidates selected for interview will be required to produce their proposed itinerary with estimated costs.
13. Successful candidates shall be required to make their own travel arrangements within the limit of the Bursary and such other finances available to them.

Conditions for the study or project

1. The subject which the candidate wishes to pursue need not be related to the subject of the Bursary Competition set by the Institute, but it must be confined to the field of health-care engineering.
2. Candidates must present, at the interview, an outline of the subject they wish to pursue, their proposed method of approach, the kind of establishments they would want to visit, the estimated time required for travel and the preparation of the report, together with an estimate of the costs involved.
3. Successful candidates must arrange their own itinerary, make all contacts with those whom they wish to visit in order to seek assistance with their projects, and obtain all necessary approvals to enter premises and to have discussions, where necessary, with subordinates in organisations.
4. The Bursary will be paid to the successful candidates as soon as the Institute is satisfied with their itineraries and that they are in a position to undertake their projects. Candidates shall pay for all expenses in connection with their projects and *no* accounts shall be paid by the Institute.
5. The Institute takes no responsibility for any of the candidates' actions in connection with their projects including obtaining documents which may be secret or have copyright protection, the taking of photographs, etc.
6. Candidates are expected to produce a comprehensive report at the completion of their studies or projects and to submit a copy for the Institute to retain and publish, if it requires.

The 1978 Bursary

The total amount of the Bursary for 1978 is £450.

The subject of the competition

Training for Health-Care Engineering

Candidates are asked to investigate the work content and career structure in the field of health-care engineering, and to determine the training requirements of new entrants to the pro-

fession in the United Kingdom and of those who need to develop their career prospects as practising engineers and senior managers.

Candidates are asked to take the following factors into account:

1. Health-Care Engineering is practised not only at District, Area and Regional level in the National Health Service, but also at the Department of Health and Social Security, in Consulting Engineering practices and in industry.
2. Engineers, when in Senior Management positions. will often have responsibilities for disciplines other than engineering.
3. The entry paper should not discuss salaries, but it is reasonable to discuss relative responsibilities inside and outside the NHS if the candidate so wishes.
4. Account should be taken of the proposal for colleges to phase-out the National Certificate and Diploma courses in engineering and the City and Guilds Technician Courses and to introduce the courses recommended by the Technician Education Council.
5. Candidates are free to consider whether existing or proposed courses at Universities, Polytechnics and other Colleges are suitable or whether academic courses specifically designed for health-care engineering would be more appropriate.
6. The need for, and extent of, post-graduate or post-certificate training should be considered.
7. Candidates are not required to consider the training and career development of craftsmen except where they may wish to refer to the possibility of craftsmen transferring to a career as health-care engineers.

When considering Health-Care Engineering in the Health Service candidates should also take the following into consideration.

8. The training need should be related to the existing administrative structure. Candidates should not anticipate any changes that might be made when the Royal Commission on the Health Service has reported.
9. Account should be taken of existing engineering staff who, according to present qualification requirements, are debarred from further career development by virtue of their academic background, age and present level of responsibility.
10. A list of circulars, etc currently dealing with the career structure and qualifications required in the NHS, and making specific reference to the training of engineers and other NHS Works staff, will be made available to entrants.

It is not intended to inhibit the candidates' approach to the subject either in its form or length but, as a guide, a range of 2,000 to 5,000 words should enable the candidates to deal with the following points:

(i) The present position.
(ii) Whether there is a need for changing the present academic requirements for posts at various levels in the career structure.
(iii) The recommended pattern of training and the estimated cost implications.
(iv) Details of the kind of study the candidate wishes to undergo, where he needs to go, the length of the proposed study period and estimated cost of travel, accommodation and subsistence.

Entries for the competition should be submitted to the Secretary of the Institute by not later than **April 30, 1978.**

Application forms from: —
The Secretary
The Institute of Hospital Engineering
20 Landport Terrace
Southsea
Hampshire
PO1 2RG (Tel. 0705 23186).

Registration with the Engineers' Registration Board

The Engineers' Registration Board has now reversed its decision regarding registration renewal procedures.

The only effect for members registered with the Board is that registration renewal slips WILL be issued, through the sponsoring Institution, for 1978. These slips will be issued, in fact, when the member pays his Institute subscription, including ERB renewal fee. Because of the volume of such subscription payments handled at the beginning of the year, there may be a delay of a few weeks in the issue of the relevant ERB renewal slip.

The Watt Committee on Energy

The Watt Committee has now published its Report Number 2 which is entitled 'Deployment of national resources in the provision of Energy in the United Kingdom, 1975-2025'.

The Report is available from the Watt Committee at The Institution of Mechanical Engineers, price £10 per copy. It is available to members of member societies at half price.

East Anglian Branch

On November 2, 1977, a group of members paid a visit to the factory of Lotus Cars, Norwich.

The visit took the form of a guided tour through all departments encompassing manufacturing, assembly and testing of the new range of high performance sports cars.

Library Notes

The following books have recently been added to our library shelves:

Industrial Energy Conservation
by D. A. Reay

Sunpower and Introduction to the Application of Solar Energy
by J. C. McVeigh

The Energy Manager's Handbook
by Gordon A. Payne

Sanitary Pipework and Drainage Systems for Health Building
by Rolf Payne

Advanced Level Physics
by M. Nelkon and P. Parker

The World and Man as Science sees them
by Forest Ray Moulton

A Laboratory Manual of Physics
by F. Tyler

Intermediate Chemistry Inorganic and Physical
by F. Prescott

Chemistry for Matriculation
by G. H. Bailey and H. W. Bausor

A First Chemistry
by E. E. Cook.

Members will be pleased to note that Council have kindly agreed to make available from January 1, 1978 a further sum of £100 towards the purchase of additional books.

Would Members care to note that as from December 1, 1977 the home address of the Honorary Librarian will be as follows: R. G. Smith, Dryhill, Cold Slad, Crickley Hill, Glos.

The office address remains as before: Area Works Officer, Administrative Offices, Wolverhampton Area Health Authority, New Cross Hospital, Wolverhampton.

Letters to the Editor

Dear Sir,

Career Structure for Engineers – Not Impossible?

Mr. B. Anderson's letter in the November issue makes interesting reading.

I must, however, disagree that his opportunity to gain professional status is *impossible*, albeit the economic state of his domestic affairs may have to take a sudden tumble.

I refer to the alternative structure at Regional Health Authority level where from Main Grade Engineer upwards the degree of responsibility of these posts satisfies the Institution of Mechanical Engineers.

Perhaps there is an anomalous situation here, but the solution, in my opinion, lies in having a single career structure for the Engineer in the Health Service which satisfies the Service as an employer and the appropriate professional bodies.

Yours faithfully,
WILLIAM GORMLEY
CEng MIMechE MCIBS FIHospE
Kilmarnock

November 5, 1977

Dear Sir,

Members at work in Oman

Having just received my June issue of our magazine (better late than never), I was interested in noting the list of International Federation Members 1977.

In 1976, the Ministry of Health, Sultanate of Oman, had decided for the first time, to employ Hospital Engineers. Fellow member George Clough, ex-Teeside, was posted to Qaboos Hospital, Salalah — a new (£25m), 300-bed hospital, whilst for myself, it was decided that I should remain within the Ministry, and set up what is now the fully functional Department of Hospital Engineering.

We have at the present time, 85 properties in the Northern Province, and Qaboos Hospital and a few dispensaries in Salalah.

Having been faced with the task of establishing one of the most important departments, in a country four times the size of the UK, with many areas reachable only by air, in the most extreme climatic conditions, this was an enormous and, in fact, sometimes traumatic challenge!

However, after one year of concentrated effort, and immense co-operation on the part of both Ministry officials and workers, we are approaching a second year, which will be *planned* engineering services.

Anyone who has been in this part of the world will realise the problems to be faced, but we are now entering another year of growth, where the proposed development of Health Services will be around £25m in 1978.

Perhaps now is the time, in our infancy, when we should be placed on the list of IFM members as: — 'Sultanate of Oman, Department of Hospital Engineering'.

Yours faithfully,
T. D. ARMSTRONG
TEng(CEI) MIHospE MIPlantE
AssocIMechE,

Hospitals Engineer,
Ministry of Health,
Sultanate of Oman,
PO Box 393, Muscat.

This is the conclusion of the article whose first part appeared in our November issue. The tables starting on page 7 are representative of many more prepared by the Personnel Division of the West Midlands RHA.

A Guide to Current Developments in Technical Education for the Works Professions-II

Part 3: TEC Programmes available

The following information is based on enquiries to Academic Institutions in the geographical area covering the West Midlands Regional Health Authority and includes only information to hand at August 1977. **It is therefore not an exhaustive list.**

The West Midlands Regional Advisory Committee provides a booklet[5] listing courses/programmes available, though the 1977/78 edition does not distinguish between National courses and programmes under the aegis of TEC.

Part 4: TEC Units – A brief review

This section attemps to give some indication of the aims of each unit, and gives comments on the relevance of units to NHS technicians.

The following are important points to bear in mind

The pages which follow have been divided into headings of each programme committee, and units will often be repeated as programme committees have chosen to adopt the same units;

A unit which appears under one

Name of College/ Establishment	Location	TEC programme availability in 1977/78 session
Brooklyn Technical College	Great Barr, Birmingham 44	A1, A5 B2, B4
Coventry Technical College	Butts, Coventry	A2, A5, A6 B2, B3, B4
Dudley Technical College	Dudley	A5
Mid-Warwickshire College of Further Education	Leamington Spa	A3 levels I and II, part-time day and (possibly) evening only; A5 levels I and II, part-time day and evening only; B4
Redditch College	Redditch	A5
Solihull College of Technology	Solihull	A5 (B3 planned for 1978/79)
Stafford College of Further Education	Stafford	A3, A5 B4
Warley College of Technology	Smethwick, Warley	A3, A4, A5, A6 B2
Worcester Technical College	Dearsway, Worcester	A2, A3, A5 (part-time day and subject to sufficient enrolments, a block release basis); B2 (B4 planned for 1978/79)
North Warwickshire College of Technology and Art	Nuneaton	A1, A2, A3, A4, A5 Levels I and II
Garretts Green Technical College	Garretts Green Lane, Birmingham 33	A1 General Eng. A2 Telecommunications A5 Mech. and Prod. Eng. B3 Building Eng. Studies (H and V)
Handsworth Technical College	Whitehead Road, Birmingham 6	A1 General Eng. A2 Telecommunications A4 Plant, Process and Control A5 Mech. and Prod. Eng. A6 Metallurgy
Hall Green Technical College	Cole Bank Road, Hall Green, Birmingham 28	A1 General Eng. A5 Mech. and Prod. Eng. B2 Building Studies B3 Building Eng. Studies (Plumbing) B4 Civil Eng. Studies
Matthew Boulton Technical College	Sherlock Street, Birmingham 5	A1 General Eng. A2 Telecommunications A5 Mech. and Prod. Eng. A6 Fabrication and Welding
Sutton Coldfield College of Further Education	Sutton Coldfield, Birmingham	A1 General Eng. A5 Mech. and Prod. Eng.
City of Birmingham Polytechnic (North centre)	Perry Barr, Birmingham	A2 Telecommunications* A4 Plant, Process and Control

*Full A2 and A4 programmes are not available at the Polytechnic as only Level III units are offered.

programme committee as not relevant may appear as relevant under another heading. This occurs because the overall programme contect has been considered;

The units listed are TEC standard units, ie units devised by TEC which colleges may adopt. College devised units, even though based substantially on TEC units, cannot for practical reasons, be listed;

Some units require pre-requisite units — either (usually) a lower level unit in the same subject or credit by virtue of previous study;

At the time of writing, units are in two series — TEC U75/ and TEC U76/ series — some, but not all, U76 series units replace U75 units. It is understood that U75 units may be studied in programmes running in 1977, but will eventually be replaced by U76 series units, which themselves may be updated.

How to gain maximum advantage from Part 4

When the general area of study (say A5) has been determined for a particular student obtain a list of units offered by the college, ensuring you obtain the unit reference number, eg TEC U76/001. Attempt to ascertain which college devised units, if any, are based on standard TEC units and obtain the code number of the standard unit.

The programme will have been authorised ('validated') by a programme committee (say A5).

Select the appropriate page giving comments on A5 units, and:

a. where units in the programme are essential — your student will be obliged to study these units (subject of course, to exemptions) and the document will help you to gain an appreciation of the aims of the units, and their relevance to the NHS technician;

b. where units in the programme are optional — your student will have a choice (albeit limited) of which units to study and after reading the aims and remarks, you should attempt to ensure that your student studies the most relevant units.

Nature of the 'remarks' column. The approach has been to make remarks of two main types:

1. a remark indicating a special feature or recommendation of a unit; or

2. a remark indicating that the unit is not of relevance to the NHS technician.

Where the remarks column has been left blank, this indicates that the unit would contribute to an acceptable programme for NHS technicians.

(A few examples of lists of units are given on pages 7-9 and 12-13).

Reference

[5] West Midlands Advisory Council for Further Education. Directory of Institutions and courses in Higher and Further Education in the region served by the Council Session 1977-78. From the Secretary, West Midlands Regional Advisory Council, Norfolk House, Smallbrook, Queensway B5 4NB (price 75p plus postage).

PROGRAMME COMMITTEE A3 - ELECTRICAL ENGINEERING - PROGRAMMES AND SPECIALIST UNITS AT ALL LEVELS IN ELECTRICAL ENGINEERING

Code No.	Unit Title	Unit Value	Aims of Unit	Remarks
Level I units (Under A3 these are common to all types of electrical technician)				
TEC U75/005	Mathematics I	1 (60 hours)	To consolidate basic principles and establish a common base for further progress, taking into account the wide variety of approaches to mathematics previously encountered at earlier stages in education.	
TEC U75/004	Physical Science	1 (60 hours)	To develop an understanding of the fundamental physical science concepts which will provide a common base for further studies in both science and technology by the student.	
TEC U75/064	Engineering Science I	1 (60 hours)	To develop an understanding by the student of the fundamental engineering science concept which will provide a base for further studies in technology.	
TEC U75/002	Materials and Workshop Practices I	1 (60 hours)	To recognise safety hazards in mechanical and electrical practices. To appreciate the range and choice of metals and non-metals in light current electrical engineering, and how they are treated in hand-tool and machine-tool operations. To appreciate the range of skills available to craftsmen and be able to meet the demands of practical work that may be incorporated in the technical role.	
TEC U75/011	Electrical Drawing	1 (60 hours)	To communicate by means of drawings, charts and diagrams. To develop the ability to interpret simple electrical/electronic diagrams and mechanical drawings. To have a simple appreciation of the factors affecting the industrial design of a product.	
Level II units				
TEC U75/012	Mathematics (1)	½ (30 hours)	This unit is to extend the fundamentals in mathematics gained in the level I unit or to consolidate the mathematical ability of those students entering the level II direct and integrate the new entrant into the scheme.	
TEC U75/039	Mathematics (2B)	½ (30 hours)	To extend the student who has taken Mathematics (1) II and requires an analytical approach. The unit would normally be taken by those students pursuing Mathematics to level III.	Particularly suitable for those proceeding to study Mathematics at Level III, i.e. is an analytical subject.
TEC U75/038	Mathematics (2A)	½ (30 hours)	The essential theme is one of application and awareness of concepts. This unit is designed to extend the student who has taken Mathematics (1) II, within confines of the above theme.	Particularly suitable for those pursuing a vocational course, i.e. is less academic than Mathematics (2B).
TEC U76/359	Electrical and Electronic Principles	1 (60 hours)	To provide a foundation of principles which will enable the student to develop an understanding of the related technologies.	
TEC U76/365	Electrical and Electronic Systems	1 (60 hours)	To enable Electrical Technicians to develop an appreciation of the broad range of systems involving the use of electricity. To enable Electrical Technicians to appreciate those parts of Electrical Systems which they will study in more detail in the section units of Electrical and Electronic Applications II, Heavy Current Electrical Applications III and Light Current Electrical Applications III.	
TEC U76/361	Electrical and Electronic Applications.	2 (120 hours)	To provide a broadly based introduction to applications in electronic and power systems.	

A3 cont'd

Code No.	Unit Title	Unit Value	Aims of Unit	Remarks
Level III Units				
TEC U75/040	Mathematics	1 (60 hours)	To extend the concepts of level II Mathematics, develop the concepts and use of mathematical modelling and broaden the mathematical knowledge as a basis for further study.	For those taking academic course
TEC U76/360	Electrical and Electronic Principles	1 (60 hours)	To continue the development of principles which will be complementary to the technologies in the programme.	
TEC U76/362	Heavy current electrical applications	1 (60 hours)	To introduce the student to applications concerned with heavy current bias. The topics include machines, transformers, rectifiers, illumination, measurements control systems and switchgear.	
TEC U76/363	Light current electrical applications	1 (60 hours)	To introduce the students to applications concerned with a light current bias. The topics include : power supplies, amplifiers, oscillators and generators, digital devices and S.C.R's.	
TEC U76/367	Lighting applications	1 (60 hours)	To provide a basic knowledge of lighting techniques for the non-specialist technician.	A subject of general interest to the non-specialist technician - useful particularly for those in Design Offices.
TEC U76/366	Lighting principles	1 (50 hours)	To provide a sound, broad understanding of the principles of illumination engineering. This Unit is intended for specialistsi.e. students intending to spend a significant part of their work on illumination engineering.	Particularly useful for the specialist in Design Offices.

PROGRAMME COMMITTEE - A4 - PLANT, PROCESS AND CONTROL ENGINEERING - PROGRAMMES AT ALL LEVELS IN PLANT ENGINEERING

LEVEL I UNITS

Code No.	Unit Title	Unit Value	Aims of Unit	Remarks
TEC U75/005	Mathematics I	1 (60 hours)	To consolidate basic principles and establish a common base for further progress, taking into account the wide variety of approaches to Mathematics previously encountered at earlier stages in education.	
TEC U75/004	Physical Science	1 (60 hours)	To develop an understanding of the fundamental physical science concepts which will provide a common base for further studies in both science and technology by the student	
TEC U75/041	Engineering Drawing	1 (60 hours)	To enable a student to communicate and receive ideas without ambiguity through the basic knowledge and skills of drafting and sketching. During unit exercises the student should demonstrate the proper care and use of drawing instruments.	
TEC U76/055	Workshop Processes and Materials	1 (60 hours)	1. To provide the student with an appreciation of what may be achieved by craftsmen and be himself able to meet some of the demand of the practical work that may be incorporated in his job. 2. To give the student an appreciation of the present range and choice of metals and non-metals.	Replaces U75/001

A4 (Cont'd)

LEVEL II UNITS (Cont'd)

Code No.	Unit Title	Unit Value	Aims of Unit	Remarks
TEC U75/118	Instrumentation Systems	½ (30 hours)	To introduce instrumentation using a system approach.	
TEC U75/119	Fluid Dynamics	½ (30 hours)	To understand basic concepts of pneumatics and hydraulics as encountered in industrial measurement and control and some typical applications.	
LEVEL II UNITS				
TEC U75/012	Mathematics (1)	½ (30 hours)	This unit is to extend the fundamentals in mathematics gained in the level I unit or to consolidate the mathematical ability of those students entering the level II direct and integrate the new entrant into the scheme.	
TEC U75/038	Mathematics(2)(A)	½ (30 hours)	The essential theme is one of application and awareness of concepts. This unit is designed to extend the student who has taken Mathematics (1) II, within confines of the above theme.	
TEC U75/039	Mathematics(2)(B)	½ (30 hours)	To extend the student who has taken Mathematics (1) II and requires an analytical approach. The unit would normally be taken by those students pursuing Mathematics to level III.	
TEC U76/053	Engineering Science	1 (60 hours)	To give a basic mechanical and electrical science background for engineering manufacturing technology technicians.	
TEC U 75/120	Instrument Drawing	½ (30 hours)	To apply knowledge of engineering drawing to sketching of instruments and the interpretation of measurement and control systems and plant diagrams.	See U76/400 on next page
TEC U76/399	Maintenance Processes	1 (60 hours)	To further the students' understanding of workshop processes applied to the maintenance of plant equipment.	
TEC U76/398	Plant Technology	1 (60 hours)	To develop the students' knowledge and understanding of plant engineering.	Recommended for NHS Technicians
TEC U76/400	Plant & Services Layout	½ (30 hours)	A. To apply knowledge of engineering drawing to sketching of plant components and the interpretation of plant supply and control systems and plant diagrams. B. To develop further the communication skill and knowledge of the techniques required for the production and interpretation of engineering drawings within the guidelines at BS 308 and other related national and international standards.	Repeat some aspects of TEC U75/120
LEVEL III UNITS				
TEC U75/040	Mathematics	1 (60 hours)	To extend the concepts of level II Mathematics, develop the concepts and use of mathematical modelling and broaden the mathematical knowledge as a basis for further study.	Suitable for NHS (Design) Technicians
TEC U76/054	Engineering Science	1 (60 hours)	To give students basic mechanical and electrical science background for engineering manufacturing technology technicians.	

HOSPITAL ENGINEERING

Increase in Advertisement Rates

Advertisement rates in the Journal will be increased from January 1, 1978. This is the *first* increase since July 1976.

Existing Advertisers with current bookings for next year will have their contracts honoured — discounts are also negotiable for any bookings placed before the end of 1977.

New Rates

Display	1	6	10
Page	£240	£230	£215
½-page	£130	£120	£110
¼-page	£75	£65	£60

Classified

£2.90 per line; £8 per single column centimetre.

Circulation ABC (January-December 1976) 2,228.

The most systematic attack on cross infection since sterilization itself

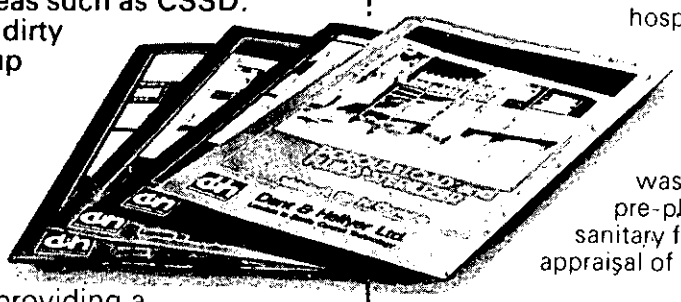
Nowadays, controlling cross infection is more than a hygiene problem.

With increasing demands on hospital resources it also presents a difficult management problem.

Sterile equipment must get into the right hands fast, involving as few "hands" as possible on the way, at the lowest possible cost.

At Dent & Hellyer we recognise what the real problems are. Quality equipment including sterilizers, bed pan washers and sanitary units are only part of our solution.

The essence of it is our ability to piece them all together into fully cost-effective packages for key areas such as CSSD, TSSU, sluice room, dirty utility room, scrub up area, pharmacy and laboratory.

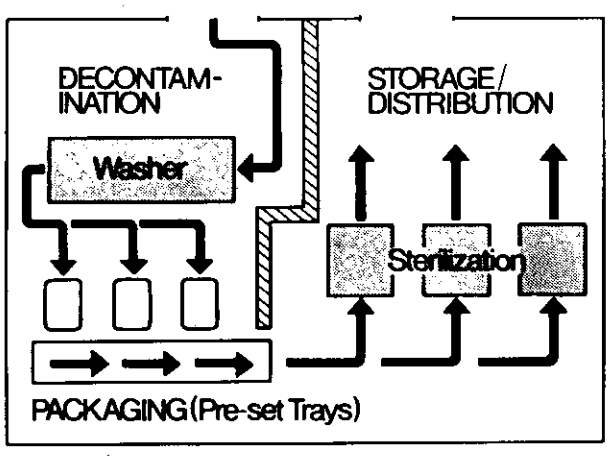


For maximum efficiency you have to plan for efficiency. This is precisely what we can do for you, providing a comprehensive service including feasibility studies, planning, equipping, commissioning, staff training and worldwide after-sales support. You also reap the benefits of a Sterile Control Technology that's based on years of experience and backed up by a comprehensive research and development programme.

For example, we have now developed an improved low temperature steam and formaldehyde process for sterilizing heat sensitive loads. We can equip your sterile supply units with a unique combination of both sterilizers and automatic surgical instrument washers. Very soon we'll be able to supply a new range of table top sterilizers.

Dent & Hellyer's concept of sterile control is of vital importance to everyone concerned with world health care.

If you'd like to know how we can assist you, please send us the coupon or contact us about your project (if you're in London you're welcome to visit our permanent display at the British Hospital Equipment Display Centre, 22 Newman Street, W.1).



Please give me details of your work in sterile control. I'm interested in: hospital and laboratory sterilizers and autoclaves ☐ surgical instrument washers ☐ bed pan and urine bottle washers and disinfectors ☐ pre-plumbed sanitary units/ sanitary fittings ☐ a free appraisal of my existing facilities ☐ (Tick as applicable)

Name _____

Position _____

Authority/Hospital/Company _____

Address _____

_____

_____

_____

Dent & Hellyer Limited, Walworth Road, Andover, Hampshire, SP10 5AA
Tel. Andover (0264) 62111
Telex 47430 Cables: Dents Andover.
A member of the InterMed Group.

HE2/77

d+h ESTABLISHED 1730 Dent & Hellyer

Dent & Hellyer Limited, Walworth Road, Andover, Hampshire, SP10 5AA
Telephone: Andover (0264) 62111

PROGRAMME COMMITTEE - A5 - MECHANICAL ENGINEERING - PROGRAMMES AND SPECIALIST UNITS AT ALL LEVELS IN MECHANICAL AND PRODUCTION ENGINEERING

Code No.	Unit Title	Unit Value	Aims of Unit	Remarks
LEVEL I UNITS				
TEC U75/001	Workshop Process and Materials	1 (60 hours)	1. To provide the student with an appreciation of what may be achieved by craftsmen and be himself able to meet some of the demand of the practical work that may be incorporated. 2. To give the student an appreciation of the present range and choice of metals and non-metals. 3. For the student to recognise hazards present in a workshop environment.	Replaced by TEC U76/055 see below.
TEC U75/004	Physical Science	1 (60 hours)	To develop an understanding of the fundamental physical science concept which will provide a common base for further studies in both science and technology by the student.	
TEC U75/005	Mathematics I	1 (60 hours)	To consolidate basic principles and establish a common base for further progress, taking into account the wide variety of approaches to mathematics previously encountered at earlier stages in education.	
TEC U75/041	Engineering Drawing I	1 (60 hours)	To enable a student to communicate and receive ideas without ambiguity through the basic knowledge and skills of draft and sketching . During unit exercises the student should demonstrate the proper care and use of drawing instruments.	
TEC U76/055	Workshop Process and Materials	1 (60 hours)	1. To provide the student with an appreciation of what may be achieved by craftsmen and be himself able to meet some of the demand of the practical work that may be incorporated in his job. 2. To give the student an appreciation of the present range and choice of metals and non-metals. 3. For the student to recognise hazard presentsin a workshop environment.	
LEVEL II UNITS				
TEC U75/035	Manufacturing Technology	1 (60 hours)	To give the student an opportunity to expand his understanding of the technological processes relevant to mechanical and production engineering and to develop an analytical approach to some of the problems associated with these processes.	Limited usefulness replaced by TEC U76/056 see next page.
TEC U75/012	Mathematics (1)	½ (30 hours)	This unit is to extend the fundamentals in mathematics gained in the level I unit or to consolidate the mathematical ability of those students entering the level II direct and integrate the new entrants into the scheme. The essential theme is one of awareness of concepts.	
TEC U75/036	Engineering Science	1 (60 hours)	To give a basic mechanical and electrical science background for engineering manufacturing technology techniciane.	Replaced by U76/053 see next page.
TEC U76/038	Mathematics(2)(A)	½ (30 hours)	The essential theme is one of application and awareness of concepts. This unit is designed to extend the student who has taken Mathematics (1) II, within confines of the above theme.	Particularly suitable for those pursuing a vocational programme i.e. is less academic than Mathematics (2)(B).
TEC U75/039	Mathematics(2)(B)	½ (30 hours)	To extend the student who has taken Mathematics (1) II and requires an analytical approach. The unit would normally be taken by those students pursuing Mathematics to level III.	Particularly suitable for those proceeding to study Mathematics at level III i.e. is an analytical subject.

A5 (Cont'd)

Code No.	Unit Title	Unit Value	Aims of Unit	Remarks
LEVEL II UNITS (cont'd)				
TEC U75/089	Engineering Drawing and Design	1 (60 hours)	1. To enable the student to prepare assembly and detail drawings. 2. To give the student an awareness of the role of the designer. 3. To introduce the student to design to a specification. 4. To give the student an awareness of the factors affecting product appearance.	Not relevant
TEC U76/053	Engineering Science	1(60 hours)	To give a basic mechanical and electrical science background for engineering manufacturing technology technicians.	Relevant - perhaps more relevant than the unit it replaces i.e U75/036.
TEC U76/056	Manufacturing Technology	1 (60 hours)	To give the student an opportunity to expand his understanding of the technological processes relevant to mechanical and production engineering and to develop an understanding of some of the problems associated with these processes.	Limited usefulness
TEC U76/354	Engineering Drawing	1 (60 hours)	To develop further the communication skill and knowledge of the techniques required for the product and interpretation of Engineering Drawings within the guidelines of BS 308 and other related BS DO STDS.	Not particularly relevant - includes tolerances, component drawing, classes of fit etc.
LEVEL III UNITS				
TEC U75/037	Engineering Science III	1 (60 hours)	To give students basic mechanical and electrical science background for engineering manufacturing technology technicians.	Replaced by U76/054 see below
TEC U75/050	Manufacturing Technology	1 (60 hours)	To expand the students' understanding of the technological processes relevant to mechanical and production engineering and to develop an analytical approach to some problems associated with these processes.	Bulk of unit not relevant to NHS - replaced by TEC U76/057
TEC U75/051	Control of Manufacture III	1 (60 hours)	To give students an awareness of management structure, production and planning in a manufacturing concern.	A useful unit which unfortunately requires the non-relevant TEC U75/050 as a prerequisite.
TEC U75/058	Mechanical Science	1 (60 hours)	To develop the students' analytical techniques in the application of scientific principles to mechanical engineering situations.	Possibly necessary for further studies i.e. as a prerequisite unit.
TEC U75/062	Electrical Science	1 (60 hours)	To increase the mechanical engineering technicians' knowledge of applications in industry of electrical and electronic systems.	
TEC U75/040	Mathematics	1 (60 hours)	To extend the concepts of level II Mathematics, develop the concepts and use of mathematical modelling and broaden the mathematical knowledge as a basis for further study.	
TEC U75/090	Engineering Drawing and Design	1 (60 hours)	1. To provide the student with an appreciation of the factors determining the choice of materials for a component or assembly. 2. To provide the student with an appreciation of the factors relating manufacturing considerations, materials and design. 3. To introduce the student to design and the evaluation of designs.	Certain aspects could form the basis for a college - devised unit which would then be relevant.
TEC U76/054	Engineering Science III	1 (60 hours)	To give students basic mechanical and electrical science background for engineering manufacturing technology technicians.	Replaces U75/037 - a relevant unit.
TEC U76/057	Manufacturing Technology	1 (60 hours)	To expand the students understanding of the technological prosesses relevant to mechanical and production engineering and to develop an analytical approach to some problems associated with these processes.	Bulk of this unit not relevant.

Your Training Centre

The Editor visits Hospital Engineering Centre, Falfield

It is now over eight years since the Hospital Engineering Centre was founded at Falfield in Gloucestershire, 15 miles from Bristol, by the Department of Health and Social Security. It was last covered in detail by *Hospital Engineering* five years ago — since then the foundations laid when the centre was first opened have been built upon with great success.

When I visited the centre on a bright, cold day recently, it was looking at its very best, with its mixture of old and new buildings sparkling in the winter sunshine. The well-equipped laboratories and pleasant grounds clearly make an excellent place to study — certainly, all the students I saw looked as though they were enjoying themselves very much.

The lecturers are well aware that many course members have not been in a classroom situation for several years. Very often the slower starters who are encouraged by staff are found to be the stronger finishers. In all the technical subjects, separate courses are provided for craftsmen and engineers.

To cater for many of the courses, special laboratory facilities have been provided. One such facility, a ventilation laboratory, incorporates a full-size 'mock-up' of an operating theatre suite which is fully air conditioned and which makes it possible for trainees to study the automatic control action, to measure and balance air flow in ducts and between rooms and to study air flow patterns within rooms. In addition there are well-equipped laboratories for steam engineering, sterilisation, control equipment, electronics, communications, refrigeration and medical equipment.

For those who attend courses the Centre is not just a training school — it is not all work and no play. The leisure facilities are good and include two full-sized billiards tables, pool and bar billiards tables, two hard tennis courts, table tennis, darts, an 18-hole putting course, colour television and, of course, a licensed bar. In many ways the Centre resembles an engineering club where staff from many scattered locations meet one another and learn from the experience of others. There is some evidence from conversations with engineers in hospitals that a bond of fellowship is developing through contacts made at the Centre.

The Centre now offers twenty types of residential course for engineers, engineering technicians and tradesmen in a wide range of subjects.

It is the Centre's prime objective to teach engineering staff to design and maintain systems economically and to ensure that equipment remains safe for patients and staff.

Courses are based on discovery methods — students learn by measuring and applying their theoretical knowledge to practical design or maintenance problems.

Design staff are taught to prepare, plan and control projects efficiently. Maintenance and operational staff learn how to maintain equipment in safe and effective working order, and to install and commission new plant.

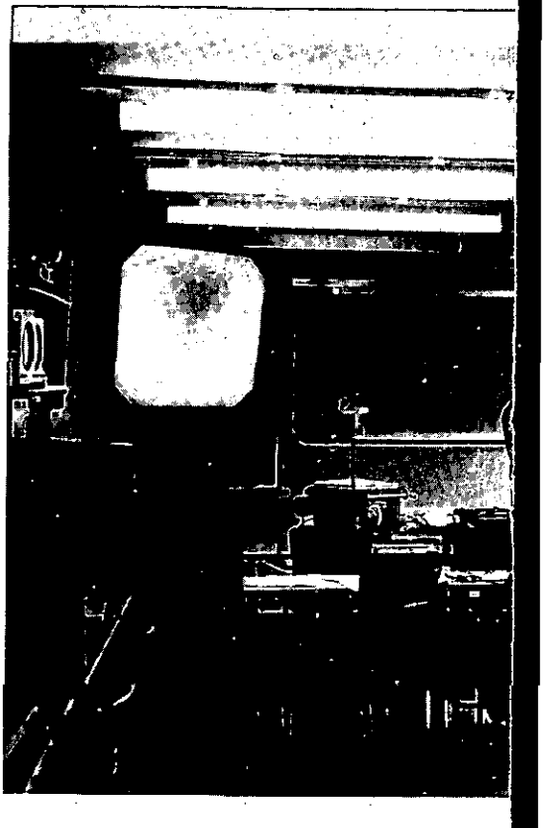
The need to communicate with medical and nursing staff, bacteriologists, physiotherapists, pharmacists and other professions in the hospital calls for an understanding of their terminology. This communication is essential in order to understand the function of their specialist medical equipment and forms part of the medical equipment maintenance courses. Other courses give an understanding of the environmental needs of the patient care team and how they can be achieved.

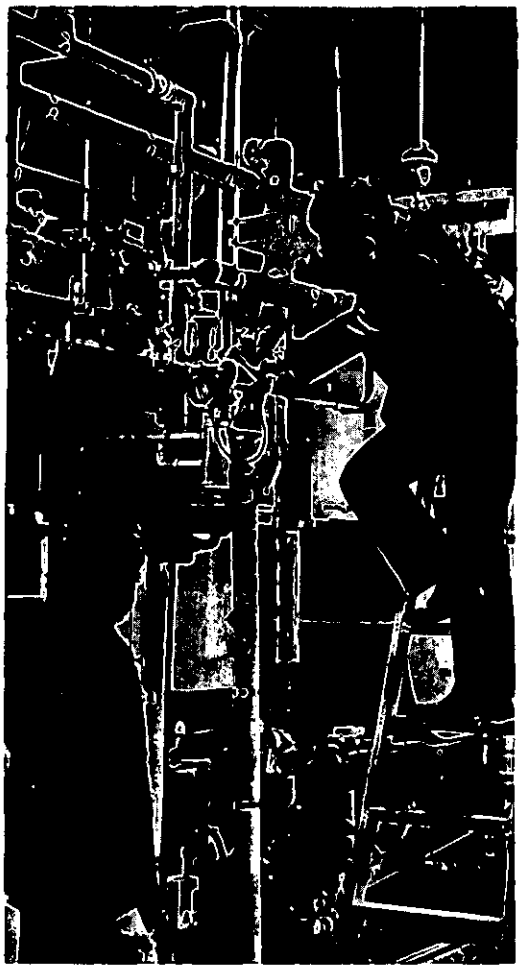
The Centre itself

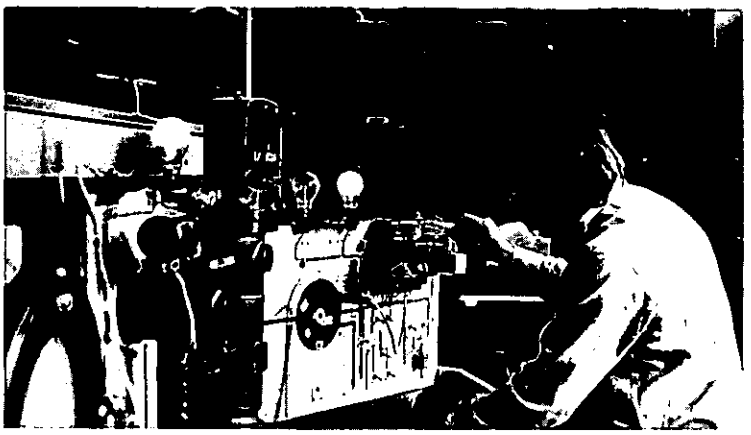
The main building at Falfield is about 100 years old, but the estate has existed for over 200 years. It was, until 1915, the home of the Jenkinson family, whose history can be traced to a Jenkinson who sailed with the famous Bristol seafarer, Sebastian Cabot, early in the 16th century.

In 1935 the property was purchased by the Home Office, and has been used ever since for a number of training purposes, mainly of a Civil Defence or Police nature. In 1969 it was acquired by the Department of Health and Social Security to provide engineering courses for all National Health Service engineering staff, and courses started early in 1970.

The Centre was fully written up in the December 1972 issue of *Hospital Engineering* by Dr. K. I. Murray and Mr. J. Barnes, the present Principal. Since then there have been many improvements and additions to the facilities — the most recent being the splendid new Northcroft Hall, opened this summer by Mr. Lionel Northcroft, as reported in our July 1977 special issue.







Left and above: Scenes around the Laboratories, showing students under training and lecturers preparing their lessons.

Below: Jim Barnes the Centre's Principal, at his desk; the attractive lounge and bar; the dining room; and a typical study bedroom — plain but comfortable.

Seminar Papers

Project Management in the Health Service

This is the third paper presented by the Institute's Seminar on Project Management held at the headquarters of the Institution of Mechanical Engineers in London on October 19.

The first two papers, by Mr. R. Paget on The Need for Better Management of Hospital Projects, and by Mr. Francis C. Graves on Managing the National Exhibition Centre, were published in our last issue.

Mr. Brooke is Regional Works Officer, Mersey RHA.

Mr. Brooke complimented Mr. Graves on his paper, which described a form of Project Management in its fullest concept. Mr. Brooke introduced his paper which had been prepared to suggest ways of moving within the Service as far as was practicable at this time towards Project Management.

Reports on the discussion after the papers are given on page 21 of this issue.

The Problems and Possible Solutions

G. BROOKE MSc(Eng) CEng MICE

In putting forward the solutions I have developed my paper in the following way:

In the first part define the frame of reference and basic premise — that is:
- — to define terms as I shall use them
- — to look at the scale of the problems we are examining
- — to identify the objectives we are to attain in this Seminar.

In the middle part I shall examine the problems which have been brought home to me by:
- — the Department
- — our lay members at Region and Area representing the User Client
- — Sectional interests in the Service
- — the Clinical interests we are to serve
- — the people in the system.

In the last part I shall develop the solutions which I believe can be achieved and implemented — by *evolution* and not *revolution*.

Let me define my terms and frame of reference.

Projects

Any one-off operation, outside the routine day-to-day function of management. We could thus include:
- — installation of a new computer and software systems;
- — a new product launch from sales development to production method;
- — the provision of new capital assets, be it an office block, hospital etc.

British Standard defines a project 'An enterprise involving a number of *inter-related* activities'.

By defining it outside the routine of day-to-day management functions we recognise that each function may have a contribution to make but there does not emerge any single clear all encompassing function within the conventionally accepted functions of either a business or Health Service.

Management

My favourite definition from the Shorter Oxford is:
'trickery and deceitful contribution' but more honestly (or is it less honestly?) *'to conduct and control an undertaking'*.

I want to make clear distinction between Management and Administration and I use the British Institute of Management International Dictionary of Management Terms here to define:

Administration

The operation and utilisation of *predefined* procedures of communication and decision-making;
the flow of paperwork.

This is not to say that Administrators in the Health Service do not manage as they undertake the two functions of Administration and Management.

There is *no* doubt in my mind a need for Administrative procedures and Mr. Paget clearly made this case. However, at this point in my paper I would like to keep separate the two concepts.

I repeat, in the field of project control:
Management is not synonymous with Administration.

The title of our Seminar is 'Major Hospital Building — Project Management'. I have explained my understanding of Project and Management and we are left with the phrase 'Major Hospital Building'.

There are those who would say that following the launch of Nucleus there is no major hospital building — hence no problem. Anyone involved in Nucleus will know this is not true.

I, too, cannot go along with this view, nor with the view that we have no problems, and that the Grey Book on Reorganisation got it right first time. To explain my reasoning I must develop the philosophy which I see as the inter-relationship between *Projects and Networks.*

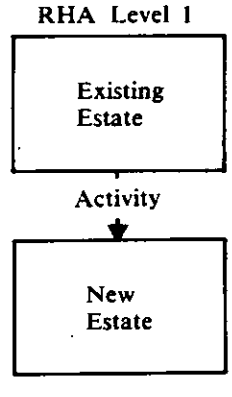
Networking is simply a tool of logic and graphical presentation of logic. Set aside all the networking jargon and think at the very fundamental level.
- — a start event
- — an end event
- — an activity which converts the start to the end event

or in BS Terms 'A representation of activities and/or events with their inter-relationships and dependencies'.

Thus activity requires the injection of resources such as
- — men
- — materials
- — money

to convert the Start Event to the End Event.

At Regional Health Authority level we have the Strategic Network



The Regional Health Authority is operating on behalf of Parliament and the Secretary of State *the function of* Project Management.

Thus is it conducting and controlling and undertaking (Manager) an enterprise involving a number of inter-related activities (Project).

Thus *within restraints imposed on* the RHA it varies the deployment of:
— men
— materials
— resources
to influence the Activity in the MASTER Network. It is *important* to recognise that the function of Project Management is operated within defined legal and managerial restraints. I make this point that Project Management is not the managerial cavalier swashbuckling through crisis and arbitrarily handing down managerial dictats. Vested interests in certain quarters has made these attributes to condemn the function of Project Management and argue that there is no role for these managerial Red Adairs in the Health Service. I agree, *but* at the other end of the spectrum, I do not believe we are well served in 'Project management by committee clerk'.

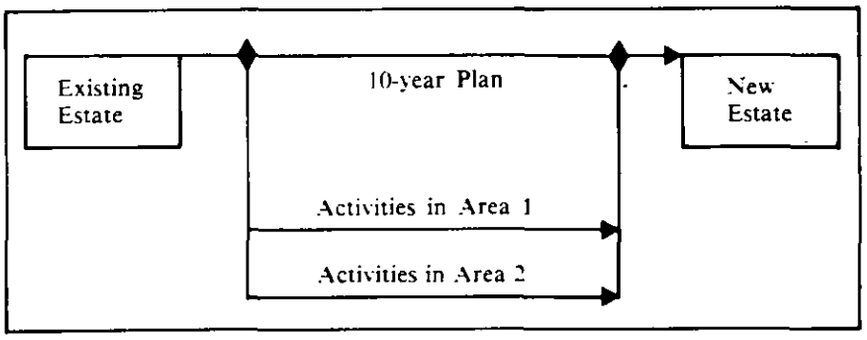
To return to my point, I have I hope, established that 'Project Management' is a skill operated at the highest level by the Regional Health Authority.

As with all functions that a senior management tier operates it must decide:
— Whether the particular management facet can be provided by an individual as the corporate head of the function:
— or does the function fit into the managerial arsenal that one of the designated chief officers have under his control.

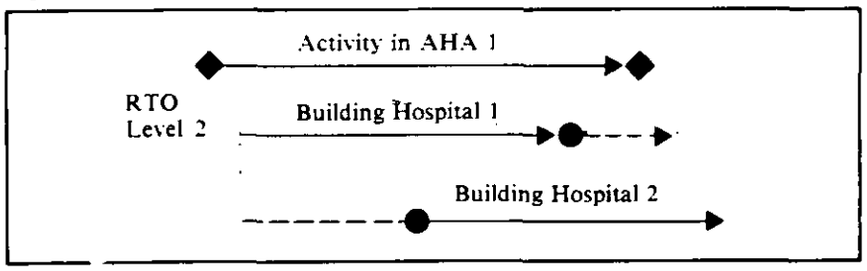
To put this into perspective
— at the very smallest unit of managerial enterprise, say the barrow-boy or the corner shop, one man is sales manager, personnel manager, financier and accountant
— at the other end of the spectrum, say Marks and Spencer, as opposed to the corner shop, the workload and skills in each managerial function may require one individual with time and resources to be designated full-time, to undertake the function, thus we have one man designated as Company Accountant, Personnel Director, etc.

What the NHS has failed to do is decide where it stands in this spectrum with regard to Project Management. Is the function of project management inherent in existing posts or should it designate one person to be responsible for this service? It is this point we are debating in our meeting.

How does the function work down through the system? Our simple one-line Activity is in practical terms broken down in the Master Network to a *series of inter-related activities, eg:*



At the senior management tier these activities are broken down to a finer degree of detail:



At this level to operate the Project Management function the RTO is fitting together all the sub-activities to mesh together in the strategic programme. It varies the resources injected into the activity, for example:
— by calling in outside designers or switching nursing and medical planners to projects of high priority:
— by bringing forward or delaying projects to mop up cash flows in the capital programme:
— the resource balancing operation.

The RTO delegates the function to further tiers for a finer degree of control, first to the Regional Capital Planning Team then to the Project Team. On each of the activities one manager is responsible for the duration of that activity and the resources invested. Thus the sum total for the project is the sum of individual activities be the activity scheduled for money, men, time, etc.

We have in all these tiers the concept of:
— delegation of the function to the tier below:
— finer degree of control and examination at these lower tiers:
— the inter-relationship of these activities *sequentially* on a time scale and in terms of available resources with other competing activities;
— managerial control over the defined activity to ensure the activity conforms to accepted criteria which add up to the total plan.

What I propound, therefore, is that we should not in this study consider in isolation the one-off major building but the total building programme. It is unreal to concentrate on the one-off hospital building, when under current plans this is limited to £6m cost at 1975 prices. This is only one activity in some second or third tier network. What we must examine is the Region's Health Capital Programme, which for example:
— in Merseyside is £25m a year
— in Trent is £40m a year.

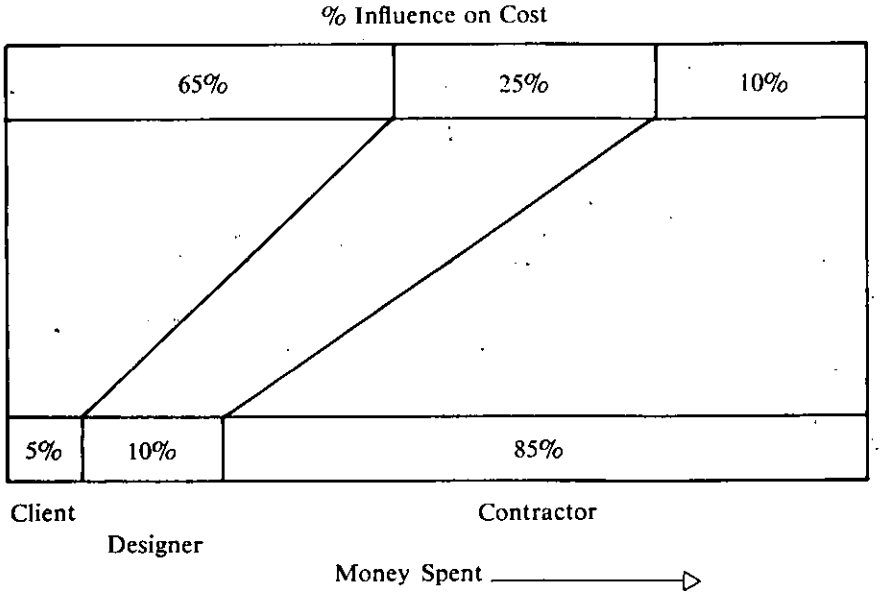
Compare this with Frank Graves' venture where he was proud of spending £50m in four years, ie, £12.5m per annum. Thus we are in the Project Management business and big business at that.

I have explained my terms and understanding. What are the objectives I believe we should achieve in this Seminar? I suggest these are:
1. Confirm that project management is a necessary function exercised by Regional Health Authorities;
2. Show that the function is not as effectively provided as it could be by present managerial arrangements as seen through the eyes of the different groups involved;
3. Develop ways of improving the function as a service to RHA and hence the community.

Consider now the problems as seen from different groups affected by the problem.

Departmental problems

Mr. Paget has carefully expounded the burdens and responsibilities of DHSS. I wonder how many people share my worry that we are meeting the needs of PAC at the cost of effective project management. Look at this chart to show the area in which I suggest we are over-concerned.



It is the 10% influence on cost which all are mountains of paper devoted viz:

— Certificates of Readiness
— Post Contract Control
— Variation Procedures
— Client Authorisation to Spend.

This is Administration, not Management.

We must bear this cross — no argument — but don't let us confuse project administration as project management. I believe the purpose of this Seminar is to concentrate and improve our performance on the 90% zone in the area of operation of the Client and Designer.

Another interfacing is with **RHA and AHA Members.**
We have the statement in the Regional Chairman's enquiry, Paragraph 247 (c) (iv): *'RHAs should ensure clear individual responsibility for the conduct of any major building project'*. A neat statement of what the client's representatives want. To date we have a petulant response from the Service — well they can't have it — we are too complicated.

A further problem area is that of **Sectional Interests** in the Health Service. The response to the above request by Regional Chairmen was:

— Building Working Group paper recommending Project Managers be appointed which the Health Service took to its heart like a clockwork boil;

— The initiative produced defence papers from Capital Administrators who defend the Multi-disciplinary Project Team and corporate responsibility as if their jobs depended on it;

— From Regional Architects in July this year a paper arguing that the real danger is re-acting now to a situation which has been largely superceded and they endorse Technical Co-ordinators!

I find this response from Architects disappointing, for it is to them that I would turn as the source of our feasible solution.

In reality there is no major conflict between the needs of the patients' representatives, that is Health Authority Chairman, and the needs of the Service, to use Project Teams.
The choice is not:
either Project Managers
or Project Teams
They are not mutually exclusive options.

What must be purged from our system is the *anonymous corporatism* of the Project Team. Senior Management want to identify the man who will carry the can and not the hot potato shuffler.

In every management process there comes a time when backsides have to be kicked or heads have to be patted. Can any one believe there is real impact when the five Chief Officers on the RTO have to synchronise their kicks to the backsides of five, ten or maybe 15 members of a Project Team?

The next problem area is the area of **Clinical and User Interests.** They rarely understand the mysteries of design process and the limitations on designs in terms of money, regulations, time or sequence of working. This communication problem must be solved. I would suggest it is best solved by identifying a credible and motivated individual rather than a group. That person must understand the design process by personal experience. One person occupying the middle ground between user interests on one side and builder interests on the other is the ideal. This is the traditional role of the Architect as set out in the standard contract. Even if the client user interests are receptive to this leadership, and I *know* they are, I believe it is up to Architects to re-assert themselves and get back into the saddle by compensating for some of their past failures to communicate.

Outside consultants/ contractors

The next problem interface I want to refer to is that between the Project Team and the outside consultants and contractors. The problem of who gives the decisions is the most frequent area of comment. In propounding solutions for Project Managers the critical questions which are asked on this interface with consultants and contractors are:

— does the Project Manager usurp the Architect in the contract?

— does the Project Manager direct the Contractor?

— do we re-write contracts traditionally accepted?

Taking a wholly pragmatic view — I believe not. The consequence would be conservative pricing and uncertainty of role.

I also believe that we must recognise as certain fixed points the professional contracts of employment and standard forms of contract. It is around these fixed points that the solutions we propound must be blended and it is within these fixed points that a motivated and effective manager can work.

Finally, let me identify what I believe is one of the most important

Problem areas.
That is:
— training
— quality
— motivation
of the people responsible for these tasks of co-ordination and control of the Project.

This, I believe, is the greatest weakness of all past recipes as propounded by the Cruikshank Report, the Grey Book and the DHSS paper on Project Management.

The pitfall in which these contributions leap headlong is
— identify a function
— give it a title
— leave it there.

I believe the problem in this field is due to the fact that the solutions did not take the next step forward, that is to look at the people who would be given these titles in terms of:
— training
— quality
— motivation.

Frank Graves made this point when his client said "I want you — not your company". Thus in the service we have to say "from which company or group of people do we think we can choose the best people" and then from within that group — choose them, train them and motivate them.

I have examined the impact of various sectors on the function of Project Management. I am loath to use the title Project Manager in my proposed solutions.

Verbal associations and connotations with terms Project Manager, Project Co-ordinator etc create different pictures in different minds. To avoid these preconceptions let me introduce a term, with some fear and trepidation:
'Scheme Manager'.

At this stage, accept this as a portmanteau name which can cover the performance of the tasks we want during the third part of my talk. That is on the solutions which, as I said at the beginning, I believe we must develop by evolution and not revolution.

I described my understanding of the Project Management role of an RHA developing and directing its Estate through its Capital Programme.

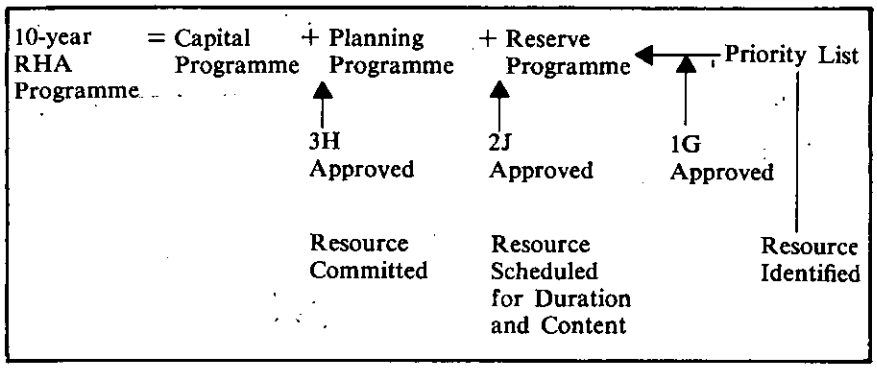
In practical terms the total programme should be broken down into sub-network activities as follows:

1. A Current Capital Programme
reporting those jobs with committed expenditure.

2. The Planning Programme
those jobs *pre-tender* and *post* briefing.

3. The Reserve Programme
those jobs where Feasibility Study or Stage 1G is completed.

Thus:



I believe the Regional Team of Officers should, on behalf of the RHA, designate:
— the *Regional Administrator* to be responsible for the *Administration* as opposed to Management of the total Programme — that is, communication between Region/Area and Department
— the *Regional Works Officer* to be responsible for the Management of the total Programme 'that is, conduct and control the undertaking'.

In turn, a 'Scheme Manager' is nominated by the RTO on recommendation by the appropriate Chief Officer:
— to manage up to completion of Stage 1G. In general this would be an Administrator because of the overlap into the Service Planning function but we should not preclude the Medical, Pharmacy or Nurse planning if the scheme needs and their personalities fit.
— the Regional Works Officer nominates the Scheme Manager from 1G to completion and handover.
— the Area will then designate the scheme manager responsible for commissioning.

Let me first develop the overall concept before examining the practical detail.

My current definition of the function so far as Works is concerned
— extends from completion of a Feasibility Study or Capricode 1G to building completion
— in content is the responsibility for the management and co-ordination of all the activities in a project network in the above range of events
— in method of operating in the use of RWO managerial authority delegated to them by RHA without changing the framework of current standard contracts or terms of appointment.

I believe these tasks in general are inherent in the role of the Architect but there are exceptions. In the *vast bulk* of jobs I would *not separate* the scheme manager function and give to a specially designated officer. The exception may be the major schemes of say, Nucleus scale or if outside design capability is used when the scheme manager role would generally be undertaken by the Liaison Architect.

This ties in with my earlier point on the issue of deciding whether the project management service is inherent in the current role of certain managers, or whether you break out and concentrate the task on one individual.

My judgement leads me to believe that any decision on an across-the-board basis to inject project managers in the Service is wrong. We couldn't hold the right people for long enough or balance their workload.

The proposals go along with:
— Hospital Building Procedure 1 in that we still have the project team as the client body
— and more important they put into action the current omission from the Cruickshank recommendation viz:
'clear indentified accountability for executive action'.

What we are asking for is:
— line management authority and accountability to a Chief Officer and *not* a Project Team
— the *extension* of the role of Technical Co-ordinator to that of a true Scheme Manager.

The elegance of this scheme is the development of the parallel role in the Area Works function on delegated schemes.

Thus, when a scheme is delegated from Region to Area it is delegated at, say, Stage 2J when the design and cost allowances are firm. We have thus the numerate criteria to measure the Scheme Manager's performance. The Scheme Manager is identified by

name and reports his performance against these criteria to his client — at that time the ATO.

At this point I am committing the sin I criticised in the Cruickshank report and the Grey Book in the early part of my talk, namely concocting a title and not considering the people who would carry the title.

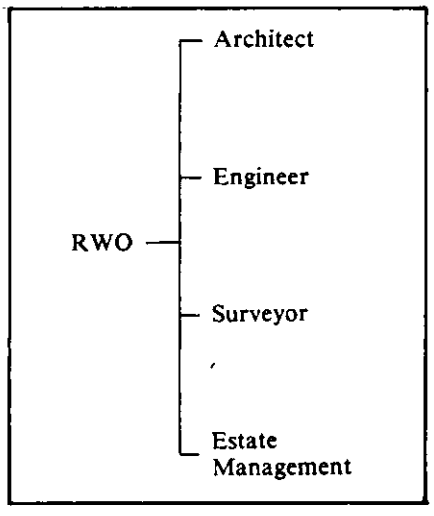
Let me correct that.

The personal characteristics I would identify in the best Scheme Manager would be:

— numeracy
— experienced and knowledgeable in the design and construction processes
— high motivation
— trained in programming and network technology
— personality.

To develop and use such people I believe the Works function should develop an additional function, namely Estate *Management* in addition to the traditional Architectural, Engineering and Surveying functions.

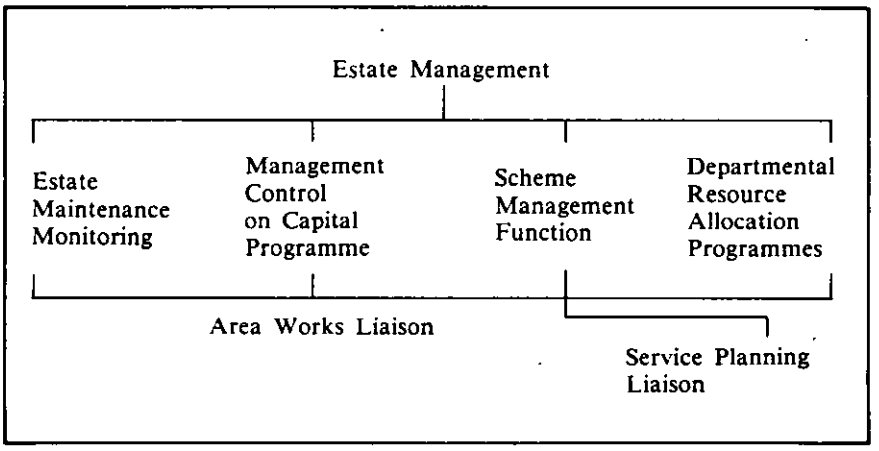
I believe we must develop — maybe what we already have in embryo:
— the true *Estate Management* function
and I *don't* mean Estmancode and Estate Maintenance because that is just part of Estate Management. Thus we shall have the fourth wheel to our cart.



This multi-disciplinary group is the service grouping which manages the Estate and hence the works Capital Programme. It is a multi-disciplinary function under the direction of an Assistant Regional Architect, Engineer or Surveyor, reporting direct to the RWO.

It is staffed by the departmental highflyers, that is all those with the ambition and calibre to become District Works Officers, Area Works Officers, Regional Architects, Engineers and Surveyors. In this way we develop a staged career structure for our scheme managers.

We are looking for the 30+-year-old Chartered Architect, Engineer or Surveyor, say at PA/PE level, looking to prove himself and develop his skills in this multi-skill Estate Management group. The service the group provides I believe should be as follows:



The information flow on scheme management in the total programme is drawn together in this section.

I would solve the problem of work balance and continuity by using when appropriate outside resources in the same way I call in Architectural, Engineering and Surveying practices, to balance loads on the in-house services.

In this way I may call in
— management consultants to develop information flow systems, networks and up-date reports on projects.

I would not employ a consultant for long assignments.
— practices such as Frank Graves, NBA, W. S. Atkinson or any practice which is in *parallel* offering a technical service contributing to the project. I don't believe we should use a 'sole service' project manager
— maybe a contractor or management construction contractor who will still offer the management information service as part of his total fee.

I believe we have in this system the required criteria for better management than we have now — these are:
— **individual motivation** — ie training for promotion;
— **clearly defined criteria** of performance, that is the ability to manage a project team to meet time and cost criteria set out in the 1G and 2J submissions;
— **accountability** on clear line management control through to Chief Officer;
— **authority** which I, as Chief Officer, receive from the RHA and in turn delegate to match the Scheme Manager's responsibility.

The proposals satisfy the needs on the problem interfaces I reviewed, namely:
— with regard to DHSS administration of public money we are sorting out administration from management and clearing responsibilities
— so far as the patient representative, the RHA and the AHA, we are identifying individual scheme managers and offering accountability
— the problems of sectional interests are met by allowing Administrators to concentrate on Service Planning responsibility in the pre-1G scheme development and so far as works professionals are concerned, offering them the chance to shoulder the burdens for which their professional training has prepared them
— so far as outside consultants and contractors are concerned a unified line of communication with client project team
— and most important, a way of developing our future managers through the Estate Management function and in turn achieving their commitment and endeavour for personal reasons.

To conclude, I believe we should be grateful to the Department's Building Group for stimulating current discussion and interest in Project Management. This is not to say I go along with their proposals for Project *Managers*. But I think their views are more valid and relevant than the Managerial luddites who argue 'No change — the problem has passed'. This is wrong. The game has changed. To respond to the higher disciplines of the cuts in management costs I believe we must evolve a better system.

I hope I have explained in outline the framework of that better system.

Invited Contributions

After the main papers reproduced above, five distinguished speakers each made a brief contribution to the debate, as shown below.

This helped to stimulate a lively discussion afterwards, on which a short report covering the main points made is given on page 25.

P S WADSWORTH CEng MICE FIMechE

Associate with the Hospital Design Partnership, London.

Introduction

With the formulation of an agreed brief for a new hospital or related phase of Health Care Project and appointment of Private Consultants, a standard Project Management chain is established which embraces:

Regional Team Officers
Project Team
Design Team
Technical Team } can be one and
Consultants } the same

On a 'one-off' scheme the Project Team can direct and control the Design Team with a view to meeting the design objectives within the programme period and within cost limits.

In recent years, with a view to establishing uniform standards of Health Care nationwide, and at an acceptable cost, the Department of Health have developed, progressively, the systems approach to Health Care Capital Projects with:

Best Buy	circa 1968
Harness	circa 1970 and now
Nucleus	circa 1976

This sponsored systems approach allows the planning period to be drastically reduced and from concept of scheme to completion of project can be achieved in five years instead of seven-nine years for a 'one-off'.

Southlands Hospital 'Harness'

Having been involved in the design of all the systems-built approach projects mentioned, it has been found necessary to introduce a Project Management system to match the increased commitment of the Dual Client situation, when DHSS participate with Region in the Pre-Contract design phase. Mr. Paget referred to Best Buy, and the need for Project Management of this system within DHSS.

The 'Harness' building at Southlands Hospital, Shoreham-by-Sea, is a typical project in which close co-operation with DHSS was involved at Project Team level, and intensive commitment of the works professionals in the Design Team.

Initially, drawing experience from a previous 'Harness' prototype and standard design brief, it was planned to design the building and be out to tender in 12-15 months. In the event it took two years, *but*, resulting from the close relationship and complete design before tender — including the introduction for the first time of the Certificate of Readiness, to which Mr. Brooke made passing reference — at this point in time the project has progressed smoothly, is four months ahead of programme on a three-year construction programme, and is within a tight financial allocation.

Project Team

Regional members are paired with DHSS members and include Administrator, Architect, Engineer, Quantity Surveyor, Doctor, Nurse and Consultant Architect.

Design Team

In addition to Regional and Consultants professional Works membership, full representations of DHSS professionals was supported as necessary by DHSS retained consultants for component development for:

Structural frame (2) + manufacturer (1)

Cladding (2) + developing company (1)

Public Health Engineering (1) + suppliers (2)

additionally other Regions contributed their own 'Harness' specialist departments, eg:

Catering — Birmingham
Mortuary — Wessex.

Project Architect

As Project Co-ordinator and latterly leader of the Design Team additional involvement with DHSS 'design cells' eg component design, planning, fire, MDB and through the DOE, Home Office and Building Research Establishment was involved.

Effectively, the administrative and liaison activity was doubled, albeit the programme reduced the time base for the project. To enable the Project Architect to be freed to lead the production drawing team, an Associate filled the role of co-ordinator, and team leader and administrator.

As the person nominated, my engineering background was to prove an ideal foil to many of the pointed design contentions that arose and had to be resolved in the design phase. Co-ordination was the name of the game played against 'Harness' Rules which prescribed building and service disciplines.

Typical comments

Disadvantages associated with Dual Client System

Greater involvement in committee;

Additional administrative commitment;

Only one true client Region, but strong DHSS influence not least of which is effective financial control through Stage 1, 2 and 3 submissions and tender approval;

Supply of design data not under control of Project Team.

Advantages

Prior agreement to general planning principles;

Medical and Nursing objectives already agreed in established planning principles;

Availability of Data Packs and standard design criteria 1 : 100 and 1 : 50 scale layout;

Ability to clear at national level design approach to meet such aspects as fire prevention and building design;
Project is up-to-date in latest thinking in terms of health care.

J A FOOTE DipArch ARIBA

Regional Architect, the Trent RHA.

Introduction

During the course of the widespread debate concerning the effectiveness of the existing processes of procurement of new health building, which stemmed initially from criticism voiced by the Parliamentary Committee of Public Accounts, consideration has increasingly been given to the concept of project management.

A number of points of view concerning this subject have been expressed within the DHSS/NHS during the past year as part of this consideration. Of particular importance have been the DHSS paper entitled *The Management of Health Building Projects* and the response to it, under similar title, prepared for Regional Administrators by Administrators (Capital) and widely discussed by Regional Teams of Officers during July in preparation for further consideration as a NHS paper by Regional Chairmen. It is freely acknowledged that this paper incorporates points which have been given expression in some of these previous statements.

Regional Architects, considering the subject to be of prime importance and having previously made a number of contributions to the debate, are pleased to contribute the following summary of their views as part of the Symposium of the Institute of Hospital Engineering. Fundamental to the viewpoint of this paper is the concept that the process of capital development involves both a *Client* who requires an end product and a *Design Team* whose function is to procure it.

The Design Team

The procurement of building projects requires the exercise of skills possessed by a number of technical professions; normally, Architect, Structural, Mechanical and Electrical Engineers, and Quantity Surveyor. These parties, commissioned for each individual project, collectively constitute the Design Team.

The process also requires the co-ordination of those skills. Thus, effective design team operation involves the identification of one of the parties as the Design Team leader with powers of co-ordination. The Architect is normally appointed, in accordance with the Conditions of Engagement of the RIBA, to act in this capacity. Supporting documents such as the *Plan of Work for Design Team Operation*, first issued by the RIBA in 1965, clearly distinguish between activities deriving from the Architect's management function and those deriving from his design function.

Nothing in this paper is intended to derogate from the responsibility of the Design Team leader. It is considered, indeed, that the operation of the Design Team will gain both from a clearer identification of who the Client is and a stricter application of the principle of accountability to that Client.

The client

The function of the 'client' needs to be more clearly identified within the RHA structure.

It is accepted that a major matter of client concern is the management of projects as defined in the DHSS paper:

> "The management of designated NHS building projects to ensure that the functional content is adequately defined, that the design teams' proposals are in accordance with this definition and that the project is completed within the time and cost constraints established by the RHA".

Bearing in mind both the complexity and the multi-disciplinary nature of the process it is considered by Regional Architects that the concept of a project manager responsible for the management of a whole building project from inception to completion and commissioning is inappropriate to the NHS situation as existing at present.

Instead, it is considered that the present well-tried and tested multi-disciplinary Project Team system provides a suitable base from which to seek improved performance.

It is accepted that responsibilities within the Project Team could profitably be more precisely defined, and accountability and authority of some individual members extended. In this connection, Regional Architects strongly support the recommendation contained in paragraph 8.8 of the Report *Planning Design and Construction of Hospital Buildings for the National Health Service* (HMSO, February 1973) as follows:

> "The multi-disciplinary Project Team is the medium by which all aspects of the project are co-ordinated from Stage 1 through to Stage 5. The client professions have priority of interest throughout Stage 1, and until the Stage 2 submission is approved. Through Stages 3 and 4 the designers and quantity surveyors have priority of interest, with the 'client' professions providing advice and clarification when required. I therefore recommend that a single design professional be formally appointed as the manager for Stages 3 and 4 and be made personally accountable for the programme, progress and cost control during these technical phases".

The general viewpoint of the NHS paper is supported. Particularly, Regional Architects strongly consider "that project managers as defined by the Department's paper should not be introduced into the NHS but that the multi-disciplinary Project Team system should continue and be reinforced. The designation of a single design professional as the Technical Co-ordinator of the design and construction stages and the project administrator as the Project Co-ordinator for the whole project is proposed as preferable to the appointment of project managers".

It is apparent that a number of Regions already practice systems similar to those described involving the identification of a Technical Co-ordinator to act on behalf of the client covering the Technical activities of project planning.

Kill or cure?

In accepting that the present discussion on the management of projects derives from the justifiable criticism of past performance in relation to time and cost on very large hospital projects, it is considered that due regard should be given to the large areas of improvement which have already been made:

a. the size of individual new contracts has been severely limited;

b. sophisticated post-contract cost control techniques have been developed;

c. procedures to ensure that projects are ready to proceed to tender have been introduced.

There is a real danger of reacting now to a situation which has largely been superseded. Instead we should concentrate on those areas where the present methods of managing health building projects can be improved.

C G TAYLOR AHA

Administrator (Capital), Yorkshire RHA.

Having accepted the need for better management of health building pro-

jects, we have to consider the full process in deciding how to achieve this. This process includes the planning of services, the preparation of the client's brief for a specific building, the design, construction and commissioning. Whilst this process is more or less sequential it is not a homogenous one lending itself to a simple management arrangement.

It is a complex process, or a combination of complex processes, involving the active participation of many different professionals working together in different groupings at the various stages, and with the leadership role changing throughout the process.

The present management method adopted by the NHS is the project team concept, as described in the current DHSS health building procedures with which most of us will be familiar.

The project team, which is an agent of the client authority throughout, enables representatives of the various professional groups, including user representatives, to work together in a corporate management arrangement. Individual members, however, retain personal responsibility for the achievement of their particular professional contribution through the NHS management structure.

The part of the whole process that does not lend itself to project team management is the actual construction, which is obviously the responsibility of the main contractor and of the supervising officer named in the contract. The project team is, however, very much concerned with progress and dealing with any matters arising, for example, client variations, but it is no longer, so to speak, in control of its own destiny.

The present project team practice has been succinctly described in the Cruickshank Report — *Planning, Design and Construction of Hospital Buildings* — published in 1973. Mr. Cruickshank was impressed by the concept of the project team but identified the need for improvement, particularly in ensuring that each design and administrative discipline work to a dated programme.

Mr. Cruickshank pointed out that the client professions have priority of interest throughout Stage 1 and until the Stage 2 submission is approved. Through Stages 3 and 4 the designers and quantity surveyors have priority of interest, with the client professions providing advice and clarification when required.

Mr. Cruickshank recommended that a single design professional be formally appointed as the manager for Stages 3 and 4, to be personally accountable for the programme, progress and cost control during these technical phases. The need for the client authority to preserve oversight of the continually changing scene was recognised, and the arrangement whereby project co-ordinators (usually administrators) are responsible for checking progress on behalf of the RHA was endorsed.

The multi-disciplinary project team concept still commends itself to administrators and, I believe, other health professions involved, as the best means of achieving successful project management in the NHS, as it enables the various professions to work together, and retains corporate responsibility for the project within the present management structure of the NHS.

It has been suggested that one way to improve management of health building projects would be to appoint a project manager for each large project and the DHSS has produced a discussion paper on the subject.

The reaction of NHS administrators to this proposal is to point out that the concept of a single individual manager responsible for timely and economical execution of a NHS project, whilst superficially attractive, is impracticable within the present management structure. The project manager would need commensurate delegated authority. He would need to be empowered, as suggested in the Department's paper, not merely to co-ordinate but to decide, resolve, deploy and command resources and demand performance.

We cannot envisage a situation where a project manager, no matter from which professional discipline he was recruited, could assume this general managerial role when corporate and consensus management has been adopted as the most appropriate form of management for the NHS because so many separate professional functions have to be performed and co-ordinated to achieve desired results.

How could a project manager demand performance from a member of the briefing group; from the design team or from the contractor? He would have none of the normal management sanctions. He would need greater authority than any other single NHS officer has at the present time.

It is for this basic reason that the introduction of a project manager responsible for the whole planning and building process is considered to be impracticable. But there are other reasons such as securing public accountability; the fact that larger projects are disappearing, and the question whether people with the necessary skills and experience are available?

Similarly one can see problems in a single design professional assuming the role of manager of Stages 3 and 4. However, the concept of a 'technical co-ordinator' being appointed within the project team concept does commend itself to us, but this is really a matter for the works professions to consider.

It is suggested, therefore, that the multi-disciplinary project team system should continue and be reinforced, and the possibility of a technical co-ordinator be pursued further. Accepting that there are instances of unsatisfactory performance, further research into the causes should be undertaken and appropriate remedial measures taken whether these concern NHS management arrangements, project team management methods, building contract arrangements or public administration generally.

The debate has just begun, but let us also seek out the fact by an analysis of performance at each stage of the planning, design and building process as a firm basis for future action.

B E DRAKE FRICS

Chief Quantity Surveyor, DHSS Euston Tower.

I propose to direct my remarks to the question of Project Managers rather than project management, and because Project Managers are beasts about which I know very little I shall cast many of my remarks in the form of questions.

I am sure Mr. Paget will have dealt this morning with the need for projects to be managed, but in case anyone is still in any doubt I have here a list of current projects in excess of £2m. Out of a total of 91 projects only 14 are without a note in the comments column of some quite serious difficulty which has been encountered during the execution of the project. Of course, we are not alone in this either as a service or as a nation, nor are we alone in considering the use of Project Managers as a possible solution. But a question which is often raised is how far the appointment of

one man to carry personal responsibility for timely and economical execution of a project from inception to commissioning is compatible with the concepts of corporate management upon which the reorganised NHS was founded. And this in turn raises the further question as to whether the routine of management handled by the RTO as corporate managers needs to be distinguished sharply from the novel and demanding problems posed by the execution of a major capital project. Certainly such a distinction is drawn in manufacturing industry, where the use of Project Managers to introduce a new product line or construct a new facility is widespread.

If we can all agree, and I feel sure we can, that all projects need to be managed we still need to define which ones require separately identified Project Managers: £5m has been suggested as an appropriate start point. But how many Regions will be building projects in excess of £5m in the years to come; are we perhaps shutting the stable door after the horse has bolted — or is the DGH policy bound to give rise to a long term need for large capital projects which is only postponed by current difficulties in public expenditure?

Powerful man though he is the Project Manager has to be accountable to somebody; should it be to the Regional Chairman, thereby symbolising the importance placed on the post by the RHA? Perhaps accountability should be to the Regional Team of Officers, or would such an amorphous group negate the sharp personal responsibility which the institution of Project Managers is designed to provide. Perhaps the Project Manager should be accountable to one member of the RTO such as the Regional Works Officer, but is he always well enough placed to provide the strong backing that a Project Manager will undoubtedly require on occasion?

One possible definition of the function of a Project Manager has been offered on the lines of "the management of designated NHS building projects to ensure that the functional content is adequately defined, that the design team's proposals are in accordance with this definition, and that the project is completed within the time and cost constraints established by the RHA". But how far can a Project Manager go in commanding or directing the Engineer, the Architect or the Contractor to achieve his objectives? And how far would such direction involve the assumption by the Project Manager of responsibility for, say, constructional standards?

What is the principal task of a Project Manager? Essentially, it is to obtain the approval of the RHA to an agreed brief, to a cost limit, to a date for completion of the work and to any amendments to these objectives which prove to be necessary. He must then establish a plan of operations and key dates for fulfilment of the plan, and he must ensure that these dates are adhered to. He must agree the resources required, and if he is to fulfil his remit he must have power to direct and control these resources as he sees fit. It is clear that the direction and control of resources could bring Project Managers into conflict with established functional heads. Such conflict is not necessarily to be deplored if, for example, it serves to bring into the open and resolve the difficult problems which arise from the different traditions in the design and procurement of building and engineering services. I think one sees a form of matrix management in which members of the staff of the disciplines — medical, nursing, works and so on, are allocated to Project Managers at appropriate times during the course of the project. There would still be a need for the disciplines as the natural home of the various professions providing the profesional skill in depth, the development of professional techniques, and the establishment and maintenance of professional standards and policies. An approach on these lines clearly presents sharp problems for the NHS, not the least of which would be where we are to obtain our Project Managers, how are we to reward them appropriately, and how can we develop a satisfactory career structure for them?

Coupled with this is the question of the source of Project Managers. Will they come from within the NHS or from the private sector, from the building professions, from administrative sources, from the construction industry, from this country or from abroad? And can one man see a lengthy project through from beginning to end?

In due course training arrangements must be considered. Should the NHS go it alone, or should we benefit from exchanging problems and solutions with those in other fields?

Building hospitals is complicated and difficult. These projects need to be well managed, and it is held that the wide variety of interests concerned need to be directed by a single individual; many are unconvinced of this and there are, in any case; many practical problems to solve.

I hope today's discussions will help to create the climate for change which hospital building needs, and that it will lead toward a solution of at least some of the problems.

G A ROOLEY CBE CEng FICE FIMechE FInstF PPIHVE PPIHospE MConsE

Eléven years ago, in this theatre, under the chairmanship of the then Chief Engineer of the Ministry of Health, there was a discussion on the theme, "The Influence of Mechanical and Electrical Engineering on Hospital Design".

I was invited to contribute to the discussion, as I have been today, and I notice on my notes of that day, a free-hand note saying, "Five minutes, and be provocative". I would like to quote from the notes that I had with me.

a. If, in designing ten new projects, costs can be trimmed through greater simplicity whereby one more new project can be built, then I think the majority of designers, working in teams, will conscientiously endeavour to do so and not allow for projects for such specialised purposes becoming monuments to posterity rather than a medical workshop.

b. The paper portrays a large structure containing many revolving parts, and I believe it is a good thing to remind ourselves constantly that up to the present time (that is 1966), the majority of projects had been very much prototypes . . .

One can compare this with the building of a ship with its working parts.

Can one imagine handing over a £10 million ship to the owners without many months of trials? We do just this with hospitals and other land based structures or, indeed, we are expected to do so.

c. Here is one of the greatest problems. If we consider the national endeavour to provide new hospitals, either we have to mass-produce from prototypes or we must ask for several months of non-occupancy of the hospital for the purposes of the trials, testing and full commissioning.

One can ask the question, "Which is the cheaper and the quicker way? Is it to prepare prototypes for mass-production? If so, have we any worthwhile prototypes existing?".

It would appear that there is a case

for forming a team of designers and administrators to look around and find some typical prototypes for comparison, analyse these and prepare guide lines and Codes of Practice with standard designs, and then get on with mass-producing.

I am sure there would be many volunteers from both the Hospital Service and the private sector prepared to join the team.

d. Simplicity in design is not the only requirement, it is also needed in the administrative and personal attitude to, and within, the Professional Team. It is necessary to rationalise the status and responsibilities of each member of the team.

We do not want to continue a running battle over the years, we want peace in the team,, and facilities to adapt ourselves to one another's disciplines. This is a great problem. It is purely administrative and must be dealt with boldly and with determination.

I am sure that if Engineers and Architects, representing the two disciplines of hospital design, spoke the uninhibited truth, they would admit that this has been an outstanding problem far too long.

Has the time come when the Ministry of Health, or other appropriate Authority, can and will search the country for men of calibre, well trained as Engineers, Architects or Administrators, having had a very broad experience in hospital design and working, to act as professional co-ordinators on all new projects?

I suppose we could call and identify such a man as Project Director, to whom all members of the team can give equal endeavour and prove professional status. Such men would need to be well rewarded, but a man of the right calibre with an income of even £25,000 per year would be cheap if one could think he could act for a group of new projects representing a capital value of £50 million.

That is what I said here in this theatre eleven years ago. Much of what I foresaw at that time, I am pleased to say, has come about.

But we are still hesitant to accept the fact that there must be someone of the right background and personality to co-ordinate and manage the full spectrum of activities in the identity of need, design, construction and putting to work of a project of largish dimension, be it hospital, commercial or industrial type.

Attempts have been made to define the work of a Project Manager as simply as possible. My own definition is as follows: —

> The commissioning of a suitable person by a client to bring together those who can act in a common cause for the fulfilment of a planned enterprise with the available expertise, manpower and material.

From experience within the last decade, I think it could be said that we are not at this point discussing the question as to whether there should be the equivalent of a Project Director or Manager, call him what you will, but as to how such a man can be engaged and what sort of man must he be.

I am not alone in believing that had we been able to engage such a man during that time then there could have been no less than a 10% saving in capital investment on new projects, with an almost incalculable sum of money saved in the subsequent putting to work of the building and its maintenance.

From the doubters, there will be a cry in terms of, "Give us proof!", to which the non-doubters will reply, "Then examine every project with which you have been associated in recent times, with a positive intention of seeing where simplification in its broadest terms could have been applied and its consequent results".

If one follows the proceedings of the Professional Institutions and remarks being made in technical magazines, one would have noticed that there has been an upsurge in interest and a searching for a method by which project management can be applied.

Questions have been raised: —

1. "Is it a new discipline or an addition to that which already exists?"
2. "Which is the best discipline from which a person should be drawn, and what sort of experience should he have had?"
3. "At the present time, is it not a fact that a likely candidate should come from middle management and of that equivalent age?"
4. "What about the personality of the person? Does this matter? Should he be of forceful character or of the leadership quality? The two might differ?"
5. "What should the educational institutions be doing about the future demand for Project Managers? Are they providing a good foundation on which they could award an added distinction on say a First Degree?"
6. "Under what Code of Practice will he work? Do the Professional Institutions already provide typical Conditions of Engagement and Codes of Practice?"
7. "Is it necessary to form a new Professional Institution or a new Association for practising professional Project Management?"
8. "Does the Standard Form of Building Contract need to be revised accordingly?"

I submit that each person taking part in a project, be he Architect, Engineer, Builder, Quantity Surveyor or within the administrative team, should be considered to be of the specialist type and work to the best of his own discipline. Nevertheless, he should be ready to be co-ordinated by a suitable person, and not expect that by being chosen as a specialist it should be axiomatic that he is able to co-ordinate and manage.

It is regretted that Mr. Herbert Cruickshank, who was commissioned by the DHSS to prepare a report on the Planning, Design and Construction of Hospitals, and reported in 1973, cannot be with us today because of illness.

I would remind you of what he said in his report: —

> "Some of the development work can be ahead of its time, other proposals may fail because the designers and industry cannot, for lack of early communication and dialogue, come to terms with a new situation."

I submit that the new situation as Herbert Cruickshank saw it is that there should be an acceptance of the application of Project Management whereby (in his terms) there will be no lack of early communication and dialogue by which those who are accountable become more closely involved.

Open Forum

Summary of main points raised

A questioner asked why it should be thought that the NHS would have difficulties in attracting people for project management when large industrial concerns do not seem to have this problem. Mr. Brooke expressed the view that the programmes of the individual RHAs

were not as large as those of the big industrial organisation, and, therefore, that it would be difficult to offer a worthwhile career structure or adequate financial rewards to compete in the market place for people engaged only on project management.

There was some discussion about whether the management of large projects up to £350,000 could be delegated to AHAs and if so when. Mr. Brooke felt this might be done when the requirement of the scheme has been fully investigated and established, and therefore Stage 2J would be the most appropriate time. He would like to see the Area and District professionals not being too involved until after Stage 1G but that Works expertise be provided at this stage by Region when strategic concepts on costs and alternative solutions were being explored. Vision and imaginative design concept must be injected at the outset.

A view was expressed that since the concept of the Regional Works Officer was introduced with Reorganisation, the project manager could be part of his chain of command. It was felt that project management should be applied to a greater range of schemes from, say, £100,000 upwards and this would enhance the career prospects. Mr. Brooke agreed that all projects should be managed properly, but that the employment of a lot of project managers to handle schemes down to this level could not be justified.

Mr. Brooke was reminded that the principle of reorganisation was maximum delegation downwards, and was asked whether he agreed that it would be more effective if District staff became more involved in project planning. Mr. Brooke agreed this might be so but said there were difficulties arising out of what was really a three-tier management system, and what we must seek is one client and one manager.

Mr. Graves was asked if he could relate his NEC experience, of one man in charge and making all the decisions, to project management in the NHS. Mr. Graves could see no reason why the same concept should not be adopted provided that the project manager is given the authority, the money and the brief.

It was said that the impression being given by the panel was that the process of designing and constructing hospitals was inefficient, but no account seemed to be taken of the fact that no increased revenue accrued from NHS capital investment, unlike other forms of capital investment. Furthermore, while the Public Accounts Committee was critical of time and cost overruns, some Health Authorities were satisfied that, despite them, value for money had been obtained. Mr. Paget said that the NHS was not the only public service in which buildings of increasing sophistication had to be provided without any financial benefit accruing to the investing authority. University building was one example elsewhere in the public sector. He did not feel that the public would be reassured by a Health Authority, or any other public authority, feeling it had achieved value for money in the face of evidence that a project had cost considerably more than had been expected.

One delegate said that a teaching hospital overseas will have been conceived and occupied within three years and a private hospital in Birmingham achieved this within three and a half years. The problem with project planning in the NHS is that there is far too much consultation and not enough decision-making. Another said that he has managed hospital contracts overseas, and they had been a success because people went into projects with a common purpose. In this country there are too many people trying to protect their own interests.

It was observed that on the NEC project Mr. Graves was able to bridge the gap between the design team and the builder, notwithstanding the use of the JCT form of contract. Mr. Graves said this was achieved by getting everyone in the team to pull together.

It was suggested that the performance would be improved if there was an overlap of the design and construction stages, either by the use of conventional contractors or by using management contractors.

In one Region the need had been accepted on one project to set up an executive group to get a job completed, which before reorganisation, had already started under another Authority. The Chairman of the Group was the Regional Quantity Surveyor, and because he had a good administrator on the Group he managed to complete the job on time. The RQS was not a full-time project manager and the results would have been even better if he had been. There are problems with getting the project manager to manage more senior people than himself.

It was said that everyone surely accepts the need for better management, but that the project manager must be given the power and the tools to do the job. He must have a continuity of programme. The time and cost of the project must be controlled and he must have the tools to do this. Mr. Paget agreed that if the need for a project manager is accepted, then so must the cost of setting the manager up. If this is difficult because of the management cost exercise in the NHS then it may have to wait, but the return for this investment should be attractive. Mr. Graves observed that there is nothing new in project management; the current problem is that the NHS is too fragmented.

An Administrator was of the opinion that if Works Officers get involved too early they have not the experience to get the brief from the client side; the administrator is best fitted to do this. Another Administrator said he is a project manager in the NHS, and succeeds because he is given the responsibility and although he has to refer to others for certain approvals he can do this quickly. It is important for the project manager to have the confidence of his Authority.

Chairman's summary

The Chairman, Mr. Brian Hill, when closing the Symposium, said that it was difficult to draw a conclusion from the discussion, but clearly none of those present would be satisfied with the status quo. When further money was released for public building there would be a need to ensure that such funds are more efficiently used and this surely must come from better management of all our resources to make certain that hospital building is more economic.

Accountability was just as important in industry as in the public service, and this should not be forgotten.

The British construction industry can build as fast as any firm abroad. There must be one man in authority; committees did not work when decisions have to be made.

He said that we should be more positive by examining what we were doing well on successful hospital projects and learn from that as well as from paying attention to the errors and delays on projects that had gone wrong. The Conference had certainly shown that we needed to shorten the lines of communication.

We needed motivation and not frustration; there was too much frustration in the construction industry's management.

Product News

Centralised vacuum cleaning

Cleaning of hospital wards and service areas is more vital than any industrial or domestic cleaning problem, yet it presents the least opportunity for a thorough job. Wards are in use continuously and patients can seldom all be moved into a day area to escape the noise of the vacuum cleaner.

The difficulties of keeping the areas clean do not exactly add to the standard of cleanliness itself. Cleaning staff are human after all, and if they are tired or careless, or provided with unsuitable equipment, small out-of-reach areas will be missed.

An alternative solution is a central vacuuming system. These can be installed into existing hospital buildings as well as new ones. They can be justified under the broad headings of efficiency and advanced philosophy for cleanliness.

A network of tubing, usually 75mm diameter, is installed from capped outlets around the skirting boards of the wards and service areas, back to a single turbine and air filter which can be anywhere in the hospital — perhaps in the plant room.

Cleaning staff use ordinary vacuum heads on lengths of flexible hose which are plugged into the capped outlets to start work. During vacuuming, dust and air is sucked back through the tubing to the turbine where it is filtered.

Tubing can be run unobtrusively around buildings — even on the outside of exterior walls if need be, so that installation of a centralised vacuum cleaning system in existing hospitals should be no problem.

Noise is one problem solved with the vacuum turbine well away from wards. The only sound is a hiss of air into the cleaning head — this alone will be a welcome improvement for patients trying to rest.

Of more importance, however, is the practical elimination of the risk of cross infection that is inherent in the use of mobile machines which have to evacuate their exhausts in each of the areas they clean.

It is recognised that it is almost impossible to filter absolutely everything from the vacuumed air. The best that one can do is to site the unit so that its exhaust cannot pollute the clean areas of the hospital. While some mobile machines claim to have excellent filter capabilities, none of them claim to be absolute, even when in pristine condition. The less care taken of them, the more they gradually exhaust some dust. Some dust collected in the corridors and service rooms inevitably transfers into wards and other special areas where the need for cleanliness is absolute.

With the centralised system nothing at all is exhausted in any of the areas that are cleaned.

A secondary point concerns the damage to floor surfaces, walls, doors and fittings, by the passage of mobile cleaners. A centralised system could contribute to its own cost simply by the saving on wear and tear on the building and fixtures.

Centralised vacuuming operates on a more powerful air pull than mobile machines. The best mobiles can achieve a pull equivalent to four inches of mercury — the centralised system's turbine produces at least six inches and can be made even stronger if required. For hospital work, however, six inches vacuum is invariably adequate.

Cost comparisons, in this cost-conscious age, must always be considered. Of course, the centralised system will cost more than equipping with enough mobile machines to service the hospital adequately. Ignoring the better cleaning results and improved hygiene standards in the air, one is left with equating the initial cost and running cost of a central system with that of mobile machines. In a situation where £1,200 would be spent on mobile machines, the centralised system might cost about £3,500. After that, however, the centralised system starts to win — a point borne out in the experience of the Princess Margaret Hospital in Swindon where their central system started showing savings in five years.

Running costs of a central system are those of one economic large turbine, not many small ones; only one person needs to empty the dust and then from a large container in one place infrequently, giving a labour saving. Maintenance costs of the turbine are small because it has only two moving parts, and is not being wheeled into door frames or bumped up stairs every day.

This article was provided by D. D. Lamson Ltd., Central Vacuum Cleaning Division, Snow Hill, Stoke-on-Trent ST1 4LZ (0782) 264141.

Classified Advertisements

APPOINTMENTS AND SITUATIONS VACANT

Bahrain

The Salmaniya Medical Centre requires the following maintenance engineer to assist in the running of a 600-bed fully-equipped hospital.

Air Conditioning and Refrigeration Engineer

To supervise technicians and tradesmen engaged in the maintenance of air conditioning and refrigeration equipment. He will be responsible for day-to-day administration, the training of personnel, and implementation of maintenance programmes for air conditioning and refrigeration equipment.

Candidates, under 40, must have HND or a degree in electrical or mechanical engineering. A minimum of seven years' experience is required in the maintenance of large air conditioning and refrigeration, and air handling units. Applicants must also have held managerial or supervisory positions, and experience of hospital equipment would be advantageous.

Commencing salary is equivalent to £9,325 pa, including terminal gratuity, and is tax-free.

Benefits include free family passages, generous paid leave, children's holiday visit passages and education allowances, free housing, settling-in allowance and free medical attention.

For full details and application form, write quoting MT/608/HD.

Crown Agents

The Crown Agents for Oversea Governments and Administrations, Appointments Division, 4 Millbank, London SW1P 3JD.

HUDDERSFIELD HEALTH DISTRICT

District Works Officer

Applications are invited from candidates holding a minimum of either HNC (Building or Engineering or equivalent qualifications, together with suitable management experience for this important post. Salary scale D2: £6,405 - £7,716 pa plus non-enhanceable supplements of £499 pa. New entrants to the Health Service will commence at the minimum of the scale.

Application forms and job description available from the Area Personnel Officer, Kirklees Area Health Authority, St Luke's House, Blackmoorfoot Road, Huddersfield (Telephone: 0484 - 654777, ext 251), to whom completed applications should be returned by January 2, 1978.

KIRKLEES

Area Health Authority

ESSEX AREA HEALTH AUTHORITY
Harlow District

HOSPITAL ENGINEER (Two Posts)

Required at St. Margaret's Hospital, Epping, Essex (Ref. HE/1); Herts. and Essex General Hospital, Bishop's Stortford, Herts. (Ref. HE/2).
Sound knowledge of mechanical, electrical and laundry equipment found in a general hospital together with management ability and knowledge of modern techniques.
Qualifications: As per NHS conditions of service (HNC or equivalent).
Salary Scale (Ref. HE/1) (24½ points and over) £3,615-£4,140 per annum plus Stage I Supplement £291 per annum, London Weighting £141 per annum, Responsibility Allowance £108 per annum and Stage II Supplement 5% of gross earnings.
Salary Scale (Ref. HE/2) (up to 24 points) £3,351-£3,942 per annum plus Stage I Supplement £291 per annum, London Weighting £141 per annum, Responsibility Allowance £36 per annum and Stage II Supplement 5% of gross earnings.
For post Ref. HE/1 candidates with full qualifications will be given preference.
Married accommodation available for both posts.
Application form and job description available from District Works Officer, Level 16, Terminus House, Harlow, Essex. Tel. Harlow 417221.
Please state post(s) applied for.
Closing date: 23rd December, 1977.

ASSISTANT HOSPITAL ENGINEER

required at King George Hospital, to assist the Hospital Engineer in the operation and maintenance of the engineering services at King George Hospital, Ilford Maternity Hospital and various clinics.

He/she should have completed an apprenticeship in mechanical or electronical engineering or have otherwise acquired a thorough practical and appropriate training and should hold an ONC in Engineering or alternative qualifications.

Salary: £3,893 pa rising to £4,359 pa (inclusive of London Weighting and supplements).

Application forms from Personnel Department, King George Hospital, Newbury Park, Ilford, Essex. Telephone: 518 1702.

East Roding Health District REDBRIDGE & WALTHAM FOREST AHA

To place an advertisement in the next issue of **HOSPITAL ENGINEERING**, appearing on **February 3, 1978**, please contact: **EARLSPORT PUBLICATIONS**, 17 St. Swithin's Lane, London EC4, 01-623 2235/8, by **January 23, 1978** latest.

King's Lynn Health District
HOSPITAL ENGINEER
(Male/Female)

To be responsible to the District Engineer for the management of engineering services within the District. Suitable applicants should have sound experience in all aspects of mechanical and electrical engineering and proven managerial ability. Minimum qualifications are an apprenticeship in electrical and mechanical engineering and possession of a Higher National Certificate in Mechanical or Electrical Engineering with appropriate endorsements or other approved qualifications detailed in Circular 261 of the Professional and Technical 'B' Whitley Council for Health Services. Salary: £4,297-£4,822 inclusive of earning supplements and responsibility units.
Application form and job description available from District Works Office, St James' Hospital, Exton's Road, King's Lynn, PE30 5NU.

Closing dates

Recruitment advertisers are requested to set closing dates no earlier than three weeks after publication date of the Journal.

Monthly publications do not receive preferential treatment by the Post Office and circulation lists in hospitals also delay receipt of the Journal by many potential applicants.

SENIOR IN-STORE MAINTENANCE PERSON

£4,000 Per Annum

Tesco require a Senior In-Store Maintenance Person for the new store under construction at Pitsea, Essex. If successful you would initially be closely involved on site during the construction and equipping programme, and will have the opportunity to visit manufacturers' works. You would subsequently be responsible for a team of three assistants whose duties would be to ensure that building services are adequately maintained.

You will need to demonstrate a good all round knowledge of general maintenance of building services as well as part training in electrical work and you must possess the ability to control staff.

Interested? Please write for an application form to:

Mr G Robinson
TESCO STORES LIMITED
46 High Street
Chelmsford, Essex.
Tel: (0245) 65091.

Checkout your job opportunities with

TESCO

Hospital Engineer

£3,351 - £3,942 per annum plus £72 Special Responsibility Allowance plus Stage I and II Pay Supplements

Required for Alton Sub-group of hospitals in Hampshire. You will be responsible to the District Engineer for the effective running of the Unit Works Department. Your duties will include practical and managerial aspects of maintaining, installing and operating both electrical and mechanical services, and for co-ordinating the activities of the Building Section. If you have already had some managerial experience and wish to develop your skills and widen your experience, then you are the person we are looking for. Qualifications required are an engineering apprenticeship and an HNC, City and Guilds or equivalent in engineering.
For further details 'phone Mr A Round, District Engineer, on Basingstoke 25906. For job description and application form please contact Personnel Administrator, Personnel Department, Basingstoke District Hospital, Aldermaston Road, Basingstoke, Hants. Tel: Basingstoke 29908/9. Quote reference number HE 49/04467.

Closing date: December 16, 1977.

BHD

BASINGSTOKE & NORTH HAMPSHIRE HEALTH DISTRICT

Kingston and Richmond Area Health Authority

Assistant Hospital Engineer

(Male or Female)

For management duties within the Area Health Authority associated with the maintenance and operation of mechanical and electrical engineering services, with some involvement with matters of a building nature. Duties will include the implementation of Planned Preventive Maintenance schemes. The Assistant Hospital Engineer will initially be based at Tolworth Hospital and will assist the Hospital Engineer in his duties at five other Hospitals and other health properties. The post will give an ambitious Engineer a worthwhile career in Hospital Engineering with the opportunity of day release to continue studies. Applicants shall have completed an apprenticeship in Mechanical or Electrical Engineering or have otherwise acquired a thorough practical training, as appropriate to the duties and responsibilities and shall hold an Ordinary National Certificate in Engineering or an alternative acceptable qualification.

Salary scale £3,063-£3,507 per annum plus £354 per annum London Weighting plus Earnings Supplement between £421 and £499 per annum.

For further information about the post, interested applicants should telephone Mr. Marchant, the Hospital Engineer, at Tolworth Hospital, telephone: 01-390 0102.

Application forms from the Area Personnel Officer, 106/114 London Road, Kingston-upon-Thames, Surrey. Telephone: 01-546 2181, extension 279.

Engineers—

Further your career with the Croydon Area Health Authority

We are seeking men or women possessing the ONC in Engineering (or equivalent qualification) who are looking for the opportunity to gain invaluable experience and excellent training as Assistant Engineers. There are vacancies at Warlingham Park Hospital, Croydon General and Queens Hospital.

Working on an Area basis but reporting to the Hospital Engineer, your duties will include the allocation of daily duties and supervision of Engineering Craftsmen/women, assisting with the induction of new staff, maintaining records relating to safety inspection of boilers, lifts etc. and co-operation with all Fire Safety Officers to ensure the strictest adherence to fire safety regulations.

You will also assist the Hospital Engineer with forward planning, introduction and oversight of Planned Preventive Maintenance schemes, preparation of budgets and budgetary control.

Salary: £3,063 rising to £3,507. Suitably qualified and experienced candidates may commence at £3,285. London Weighting of £354 and Supplementary Allowance of £291 is also paid, plus 5% Supplement — minimum £130 / maximum £208.

Applications stating age, qualifications/apprenticeships, details of previous experience to Area Personnel Officer, General Hospital, London Road, Croydon, CR9 2RH, quoting Ref: AWO 15.

Closing date for applications is December 20, 1977.

British Hospitals Exhibition 78

Unique centre for wise budget spending

BHE NOW BACK IN LONDON

In 1978, the British Hospitals Exhibition returns to its original venue - London. Sponsored by the Institute of Health Service Administrators, it promises to be the most comprehensive exhibition ever staged in Britain of materials, products and services essential to the efficient running and maintenance of hospital services. Major manufacturers of all these supplies, both leading, well-known companies and smaller, specialist firms will be taking part. Established since 1958, the BHE is the only event of its kind held in Britain and as such provides hospital purchasers with a unique opportunity.

WHY EVERYONE CONCERNED WITH PURCHASING SHOULD VISIT BHE

Each year, hospital buying authorities tighten their belts.
Each year it is more difficult to ensure that every penny spent is well spent. This becomes increasingly difficult because of the constant flow of new products and new materials coming onto the market.
Finding out about them all takes time and in most cases, you have no chance of seeing products before you make your decision. And how can you be able to compare different manufacturer's products, features, price and value for money side-by-side.
At BHE you can.

ANNUAL CONFERENCE OF THE INSTITUTE OF HEALTH SERVICE ADMINISTRATORS

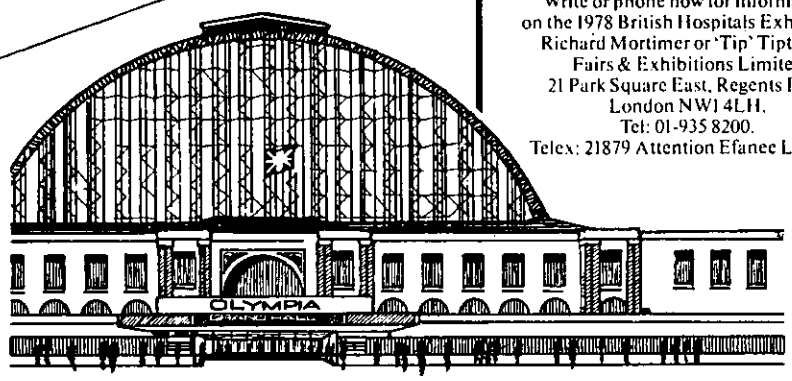
To coincide with the BHE, the Institute is holding its Annual Conference at Olympia thus giving visitors an opportunity to attend.
The conference programme, which will include leading speakers on various aspects of health service organisation and management, will be far-reaching in its examination of future trends in health service management techniques and funding.
If you would like to receive further information please contact Alice Dickson at the Institute or the address on the right.

THE BEST OPPORTUNITY YOU HAVE: DON'T MISS IT

Whatever area of purchasing is your concern - whether you're in hospital administration or laundry management, if you are a domestic superintendent or a supplies officer, the BHE is of vital interest to you. It is your only chance this year to find out the latest developments in your particular area of hospital and healthcare service. Make sure you come along.

BHE: UNIQUE OPPORTUNITY TO SEE YOU ARE ... AHEAD

BHE is the exhibition where you can see the full range of equipment, materials, supplies and services available for the efficient running of your hospital - at one time and under one roof. The British Hospitals Exhibition '78 will be even more comprehensive than ever before. Around 300 companies will be exhibiting. Many of them are manufacturers, others are smaller, specialist companies. Many are British companies but companies from overseas will also be represented.



GRAND HALL OLYMPIA LONDON

5-8 June 1978

Sponsored by the Institute of Health Service Administrators

British Hospitals Exhibition 78

VISITOR OR EXHIBITOR?

Write or phone now for information on the 1978 British Hospitals Exhibition:
Richard Mortimer or 'Tip' Tipthorp,
Fairs & Exhibitions Limited
21 Park Square East, Regents Park,
London NW1 4LH.
Tel: 01-935 8200.
Telex: 21879 Attention Efanee London

Organised by Fairs & Exhibitions Limited (Member of the Kern Organisation Limited)