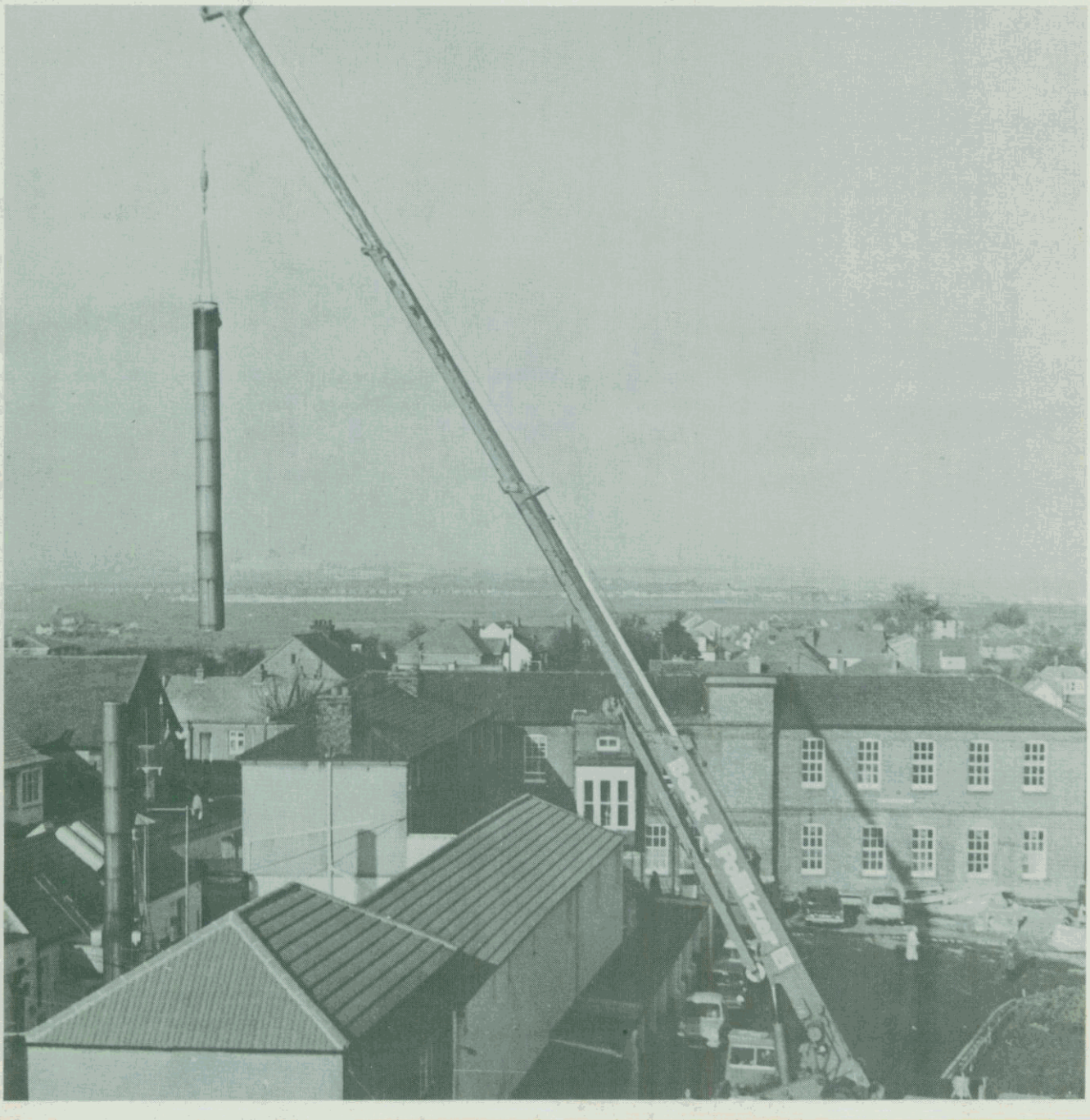
The Journal of the Institute of Hospital Engineering July/August 1981

HOSPITAL ENGINEERING



Sheppey General Hospital
Heating system conversion

Times Health Supplement

The Times is issuing a special supplement on health care in the UK in the Autumn, and the Institute has been invited to make a contribution to this publication.

Duncan MacMillan, Area Works Officer, Trafford AHA, and Amos Millington, Area Engineer, Salford AHA, have collaborated in producing a suitable item, setting out the wide range of responsibilities of managers in works services in the NHS.

We take this opportunity to invite members to write technical papers for consideration by Council's Publications Committee, for inclusion in the Institute's Journal.

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HOSPITAL ENGINEERING

The Journal of the Institute of Hospital Engineering

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The Institute of Hospital Engineering

Report of the 14th Annual General Meeting

Hallam Tower Hotel, Sheffield — May 15, 1981

The President, Mr. L F Turner presided and the meeting was attended by 65 members, numerous apologies having been received.

The proceedings commenced with the President requesting the Secretary to read the Notice convening this Annual General Meeting.

The President then Proposed that, with the consent of the meeting, the Report of the Auditors be taken as read. Dr. B G B Lucas seconded and this was approved without demur.

The President then Proposed *'That the Report of the Council and the Audited Accounts of the Insititue for the year ended December 31, 1980 be received and adopted'*. Mr. K J Eatwell seconded. The President invited questions on the Report and Accounts, and none being forthcoming the President called for a vote on the proposal, which was carried unanimously.

Elections to Council

(a) The President reported that in accordance with the Articles of Association, the following members of Council would retire at the conclusion of this Annual General Meeting:

B. A. Hermon, General Member;
S. Ratcliffe, Nominated Member;
M. Brooke, Area Member — East Anglia and East Midlands;
E. A Johnson, Area Member — Wales;
A. Millington, Area Member — North West.

(b) The President announced that the following, being the sole nominee in their respective categories, were elected to Council unopposed:

B. A. Hermon, General Member;
S. Ratcliffe, Nominated Member;
M. Brooke, Area Member — East Anglia and East Midlands;
E. A. Johnson, Area Member — Wales:
A. Millington, Area Member — North West.

The Institute's Auditors

The President Proposed *'That Messrs. Moore Stephens and Co. be re-appointed as Auditors to the Institute and that Council be authorised to fix their remuneration'*. Mr. B. A. Hermon seconded and the proposal was approved unanimously.

Any Other Business

The President asked whether any member wished to raise any item of 'other business'.

Mr. R J Chatwin asked for information on the system of allocation of funds to the Institute's Branches, to enable them to conduct their necessary business, and the President requested the Secretary to reply. It was explained that this subject was currently receiving the consideration of Council. In fact, Council's Finance Committee was to meet on June 9 when this would be an item on the Agenda, whereafter it would be the subject of further deliberation by Council. The President endorsed this and thanked Mr. Chatwin for raising the matter.

No further items being introduced by members, the President then turned to his valedictory message, and said that he would like to refer to certain major events during his term of office, and make certain other points.

First, in touching on the 'international scene', he would like to speak of the fact that some 30 delegates from Britian had attended the Washington Congress of IFHE, and refer also, to the high quality of the Papers presented at that Congress by UK members.

Still on the subject of IFHE, the President spoke of the great pleasure of the Institute on being invited to stage a second International Seminar, which suggested, surely, that the first such Seminar staged by the Institute had earned the approval not only of those who attended, but many others too. The President then turned to what he considered to have been another major event, when the Institute had chosen to designate 1980 to be *'Hospital Energy Conservation Year'*.

In his enthusiasm he had agreed to be one of the Adjudicators in each of the five sections of the Competition, and had found this, whilst immensely interesting and rewarding, an almost impossible task because of the high quality of so many of the entries.

Turning to the Institute's steadily growing membership, the President drew attention to the increase of 162 during 1980, which represented a growth of approaching 10% during the year.

Again the President wished to make further reference to the plans to establish the Lucas Travelling Scholarship Fund, and commended this to members and hoped that it would receive their support.

The President said that there were a number of 'thank you's' which he wished to record. During his term of office he had visited meetings of all of the Institute's branches, and he was ever conscious of the invaluable and continuing work done by Branch Officers and Committees, and on a more personal note, he would like to express his deep appreciation of the welcome and hospitality afforded him.

Again, he strongly wished to emphasise the efforts of members of Council and the Chairmen of Council Committees. As he had said on previous occasions, he feared that the 'members at large' simply could not realise the contributions of members of Council, which so deserved recognition.

If he may, he would like particularly to make mention of the work of Council's Education Committee who, apart from planning the technical programme of the Annual Conference, were responsible for the One-day Symposia which had increased to five in 1980. Referring to these, he would like to make especial reference to the recent Symposium which had represented the Institute's contribution to the International Year of Disabled People, when we had been honoured by HRH the Duke of Gloucester graciously consenting to formally Open, and attend, the proceedings. His Royal Highness had shown great interest in the Institute's activities, and it was hoped that we might have his support of future occasions.

The President said that he must express appreciation for the continuing help and support given to the Institute by the Department of Health and Social Security.

Mr. Turner turned now to not the least of his pleasurable tasks, and introduced 'someone who needed no introduction' — Mr. John Constable, who was to succeed him as President of the Institute. He had known Mr. Constable for a long time, had the very highest regard for him and it was quite impossible to describe the extent and depth of his pleasure in handing over the 'baton of office' to him. He then Invested Mr. Constable with the President's Jewel of Office.

Mr. Constable, on assuming the role of President, said that first he must express his appreciation of the honour, his keen awareness of the responsibility he was undertaking, and his concern that he should do justice to the office.

Mr. Constable said that it was unlikely that any contribution he might be able to make would bear comparison with that of his predecessor, and that it would be impossible for him to list the totality of his 'input' to the affairs of the Institute.

Sufficient, perhaps to say, that membership had grown to the order of 20% during his term of office — that he had presided over all Council meetings during the period, and attended 99.99% of all meetings of Council Committees and Working Groups — this as well as visiting all branches. Yes indeed, it was impossible to quantify or qualify the extent of his contribution — it could only be said that the Institute had gained tremendously from his sacrifices.

It was a very, very considerable pleasure, therefore, to present to him a Past-Presidents Jewel, and he hoped that whenever we saw him wearing it in future, we were reminded of the debt the Institute owed to him.

For his own part, and looking ahead, Mr. Constable said that apart from his awareness of the responsibility of the office, he now assumed he was aware, too, that the work of the Institute is indeed important; that the work of the Branch members was important — in the end result it is the 'grass-roots' that are the most vital — without their virility the Institute can be nothing.

The President then closed the meeting.

International Federation of Hospital Engineering

Council Meeting

A meeting of the Council was held in Zagreb, Yugoslavia during the period 26th — 28th May, 1981. The following are the principal issues on which decisions were made:

1. Warm appreciation of the high standard of organisation of the 1980 Washington Congress was expressed by the Council and the President was asked to convey their appreciation to the American Society of Hospital Engineers.
2. The Vice President, Cor P. Sonius, gave a resume of the progress to date in the arrangements for the 1982 Amsterdam Congress. Simultaneous translation as appropriate in English, French, German and Italian will be available. Fifty papers had been received so far but more would be welcomed and the closing date for the submission of title and abstract of the paper had been extended to the end of June. Fees were provisionally fixed at 475 gilders (200$) for the delegates and 200 gilders (86$) for wives. For all applications received after the first closing date an additional 50 gilders would be chargeable for late applicants.
3. It was reported that Ghana had not paid membership fees for many years and although the Council had been reluctant to exercise their right to exclude this country from participation in the IFHEs affairs, it was now accepted that the formal step of exclusion must now be taken.
4. It was reported that a national association of hospital engineering had been formed in Venezuela and it was probable that this country would be applying for full membership in the near future.
5. An application for associate membership from a representative of Saudi Arabia was considered. The Council considered that this application might be granted but requested that the applicant should afford some assurance of the prospect of a national association in his country and that he would work towards this objective.
6. It was accepted that some refinement to the structure would probably be necessary in the future but as an interim measure, it was decided to retain the existing structure but to double the present fees for 1982.
7. The General Secretary, Joao Galvao, reminded the Council that his appointment in 1980 had been for a period of two years only and it was indeed his intention to relinquish the post at that time. It was decided to obtain the views of all member countries on the principles to be adopted in choosing a replacement. They would also be asked to submit the names of individuals considered suitable for appointment.
8. The representatives from Spain sought the agreement of the Council to the holding of the 1986 Congress in their country, probably in Barcelona. The Council, whilst fully sympathetic with the proposal, felt that this decision should be postponed until the next meeting to be held in Amsterdam in 1982, when it was probable that there would be fuller attendance of members.
9. The UK representatives announced the arrangements for the holding of a Second International Seminar for Senior Hospital Engineers at Falfield to be held 18th April — 7th May, 1982. Leaflets giving a resume of the course and an application form were distributed. The arrangements were welcomed by the members and the representatives from Italy asked for copies of the leaflet to be sent direct to organisations and individuals, in accordance with the list which they would supply.
10. The next Council Meeting will be held in Amsterdam in May 1982 in association with the International Congress.

1981 Five Branch Meeting

The annual Five Branch meeting of the London, West Midlands, South West, Southern and East Anglia branches of the Institute, was held at The John Radcliffe Hospital, Headington, Oxford on Saturday, June 6, 1981.

The meeting, arranged by the West Midlands Branch, attracted members from all five branches and the new President, Mr. John Constable, acted as Chairman for the day.

The opening paper on 'Diving in the Red Sea' was represented by Mr. Ron Swinden, Area Works Officer, Oxford Area Health Authority (T). This was a slide presentation of sub-aqua life on the coral reefs in the Red Sea and included some expert photographs of life beneath the waves.

The second paper was given by Douglas Harrison, a consultant plastic surgeon from Mount Vernon Hospital, Middlesex, and was again a slide presentation on his work in hand surgery and microvascular techniques — definitely not for the squeamish.

Lunch was taken in the restaurant associated with the main hospital, which enabled members to inspect parts of the new hospital during the recess.

After lunch, John Sampson, Secretary of UKAPE spoke on the subject of engineering trade unions within the NHS. The ensuing discussion was lively and topical, demonstrating the concern of the members for the subject under discussion.

Mid-Scotland Branch

At the Annual General Meeting held on April 25, 1981, the follwoing principal Branch Officials were elected:

Chairman:
Mr A Hunter, Dundee.
Vice-Chairman:
Mr W J Sutherland, Elgin.
Secretary:
Mr I Notman, Aberdeen.
Committee:
Mr A Fleming, Dundee;
Mr W D Campbell, Dundee;
Mr J S Grant, Fife;
Mr D MacLeod, Inverness;
Mr R C Forbes, Aberdeen.

Yorkshire Branch Symposium

An audience of 70 attended a symposium — 'Microcomputers and maintenance management' — held at the Yorkshire Regional Health Authority, Harrogate. Dr. Green, of the Chief Engineers Department at the DHSS, gave the presentation based upon a micro-computer system presently in the final stages of programming at the Pontefract General Infirmary.

Particular interest was generated during the presentaton on the various computer-systems available. The micro, mini and main-frame systems, including recent marketing techniques of the various manufacturers.

It was emphasised that a need

The Institute of Hospital Engineering

The Responsibilities of Health Authorities in Estate Management post-1982

at

The Institution of Mechanical Engineers
1 Birdcage Walk, Westminster

Wednesday 30th September, 1981.

Circular HC (80)8: 'Health Service Development — Structure and Management' gives no guidance to Health Authorities about structures to deal with the management of the extensive and complex NHS estate: The Secretary of State has asked that these be left to the new Health Authorities to determine. Chairmen and Members of Authorities, when deciding these structures, will need to ensure that they will take into account legislation, codes of practice and guidance applicable to estate management. Such a wide subject cannot be covered fully in a few hours. This one-day Symposium has been designed to present in lay terms only some of the main responsibilities and problems to be considered.

PROGRAMME

10.00 Coffee

10.30 OFFICIAL OPENING by
JOHN CONSTABLE Esq CBE CEng FICE FRICS FIMunE FIHospE President, The Institute of Hospital Engineering.

CHAIRMAN for the day
W M DARLING Esq OBE FPS
Chairman, South Tyneside Area Health Authority; Chairman National Association of Health Authorities in England and Wales.

10.40 ESTATE MANAGEMENT AND NHS PLANNING
Speaker: CYRIL BATTYE Esq BA FMS MBIM
Head of Research Centre for Health Services Management, Leicester Polytechnic

11.15 GETTING THE BEST VALUE FROM EXISTING BUILDING STOCK
Speaker: ROBERT J MAXWELL Esq JP PhD
Secretary of The King Edward's Hospital Fund for London.

11.50 DHA LIABILITIES — LEGISLATION, CODES OF PRACTICE AND GUIDANCE

Speaker: PETER TANKARD Esq CEng MIMechE AMBIM, FIHospE
Area Works Officer, Berkshire Area Health Authority.

existed for compatibility of systems between Health District and Regions, which could then result in interchangeable program facilities.

A vote of thanks to Dr. Green was given by Mr. M Lowsley of the Regional Engineers Department. Mr. J R Fielding, Yorkshire Branch Chairman, gave special acknowledgement to Mr. K H Dale OBE, Regional Engineer, and other Officers connected with the organisaton of the event, including the Yorkshire Regional Health Authority for receiving the Institute.

12.25 ORGANISING MAINTENANCE
Speaker: DOUGLAS ROBERTSON Esq FRICS FBIM
Principal — The Surveyors Collaborative; also Executive Director, Building Maintenance Cost Information Service.

13.00 Lunch

14.30 ESTATE MANAGEMENT AND INDUSTRIAL RELATIONS
Speaker: NICK BOSANQUET Esq BA MA MSc
Lecturer in Economics at the City University; Editor of *'Industrial Relations in the NHS — The Search for a System'* — published by the King Edwards Hospital Fund in 1979.

15.10 REALISING THE ESTATE POTENTIAL
Speaker: BRIAN DRAKE Esq FRICS
Drake and Kannemeyer

15.40 FINDING A BETTER WAY OF FUNDING THE DEVELOPMENT AND MAINTENANCE OF THE ESTATE
Speaker: GORDON BROOKE Esq MSc CEng FICE MBIM
Regional Works Officer, Mersey Regional Health Authority

16.15 Close

Reduced Rate Rail Fares and Hotel Accommodation — Substantial rail fare reductions are available for delegates attending this Symposium. The following are examples of second class return fares to London (for first class add 5%) Grampian Region £43; Glamorgan — £17; Cornwall — £26; Oxfordshire — £6. Grand Metropolitan Hotels in London are prepared to offer delegates a reduction on their normal rates.
Application forms to obtain these reductions may be obtained ONLY from The Institute of Hospital Engineering.

N.B. Please note that tickets are available ONLY from The Institute of Hospital Engineering. (Tel. Portsmouth (0705) 823186).

To: The Secretary, The Institute of Hospital Engineering, 20 Landport Terrace, Southsea, P01 2RG.

Please send to me ... ticket(s) for the ONE-DAY SYMPOSIUM entitled "The Responsibilities of Health Authorities in Estate Management Post-1982" to be held on Wednesday 30th September.

I enclose £..... to cover cost at TWENTY FOUR POUNDS each (includes Morning Coffee and Lunch). No fees will be returned for cancellations (in writing please) received after midday on Thursday 24th September, 1981.

NAME (in capitals please).....

ADDRESS.....

.....

Position.....

(Please list those attending overleaf)

Southern Branch

The Branch Officers and Committee Members for 1981/82 are:
Chairman;
Mr J Walker.
Vice-Chairman;
Mr D Chaplin.
Secretary/Treasurer;
Mr R Boyce
Committee Members:
Mr K Andrews; Mr J Attryde; Mr E Boyland; Mr G Brookbanks; Mr J Feasey; Mr L House; Mr L Jennings; Mr M McNeil; Mr S Snow; Mr D Townley-Jones; Mr P Webb; Mr J Wenyon; Mr S Whiteley; Mr D Wicks; Mr F Williamson; Mr D Wilson.

South Western Branch

At a recent meeting, the following Officers were elected for 1981/82:
Chairman:
Mr K L Lucas, Southmead Health District.
Vice-Chairman:
Mr C E Watkins, Director, Calenge Ltd.
Treasurer:
Mr H R Stiddard, Hoare Lea and Partners.
Secretary:
Mr A J Graver, Spirax Sarco Ltd.
Committee:
Mr J W Barnes, Hospital Engineering Centre, Falfield;
Mr D J Shoebridge, Hortham/Thornbury;
Mr E W Knight, Brentry Hospital.

Member Retires

W A Bryars is to take early retirement on November 1, 1981 after 32 years with the Health Service, of which for nearly 25 he has been Regional Engineer to the Mersey Regional Health Authority. Throughout this period he has been a keen and participating member of the Institute, being one of the comparatively early members.

We are delighted to say that he will continue his membership, and we hope that we may have the pleasure of his company on many future occasions and meanwhile offer all good wishes for a most happy retirement.

Institute Members Upgraded/Regraded

To Fellow

B. A. Belgrave, London Branch;
D. Blythe, London Branch;
M. Brooke, East Anglian Branch;
B. V. Chapman, South West Branch;
N. H. Christie, West of Scotland Branch;
D. Clarke, East Midlands Branch;
L. W. Clayton, North West Branch;
J. R. Crabtree, London Branch;
R. P. Dawson, London Branch;
D. Griffiths, Welsh Branch;
R. Horner, London Branch;
W. J. Kelly, Overseas;
I. K. King, North West Branch;
S. C. Kirby, East Midlands Branch;
B. G. Matthews, Overseas;
R. R. Morgan, Welsh Branch;
B. J. Quinn, Northern Ireland;
R. C. Raynham, London Branch;
A. J. Reynoldson, London Branch;
B. A. Richardson, North East Branch now Overseas;
F. P. Smith, East Midlands Branch;
J. A. Williams, North West Branch;

To Member

D. J. Gilbey, North East Branch;
J. A. McHugh, London Branch;
J. A. Plummer, East Midlands;
O. Tomori, Overseas.

Diary Note

The Christopher Hinton Lecture

The 1981 Lecture will be given by Sir Robert Clayton, CBE FEng, Technical Director of GEC and a Vice-President of the Fellowship, at 6.00 pm on Tuesday, September 29, 1981, at the Institution of Electrical Engineers, London WC2. The title for the lecture is:

To Calculate, Communicate, Command and Remember.

Further details and a brief synopsis of the lecture available from The Fellowship of Engineering, 2 Little Smith St., London SW2. Telephone: 01-222 3912.

Health and Safety at Work Exhibition

The 1981 Health and Safety at Work Exhibition will take place at the Wembley Conference Centre, from November 3-6.

In addition to the stands displaying a complete range of products, equipment and services allied to the health, safety and welfare of Britain's workforce, there will be a large information source stand for visitors. A complete safety film programme will be on show in the Severn Suite cinema throughout the duration of the exhibition.

Full details of the Health and Safety at Work Exhibition may be obtained from the Organisers, Maclaren Exhibitions Limited, Davis House, 69-77 High Street, Croydon, CR9 1QH. Tel: 01-688 7788.

Tom Terry Retires — but not for long

Tom Terry, CEng FIEE MCIBS, Area Maintenance Manager with the Lanarkshire Health Board until 30 June this year has now retired from the Service, and has become the partner responsible for running a new mechanical and electrical engineering Consultancy, Woolgar, Hunter Associates.

The practice is based at 16 Park Circus, Glasgow (Telephone number 041-332 0487), and is associated with Woolgar, Hunter Associates of the same address.

Before his recent retirement Mr Terry had been with the Health Service in Scotland for nearly 20 years, since he joined the Western Regional Hospital Board in January 1962 as Principal Assistant Engineer. He has been with the Lanarkshire Health Board since 1975. He spoke for several years on the Institute's Keele Courses, although his main professional activity outside the office has been with the Institute of Electrical Engineers, for which he sat on various committees for the last 14 years.

Obituary

Robert T W Doubleday

We are sorry to report the sudden death of Mr Robert Doubleday on June 2, 1981, whilst on holiday in Italy.

Mr. Doubleday was an old and valued member of the London Branch. having served for many years in various offices, including that of Branch Chairman. He was well-known for his zeal and energy in promoting the good of hospital engineering in general and the London Branch in particular.

He was born, educated and trained in North London, and was proud of his Cockney connections. He joined the Royal Engineers in August 1939 within weeks of his 19th birthday and was demobilised in 1946. At the time of his death he was District Works Officer to the Enfield District of the Enfield and Haringay AHA, having served in the NHS since 1952. Mr Doubleday was a larger than life character, and his large physique was made more impressive by his wide knowledge of many subjects, including art, literature, music, photography (he was ARPS), archaeology and arboriculture.

He will be remembered particularly for the support and opportunities he gave so many of the younger members of the profession.

Mr Doubleday is survived by his wife Terry and sons Geoffrey and Stephen, to whom we offer our sympathy.

Ernest Haslam

We are sorry to report the death of Ernest Haslam, lately Senior Partner, Donald Rudd and Partners, and a Fellow of the Institute for some time. Mr. Haslam had suffered indifferent health for several years.

J H Slade

We are sorry to report the death of Mr J H Slade who was a very early member of the Institute. Indeed, he was one of the Founder Members of the Yorkshire Branch maintaining an interest in the Institute's affairs throughout his life. Mr Slade, who was 81 years old, died on the 14 June, his wife having pre-deceased him by only three months.

CEI Conference

The Interdisciplinary Technical Committee of CEI/CSTI is to hold a Conference entitled 'Industrial Islands', from the 17-19 November 1981. Full details should be obtained from: Dr E G West, Chairman, c/o The Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster.

15th Edition of IEE wiring Regulations

The Institution of Electrical Engineers is responsible for publication of the regulations concerning the wiring of buildings, and in April it published the 15th Edition of these wiring regulations.

The new edition is different from its predecessor both in content and format. Although there are substantial changes, they are not such as to make the existing practices obsolete overnight, and the requirements of both the 14th and 15th editions will be equally valid until 1st January 1983. Nevertheless, there are major differences, many arising from revised international standards, and members are advised to make sure that they take steps to bring themselves up to date if they are involved with the regulations, or have cause to ensure that work is performed in accordance with them.

The IEE has announced a series of aids to assist with the transition, namely two books which are published by Peter Peregrinus Ltd., and a comprehensive series of meetings and short courses of instruction.

A Guide to the 15th Edition of the IEE Wiring Regulations

This book (176 pp) by John Whitfield is written in a clearly understandable style, and has been checked by the Technical Regulations Department of the IEE for accuracy. It is intended to complement the wiring regulations which are written in legally and technically precise terms. It will be helpful to those studying the new regulations for the first time, and helps unravel the 15th Edition for those who already have experience of the earlier edition.

Commentary on the 15th Edition of the IEE Wiring Regulations

This book (240 pp) by Brian Jenkins provides a readable introduction to the new edition which can also be used subsequently as a reference book. After describing the background to the wiring regulations and the inter-relationship between national and international standards and legislation, the commentary examines numerous individual regulations, offering some explanation and further information where it is believed that this is necessary for a full understanding of these regulations.

While the commentary is of particular interest to designers, inspectors and supervisors, it is believed that anyone concerned with electrical installation work, whether on the design side, onsite erecting and installation, or in the training field, will also find something of interest in it.

In addition to these books, three types of event are being arranged as part of a co-ordinated solution.

Evening Meetings

These are being organised by the IEE's local centre network throughout the UK. They will outline the content and purpose of the regulations and highlight the problems which may arise in their application. They will also indicate the levels of awareness and knowledge required from the various groups of people who will be affected by the regulations, or who will have to implement them. Attendance at these meetings is free and they are open to non-members also.

Seminars

A series of one-day seminars, cosponsored by the IEE, IEETE, CIBS, ASEE, ECA, ECA of S, CIBS and NICEIC, is being held throughout the country. The seminars are designed for those at managerial and supervisory level who require a detailed knowledge of the implications of the regulations. A programme of six events is being arranged for the Autumn.

Short Courses

A series of 2-day courses has been arranged to provide an in-depth understanding of the regulations for those who are responsible for their correct application. Class sizes will be limited to a maximum of 30 students, and the courses will be held in hotels throughout the country.

The short course can also be run as an in-company training scheme.

Further information about the meetings, seminars and short courses can be obtained from Dick Jones, Institution of Electrical Engineers, Savoy Place, London WC2R OBL, Telephone: 01-240 1871, Ext. 279.

Letters to The Editor

Direct Labour

Dear Sir,

At long last we have seen a viable system for the determination of the establishment of Senior Engineers and Senior Building Officers, and Engineers and Building Officers.

The coincidence of the scheme with the Government expenditure cutbacks has not helped provide a smooth introduction of the system in respect of the filling of the additional posts created, and, indeed, in this province, industrial action was necessary to 'encourage' some Area Boards to comply with the relevant circulars. Where such action has not been implemented, Boards are still 'dragging their feet'.

The main topic of my letter is the direct labour establishment within Districts. As far as I am aware, we have never yet had a criterion or yardstick for the determination of an establishment of direct labour numbers. In this I may stand to be corrected but, assuming that no such criteria exist, then isn't it surely time we had such a system?

I have personal experience of establishment numbers in existence in 1963 still applying today.

Surely a system suitable here could be that applicable to Engineering and Building Officers below District level, i.e. building cubic capacity, with some allowance for plant and services in the case of engineering trades.

I would be most interested in the views of other Engineers on this topic.

David K. Howie
Senior Engineer
Gransha Hospital, Londonderry

Bonus Schemes

Dear Sir,

It was with great interest that I read the article 'Works Incentive Schemes' in *Hospital Engineering* (May 1981). I feel that I must comment though on the contents of the article, as I feel they were rather subjective and did not give a true picture of the values of the Bonus Scheme. Some of the points that I feel are misleading are:

I do not think that the Bonus Scheme in any way assisted with the recruitment of better class tradesmen. If anything the work force, and certainly within our own area, has been reduced.

The idea that financial resources were available in the past to provide the service required is not strictly correct. Prior to the Bonus Schemes it was difficult to cost much of the activities of the Works Department, particularly at hospital level. This has now been improved by the introduction of the Bonus Scheme which provides a one hundred per cent accurate picture of staff utilization. Therefore, it does not follow that the Bonus Scheme 'severely hinders' the service provided by the Works Department and, in fact, as a management tool there is no other alternative method that could improve on it.

From the point of view of industrial relations the more discussion that there is between management and staff the better, and surely meetings to resolve difficulties must assist in the smooth running in the Scheme and Works Department.

It is suggested in the report that services and productivity are not complimentary. This is not necessarily the case. If tradesmen are operating at a high level of productivity, then surely the service provided to the hospital and patients is increased beyond the leisurely level found in many hospitals previous to the introduction of the Bonus Scheme.

Difficulties have arisen in the field of day-to-day repair work, but this problem has been solved by the use of pre-timed matrices, which gives the tradesmen an approximate time for doing the job which may be modified in the light of complications. After one year's trial period this was found to be quite effective, and certainly very popular with the tradesmen who preferred to know, prior to doing the job, even an approximate time.

I must agree with the point made in the article with regard to P.T.B. staff and, in some cases, their reluctance to comply with the implementation of the Scheme. This, I feel, is due to the slightly unfavourable financial deal we received, but in the majority of cases where the Bonus has been applied to the existing Estmancode system, I think most people would agree that a very thorough and successful Bonus system has been introduced and run.

With regard to the question of increased paperwork, much of the Scheme paperwork can be contained within existing paperwork used for the Estmancode system, and in many areas this paper load has been reduced by the use of micro-computers.

I cannot accept that the appointment of (highly skilled craftsmen) as planner estimators is a loss to the system or the nation, as the experience and knowledge that they may impart to the system helps a great many other tradesmen to carry out their duties.

Having discussed this article with members of the Works Department at all levels, we feel that the suggestion that there has been a lowering of traditional workmanship and a reduction in standards is unfair. It is now the case that tradesmen attending to maintenance and repair, in the majority of cases, have an advice note to work to — this advice note being provided by the engineer and planner estimator, whose skill and knowledge may be transferred to the tradesmen via the advice note.

The majority of tradesmen that I have spoken to agree that having a set standard of work, in the form of the advice note, is far more useful than being allowed to struggle along on their own. It is specified in the Bonus Scheme implementation handbook that Bonus will not be paid to those tradesmen who carry out work that is not of sufficient quality to satisfy the supervisor. This is a sufficient safeguard against poor quality work.

The Bonus Scheme is much more than a complicated and expensive method of calculation a man's pay. It has become an exceptionally useful management tool. The quality of the system is, therefore, the responsibility of the manager in each individual situation.

I would suggest that the paper *Incentive Bonus Scheme* by R. H. Yorke, Area Works Officer, Tameside, is worthwhile reading, and his conclusions on the Bonus Scheme have great interest. He suggests that the Bonus Scheme is the only system which guarantees a hundred per cent return of information from tradesmen and, as such, gives access to a high level of management control.

M. Shand, TEng MIHospE LIPlantE
Engineer
Royal Northern Infirmary
Inverness.

PVC Incineration

Dear Sir,

In the May 1981 issue of *Hospital Engineering*, Robert David Buckley wrote an article *'The Energy Economics of Hospital Refuse Disposal'*. In the paper, Mr. Buckley refers to advice, which I included in an article published in the October 1975 issue, concerning the problems associated with incinerating refuse containing more than $1\frac{1}{2}\%$ (approximately) PVC.

Subsequent discussions with the Alkali Inspectorate related to this potential infringement of the Alkali Act, have led me to conclude that the above figure is somewhat low. Loss of hydrochloric acid, e.g. into the ash, is a factor which reduces the proportion of this constituent in the stack effluent.

However, the general point is still worthwhile making and it is obvious that designers and operational staff must be constantly aware of the dangers of one load of refuse containing a preponderance of PVC, sufficient for the incineration to exceed the mandatory upper limit for hydrochloric acid in the effluent gases.

James McDowell FIHospE
Newcastle upon Tyne

Readers may have seen in the May issue of the Health and Social Services Review, *a statement on page 153 entitled* 'Working relationships between Works officers and administrators — Joint paper from IHSA, ACAHA and ASUA'. *The following two articles are the reactions prepared by* B A Hermon *and* H G Hanson, *the two Works Officers who have been party to the discussions with the IHSA.*

NHS Reorganisation
The Works Function

B A HERMON CBE CEng MICE FIMechE FCIBS CIHospE
H G HANSON DipArch ARIBA

The joint statement beginning on page 152 of the May 1981 issue of the Review should be helpful to administrators and Members of the new DHAs, but Works Officers are surprised to see the statement on pages 153 and 154 made by the three Associations of Administrators.

Works officers have also indicated their willingness to continue discussions with the IHSA and ACAHA on the question of relationships, because it is a nettle which Ministers preferred to be grasped by DHA Chairmen and Members. It is essential that they are given the best professional advice about their responsibilities for the management of the NHS Estate, valued at around £20,000m. However, the publication of the statement by the Administrators has now brought the issue into public debate.

The statement confuses 'management' with 'coordination' and is full of generalisations. It accepts in 4.3 that the two elements, professional and managerial, will at times be 'inextricably linked together' — yet advocates that by trying to separate the two elements there would be 'clear managerial accountability' — how can it be both blurred at the edges and clear?

Works officers have demonstrated over many years that professional and managerial responsibilities cannot be separated with any degree of safety; to attempt to do so will lead to conflict — not on whether doctors get their coat hooks, but on matters which concern the safety of patients, staff and visitors. When failure occurs there will be endless arguments about whether it is due to professional or managerial incompetence.

Professional Works Staff are trained in management in order to carry out their function: either to execute contracts or to make the best use of the estate and operate its services round the clock. The clearest managerial accountability will be achieved if the Chief Works Officer is directly and wholly accountable to the DHA for knowing what has to be done — and getting it done without receiving further instructions from others.

To achieve this he will need to have first-hand knowledge of the discussions at DHA and Team meetings, from which he can extract the line of action he needs to take, and ensure that all Works staff are properly and clearly instructed. None of this detracts from the administrator's role as the coordinator.

The reference to managerial relationships in industry is a generalisation which is surprising in view of the state of British industry so frequently referred to by Ministers, the Press and the engineering professions. In fact, there are many successful manufacturing companies which are led by professional engineers. In the construction industry firms are almost entirely headed by people from the Works professions with considerable success. Firms in the construction industry have survived the depression so far through good management by professionals who know the business.

The reference to health service relationships in other countries is also a generalisation taken with a biased view.Those who attended the International Congresses of Hospital Engineering in Rome 1970, and in Paris in 1976, will know of the frustration expressed by the Works professions because of their managerial relationships. The reference to Scotland is not understood, as the Section 2495-2499 of the *PTB Whitley Council Handbook* defines the Area Maintenance Officer as 'An officer responsible to the Health Board for all aspects of maintenance policy and advice'.

The analogy given of the relationships in the Region Works organisation is poor because the RWO is not only required to be a Works professional, but he must also have had a breadth of experience across the construction and estate management professions. He should, therefore, be competent to judge professional decisions and to take full responsibility for professional recommendations made to the Authority — in fact, the RWO fulfils the requirements of paragraph 26 (ii) *of HC (80) 8.*

It must be made clear, that full and direct accountability of the Chief Works Officer to the DHA, does not detract from this responsibility to give the administrator or any other Team member any information they need to do their job. In fact he would be expected to feed information without being prompted, whereas if he is

managerially accountable to the Administrator (whatever that means) he may wait until he is asked for it.

Administrators are trying to put the clock back some 30 years and re-create the conditions which brought about the *Tyler* and *Woodbine Parrish Committees* in the 1960s, which recognised the need for professionalism to keep pace with the increasing complexity of estate management. Unless the Chief Works Officer is given full and clear accountability to the DHA for the whole of the Works function, albeit with the strong relationships at Unit level referred to in the joint paper, it will be difficult to retain the professional staff who have so successfully begun to develop estate management since 1974 — in spite of cuts in their budgets and restrictions on staff recruitment.

Through no fault of Works Officers, the DHAs will inherit a vast backlog of maintenance which can only be eliminated by the injection of funds. If and when that injection comes, the DHAs will require good Works Managers clearly accountable for achieving ambitious programmes; this can only be assured if the Chief Works Officer has full managerial control.

B. A. Hermon
Regional Works Officer

In their submission on *'Patients First'* the IHSA stated that they considered the Works Officer should be accountable to the Administrator; and although there may now be more awareness of the problems and difficulties on taking on such a task, there seems to be a reluctance to change this view — even though logic demands it.

Administrators do not see themselves accepting professional responsibility any more for Works than for Medicine, but they do think that professional accountability can be separated from management accountability. If one considers the size and content of the tasks in Estate Management, many of which are inter-related, it would be illogical to suggest that a few are management issues solely within the purview of Administration.

Divided responsibilites created in 1974 did not work and are unlikely to work in 1982. Unnecessary lines of management accountability would hamper quick responses to urgent needs and emergency situations. The question must be asked as to who is responsible when something goes wrong?

Paragraph 26.2 of *Circular (80)8* clearly states:
'Authorities should assure themselves that the Manager can be held accountable for the work of the individual. This is especially relevant when considering whether a Member of the Administrative discipline can be made managerially accountable for non-administrative staff.'

It must equally be remembered that the Public Accounts Committee in 1970, along with other reports, criticised the neglected assets and the way the Building and Engineering Services were operated and managed. Largely because of these events in 1974, Works Officers were brought in to take over Estate Management in its broader context.

It is natural for a new organisation to be open to criticism, but these have often been related to more over-embellished trivial issues. They are not always wholly related to the present management arrangements, as these arise largely from other factors facing society, such as Industrial Relations, availability of Manpower and the lack of funds. Many of these problems would have been aggravated without the management structure which now exists in Works.

Works Officers recognise the role of the Administrator as a co-ordinator. Some criticism of arrangements between Works Officers and Administrators may be due to the fact that the Administrator may not always have aspired to undertake this role. It appears from the Administrator's Paper that they seem uncertain of their ability to operate a co-ordinating role and are, therefore, looking to a management relationship to strengthen this. If one accepts this philosophy, then what is being said for Works could equally apply to Finance, Nursing and Medicine, since they are all largely important functions.

Works Officers are aware of certain anxieties expressed by Administrators in paragraph 5 of their Paper referring to Planning, Programming, Estate Management and Capital Schemes etc., and have explained how these can be overcome. If the Administrators see these activities being managed by them, they are effectively saying that the Nursing Officer and Medical Officer will have to work through them on these fundamental issues, rather than directly with the professional officer providing and operating the service.

Works Officers would expect these subjects to be matters for the Team, which the Works Officer would discuss and agree with them collectively. To do otherwise would isolate the 'clients' from the Works Officer, thus creating an unnecessary barrier and presenting the Adminstrator with a major responsibility, bringing him nearer to the Chief Executive role in relation to his colleagues.

The references in the Paper to the comparisons with industrial organisations, North American Hospitals etc., are dubious where hospitals do not operate in groups, or have the same type of development potential as exits in the NHS. Industrial Companies usually have Boards of Directors which include a professional or technical Director, and he can become, and often is, the Managing Director. In many large profesional organisations, the Administrator is accountable to the professional officer, and it is interesting to reflect on the theory as expounded by Dr Robert Moss.

The objective in *Circular (80)8* of strengthening Unit Management has been discussed on many occasions.

We agreed broadly that Units would vary in size, and many Works activities would need to operate on a District basis — because of the scale of the operations, the complexities and effective use of labour etc. It will be for the DHA to decide on its Units and consider the most appropriate methods of management. Paragraph 31 of the Circular does recognise there may be the exception on the management arrangements for staff working within Units. Administrators recognise there is a problem, but are unlikely to solve it by seeking split management responsibilities with a Works Officer accountable two ways, as already happens in the present District arrangements.

The NHS may have to reflect on what it really wants. The key solution to virtually all these problems is getting the Works Organisation on a proper professional management footing at the outset. This is most likely to happen if a new Chief Works Officer is apppointed who is directly accountable to the new Authority for Estate Management in its totality.

H. G. Hanson

The author is the District Engineer at Keycol Hospital, Newington, and this paper was an entry in the Hospital Energy Conservation Year Competition.

Sheppey General Hospital
Boiler Conversion from Steam to MTHW

M TOWLER CEng FIMarE

Introduction

When energy saving projects are considered, it is often difficult to justify the capital cost when the payback period is calculated on energy costs alone. This paper is an account of one such project, which resulted in the payback period being reduced from 7 to $4\frac{1}{2}$ years, when other factors were taken into consideration.

Improvement in the utilisation of energy often produces increases in efficiencies in other areas, — such was the result of this exercise.

The Sheppey General Hospital serves the community on the Isle of Sheppey, and contains 69 acute beds; 25 beds in a modern maternity unit, and 12 geriatric beds. There are also the physiotherapy, X-ray, operating theatre and out-patients departments.

Prior to conversion, the boiler plant consisted of 2 steam generators rated at 3,000 lbs/hr each. *(Figure 1)* Steam was supplied to 4 calorifier rooms, Catering Dept., sterilizers in the labour suite and operating theatre, and a small number of steam convectors for space heating.

The requirement for steam services at the Hospital began to decline when the Medway Hospital CSSD opened in 1966; all operating theatre and maternity unit requirements were eventually supplied from this department, and in 1971 the sterilizers were removed. Parallel with this policy, steam-heated catering equipment was replaced with gas over an extended period, and by 1975 steam usage was reduced to the calorifier rooms and space heating.

Following Department guidance in *ED75/19*, an investigation was held into what energy and other savings could be achieved in changing the steam plant over to LPHW. The following items were taken into consideration:

- Boiler Efficiency;
- Fuel Costs;
- Labour Costs;
- Radiation/Condensate Losses;
- Maintenance Material Costs;
- Environmental Improvements;
- Insurance;
- Replacement of Existing Plant.

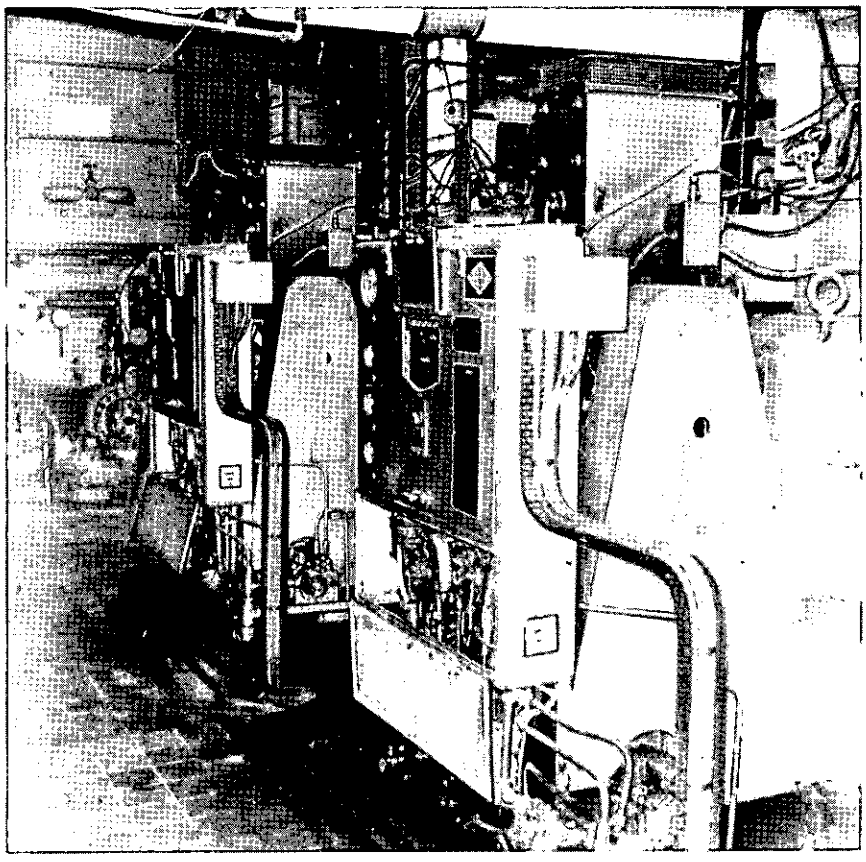


Figure 1: Original steam-raising plant.

Boiler Efficiency

The steam generators, in summer months, cycled on and off due to the low demand for steam, and conse-

quently operated at a reduced efficiency over this period. Efforts were made to conserve fuel during the summer months by shutting the plant down for 4 hours in the afternoons. It was, therefore, considered that gas-fired modular boilers would be ideal to meet the extreme fluctuations in load which existed in this small Hospital during the course of a year i.e. 2×10^6 BTU's./hr down to zero.

Each of the steam generators had two electric motors, one of which was 15 h.p., so electrical savings were available in changing over to naturally-aspirated gas-fired units. However, this saving would be partially offset by the installation of primary pumps in the heating mains.

Fuel Costs

At the time, fuel costs were:

35 secs oil — 14p/therm;
Gas — 9p/therm;
Annual consumption — 130,000 therms (average);
Estimated savings — £6,500;
Estimated annual savings, including 20% improved boiler efficiency — £8,500.

Labour Costs

Due to the high labour content associated with:

The planned maintenance of the steam generators;
The higher technical skill required in diagnosing faults with their control systems;
The maintenance currently carried out on steam calorifiers, steam traps, pressure reducing valves, steam and condense mains etc.,

it was considered that on changing over from steam to LPHW, the maintenance staff could be reduced by one Grade 4 Craftsman.

As the boiler house was already operating unattended, savings from loss of boiler attendants were not available. However, as the steam generators were serviced annually by the manufacturers, savings of £400 per annum would be realised by their removal.

Radiation/Condensate Losses

With the numerous valves, flanges, steam traps, pressure-reducing sets and lower mains temperatures, it was estimated that a reduction of at least 5% in losses under this heading could be achieved.

Maintenance Material Costs

The current expenditure of £1,000 per annum for spares for the steam generator and steam services would be reduced to a minimum.

Environmental Improvements

Four improvements under this heading could be foreseen:

Noise — conditions in the boiler house were such that it was impossible to reasonably carry on a conversation.

The generator coils had to be regularly washed through with acid and washed off externally. This was unpleasant, time-consuming and resulted in many hours devoted to trying to keep the boiler house in a presentable condition.

The boiler house forms the wall of a public road in a residential area, and therefore, although the chimney was 60 feet high, there was a possibility of contamination from flue gases. The Hospital being situated on one of the highest points of the Island, the removal of the chimney would improve the landscape. *(See Front Cover).*

The occasional emission of steam from exhaust heads, valves and plant rooms would be avoided, as would be the inevitable staining of brickwork, plant room floors and other areas.

Insurance

Although only a minor saving of £50 would result under this heading, nevertheless a saving would be made, and the requirement for maintaining records for this purpose would cease.

Replacement of Existing Plant

The cost of replacing the existing generators and chimneys in 10 and 6 years time respectively, would have been £26,000 and £5,000 at current prices. However, this cost was not included in the final analysis. The estimated financial and energy savings were established from these headings, and are shown in *Figure 2.*

Preliminary investigations with SEGAS were carried out at District level. As there were no gas services of sufficient size in the immediate area, it would be necessary to run a new 4 ins. gas service from the high pressure main in the village a quarter of a mile away. The cost of this main — £6,000 — would be financed by the District in order that it would be completed by the time that the main contract was placed; ie work on the gas main would proceed as soon as finance was made available for the conversion.

Within the Hospital it was proposed that it would be best to have two boiler houses, achieved by utilising the existing boiler house, and forming an additional boiler house of lightweight construction at the opposite end of the Hospital in a former oil bund. In this way the new boiler house could be erected and used to serve the lower end of the Hospital, one steam generator removed, and the remaining modular boilers installed in the existing boiler house.

Estimated costs and savings were sent to the Kent AHA, and approval and finance were made available by the South East Thames Regional Health Authority. Due to the extent of the project, *Harding McDermott & Partners* were appointed as Consulting Engineers.

After a thorough investigation, it was decided to install all the modular boilers in the existing boiler house, and to reduce the size of the new mains to utilise a MTHW system to operate at 230°F and 30 PSIG. Basically, the completed plant consisted of 11 *Hamworthy Modular*

Figure 2: Estimated savings.

Savings		
	Energy %	Financial £
Boiler Efficiency	20	2,000
Electrical Savings		500
Fuel Costs		6,500
Labour Costs		3,500
Radiation/Condensate Losses	5	500
Maintenance Materials Costs		1,000
Insurance		50
Totals 25%		£14,050

Boilers each rated at 256,000 BTU's/hr. *(Shown in Figure 3).* The heating calorifiers were removed, and *Satchwell* mixing valves installed along with *Spirax Sarco* High Temperature shut-off valves, in the heating mains.

Four of the six domestic hot water calorifiers were changed, as were all calorifier controls. The only radiators to be changed were the convectors previously served by steam.

Work commenced in August, 1976, and was completed in March 1977. The work was enabled to be carried out by utilising one of the mobile boiler plants belonging to the Health Authority. Nevertheless, interruptions in heating did occur, and the co-operation and understanding of all Hospital personnel and patients was much appreciated.

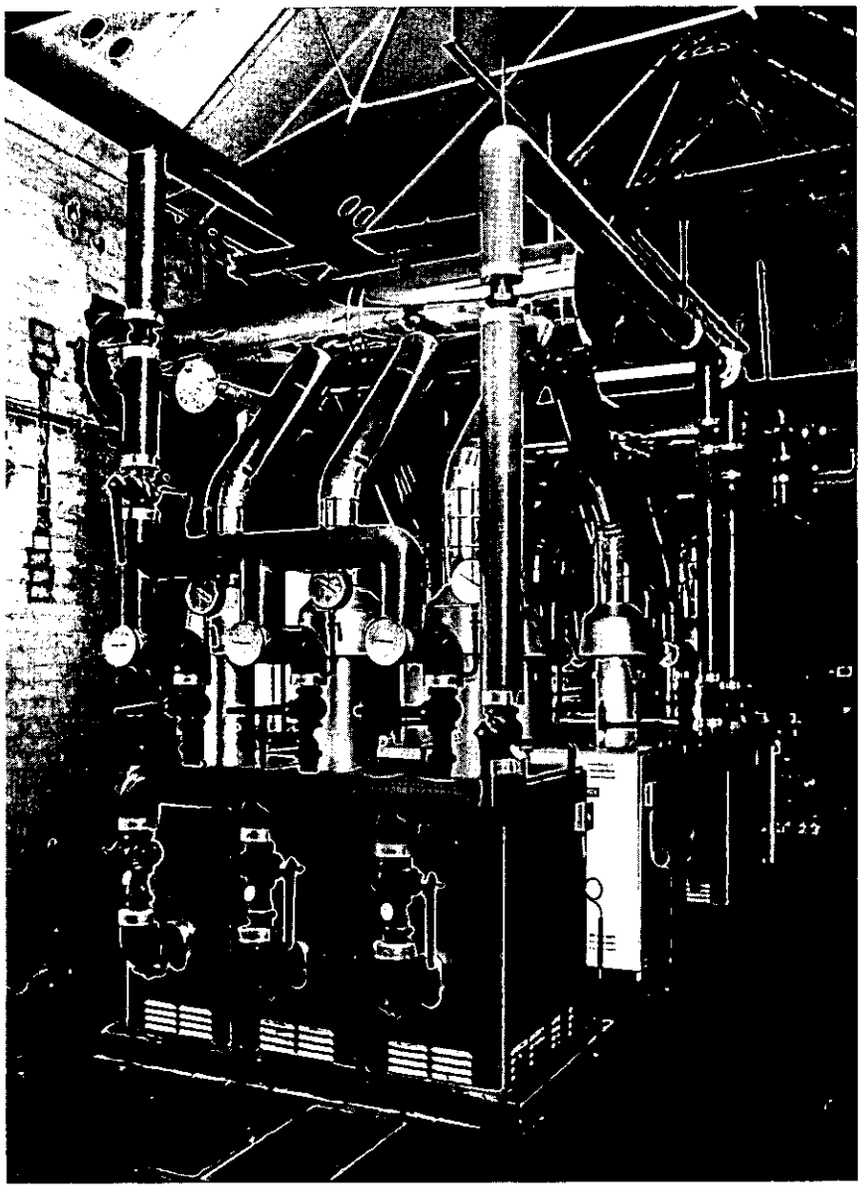
The above figures were verified by SEGAS, who were interested in the project — .which was eventually awarded the runners-up place at the SEGAS, *'GEM'* awards, held at the Gatwick Park Hotel last year.

The work was carried out by *Haden Young* of Canterbury and the writer would like to thank them and SEGAS Commerical Division, Maidstone, for their co-operation, also, the S. E. Thames RHA and the Kent AHA for providing the necessary finance — £66,000 — for the major part of the project.

Year	Fuel	Consumption Therms	Deg. Days Below 60°F
Nov 75-Oct 76	35 secs oil	125245	3091
Mar 77-Feb 78	Natural Gas	102516	3717
Fuel Cost Savings		**Energy Savings**	
Ignoring Deg. Days: £8308 Considering Deg. Days: £9860		35 secs oil: 40.52 therms per deg. day Natural Gas: 27.58 therms per deg. day Energy Savings: 32%	

Figure 4: Fuel consumption comparisons.

Figure 3: New MTHW boiler installation.



Energy Savings

As monthly fuel consumption readings for previous years were readily available, comparisons between the first years operation on gas and the previous year on light oil were made and are given in *Figure 4.*

It is unfortunate that the financial savings achieved by the price differential between natural gas and light oil at that time have not been maintained; however, the rise in cost of both fuels has offset this loss. Fuel cost savings are currently around £7,500 per annum. In addition to the energy savings, the staff was reduced by one Grade 4 Craftsman.

It has subsequently become apparent that the work associated with the heat source and plant rooms is now minimal, and allows the Grade 4 Craftsmen to provide effective cover for the Clinics, Ambulance Stations, Home Hoists, Health Centres and Residences in the remainder of the Sector. Replacement spares are now minimal.

Environmentally, all aims have been realised; the working conditions in the boiler house and plant rooms are now first class. The boiler house is easily kept clean, the naturally-aspirated boilers have cut out all noise, and have proven to be remarkably free from build-up of combustion waste on their heating surfaces, reducing maintenance in this direction to a minimum.

Further consumption figures endorse the energy savings achieved. *(Figure 5).*

Payback Period

The cost of the project was £72,000, including the gas main.

Final Savings (All figures 1976-77)	£
Energy Savings:	9,860
Electrical Savings:	500
Labour Costs (including Contract):	4,000
Maintenance Materials:	1,000
Insurance:	50
Total:	£15,410

This gave a payback period of just over $4^{1}/_{2}$ years.

Experience over the past three years indicates that labour savings are in the order of $1^{1}/_{2}$ Grade 4 Craftsmen.

The energy savings are currently running at around 33%, and the main object of this interesting project has been realised. The Hospital is now enjoying spin-offs from the conversion, not least of all the relief from problems which can arise with the delivery of fuel oil to such a remote location.

Figure 5.

Year	Fuel	Consumption Therms	Deg. Days Below 60°F	Therms Per Degree Day
April 74-Mar 75	35 secs oil	140313	3485	40.3
April 75-Mar 76	35 secs oil	133968	3536	37.9
April 78-Mar 79	Natural Gas	101248	4013	25.2
April 79-Mar 80	Natural Gas	101464	3551	28.5

The author of this paper is Consultant Architect to the Royal Association for Disability and Rehabilitation, and he gave this paper at the Institute's Symposium, Accommodating the Disabled *on April 29 at the Royal Festival Hall.*

International Standards and Design for Disabled People

A Review of Progress

C WYCLIFFE NOBLE OBE FRIBA

Introduction

For some time the planned environment, and the responses of people to it, have been areas that sociologists have examined. In retrospect, they have become disenchanted when discovering how some inappropriate preconceptions and practices have become the 'norm' to meet the varying needs of a population.

Often, in shaping the environment for people, forces have been present which have not readily been identified, and judgements have been made on a hypothesis — which has resulted in short-lived enthusiasm for a new city centre, high-rise housing or urban development. We are told, all too often, that not only is a development ill-conceived, but that it has disastrous social consequences.

In architecture and planning however, unlike the development of a supersonic aircraft, there is no prototype to test, there is no trial run, there is no certificate of worthiness. In fact, all too often people have to accept the proposition rather like marriage — 'for better or for worse'. Thus, the population is provided with their new town centre, or supermarket or road network whether they like it or not, and whether or not it functions efficiently for all the people who wish to use the amenities.

In many cases therefore, the technology of shaping the environment around human behaviour fails because some minority groups — people with special needs — are ignored.

It is, of course, argued that the rehabilitation of an individual to a particular situation, can be more readily and easily accomplished than any radical adjustment of the planned environment. This has led to a misunderstanding; the result has been a surprise for those in new housing, being even less convenient,

and sometimes unusable, by some who are handicapped.

However, in considering environmental factors which can make life more tolerable, one has to consider some starting points.

This paper, therefore, is a summary outlining one area in the field of Building Construction and technology, where international agencies are being influenced to take account of the needs of disabled people.

Standards Institutions

It is clear that, in architecture, a variety of requirements affect decisions taken on the arrangement of spaces and in the selection of components used for the fabrication of a building. But in recent years, economic factors have further generated an activity to harmonise, shape and co-ordinate sizes for the elements of construction.

In a world where industrial growth, competition and exporting cannot be ignored, the economic attractions for wider markets are seen as evidence within the construction industry by an increase in the use of imported and exported components and materials.

The argument for standardisation, from an industrialist's point of view, cannot be ignored.

Coupled with this fact, but on a more ambitious level, is the group who wish to standardise the space requirements in buildings to match certain functional activities of people.

In certain quarters this latter aim has some appeal, but when seen in the light of the interaction and range of consumer and producer opinion — tempered by historic, economic and cultural differences of a country — the goal is much more difficult to achieve in reality, (albeit that one supposes that consumer needs have priority over national prejudice).

Whatever stimulates co-operation in the field of building technology at international level, it has to be recognised that it is at national level that the formulation of policy exists and where priorities are established.

Already, national Standards Institutions in Europe who produce Codes of Practice and Standards of their own for consumer goods as well as for the building industry, have considerable expertise in their drafting procedure and the public comment procedure, which is part of the standard-making formula.

To understand the areas of influence further, some Standards Institutions — notably the German DIN, Dutch NNI, French AFNOR, Swedish SIS, and the American ANSI — have been in existence for over half a century, the oldest one being the British Standards Institution which was founded in 1901.

It is understandable therefore, that differing criteria will emerge when attempting to produce an international standard, and the effort to achieve harmonisation is time-consuming.

Nonetheless, the national Standards Institutions are committed to a programme of international co-operation, as representative bodies to the International Standards Organisation (ISO).

I can think of no more convenient place to start than at the beginning, and recognise that there are protagonists for the standardising philosophy, whilst there will be those still sceptical about the merits of such co-operation to the extent that it could erode innovation, inventiveness and flexibility.

The protagonists expect that the benefits could be applied in several sectors affecting disabled people:

Improved and more equal quality of aid components — improved safety, function and strength;
reduced manufacturing and handling costs;
increased compatibility: the ability to combine aids and aid components;
increased co-ordination in research development and testing methods;
increased exchange of information via agreements on definitions and classifications.

On the other hand, it has been argued that custom-design to meet the extreme variation of impairment makes standardisation inappropriate, as the volume of components is not likely to match bulk production-line techniques.

The argument rests on:

The commitment is too expensive and time consuming;
the process becomes an obstacle, and the benefits to disabled people limited.

It is contended that standardisation becomes such a compromise that it becomes, as Spike Milligan would put it, *rather like a floor so cunningly laid that no matter where you stood, it was almost certainly under your feet.*

What then is the philosophy behind the notion of standardisation as related to building construction?

Standardisation is the art of creating unitary rules: to make life easier for producer and consumer alike; to diminish the risk of errors and mis-calculations, and to enable people to enjoy things already accomplished. The work of standardisation, which is a complicated and often very difficult work, is done on several levels, from the single company or workshop to the global organisation.

I believe intervention now is vital, otherwise we could easily find ourselves left behind because of isolation, resting so easily on a catalogue of minimal recommendations which is unrelated to International Consumer opinion.

On all levels the work has in common:

The working together of all, or at least as many as possible, of the interested parties;
the hammering out of a result that can be accepted by producer, consumer, governmental authority, scientific institution, and whoever else may be affected by the new standard.

For all this, procedure is required. The national standardisation organisations in the world have many features in common: the fundamental procedures are the same, but there are also many differences which are due to historic variants, contrasting economic and social situations, and other factors.

The Instrument for International Co-operation

International co-operation between national Standards Institutions is arranged under the auspices of the International Standards Organisation — referred to previously as ISO — which was founded in 1947. The ISO work covers a wide range of topics, from containers to dental equipment; from computer languages to materials testing, and from machine tools to environmental pollution.

ISO, with membership in 88 countries which represents 95% of world production, claims to be the largest international organisation for industrial and technical collaboration, and brings together in its technical bodies the interests of producers, users (including consumers), and government and scientific bodies. It co-operates closely with the Inter-

national Electrotechnical Commission (IEC).

A member would be described as 'most representative of standardisation in its country', and where no such qualification existed, the designation of 'Correspondent Member' would be applied. The United Arab Emirates recently became a 'Correspondent Member', with the Peoples Republic of China (CAS) joining ISO earlier.

The General Assembly is the principal meeting of ISO and meets triannually.

The results of ISO technical work are published as International Standards, which represent a global concensus of opinion. It has 1600 Technical Committees with decentralised Secretariats located in 30 countries, with a Central Secretariat in Geneva.

Technical Committees may be subdivided into Sub-Committees or Working Groups, in which 'P' members participating have an obligation to attend meetings and vote, whilst others choose to be kept informed by having an 'O' (observer) status.

International organisations can participate when appropriate and they do so on two levels. They can be granted liaison status 'A', i.e. active participation, or status 'B' in which case they only receive information.

A Standard, which emerges as the result of agreement between members, is given approval by voting procedure and has to be approved by the ISO Council.

It may then be implemented by incorporation into a National Standard, although there are other ISO documents such as an ISO Guide which would not have this status.

United Nations Request

It was at the request of the United Nations that, at an ISO meeting held in Rotterdam in February 1976, this item appeared on the agenda of ISO Technical Committee 59: *Action to be taken in Building Standardisation to take account of the needs of Disabled people.*

This was a challenge, for up until 1977, before Working Group I responsible to *TC59* was set up to influence the work within ISO, consideration of the needs of disabled people was somewhat fragmented, and lacking in overall strategy and co-ordination.

Working Group 1 *of TC59,* has now held six meetings, and emerging gradually are a framework and guidelines, to which standard-making committees are able to refer. Its mandate is as follows:

> To work and consider the requirements of disabled people in ordinary building standards;
> to collect available information about these requirements, and to request ISO and those concerned to consider them in their work;
> to initiate, and if necessary prepare, standards on subjects of importance to the disabled not dealt with by other ISO committees.

This should mean that in all normal standard-making procedures, the requirements of disabled people will now be considered — not merely as a supplementary requirement of special provision, but as an integral part of standard-making procedure.

What is Being Achieved

Sometime earlier however, when work commenced on drafting a Standard for the size of passenger-lift cars, the *International Commission on Technical Aids, Housing and Transportation* (ICTA), had already noted that by influencing this work, there was no need to separate standards for the able-bodied from the disabled.

To implement the proposition to grade the size of cars and agree on an 800mm width of door, it was simply a matter of identifying at what starting point in the table of sizes would you specify an ordinary lift usable by people in wheelchairs.

An International Standard on Lifts, the work of *TC178, ISO 4190/1,* was published in 1980. A further draft Standard *DIS 4190/5* on the subject of *Control Devices, Signals and Additional Fittings to Lifts* is in circulation.

Working Group I, in pursuing its role of reminding standard-makers of their responsibility, has led to the restructuring of some work on drafting documents related to *Sanitary Appliances; Basic Spaces and Utilisation Areas* and *Bathrooms and Toilets for Handicapped People in Wheelchairs.*

TS59/SCII, which is concerned with kitchen equipment, has already been co-operating with WG1. *ISO Standard 3055: Kitchen Equipment Co-ordinating Sizes* is at revision stage, and *Draft Proposal 7515: Guidance for Planning Domestic Kitchens,* will be subject to WG1 intervention.

Other Technical Committees have special roles like *TC136/SC8/WG3,* which has produced a document whose scope specifies: *Limits of Overall Dimensions for Wheelchairs,* and further, *TC173* is one of the newer committees covering *Technical Aids for Handicapped Persons.*

Priorities

As a first priority, part of WG1's strategy was to produce an introductory document on the design requirements that should be incorporated into ordinary standards for building construction, so that the facilities are usable by disabled and able-bodied people.

This has taken the form of an ISO Guide, and has been accepted by *TC59* in its present format, on the condition that further, more detailed information will be issued and eventually combined into a consolidated document.

The document, known as *ISO Guide: Functional Needs of Handicapped People in Buildings — Design Guidelines Part 1,* will be published during the International Year of Disabled People.

A considerable amount of work has already been undertaken and agreed for inclusion in Part II, and the Secretariat in Sweden (SIS), working in conjunction with the Swedish Institute for the Handicapped, representatives from The Royal Association for Disability and Rehabilitation, and the Department of the Environment in the UK — assisted by colleagues from other countries, — believe that they are preparing the basis for close co-operation in integrating the design requirements of disabled people into the ordinary standard-making procedures of ISO.

It is a new area of work, because the implications and results can affect the whole field of international building technology. The standards, up to the formation of WG1, were generally related to the able-bodied user, but by international co-operation a wide range of user products like lifts, doors, kitchens, bathroom equipment and technical aids, will be available, designed and standardised — not just for that non-existent 'average man' — but to meet the needs of those with differing abilities.

It is significant that in IYDP 1981 disabled people from many countries are actively participating in this work.

This paper was presented at the Institute's Symposium Accommodating the Disabled, *Festival Hall on 29 April 1981. The author is Consultant Ergonomist to the DHSS.*

Access for the Disabled

Comparing Codes of Practice for the Design of Buildings

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Foreword

It is necessary for me to explain that I am not a Civil Servant, but have worked as a commissioned Consultant to the DHSS for a number of years, concerned principally with detailed aspects of hospital and health building and equipment design.

The views expressed in this paper, however, are personal, and should not be seen as representative of official DHSS policy.

Historical Development

The legal standing of 'codes of practice' varies very considerably from country to country, and even from authority to authority within a country. In Sweden for example, *Building By-Law 42a*, enacted in 1966, specifically requires that all buildings, and parts of buildings, used by the public must be designed to meet the requirements of disabled people. Originally this applied to public buildings and places of work only, but in 1976 this was extended to also include housing. This covers all new buildings, and most major alterations to existing buildings.

The legislation is supported by directives, published by the Board of Physical Planning and Building, explaining how the law is to be interpreted. They are roughly equivalent to our *British Standard Codes of Practice*, but with more positive legal support, in the sense (as I understand it), that they are an extension of the bye-law itself, and therefore have some of the characteristics of our Building Regulations.

At the other end of the scale are the countries and authorities that give no specific encouragement to the provision of amenities for the disabled. Portugal, I understand, is a current European example, but hopefully may not remain so for much longer. West Germany, Switzerland, Denmark, the USA, France, Japan, New Zealand, and others all have regulations which vary in application and degree of compulsion. Norway, which has taken an active part in the development of guidance in Scandinavia, does not at present have enforcement, but, I understand, looks to I.S.O. to produce a code (or codes) which they can adopt as a legal framework.

A review of the international bibliographies shows that we have progressed in roughly three phases since the Second World War, each taking about a decade. (This classification is my own and has no official standing, but may help to clarify a fairly complex period of development).

Phase 1.
Discussion and statement of social responsibility, principally during the 1950s. (The World Veterans Federation produced it's second preliminary report *The disabled and the question of housing* in Paris in 1958).

Phase 2.
Identification of the broad characteristics of disability, and the problems of designing for the disabled took place during the 1960s. (Selwyn Goldsmith's *Designing for the Disabled* first published in 1963. *BS CP 96:* Part 1, produced in 1967).

Phase 3.
Wider studies of physical barriers inside, and to a lesser extent outside buildings; developed in intensity during the 1970s. (Swedish document *Accessible towns — workable homes* was produced in 1972. Fully revised and expanded edition of *Designing for the Disabled*, 1976. BS 5619 *Design of housing for the convenience of disabled people* published 1978. *BS 5810* (formerly *CP 96)* revised 1979).
Progress in the developed countries has been roughly parallel, but with some countries like Sweden and some agencies in America too, showing the way.

(It was suggested to me that Portugal is behind the other countries I listed because it didn't start on it's first phase until after the wars in Angola and Mozambique — roughly 20 years behind other European countries, and that this emphasises the part played by veterans' organisations in gaining political recognition for the cause of the disabled in most countries).

The American position is complex in that the American National Standard may be accepted, not accepted or modified by individual States. The time scale, however, was parallel to the development in Europe. The first *National Draft Specification* was produced in 1961, was amended in 1966, and the *Architectural*

Barriers Act passed in 1969. The *National Specification* was revised in 1977, and the Act itself was extended in a number of practical ways in the 1970s to try and make it more effective.

Some large national and international companies have now also produced manuals to assist the accommodation of disabled persons on their staff, or disabled persons who have access to the organisation's facilities or operations. For example, the I.T.T. Corporation's *Safety Guide for the Handicapped* which generally reflects American Federal Standards, and those of the North Carolina State Building Code. This was first produced in 1979.

Scope of Discussion

I am going to use the term 'code of practice' fairly loosely, to mean the identification by national, regional, local or other authorities, of the essential provisions that need to be incorporated in buildings to ensure that they are conveniently usable by disabled people. I am not going to be particularly concerned with whether these codes are mandatory or advisory, because I would rather concentrate on the qualitative aspects of the advice being given.

I have two reasons for doing this:

Firstly, it is at the level of the individual activity or activity space that the users (the disabled person or the disabled person's helper) talk about the failure or success of a particular provision. If the standard of the advice proffered is poor, then logically it makes little difference whether you comply with it compulsorarily or voluntarily. You will inevitably end up with a less than satisfactory solution.

Secondly, although it may be known to those who draft the codes of practice, that code recommendations generally represent the 'minima' for given provisions, in practice they are rarely exceeded, and become synonymous in the architect's or designer's mind with the 'standard' or even the 'ideal' or 'optimum' provision.

This second point I think is a particularly important one, to which we should give very serious thought if we are to effectively achieve our objective of building satisfactorily accessible buildings.

Code Content and Objectives

Comparison of 'codes of practice' show that they are very similar in detail. Most, as I have already said, are primarily concerned with public buildings:

> *to make them suitable for use by persons whose mobility or orientational ability is reduced as a result of old age, handicap or illness.*

Only the exceptional few are directly concerned with housing. The Swedish code, for example, requires that:

> *it should be possible for persons suffering from physical disabilities to visit and even live in newly constructed dwellings on a temporary basis, and following only limited alterations should be able to live there on a permanent basis.*

The objective behind this is to afford the disabled person as free a choice in where they want to live as is available to other people in the community.

None of the codes contain any significant or comprehensive regulations or guidance relating to the urban environment.

Building Provision Recommendations

Of the individual building provision recommendations generally, three points can be made:

1. That the list of items covered are very similar in all codes, as are items not covered or avoided (e.g. do you use sliding doors or side hung doors? They don't wish to enter slightly contentious arguments of this kind, although there is some evidence now that preferences do exist among identifiable characteristic groups of disabled users).
2. In all cases the wheelchair user and wheelchair circulation is seen as the most critical factor affecting accessibility and space. The needs of the ambulant or semi-ambulant disabled are seen as unlikely to exceed those of wheelchairs, so they are regarded as being met by the wheelchair regulations. (This may be a marginally sweeping assumption. It is in fact only true if the allowances for wheelchair movement are generous. For example, the space required by persons using 2 tripod sticks or shoulder crutches is surprisingly large, 950mm or more. Straight movement in a wheelchair can on the other hand be undertaken in 900mm).
3. The actual dimensional recommendations made show such remarkable congruity, that one must suspect that a very high level of interchange of data has taken place; and as codes are revised they match even more closely.

One suspects strongly that Selwyn Goldsmith must accept much of the blame for this, because he made such a remarkably successful job of bringing together international knowledge and opinion in a single volume, at a crucial time in code development. Whilst I admire this work by Selwyn Goldsmith, especially the time-scale in which it was achieved, it must be said that it does contain some recommendations with which, from my personal experience and knowledge in hospital work, I cannot agree. It follows that where these have been 'lifted' and used in codes of practice, I disagree with their recommendations too.

Such differences as do exist between codes are attributed generally to population differences. We tend to say that the Scandinavians favour slightly more generous spaces because they are taller. The Japanese require all height dimensions to be reduced by at least 50mm. because they are shorter. Equipment size differences can also be identified — American cars require 300 — 350mm. more space width than a standard European car. The user space component, however, remains the same or similar.

Exceptional factors, such as the Japanese, Indian or other life styles being significantly different in respect of some activities, must of course be given quite separate consideration.

Individual Standard of Recommendations

It would be wrong, however, to overlook the fact that some countries, such as Denmark or Sweden, are more open to popular movements than others, and that this can be reflected in a more generous attitude towards standards than in others.

I am talking about, in most cases, very small differences of 100mm, 50mm or less, but which can be very important in terms of comfort or convenience for disabled persons or their helpers.

In Britain, I know that during the development of CP 96, the argument: —*'If you ask for too much, you may end up getting nothing'* was frequently employed. It can be very successful at effecting a compromise, especially when you are also trying at the same time to establish a basic recognition of need. In these circumstances, less than satisfactory standards can be adopted, especially in first drafts.

Approximately 8 years later CP 96 was revised, but was it in fact improved? Need is no longer in question, as by this time it is clearly accepted; but the attitude of economy (one detects even to a point of meaness) remains.

Do you metricate up or do you metricate down? Does a 2ft. 7ins. clear opening width (785mm.) become 800 or 750mm. It became 750mm. (-35mm. = approx. 1½ ins.). Similarly, does a 4ft. 0ins. corridor width (1220mm.) become 1250 or 1200mm. It became 1200mm. — both were metricated down.

Individually, considering travel in a straight line, the consequences may not be too serious; but if you consider turning from a narrower corridor into a narrower door opening — the combined reductions may be very much more serious. Have we got it right? My personal opinion in this instance is that we have not.

I say this because there is another consideration. From surveys in Britain and Sweden we have evidence that something between 5% and 10% of users find the standard wheelchair too narrow. How wide is a wider chair? The standard chair is 660mm. wide, so lets assume a wide chair to be 700mm. max. We must also recognise that these users want larger chairs because as people they are bigger, heavier and consequently more difficult to manoeuvre.

We therefore really need even more clearance than for the standard chair user which was approximately 100mm. We can calculate the clear opening width required to be:

> Wide wheelchair width + increased allowance for movement = 700mm. + (say) 150mm. = 850mm;

or 800mm. if you are prepared to accept slightly more restricted movement for the larger users, but certainly not 750mm. which would be very difficult indeed, especially to turn into or out of a narrow corridor. A movement allowance of 100mm. is not generous. It works out at less than 2ins. on either side for the standard wheelchair.

The larger users especially would be unlikely to pass through a minimum 800mm opening frequently without injury to their hands — due to pinching between the hand rim and the door jamb.

The question of corridor width is more difficult to establish precisely, but a width of 1200mm. is certainly marginally acceptable, in that it will afford restricted passing by a wheelchair and an ambulant person. 1400mm. would, however, provide significantly better manoeuvering space, including the possibility of 180° turns if the inset door opening space is also used.

I would therefore have favoured metricating up in the case of the 'clear opening', and would reluctantly go along with the 'corridor width' decision. The consequences of the decision, as taken by B.S.I., is that there is a strong possibility that about 5% of potential wheelchair users will, to some extent, be barred by these minimum conditions — which I am sure was not intended.

The Swiss recommend 1300mm. corridors and 900mm. clear door openings for public buildings. That recommendation we could reasonably call 'comfortable', but the difference really is quite small.

Character of Advice Proferred

You can argue that 750mm. is only a minimum. Door openings can in fact be wider than this minimum. We must accept, however, that 'codes of practice' are not simply extensions or adjuncts to legislative instruments; they are in practice used as readily accessible, and easily referred to, references by architects and designers on their drawing board. This I am sure was part of the original intent behind codes of practice, and I personally think it right that this should be so.

Designers do not however question a code recommendation — they accept it as authoritative. Codes should therefore be comprehensive, explicit and economical in presentation. It is not enough to say that something must be adequate, we refer to a code because we want to know what 'adequate' is, not necessarily scientifically proven, but at least a representative consensus of informed opinion.

I am frankly worried that, as codes become more and more legally orientated, they become less and less helpful, in that we become inhibited and excessively careful in what we include in them. Advice is measured in terms of avoiding possible prosecution, rather than quality control; and with this change of emphasis we are presented with what is very much the lowest common denominator in all cases.

Particularly significant is the fact that this can also happen at the International Standards level, with longer and more pernicious effect. We know (from some bitter experiences) that they take a long time to produce; it seems reasonable therefore to assume that once enacted they will take even longer to change if we get it wrong.

We really ought to stop and think long and hard about this one. The character of the code of practice has changed from 'friendly advice' to 'legal threat', and we may well have lost something on the way.

Limitations of Present Approach

The present position leaves too little room for intelligent experimentation which could benefit both designer and user. For example, *BS 5810 : 1979* states that:

> *'long ramps near the maximum gradient of 1:12 should be provided with resting places at intervals'.*

I know that queries on this question have come from both designers and users. They want to know how long is 'long', what the 'intervals' should be, and what characteristics 'resting places' should possess.

As an ergonomist, I know this to be a very difficult area in which to develop scientifically precise data, but we could make some intelligent guesses to produce a draft graph relating 'gradients' to 'maximum lengths between platforms'. It should then be possible to attach a proposal of this kind to a code for a trial period, to test it's effectiveness and build up a pattern of empirical experience.

Unfortunately this would not seem possible within the framework of current attitudes towards code development.

Variations in Standards

I would like to return to discussion of different space standards being needed for different building types. The foreword to *BS 5810 : 1979* contains the following paragraph:

> *'in the case of certain building types which are financed in the UK from public funds, for example health, welfare and educational buildings, the government departments concerned recommend standards of provision and design including those for disabled people. In certain instances their recommendations are more stringent than those in this code and reference should be made to the appropriate departments, eg. the DHSS and the DES.'*

The inference is clear, that because people are illest and therefore most debilitated when in hospital, they require more critical consideration, which is reflected in more generous standards. The differences are generally small but significant. The DHSS for example, recommend 150mm. more space at the side of the WC for side transfer from a wheelchair, than the British Standard.

This is specifically to allow patients to angle their wheelchair for transfer, according to individual ability and preference, and also to make general manoeuvring easier and provide for easier approach by assisting staff. With the basic British Standard only parallel side transfer is possible.

What then is our experience in the DHSS of inadequate space in hospital rooms?; or equally, of badly-positioned equipment in theoretically adequate space, which can also prevent a room being used as intended? I list the possible effects:

- extra work for the staff;
- the job taking longer;
- manoeuvring being more difficult and less convenient;
- procedures will tend to be more uncomfortable for the patient;
- the patient is likely to suffer loss of privacy;
- heavy and difficult patients will receive attention less frequently;
- because 'unit activity time' is longer, more staff may be required, or the frequency of activities generally may have to be reduced;
- there is a possible 'knock-on' effect that other patient amenities — especially for the less mobile patients — would also be adversely affected;
- it may not be possible to use aids, thus exposing staff and patients to potentially hazardous conditions unnecessarily.

There are direct parallels to these effects in community building situations, and in the home. The activities may not be seen as being as important, in terms of failure or difficulty in carrying out an activity, as in hospitals; but the activities may well occur very much more frequently, which is an equally important criterion, especially in respect of activities by disabled persons.

Qualities of Good Code Provisions

What then should we look for in good code recommendations to accomodate the disabled? Based on my experience of designing for patients in hospitals, I would personally look for:

- the provision must significantly reduce the time taken in essential daily routines;
- the provision must reduce the physical effort involved, both in assisted and especially independent procedures;
- the provision must encourage greater use of the facility, including earlier use during rehabilitation;
- the facility must encourage independent use, and reduce the demand on family or helpers;
- the provision should apply equally to the home, work, or public or other building situation;
- the provision should minimise the need for transfer, or the number of transfers, to and from the wheelchair by wheelchair users; and minimise travel and transfer distances generally, including providing safer and easier assisting conditions for helpers;
- the provision should, where possible, also provide for the needs of the ambulant or semi-ambulant disabled.

Clearly, all provisions in existing codes do not meet all these criteria. The space available and the layout of lavatories, for instance, generally provide dangerously poor 'working conditions' for helpers. It may be that we have to get away from a basic concept of 'adaption' to provide satisfactorily for real need.

At the DHSS for example, we found that a new concept (a combined wc/shower/bidet facility) offered potentially very considerable advantages for spinal injury patients over more conventional facilities. This cuts the time (and therefore the effort) needed for essential daily toilet routines by well over 50%, leaving patients more time, and more able to take part in other amenities available to them.

Apparent Costs

The final point I want to make concerns value for money. It is only comparatively recently that designers generally have come to the realisation that if you design for the 'average person', you will probably end up with a solution which is unsatisfactory for at least half the potential users. A more sophisticated approach is needed, including knowledge of your population distribution.

Richard Neutra, the American architect, put it rather well when he said that it was *'knowledge of the biological variables that must limit arbitrary design'*.

We have progressed to a point where we can accept and discuss rationally whether we need 4, 5 or 6 different sizes of school furniture to cater satisfactorily for children's growth, from primary school through to secondary education. Unfortunately, we still do not seem to see the needs of the disabled with the same clarity.

The needs of the disabled coincide in many instances with those of the very young and the elderly, who, together with the disabled, represent significantly the larger proportion of the total population. In using a 'design standard' geared to the needs of the 'strong mobile adult' only, we are in fact designing for a minority of the population. Design education is very much to blame in that it has consistently failed to recognise this.

Because we still see designing for the disabled as a special requirement tacked on to the 'healthy adult' concept, as opposed to being a part of a total variable population, the needs of the disabled are inevitably seen as involving increased investment costs.

The very existence of a separate 'Code of Practice' for the group is also

seen as supporting proof of this. I don't have to remind you that anything which is seen as being more expensive than we are accustomed to, is not very popular — especially at the present time — whether it's the International Year of Disabled People or not.

To achieve better results, a change of approach may be needed, possibly to integrate this specific data into a more general code. It would of course have the disadvantage of scattering this specific advice throughout a much larger general document. This may not be so useful from a designers point of view, and could in turn, because the data is less accessible, result in the production of less satisfactory designs.

The alternative would seem to be a research and education exercise, to show how *the building and environment value for money balance sheet* is drawn up; to show the savings that can be achieved, by building to standards which actively decrease institutional care system costs, (including the need for costly 'less than satisfactory' adaptations); by increasing the population group able to manage themselves, — starting younger and being able to go on longer in old age, together with the disabled persons group.

Summary

In conclusion, implicit in the 'codes of practice' is the recognition that handicap is the result of a combination of physical disability and deficiencies in the built environment. It is vitally important that some 'slack' be built into the system which takes proper account of the nature of disability, and ensures that codes of practice are not set so close to the threshold levels at which buildings just become possible for disabled people to use, that they largely lose their effectiveness, — or even worse, encourage less than adequate solutions.

There can be few experiences more guaranteed to depress a disabled person in a wheelchair than to go into a WC., and on closing the door, find that you just (and only just) can't turn to manoeuvre into position next to the WC. You have to open the door again, go out (often into a very public place, with a high probability of another customer queuing up to use the only unisex facility available), turn round, apologise, and go in again backwards. It's frustrating, embarrassing, and worse, it's energy-sapping both physically and emotionally.

Codes must eliminate that kind of experience.

Lobbies that are of such a size that you have to open both doors simultaneously in order to pass through, do not perform their function of being draught-or smoke-barriers effectively. They are difficult and potentially hazardous for the 'healthy adult', but they are impossible for the disabled. There is no way that a wheelchair disabled person can cope with two spring-loaded doors simultaneously. Getting it right does not simply make life easier for the disabled, it does the same for mothers (or fathers) with prams, or other frequent everyday activities involving adults or children generally, like carrying suitcases, parcels or shopping bags.

Some ridiculous conventions persist in Britain, and there is evidence that these are more prevalent in the private sector than in the public sector of buildings; reflecting the greater use of *Parker Morris* standards in government funded buildings.

In housing, for example, external doors are bigger than internal doors, and doors to bathrooms and WCs are smaller than those to (other) living rooms — why? It certainly isn't because it's good design, as it completely undermines visual co-ordination; and rarely is it because there is inadequate space for a larger door. It must be that we think it cheaper; but, the 100/150mm. difference must be filled with partition — the blocks must be laid, they must be plastered on both sides, then primed and painted.

In reality the cost difference is so small that it cannot possibly outweigh consideration of greater convenience for day-to-day activities, and reduced damage, to both building fabric and furnishing, during those occasional activities when larger items of furniture or equipment are moved, such as for redecoration or home removal. The disabled could be automatically accomodated, and not require separate or additional consideration.

I believe that the current *British Standard Code of Practice 5810 : 1979* can be improved both qualitatively and in it's range of provisions. But before we do this, we must undertake more objective 'work study' type evaluations to maximise the return from expenditure. Money is the most immediately effective force that we as a community understand. It is very possible that 'codes of practice' by moving significantly away from the 'functional threshold approach', may be able to make important gains in the quality of life for the disabled, their relatives, and helpers (also minimise demand on social services), by reducing the time and effort required for daily routines, and therefore encouraging greater independence at no significantly extra cost to the community.

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Mr Stoneham won the 1980 Bursary Award to research underfloor heating. His full paper will be published soon — here he describes how he went about the necessary research.

1980 Bursary Award
Preamble to the Technical Paper

H G STONEHAM MIHospE

The idea of visiting engineering colleagues in other countries, to learn for myself about their ideas and techniques, has always been attractive. It was therefore with excitement that I learned of the Institute's Bursary Award Scheme, and made up my mind to submit an entry at the first opportunity.

After reading the excellent technical paper produced by the winner of a previous award, David Buckley, my resolve to enter for the award was strengthened. I did not have any particular subject in mind, and my first, and possibly hardest task was to select a suitable subject. Many subjects were considered but none of them seemed right, and as the closing date for the 1980 competition drew near, I began to think that I would not find a subject in time. Then, with just two weeks remaining, I hit on the idea of researching underfloor heating.

My entry was despatched to the Insitute and, thankfully, arrived in time to be considered. After acknowledgement of my entry, a couple of months passed before I was invited to attend an interview. Not surprisingly I was quizzed at some length and depth on my proposals by the members of the Award Panel. A further short, but rather tense, period was ended when I received a notification from the Institute that I had been awarded the Bursary for 1980.

The Institute normally expects the Bursary Award winner to take up the award as soon as possible after it is made, but because I was in the process of changing employment it was agreed that I would defer making my foreign trip for some months. However, there were plenty of other preparations to make. With the help of the Institute, I wrote to Hospital Engineers in Germany and Switzerland to ask if they could assist me. I searched through the journals of professional bodies such as the CIBS, ASHRAE, and of course the Institute of Hospital Engineering. This search revealed that many papers have previously been published on the various aspects of underfloor heating, and copies of these papers were obtained and studied at length in order to build up my background knowledge.

Slowly my itinerary began to take shape. My first visit abroad, in February of this year, was to a trade fair at Essen in Germany. I was invited to join a charter flight for the day. We departed from Gatwick Airport at 8 o'clock in the morning, in a twenty-seat twin-engine aircraft; the weather was clear all across England, but it worsened as we reached Germany. Our aircraft was too large to land at Essen, so we touched down at Dusseldorf International Airport.

Our hosts had laid on transport to take us direct to Essen, a distance of about 30 kilometres. The Exhibition Centre was large with several interconnecting halls, not unlike the NEC at Birmingham. I was amazed at the number of stands exhibiting underfloor heating, and many stands were also showing heat pumps. The whole of the exhibition was directed towards energy conservation.

During my visit I was able to make arrangements to see actual installations and visit factories on my return to Germany later in the year. Our return flight from Germany, at 6 o'clock in the evening, proved rather interesting — during the day the weather had worsened and we took off from Dusseldorf in a blizzard, and endured a bumpy ride until the Channel was reached.

As a result of contacts made during the visit to Essen, and those made with the help of the Institute, I was now able to plan my route in detail. Apart from one further delay, caused by commitments at work, my plans proceeded smoothly to fruition.

I departed from England on Sunday, 17 May, on the 9.30 boat-train heading for Osnabruck in Northern Germany. My scheduled train from Ostende was due to arrive at 00.53 hours on Monday morning, and as my hotel was due to shut at 01.00 hours, I was somewhat worried that I might have to spend the night sleeping rough. However, the ship arrived at Ostende in good time, and I found that by getting a different train and making several changes I could get to Osnabruck by 00.30 hours.

To my amazement everything went well: I had a spectacular ride through the Ruhr, where the many steelworks alongside the railway lit up the sky with a fiery glow. My companions on the train seemed to be mainly young Germans returning to work after a weekend at home. For some reason they regarded me as an object of amusement, but despite the copious quantities of beer that were drunk, remained friendly. The trains ran on time and I reached Osnabruck on schedule.

My first appointment, at 09.00 hours on Monday morning, was with a company who manufacture underfloor heating systems. They had arranged for me to spend a day on their Installation Engineers Training Course. This proved to be an intensive but worthwhile exercise, as it gave me a clear illustration of modern

design methods and criteria. In order to get in as much training as possible, my hosts kindly worked until 20.00 hours with only a half hour break

Furthermore, they had the hard job of speaking almost continually in technical English! After an excellent evening meal, and a short walk around the older parts of Osnabruck — the City features a hall in which the Thirty Years War was ended — I retired to bed.

My second day in Osnabruck was spent in looking at completed installations, and some where work was still in progress. I had the opportunity of observing German building workers and practices. In general they did not appear to differ much from our own. The craftsmen did not seem to work with any greater urgency or precision.

The next day, Wednesday, was a travelling day. I had decided to travel mostly by train, and I made the long journey to Lausanne in Switzerland. My first train took me through the Rhur and down to Koln. I then changed to the Amsterdam-Basel Express. This travels along the Rhine Valley which has some spectacular scenery, with little castles perched on the top of high wooded hills. At Basel I changed trains again for the 2½ hour trip to Lausanne.

My first day in Lausanne, Thursday, was spent at the University, where I was shown the research facilities and discussed the various programmes. The University has produced some controversial results concerning the rate of heat emission from floor surfaces, which have caused considerable debate in other research centres.

Lausanne, the chief city of the Canton of Vaudois is situated on the edge of Lake Leman. A little further along the lakeside is the town of Montreux, which features the Castle of Chillon where Lord Byron was imprisoned. My second day in Lausanne was spent at the Centre Hospitalier Universitaire Vaudois, where the engineering staff showed me around the buildings, and gave their views on the problems of operation and maintenance of the underfloor heating systems installed in the wards and laboratories.

I travelled on to the City of Zurich during the weekend. Zurich, the largest city in Switzerland and chief city of the Canton of Zurich, stands at the head of Lake Zurich. On Monday I met with engineers from a Swiss underfloor heating company to obtain their viewpoint. As in Germany, underfloor heating now occupies a large sector of the market for heating equipment, and can be found in many public and private buildings. The Swiss have approached underfloor heating in their typically precise manner.

Tuesday saw the end of eight days travel and study, with only the flight to London to complete the trip; this being uneventful, I arrived home on the Tuesday evening. I have now the task of making sense of the diverse information that I have collected, and writing the paper for the Institute.

I was most impressed by the response of our colleagues in Europe, who went to great trouble to assist me in every way. One of the most significant factors of the journey, was that practically everybody I met could speak to me in English, whereas I had only a smattering of their tongues. Despite this language problem I would whole-heartedly recommend a visit to Europe.

Product News

Sound Level Meter

Dawe Instruments Limited, have introduced into their range the 1408F, an inexpensive Type 2 Sound Level Meter.

The instrument complies with the requirements of IEC 651, the consolidated revision of earlier international standards and soon to be published as a British Standard. It therefore exceeds the requirements of BS 3489 and ANSI S1.4 Type 2.

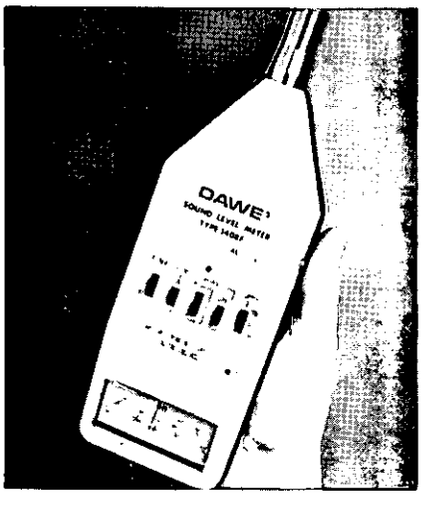
The wide range of 30 to 120dB is covered in three overlapping ranges, with both A and Flat (Linear) frequency characteristics selectable.

Fast, Slow, impulse and Maximum Hold time-weightings are provided to enable the instruments to measure steady, varying or short duration sounds. The maximum hold facility with a decay rate of less than -1dB over 5 minutes, is particularly suitable for measuring the rms level of intermittent or short duration sounds. An ac output is provided to feed tape recorders and frequency analysers.

The instrument can be supplied in a carrying pouch or in kit form which includes an acoustic calibrator and windshield contained in a compact carrying case.

For information contact: Dawe Instruments Ltd, Concord Road, Western Avenue, London W3. Tel: 01-992 6751.

1408F Sound level meter.



Maximising Boiler Efficiency

An average of between 3/7 and 5%, though sometimes as high as 20% savings in fuel consumption, plus reduced maintenance are claimed if boiler installations are adjusted to peak operating efficiency, using the new Thermco P.12 gas analyser.

Portable, electronic and costing less than half the average outlay for single permanently installed instrumentation providing separate readings for CO_2 and temperature, the P.12 measures both continuously, giving a true operating efficiency indication. The same instrument can be used on any number of boiler sites and even where some of these may have integral instruments, can provide a valuable back-up facility against breakdown.

Technical Details

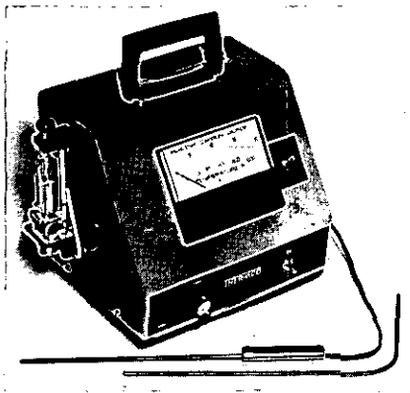
Size: 8ins. x 10ins. x 8ins. (20.32cm x 25.4cm x 20.32cm.)
Weight: 15lbs. (6.80kg)
Method of analysis: Thermal Conductivity.
Sample temperature: 32° to 1000°F

Range: 0-20% CO_2 plus 0-1000°F temperature.

All units complete with a 10ft. sample hose, sample probe, instruction manual, spare filter cartridges, thermocouple and compensating cable, and supplied with carrying case.

Futher information from: A E W Energy Ltd., Walworth Industrial Estate, Andover, Hunts. SP10 5AV. Tel: 0264 61331.

P12 Flue gas analyser.



Miniature Bench Drill

The Minidrill, with a 6.5mm. chuck capacity, measures just 435mm. high by 315mm. deep and is supported on a sturdy cast iron base table 170mm. x 170mm.

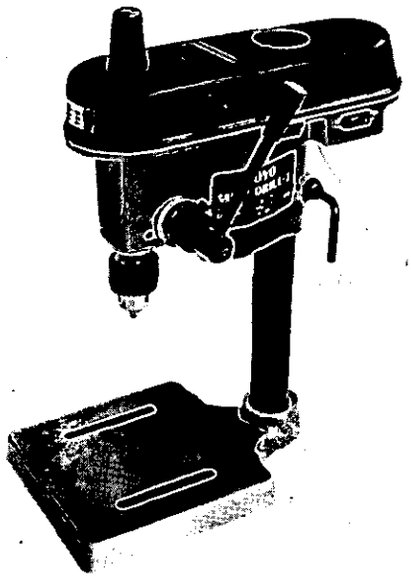
Power is generated by a 220/240 volt motor and transmitted through an easy-change belt and reduction pulley system to provide six drill speeds from 850 to 3100 rpm. A high speed model (7000 — 10,000rpm) is available to order.

The main spindle, precision ground and hardened for both accuracy and strength is bearing mounted at both *ends and has a smooth-action rack* and pinion feed. This is controlled to a maximum of 45mm. by the lever arm incorporating a specially calibrated depth gauge adjustable according to the size of the workpiece.

A lightweight die-cast aluminium headcasing, lowers the units' centre of gravity, giving exceptional stability to the Minidrill; and by swiftly dispersing any heat build up it helps to prevent siezure of the machine during prolonged heavy use.

Literature is available from: Eric H. Bernfeld Ltd., PO Box 111, 17a The Broadway, Potters Bar, Herts, EN6 2HG. Tel: Potters Bar (0707) 43619.

The new Minidrill.



Classified Advertisements and Appointments

For Sale

JOHN THOMPSON COCHRAN 1971 Horizontal Steam Boiler No. 10787 Multipac evaporative rate 25,000 lbs/hr. Max working pressure 150psi. Hamworthy Burner AW1 dual-fired with natural gas or 35 secs gas oil. Two 1978 Continuous Running Feed Pumps type Grundfos CR30110. Regularly maintained in perfect working condition.

Also 60ft steel chimney. Open to offers.

Contact: Rod McIntyre, VITA-Tex Ltd, Buckingham Avenue, Slough. Tel: 75 28181.

SOUTH GLAMORGAN HEALTH AUTHORITY

Applications are invited from Contractors with registered offices within the area of South East Wales for inclusion on the South Glamorgan Health Authority's List of Approved Contractors.

1. General Contractors
2. Electrical Engineering Contractors
3. Mechanical Engineering Contractors
4. Structural Engineering Contractors
5. Civil Engineering Contractors

Applicants are requested to state the value of contract work that they would be prepared to undertake:

£150,000 and over
£50,000 – £150,000
£15,000 – £50,000
£15,000 and under

Applications are also invited for the following small building works and materials:

Blinds, chimney stacks, cubicle rail/curtain track, demolition, door maintenance, fencing, flooring, glazing, garages, greenhouses, sheds, laboratory fittings, landscape gardening, metal fabrications, painting/decorating, partitioning, plant hire, roofing, shelving, shop fitters/joinery, signs, steelwork, suspended ceilings, tarmacadam surfacing, tree felling, wall washing, window maintenance, civil engineering.

All applicants will be considered but, due to the limited amount of monies available over the next few years it may be necessary to restrict selection in each of the above categories. Non-selection will not therefore, reflect on the ability of applicants.

IT IS IMPORTANT TO NOTE THAT CONTRACTORS ALREADY ON THE AUTHORITY'S APPROVED LIST MUST RE-APPLY FOR INCLUSION ON THE REVISED LIST.

Application forms can be obtained from Mr C. K. Davies, Area Planning Officer, South Glamorgan Health Authority, Area Planning Department, Lansdowne Hospital, Canton, Cardiff. The closing date for receipt of completed application forms is 4 september 1981.

To place a classified or display advertisement in this journal contact:

Kate Oriel
Hospital Engineering,
48 Southwark Street,
London SE1 1UN
Tel. 01-403 6166

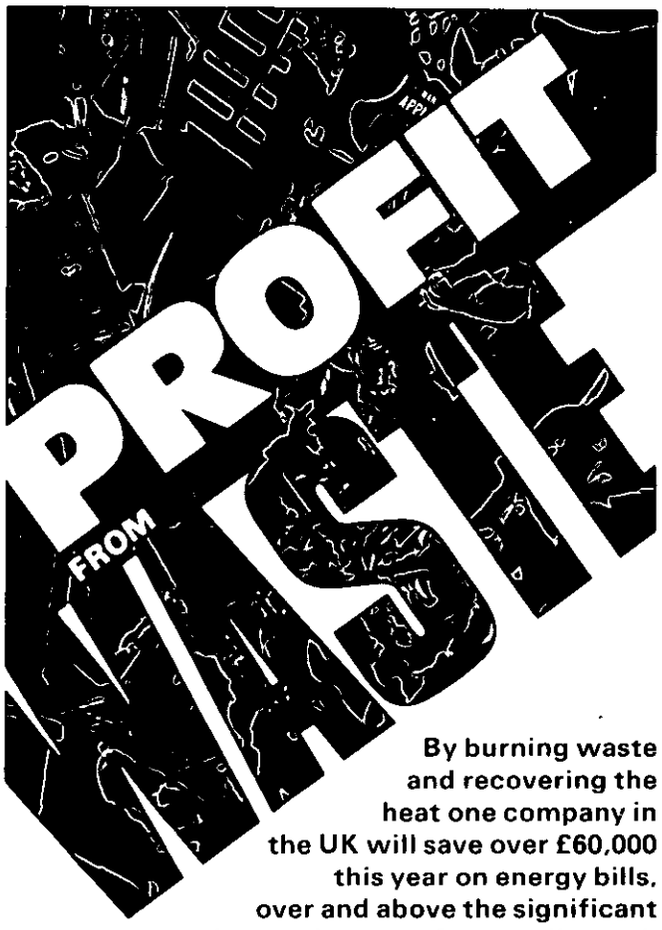
Salford Area Health Authority (Teaching)

SENIOR ENGINEERS

The Authority are appointing two Senior Engineers, to be based at Hope Hospital, Salford, and to be responsible for Day to Day Maintenance and Operation. Initially, one of the two persons appointed will be responsible for commissioning Phase 1 of the Hope Major Development (£15m Contract).

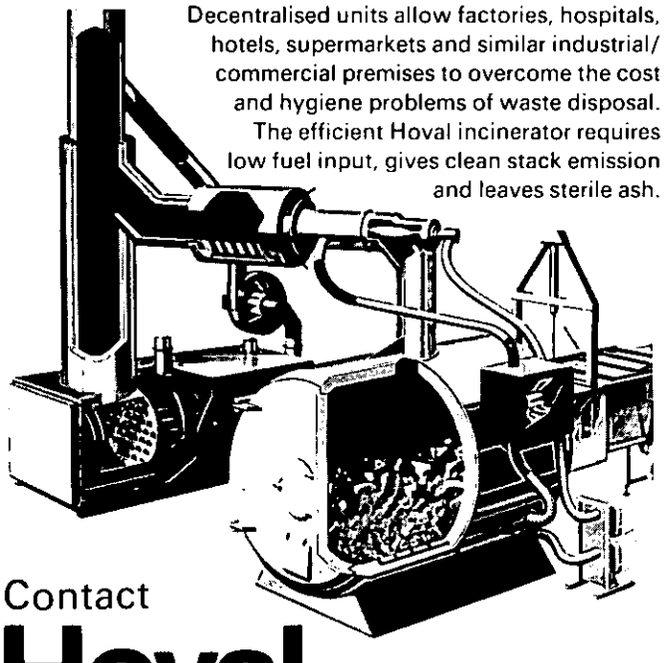
The Salary is £6,822 – £7,896, plus a 13% productivity allowance.

Further details, Job Description and Application Form from Mrs. Brown – 061-707 5000 Ext. 46, or by writing to: Area Works Officer, Salford Area Health Authority (Teaching), Peel House, Albert Street, Eccles, Manchester M30 0NJ.



By burning waste and recovering the heat one company in the UK will save over £60,000 this year on energy bills, over and above the significant saving on the cost of waste disposal.

The Hoval Pyrolytic incinerator, with optional heat recovery pack, is designed to burn most materials and provide an efficient non-pollution answer to waste disposal. Decentralised units allow factories, hospitals, hotels, supermarkets and similar industrial/commercial premises to overcome the cost and hygiene problems of waste disposal. The efficient Hoval incinerator requires low fuel input, gives clean stack emission and leaves sterile ash.



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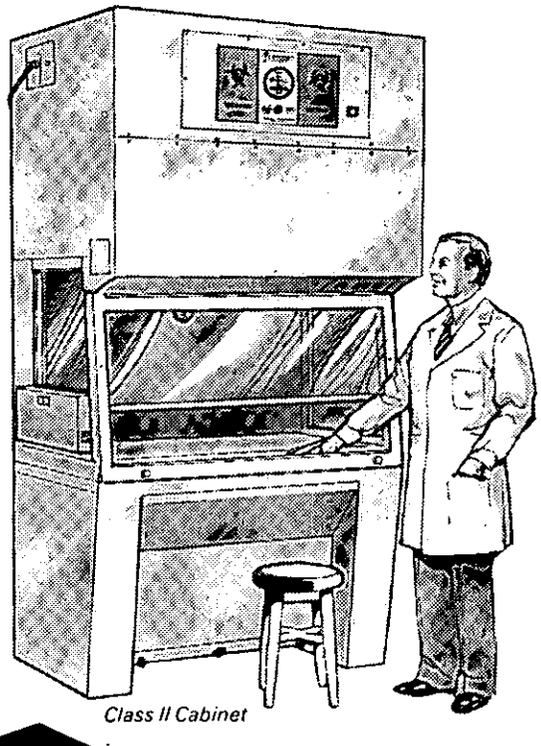

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