Building Metrication News

CONSULTANT EDITOR: ANTHONY WILLIAMS, AADipl, FRIBA

This section, which will appear in the fourth issue of 'Building' each month, will give current news and information on metrication as well as provide a forum for industry in which the ramifications on the change to metric can be freely discussed. It is published in association with the Modular Society.

PLANNING FOR THE CHANGE

In fifteen months' time architects are to start designing in metric measurement and a year later contractors will start the first metric buildings on the ground. Three years after that at the end of 1972 the bulk of the metric change, as far as the construction industry is concerned, is due to be complete. The count down has started but are we prepared? Most trade and professional organisations have now set up the machinery for programming the change and for providing advice and information for their members. But the programme is tight and although within months we shall probably be sick to death of such terms as metric change, metrication and even metri-change, there is little sign that the implications of the timetable have been grasped.

In a year's time we shall need to have beside us revised 'itions of each of our essential reference publications. lders' price books, building regulations, books on umbing and on planning, BRS digests, ministry bulletins, the list goes on and on. But if plans haven't already been made for new editions, publishers and authors will have to move pretty rapidly. Over the coming months we shall need to re-stock every technical reference library in the country. There is, however, a small but irritating detail in need of national agreement. No decision has yet been made as to whether the stop or comma should be used in describing the decimal point. It is in fact a complicated matter and the outcome is unlikely to please everyone. The need for a decision is now urgent and it is the responsibility of the Minister of Technology to make it, so our first plea in Building Metrication News is to Anthony Wedgwood-Benn to come down on one side of the fence.

A change to metric measurement at some time was inevitable. Whatever time was chosen it would have been inconvenient and expensive. The longer it was left the more expensive it would have been. Decisions being made at the present moment in support of the change will determine the success of our use of the metric system for hundreds of years. The opportunity is unique for it allows us not just to change our method of measurement but to rationalise our vocabulary of building components. But it does mean change; change for the size of every component in the country. Let us make certain that we do not play lip service to change while in fact maintaining our existing anarchy of sizes. Certainly this is the cheaper way out in the short term and it is hardly unreasonable for any firm or sector of industry to wish to achieve the change with the maximum economy. But whenever we are debating the extent of the changes involved let us consider not only our immediate technological and economic problems but also the fact that we are determining a pattern for future generations, future exports and future international collaboration. On this will depend our future economy and technology.

The objective of Building Metrication News is to bring together, in one place at regular intervals, news of everything which will help individual firms to plan ahead. We are better able to do this if both trade and professional organisations as well as individual firms let us know how their plans are progressing and what affect the change has. Such information will be very welcome.

ANTHONY WILLIAMS

Anthony Williams, who has agreed to act as Consultant Editor for Building Metrication News, is the current chairman of the Modular Society Council and represents the Society on a number of BSI committees concerned with modular co-ordination and metric change.

He qualified as an architect and practised as a member of the Hertfordshire County Council Architect's Department from 1949 until 1956. He has always contended that the future of building lay in the development of well designed economically viable building components

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NEWS FROM BSI

Point or Comma?

In the May issue of BSI News, a brief questionnaire was published on whether a comma or a point should be adopted for the decimal sign in the UK metric system. The scope of the enquiry was limited to weights and measures expressions in BSI documentation, notably standards, and did not touch on the separate problem of indicating the decimal in decimal currency. The following choices were offered:

1. The comma should be used on metric drawings but the point in text as at present.
2. The comma should be used as the decimal sign in metric quantities but the point should be used in imperial quantities.
3. The comma should always be used as the decimal sign.
4. The point should always be used as the decimal sign.

The results of the voting, published in the BSI News September issue, were:

Choice 1— 28
Choice 2—194
Choice 3—571
Choice 4—667
Others 11

Therefore, from the 1,471 returns so far received, preference appears to be fairly evenly divided between the exclusive use of the point or the comma—a result which, although not unexpected, does not provide a clear lead in any one direction. The arguments for the point, summarised in BSI News, are that it is a long-established and familiar convention in the UK. Much confusion might be caused by changing it, especially as the comma is very widely used—particularly in manuscript—to divide large numbers in groups of three, and also to separate numbers in a sequence. Errors of understanding about the position of the decimal could have serious consequences, particularly in industry and medical dispensing. The importance of aligning decimal sign usage throughout the English-speaking world is also emphasised. It is felt that readers expect documentation in their native language to employ familiar conventions, whereas they are prepared for differences in foreign language publications.

Attention is drawn to the special problems of computer programming, in which the American computer companies have a fairly strong position in most parts of the world. Any software written in the USA uses a point as the decimal sign and would therefore have to be modified (as is now done in Europe) if the UK adopted the comma.

Comma Advocates

The most persuasive argument put forward by the comma advocates is that its adoption is a logical consequence of the UK's decision to move to the metric system, in which the comma—in spite of some exceptions—is the established decimal sign. They indicate the variety of functions now served by the point—as punctuation mark, decimal sign and multiplication symbol—and draw attention also to the existing discrepancies between USA and UK practice (the former uses the base point as decimal, against the UK's base or mid-point). This in its turn leads to confusion with the point used as multiplication symbol.

Common Language

BSI News say that the replies to their inquiry show clearly that there are strong arguments both for and against making a change in UK established practices. It is, however, also apparent that the majority of respondents hope for an internationally-acceptable decision, and attach prime importance to having a common language in the spheres of weights, measures and symbols right across the world as far as that can be achieved.

For the UK, now changing not only to the metric system but also to decimal currency, the choice of one symbol for the decimal sign, applicable in all contexts, is a matter of long-lasting significance and must be made at the national level.

For this reason the scope of the inquiry has now been extended, in consultation with the Decimal Currency Board, to commercial, financial, consumer, business machine and other interests. BSI News hope to report the results of this second investigation at an early date.

PUBLICATIONS

Below are some of the main publications which provide a background to the change to metric.

BS 350 Conversion factors and tables. Part 1: 1959 Basis of Tables. Conversion factors. 15s. Part II: 1962 Detailed conversion tables 25s. Supplement No. 2: 1967 (PD 6203). Additional tables for SI conversions. 20s.

BS 1957 Presentation of numerical values (fineness of expression; rounding of numbers). 3s. 6d.

BS 2856 Precise conversion of inch and metric sizes on engineering drawings. 5s.

BS 3626 Recommendations for a system of tolerances and fits for building. 6s.

PD 6030 Programme for the change to the metric system. 5s.

PD 6031 A guide for the use of the metric system. 7s. 6d.

BS 4011 Basic sizes for building components and assemblies. 4s.

BS 3763 The international system (SI) units. 6s.

PD 5686 The use of SI units. 2s.

The BSI Conversion Slide. 21s.

All these are available from the BSI Sales Office, Newton House, 101-113 Pentonville-road, London, N1.

ANTHONY WILLIAMS

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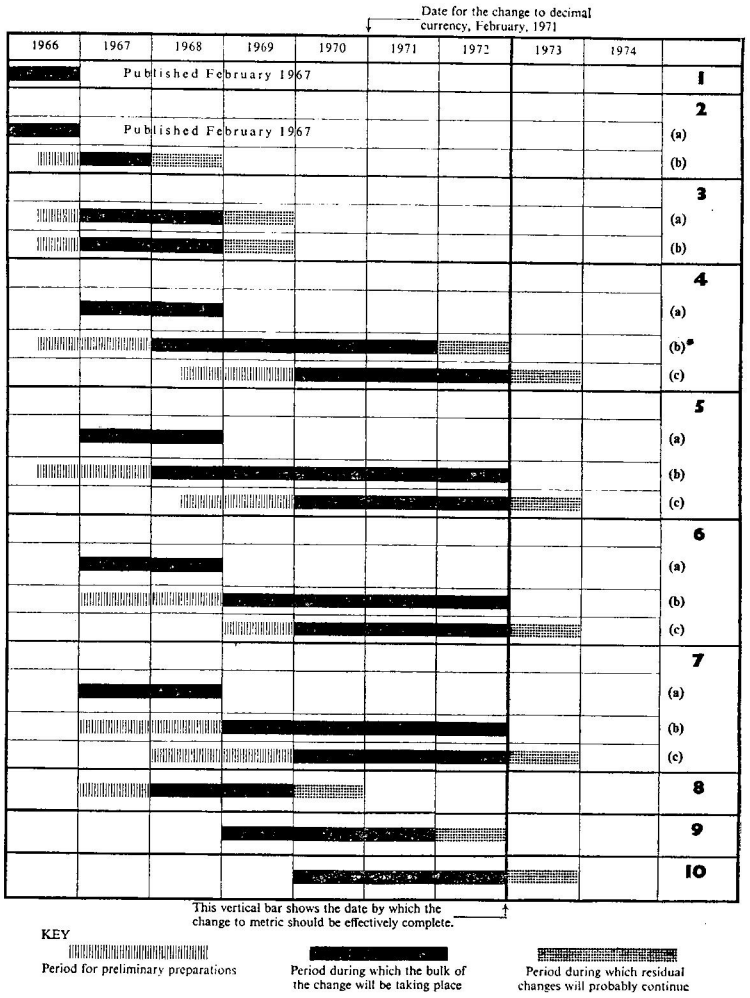
and this led him to join the BSI staff with the job of writing the first report of the European Productivity Agency's project on modular co-ordination. He later moved to the RIBA as head of the Technical Department and concentrated on the establishment of technical information and management services for architects, and in particular with methods of liaison with manufacturing industry. It was during this period that he was instrumental in achieving the adoption of the 'A' series of International Paper sizes which is now so widely used in the construction industry. In 1963 he left the RIBA and was appointed a RIBA Research Fellow on industrialised building. For the next three years he was the London partner of Alex Gordon and Partners when, as part of his work, he was concerned with the design of IBIS. His present practice is a consultancy to industry, specialising in the investigation, design, development and documentation of building components and currently the change to metric and to modular co-ordination is a major preoccupation.

BUILDING METRICATION NEWS

The Construction Industry Programme Chart

The chart shows the programme devised for the change to metric in the construction industry.

1	Time taken to produce the programme
2	Preparatory studies
	(a) Time taken for BSI to produce its construction industry guide to the use of the metric system
	(b) Time required for BSI to produce key dimensional recommendations based on user studies
3	Essential reference publications
	(a) Time required to make available in metric terms essential reference publications of an *official* nature
	(b) Time required to make available in metric terms essential reference publications of an *industrial* nature
4	Products for which dimensional co-ordination is essential
	(a) Time required for manufacturers to provide technical information in metric terms for their products *as they are now produced*
	(b) Time required for BSI to produce metric dimensional recommendations and British Standards for these products
	(c) Time required for manufacturers to change to full production of new metric dimensionally-co-ordinated products
5	Products which are dimensionally related to those in Item 4
	(a) Time required for manufacturers to provide technical information in metric terms for their products *as they are now produced*
	(b) Time required for BSI to produce metric dimensional recommendations and British Standards for these products
	(c) Time required for manufacturers to change to full production of new metric dimensionally-co-ordinated products
6	Products which are not dimensionally related to those in Item 4
	(a) Time required for manufacturers to provide technical information in metric terms for their products *as they are now produced*
	(b) Time required for BSI to produce metric dimensional recommendations and British Standards for these products
	(c) Time required for manufacturers to change to full production of new metric dimensionally-co-ordinated products
7	Products which are only required to have sensible metric sizes and values
	(a) Time required for manufacturers to provide technical information in metric terms for their products *as they are now produced*
	(b) Time required for BSI to produce metric standards for these products
	(c) Time required for manufacturers to change to full production of their products to the new metric standards
8	Time required for manufacturers to produce all measuring instruments for the construction industry calibrated in metric terms
9	Time required for designers and quantity surveyors to change to the production of drawings and documents in metric terms *for all new contracts*
10	Time required for main contractors and sub-contractors to change to construction based on metric drawings and documents produced under Item 9



LETTERS

More Time Needed

Sir,—As manufacturers of building components, the forthcoming change to metric, whilst likely to lead to benefits in the long term resulting from rationalisation, increased productivity and wider markets, presents a whole range of problems.

After the Government had announced its support for the change to metric, the British Standards Institution was asked to organise and co-ordinate the change for the construction industry. The Building Divisional Council of the BSI accepted a suggestion by the Ministry of Public Building and Works that advantage be taken of the change to advance user requirement standards and include the introduction of dimensional co-ordination. Metric change-over has therefore become a change in dimensions adjusted to metric ranges and metric modules. The programme of change has been outlined in the BSI Document PD6030 supported by other Standards still in draft for the control of dimensions in buildings. These show different dimensions for different building types and differing plan disciplines.

The BSI are assumed by Government to represent industry, and their final programme has indeed industry's approval. However, there is a growing feeling that the programme of change may be too tight, and that it would be wise to consider a postponement of the programme until the Government and the BSI representing users and manufacturers have decided upon a system of co-ordination and published their Standards.

There is some apprehension, too, about the cost of the change-over, especially at a time when profits are under considerable pressure. The cost to the manufacturer is far greater than that of merely changing his literature and stock records. For many, new capital equipment would be required, especially as the metric size ranges are usually slightly greater than the foot inch ranges. Furthermore, as maintenance work will require a continuing stock of pre-metric components, it may be necessary to run both production lines together and hold double stocks. There may be similar requirements for export to non-metric areas of the world. Each manufacturer will have to decide whether and when to change, and they are likely to make such a decision on commercial estimates based on return on capital. If costs are to rise no more than is necessary, and there can be no doubt that such rise in cost must inevitably be reflected through to the finished building; if some of the smaller manufacturers are even to remain in business under such increased costs, and if the gates are not to be opened to the import of metric components from overseas, the Government must give consideration to the assistance to industry in the change-over over the short term in ways

additional to any help that may be obtained by way of investment allowances. It is also vital that Government Departments, as the largest direct and indirect consumer of building components, say clearly and soon when they are going to publish specifications and place orders in metric terms.

There is an area of doubt as to whether, indeed, there is a single metric Standard in other parts of the world, and it is essential that the various Government Departments be urged to ensure a place for Gt. Britain on the Councils that will decide such Standards in the future. Government Departments also have a part to play in persuading the various non-industrial bodies concerned in the building industry to consider metric Standards in line with other parts of the world.

In all these deliberations, manufacturers must have their say, and if they do not make their voice heard they have only themselves to blame. The Association of Industrialised Building Component Manufacturers Ltd. representing a growing number of component makers has been urging consideration of the points I have mentioned. I would remind your readers that the British Standards Institution, which was set up by Royal Charter in 1929, gave as one of its objects 'to co-ordinate the efforts of producers and users for the improvement, standardisation and simplification of engineering and industrial materials . . . and to eliminate national waste of time and material involved in the production of an unnecessary variety of sizes . . .'

J. A. de NORMANN

Manager—Building Development Group, ICI.

Effects of the Change

Sir,—Britain's decision to adopt the metric system was a bold, timely and challenging one. In its wake will follow a major programme of change involving far more than mere units of measurement. During the coming years industries will be re-tooling, modifying their products, and in some cases changing complete ranges of products, to line up with continental standards. These modifications in turn will bring about changes in the arrangements for storing and transporting goods. Costing and accounting procedures will be shaken to their foundations. In fact, there is very little that will not in some way or another be affected by the change.

In the Building Industry we draw upon a very large number of component industries, and therefore use many methods and units of measurement. We must ensure that agreement is reached upon the way we use the new system so that proper integration is achieved. The quantity surveyors' need for convenient units of square and cubic measure must be considered in relation to the designers' need for accuracy in linear measure and vice versa. Many of the constants which we have previously taken for granted such as 'K' or 'U' will be replaced with metric equivalents.

We have to be prepared for the problems that arise as we settle into the system. These will be minimised if we concentrate now upon training everyone in its use, so that the transfer is as painless as possible and losses in productivity are kept to a minimum.

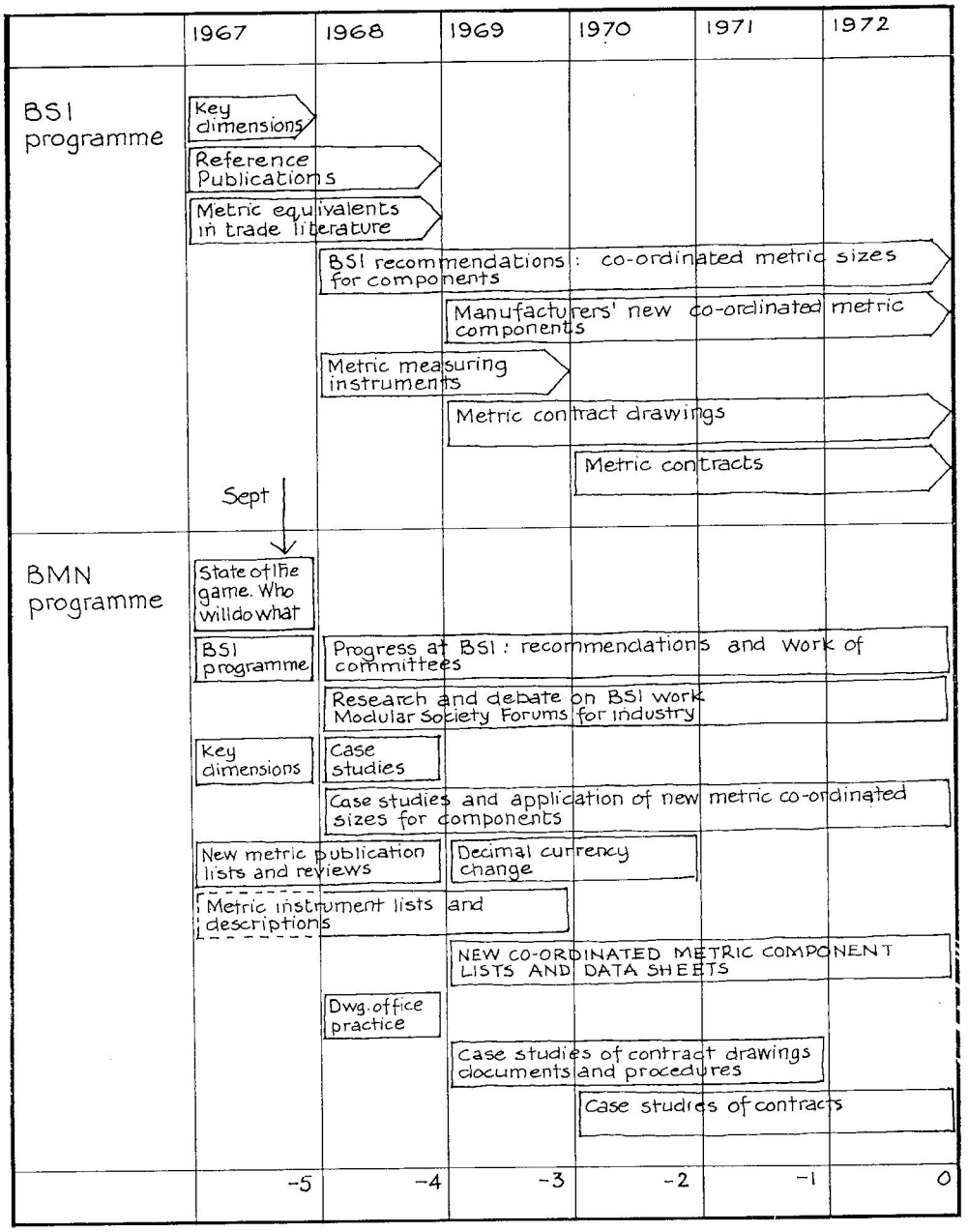
The British Standards Institution is performing the vital function of pulling threads together and promoting interest and discussion in the practical applications of the system and in SI. Thus there seems to be a good chance that the threads finish up in a satisfactory plait and not in the awful tangle which so often results from conflicting opinion or hasty compromise.

We have been presented with marvellous opportunities for renewal, improvement and standardisation which we must not lose.

NEIL WATES [MA]

Director, Wates Limited

1260 London-road, SW16.



Above is an outline of the future programme of Building Metrication News showing how it will develop as the programme for the change to metric is carried out.

The Metric Change

THE CONTRIBUTION OF GOVERNMENT DEPARTMENTS

This article has been contributed by the Ministry of Public Building and Works in their rôle as co-ordinators of development work by central government departments.

It is important to recognise in the change to metric measurements for construction two distinct aspects.

The first is no more, and no less, than converting our thinking and techniques of measurement from the variety of imperial measures to the relative simplicity and coherence of the metric system. At its simplest level this means no more than translating existing foot/inch dimensions into their direct metric equivalents. Such changes would, of course, result in complex decimal fractions, and it is essential therefore to change not only our method of measurement, but also the sizes of building products.

The second aspect of the change is therefore a conversion to new dimensions that make sense in metric terms. But if, in changing to metric, designers and manufacturers must in any case change to new sizes that are more suitable for metric measurement, does it not make more sense to take the opportunity of adopting sizes that are within a co-ordinated framework, and make sense not only in metric terms, but also in relation to one another? This opportunity to make a practical advance towards a degree of dimensional co-ordination that has so far been contemplated only in theory, is an aspect on which the current work of Government building departments is particularly concentrated.

Already in 1962 these Government departments had recognised that greater standardisation, a prerequisite for making progress in the industrialisation of building methods, could only be achieved by centralised development work. For this reason an interdepartmental Building Development Liaison Committee was set up, and the newly-enlarged Ministry of Public Building and Works was given the responsibility for co-ordinating development work in the individual departments. At the same time an interdepartmental Working Party prepared joint recommendations for a framework of co-ordinated dimensions for the buildings for which they were responsible —schools, hospitals, offices and housing— and whose users' requirements they had studied. The results of this work were published as DC1, DC2 and DC3.

In 1965, when the decision to change to the metric system throughout industry was taken, it was recognised that, provided the necessary development work and studies of users' requirements could be carried out within the time-table set for the changeover, the opportunity it offered for co-ordinating dimensions, and thus facilitating the process of rationalising the variety and standards of building components, could not be let slip.

At the same time it was recognised that the implications of the practical achievement of co-ordinated dimensions on industrialised building technology were far-reaching. A joint appraisal by Government Departments of how building technology might develop in the future concluded that it could develop in three ways: first, through the continued use and improvement of systems; second, towards the use of compatible factory-made components available on the free market; third, towards the use of standardised whole buildings. In housing it was felt that all three of these ways were probable: for schools it was thought that both the first and second ways were possible: but, for the majority of other buildings it was agreed that the second way, development towards interchangeable components, was the only one likely to offer the full benefits of industrialisation. The reasons for these conclusions lie largely in the difficulties of organising demand for the majority of building types to allow systems to develop economically. On the other hand, the economic benefits of compatible components can be more readily realised.

Working Party

To take full advantage of these opportunities, the interdepartmental Working Party was reconstituted in 1965 as the Interdepartmental Sub-Committee for Component Co-ordination, under the Building Development Liaison Committee. At the same time, in order to provide the Sub-Committee with the full-time resources it had previously lacked to carry out the technical studies which the co-ordination of departments' work on dimensions and components required, a full-time Component Co-ordination Group was set up working under the Sub-Committee's direction.

In the light of the time-table for the change to metric, the work of the Interdepartmental Sub-Committee has initially concentrated on dimensions in order to provide the British Standards Institution with a clear and definitive picture of the needs of public sector building programmes of which they can take account in formulating standards for the industry as a whole. The first task, now virtually complete, has been the preparation of revisions in metric terms of the original DC documents, DC4 and DC5, giving recommendations on vertical and horizontal controlling dimensions, have already been published. DC6, which gives guidance on the use of these dimensions in planning buildings, is with the publisher. DC7, giving intermediate dimensions such as doorhead and window cill and head heights, will shortly be issued. In addition, Departmental bulletins, giving more detailed information on the use of these dimensions in specific building types, are being prepared.

In Tandem

This work has been directed towards the first stage of the BSI programme: the publication by them of recommendations for key controlling dimensions at the start of next year. The next stages of the Interdepartmental Sub-committee for Component Co-ordination's work has similarly been phased to keep in step with the work of the BSI in producing new metric standards for individual components, tackled in an order of priority which reflects their dimensional significance in relation to other components. To assist in this an arrangement of components within six functional groups — Structure; External Envelope; Internal sub-division; Services and Drainage; Fixtures, Furniture and Equipment; External Works—has been drawn up. Within these groups the various components which combine to make up the group have been identified so that their inter-relationships can be more clearly seen and all the changes resulting from a change of dimensions in one element identified. This work too has been fed into the deliberative machinery of the BSI as part of the Government's contribution to the metric change. The results of the work on dimensional and component co-ordination will lead to basic sizes for dimensionally co-ordinated components. This is the first step towards standardisation; the next must be the standardisation of the other performance requirements for components. Beyond this are the more difficult and long-term objectives of establishing a complete technology of building wherein components can be joined together in the infinite variety of ways required to satisfy the majority of building requirements. This will require study of building accuracy and the economics of tolerances, together with the development of jointing techniques to establish a national code.

Over the next few years the work of Government Departments, through the Interdepartmental Sub-Committee for Component Co-ordination and its Component Development Group, will concentrate on tackling these problems. This work will be Government's contribution to assist industry on making decisions when to retool in metric sizes, and will also present industry with clear co-ordinated requirements for component design and development.

NEWS FROM INDUSTRY

Educational Training

Last February the RIBA Board of Architectural Education held a fairly full discussion on metrication at a meeting of their Schools Committee. This is attended by the Heads of all the recognised schools and some of the listed schools. Following an introduction by Oliver Cox, chairman of the Standardisation Working Party of the RIBA, it emerged from discussion that some schools, such as Portsmouth, were already encouraging their students to design in metric without any particular difficulties arising.

It is clear that for several years architects will have to work in both metric and imperial measures and that students trained on metric in the schools will have to adapt themselves to imperial during their practical training. Members of the Committee who had had experience, for instance, in going from this country to the continent, thought that this would not present major difficulties. Since then it has been suggested that the schools might set up small Metric Working Parties to study the methods and possible difficulties of introducing metric into architectural education and it has now been agreed that the Courses and Forums Committee, which is run by the Schools Committee, will hold a Forum on 'Changing to Metric,' in the spring of 1968. Each school will be able to send a representative to this meeting which will last a day.

Metric and the RIBA

In May last the RIBA's Technical Committee formed a Metric Change Panel to take over the various work being done on various committees and panels within the Institute. The chairman of the Panel is P. L. Cocke, AADipl, FRIBA, the other members being J. M. Austin Smith, CBE, FRIBA, Oliver Cox, ARIBA, Anthony Laing, ARIBA and Alan Roe, FRIBA.

Terms of reference are to consider whether the RIBA should set up an Advisory Service for members in connection with the metric change and, if so, how this should be organised. The report is to be made to the Professional Services Board of the RIBA this month.

The Panel has had two meetings and has circulated a questionnaire to about 30 architects and others who either are concerned with the metric change and the co-ordination of dimensions or who represent a particular section of the industry.

Metrication Consultant

Earlier in the year, the NFBTE appointed A. W. Rickard, BSc(Eng), AMICE, as metrication consultant to the Federation. One of his main functions is to assist the Federation's specialist Metric Sub-Committee—set up 17 months ago—to ensure that the contractor's viewpoint is made known to the British Standards Institution at all stages of the implementation of the building industry's change-over to the metric system.

Mr. Rickard is a member of the staff of John Laing and Son Ltd., where his duties are now entirely concerned with metrication. The Federation's Metric Sub-Committee consists of Mr. G. A. Britton (John Laing & Son Ltd.), A. S. Elett (Gilbert-Ash Ltd.) and G. G. Rice (Richard Costain Ltd.) with the Federation's Technical Officer, Eric Thompson, as its secretary.

Timetable for Aluminium

A special panel concerned with metric standard has been set up by the Aluminium Federation and is currently reviewing all standards and specifications concerned with the industry's products. The time table to which the panel is working is expected to ensure that new metric standards will be in draft form shortly before the end of 1968. These standards will, of course, relate to plate, sheet, strip, extrusions, tube, wire, forgings, castings, etc., and not to the finished products.

Heating and Ventilating Guide

The Institution of Heating and Ventilating Engineers has been working on the problem of the use of the SI system in the services industry since early 1964. Considerable progress has been made, and it is possible that the next edition of the IHVE Guide, originally planned to be produced in 1970 with normal imperial units, will be able to be produced at the same scheduled time using the SI system.

Five Study Group

Five technical study groups within The Association of Industrialised Building Component Manufacturers Ltd. are considering the recent progress of work emanating from BSI. The Association is represented on BSI Technical Committee B/94—Modular Co-ordination in Building, and BSI subcommittee B/94/4—Metric Building Sizes (Advisory) by their general manager, V. L. Cox.

Volunteer Speakers

The scheme to provide volunteer speakers on the metric system, conceived jointly by the Building Centre and BSI, has met with a good response. Over 100 firm requests have been received from all over the country, and in addition there have been many individual inquiries for further information. The panel of available speakers, which includes architects, surveyors, and civil and structural engineers, has increased from 100 to 130. Any group or association with interests in the construction industry can obtain a speaker simply by getting in touch with Gorden Steele, Education Officer at the Building Centre, 26 Store-street, London, W1. They should give details, date, place and time of the meeting and indicate the type of audience expected. The Building Centre will then select a suitable speaker from their list, ascertain that he is available, and then pass his name onto the inquirers for them to make the necessary arrangements.

The Building Centre have found that as well as single lectures, there has also been a call for one or two day conferences such as those at Birmingham and Bristol noted in our Coming Meetings column. The Birmingham meeting is expected to attract an audience of 1,000. Manufacturing firms are also showing a great deal of interest, one request coming from as far afield as the Channel Islands.

The Modular Society

Following this year's AGM on Monday, 2 October, at The English Speaking Union, 37 Charles-street, Berkley-square, London, W1, The Modular Society is to hold an informal meeting on the society's rôle in the change to metric. The discussion will be opened by K. M. Wood, BA, FCA, chairman and joint managing director of Concrete Ltd., who has recently returned from serving as Industrial Adviser on Housebuilding to the Minister of Housing and Local Government.

The Chair will be taken by Professor Misha Black, OBE, RDI, PPSIA.

The AGM is called for 6 p.m. and the meeting will begin at about 7 p.m. The cost of attendance is £1 which includes a buffet supper (served at 6.30 p.m.).

COMING MEETINGS

THURSDAY, 12 OCTOBER

Change to the Metric System

One day symposium at the University of Aston, Birmingham, organised by the RIBA West Midlands Region in collaboration with the Birmingham Branch of SAAT and the Birmingham School of Architecture. Starts at 10 a.m.

WEDNESDAY, 25 OCTOBER

Standardisation: The Way Ahead

A seminar for the building industry organised by The Modular Society in co-operation with the Royal Society of Arts held at the Royal Society of Arts, John Adam-street, London, WC2. Meeting from 10 a.m. to 4.15 p.m. Tickets 45s.

FRIDAY, 27 OCTOBER

"The Transfer to the Metric System in the Construction Industry."

Bristol meeting starting 4.30 p.m. Friday to mid-day Sunday, organised by the University of Bristol, Departments of Architecture and Extra Mural Studies. Fee £9.