

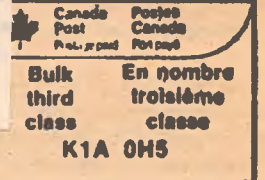
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Measurement units

Innovations for scientists and consumers

A symposium sponsored by the U.S. Metric Association and the American Association for the Advancement of Science held in January in Toronto focussed on innovations in measurement for scientists and consumers.

Among the guest speakers were Sydney Andrews, member of the U.S. Metric Board and director of the standards division of the Florida Department of Agriculture and Consumer Services, who presented a paper on the effects of change on society (See text below).

Howard Layer, U.S. National Bureau of Standards in Washington, gave a talk on the laser wavelength measurements related to a definition of the metre.

Kenneth Evenson, National Bureau of Standards, Boulder, Colorado, also spoke of the laser frequency measurements as a means of redefining the metre.

Howard Faulkner, professor of

technology and coordinator of metric studies, University of Southern Maine, gave a talk on metric language for computers.

Paul Boire, executive director, Metric Commission Canada, gave a talk on the Canadian program with emphasis on special uses of the litre unit in North America.

Members of a discussion panel were John Sargent, McDonell Douglas Canada, Ltd. in Toronto; Mario Iona, professor of physics, University of Colorado; and L.A. Zadeh, professor of computer science, University of California.

Frances Laner, consultant in technical communications and manager of the Rocky Mountain Region of the U.S. Metric Association in Denver, Colorado, who arranged the symposium, provided the following report summarizing the findings of the meeting.

The symposium presented reports of new developments related to

the science of measurement. The focus on the role of scientists and consumers in making a transition to the modern measurement language, the International System of Units (SI).

Measurement provides many-sided activities in the lives of all world citizens, and also provides a useful bridge for scientist and consumer to meet. Thus, an excellent opportunity exists in which both may derive benefits from well-developed and planned goals.

How such goals may be attained are no better described than in the achievements made by Canada to introduce the new SI units to replace the traditional ones in use. Managing such a change requires prudent planning of effective and yet flexible programs to obtain nonchaotic and noncostly results. A brief summary was given of Canada's progress, with special stress on the use of the litre unit for

specific products recently changed or being targeted for early change.

Programs in the United States were presented briefly. The focus was to describe the difficulties inherent in programs which must be suited to large populations. The benefits of uniformity in any activity are never completely attained when loss of traditional concepts causes concern. Secondly, some doubts were expressed in solutions under a voluntary effort. In many respects, such efforts easily become frozen through the structure of organization which prevents a rapid approach to problems.

In the realm of scientific endeavors, new data was reported of measurement experiments which relate specifically to an accurate definition of the standard of length, the metre. Results in wavelength and laser frequency experiments of recent date were of interest. Measurement science

does not remain rigid or static, and the new findings will have far-reaching effects on the science discipline. Such findings, however, need not concern the consumer in the early period of changes.

Finally, ways were described in which modern measurement methods can be approached through the computer. With the rapid succession of computer uses for a myriad of activities, the advent of metric computer language enhances innovations. The critical role in fostering innovations in conversion programs must come from the governing bodies of a nation. Inadequate legislation limits progress and only serves as a barrier to move ahead. The adoption of a universal uniform system of measurement will also lead to better communication and exchanges among nations in all fields of science and human endeavor.

The effects of change on society

by
Sydney D. Andrews, Member
United States Metric Board

Use of the metric system in the United States was legalized by Congress in 1866 but it brought about very little change on society in the country. This new measurement system which had evolved from the introduction in 1791 of two fundamental units — the metre for length and the gram for mass — by the Paris Academy of Sciences, had spread throughout many countries of the world. Unfortunately, it did not gain general acceptance in this country, and except for the scientific community little change was noted because of it.

Following World War II increasing international trade with countries which had adopted the metric system brought a renewed awareness of this simple system which led to a study authorized by Congress in 1968. The study concluded it would be in the best interest of this country to convert to the metric system in a planned and coordinated manner over a specified period of time. Such a recommendation was made to Congress which ultimately passed the Metric Conversion Act of 1975.

This Act deleted all reference to time frames and emphasized that

conversion should be on a voluntary basis. It provided for a seventeen-member United States Metric Board to carry out the provisions of the Act, the members to be appointed by the President and confirmed by the Senate. The Board was given no mandatory powers, but was directed to carry out programs of research, education, and public awareness.

Many metric advocates have expressed disappointment in the Metric Conversion Act of 1975, and the actions of the Board in carrying out its policies. This is due largely to a misunderstanding of the provisions of the Act, and the authority granted the Board. Membership on the board is a microcosm of the country, its members coming from different parts of the country, from different segments of the economy, with differing views on metric conversion — even differing opinions of what the Congressional intent was in passing the Act.

Because of these many differences, progress has been slow, but the Board has taken some action in many areas. In the public sector the Board has been quite active. An Interagency Committee on Metric Policy, consisting of representatives of forty-three government agencies has been established. This committee is chaired

by the Chairman of the United States Metric Board and made up of officials at the policy making level from these agencies. Its operational functions are handled on a day-to-day basis through the Metrication Operation Committee which is made up of lower level officials, and for which the U.S. Metric Board supplies the Secretary. The Federal Government Metric Conversion Policy and the guidelines for implementing this policy have been published. It calls for the increasing use of the metric system within the federal government and provides for assistance in developing and coordinating cost-effective metric conversion activities. A recommendation to include metric units in all press releases has been circulated to federal agencies as part of the responsibility for increasing public awareness of the metric system.

Guidelines for the implementation of the policy developed by this interagency committee calls for the agencies to establish employee metric awareness programs and to develop education and training programs for metric usage. They also call for the adoption of metric units and practices within each agency and emphasize acquisition of metric products and services when available and appropriate.

Individual agencies have chosen different plans for metric conversion depending on their needs. The Defense Department, taking into account their need for compatibility with Western European countries, has set a target of 1990 by which time procurement standards for equipment must be available in terms of metric units. The Department of Commerce with its interest in international trade, and its responsibility for a common measurement base for commerce and industry, has announced a goal to convert all appropriate departmental activities to metric usage by 1985. The Department of Agriculture, which continues to increase its interest in international marketing of agricultural products, has already converted the recording of these quantities to metric units.

Even though there has been much progress toward metric conversion at the federal level, there have also been some problems. The plan of the Department of Transportation for the replacement of highway distance signs was rescinded following adverse comments from the public. Also, a plan to introduce metric units into weather reporting has been held up until it is felt that education and awareness can better prepare the general public for acceptance.

The Metric Board has developed liaison with state metric councils, and committees, through a series of regional meetings, and one national meeting at which time the National Council on State Metrication was formed. It is felt that this liaison will not only provide better metric communication nationwide, but also increase awareness. This organization can also be very helpful in eliminating legal barriers to metric conversion that may exist in various state jurisdictions. The Metric Board also is working cooperatively with the National Conference on Weights and Measures, which is made up of state and local weights and measures officials, to try and bring uniformity and rationalization as the marketplace changes to the metric system. Weights and measures officials who have traditionally been the watch dogs of the marketplace will have added responsibilities during the conversion period to point out deceptive or misleading practices during the inevitable confusion which will accompany a change of this kind, and they will be able to take legal action against those unscrupulous enough to practice fraud and

(To page 4)

New Zealand reports on conversion in engineering

The following report, based on replies to a questionnaire received from 110 engineering establishments in New Zealand, was prepared and sent to MCC by W.B. Beaven, chairman of engineering and engineering servicing industries sector committee, Department of Trade and Industry, New Zealand.

1980-07-21

Metric conversion in engineering manufacturing: Third survey

This report is based on replies to questionnaires received from 110 engineering establishments. The forms were sent out in January 1980 to representative firms whose figures it was believed would give a realistic indication of the volume of metric production in each of fourteen manufacturing categories. The 1980 survey covered two manufacturing categories not included in the two earlier surveys. The new classes are Component Manufacturing Sheetmetal Products.

The survey forms provided for a description of each type of product manufactured together with the percentage of each made to metric dimensions. Also requested was the percentage of total manufacturing now metric. For the first time the 1980 questionnaire also asked for the extent to which catalogues and advertisements are produced in metric terms and the percentage of incoming orders asking for products in metric. Firms taking part in the survey were invited to comment on difficulties or other factors inhibiting the greater use of metric design in engineering manufacture.

In summarising the mass of detailed information on the survey forms the Sector Committee found it necessary for the purpose of this report to make a number of assumptions, but these have been soundly based.

Overall progress

Not surprisingly, the 1980 figures do not show the significant increases in metric manufacturing produced in the 1978 survey. This, however, seems to be characteris-

tic of the final stages of most major changes involving large numbers of establishments. The current survey did highlight a number of problems, some of which will diminish with the greater availability of metric materials and components. There are other problems including those arising from delays in converting overseas designs, standards for hydraulic fittings and the need to maintain quantities of imperial spare parts, for which adequate solutions are not likely to be available in the short term.

Materials and Components

There were fewer reports of difficulties with raw materials than in previous years' surveys, although there are still complaints that metric steel and metric stainless steel in the required manufacturing sizes are not always readily available. Shortages of metric fasteners, especially stainless steel fasteners, were reported. Shortages of metric engineers' studs and specific sizes of shafting were also among the items causing difficulty.

Manufacturers should pass details of their complaints to suppliers, and where appropriate this Sector Committee will assist in overcoming the difficulties providing the Committee is informed of the circumstances promptly.

Design

Some 20 manufacturers are finding that the need to conform to overseas imperial designs or use products made to inch dimensions, principally from North America, is limiting their metric output. Although the use of overseas design is governed by decisions outside the immediate control of many New Zealand manufacturers, it is clear from the comments entered on the questionnaires that a number of manufacturers have found a need to modify the overseas design to incorporate locally-made metric materials and components. *Clearly there must be many cases where it is to the advantage of our manufacturers to urge their North American associates to change to*

an arrangement where the local people could have control over some part of the product or at the very least, they could press the overseas firms for details of their metric programmes and timings.

In this way we should aim at firmly establishing the target of reducing the inch dimensioned part of the product to such a small percentage of the total that the specifications can be purged by soft converting these imperial dimensions without any physical change in the size of the parts.

Pipes

There is some misunderstanding about pipes and a number of manufacturers are under the impression that physical changes are to be made. This is incorrect. RSP threads, based on the Whitworth thread, have been standard on the Continent for many years and there is no intention of departing from them. It is recommended that the nominal bore of the pipes be expressed in millimetres, e.g., 6, 8, 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 125, and 150 mm.

Editor's Note: Better have a closer look at this, lads.

Hydraulic Fittings

The complex situation that has arisen with hydraulic fittings has been accentuated by the introduction of plastic materials with the result that there is now a demand for replacement imperial fittings, metric fittings and also for fittings for plastic hydraulic hose. The International Standards Organisation has been asked for information on this subject and their reply will be circulated to the engineering firms concerned.

Catalogues, Advertisements and Orders

Of the surveyed firms which issue catalogues 57 percent use metric units exclusively in their publications but only 44 percent of advertisements are solely in metric terms. As could be expected there is a relationship between the percentage of incoming orders asking for products in metric (52 percent) and the extent to which manufacturers use only metric units in describing their products.

The continued use of imperial units in printed matter encourages people to cling to the old units and is counter productive to much of the work undertaken to promote the change.

Category 1 - Heavy Engineering

Firms Surveyed: 8
Metric production in the eight firms surveyed in the heavy engineering category remains at 80 percent of total production, a figure that might be improved by the conversion of more overseas designs used in the industry.

Category 2 - Structural Steel

Firms Surveyed: 8
With 93 percent of the production in metric terms the programme for this category is virtually complete. The use of old stocks of material and work on some contracts involving modification of existing imperial structures account for most of the small percentage of existing non-metric production.

Category 3 - Construction Equipment

Firms Surveyed: 8
Metric production in the participating firms has remained at 65 percent. Dependence on overseas designs from imperial countries is the main factor restraining greater progress.

Category 4 - Industrial Trucks

Firms Surveyed: 6

This group has progressed to 65 percent metric production from the 1978 figure of 50 percent. The continued use of imperial overseas designs and components, and shortages of some metric materials in this country, are the principal problems entered on the survey questionnaires.

Category 5 - Agricultural Machinery and Ancillary Equipment

Firms Surveyed: 11

This category advanced from 72 percent to 81 percent. The use of long life production equipment, overseas designs and problems in procuring suitable metric materials and fastenings have slowed the rate of change. The notes earlier in this report should eliminate doubts about BSP threads though problems arising from non-metric hydraulic fittings are likely to remain for some time.

Category 6 - Heating and Ventilating

Firms Surveyed: 5

The continued use of imperial tooling, overseas design and components have held the percentage of metric production at the 1978 figures.

Category 7 - Producers Plant Equipment

Firms Surveyed: 15

The percentage of metric production remains at 70 percent. The results from this manufacturing group illustrate the difficulty of maintaining momentum in the final stages of the change. High costs of retooling, problems with overseas design and components, and shortages of metric materials in suitable sizes are said to have retarded progress.

Category 8 - Pumps

Firms Surveyed: 7

Several manufacturers were not aware that the nominal bores of pipes will be expressed in millimetres without any physical change in the nominal bores or threads. The problems of converting spare parts were also raised although in most cases the dimensions of these parts should be capable of being soft converted.

Category 9 - Transport Equipment

Firms Surveyed: 4

Metric production by members of this group has moved from 64 percent up to 82 percent which is a considerable advance in view of the extent to which manufacture is carried out to overseas design.

Category 10 - Valves

Firms Surveyed: 9

At 63 percent metric production has not really progressed during the last two years. The cooperation of local authorities is being invited in stimulating a demand for valves with flanges in metric sizes.

Category 11 - Power Transmission

Firms Surveyed: 5

Metric production remains at 90 percent with much of this in the form of soft conversions. Work is proceeding on a number of British Standards for transmissions. A number of International Standards are available for transmission chain and also for conveyor chain. Manufacturers should consult the Standards Association of New

Zealand for information on standards for power transmission.

Category 12 - Fasteners

Firms Surveyed: 2

The number of comments from manufacturers about shortages of fasteners has decreased. Metric production of New Zealand-made fasteners is touching 65 percent, a figure that is likely to increase rather slowly owing to the continued demand for high tensile imperial bolts and also for imperial set screws from firms associated with the mechanical maintenance industry. A number of manufacturers reported difficulty in procuring high tensile metric fasteners, in some cases from overseas sources.

Category 13 - Engineering Components

Firms Surveyed: 13

This group was not included in earlier surveys. Though the overall percentage of metric production was a low 41 percent the performance of the 13 companies was far from uniform. The continued use of imperial screw threads in a number of industries, the high cost of retooling and the slow run down of stocks of imperial materials and components were offered in comments on the low percentage of manufacturing now converted.

Category 14 - Sheetmetal Products

Firms Surveyed: 9

Sheetmetal manufacturers were surveyed for the first time and recorded 86 percent metric production. The main comment from the group was about the poor supply of stainless steel fasteners and sheetmetal and also shelf stocks of metric drills, reamers and taps.



Errata

The article, *Lummus leader in metric education of employees*, on page 4 of the 1980 - 10 issue of the *Metric Monitor*, contained some errors.

- This multi-national company is properly called The Lummus Company, a Subsidiary of Combustion Engineering Inc. The corporate offices of The Lummus Company are located in Bloomfield, New Jersey.

- The head offices of Lummus Company Canada, Ltd. are located in Toronto and not in Calgary as reported in the article. There is a branch office of Lummus Company Canada, Ltd. located in Calgary.

- The Metric Conversion Administrator for The Lummus Company and other companies within the C-E Engineering Group is Mr. Svante Humbla.

Corsica is part of France and not of Italy as stated in an article by Keith Studman on page 6 of the November issue of the *Monitor*.

The person appearing in a photograph with New Brunswick metric information officer Aldéo Daigle on page 4 of the December issue of the *Monitor* is Anne Lagassick from the N.B. Department of Agriculture and not Sheila Kerr as shown in the caption.



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Problems anyone?

As I read the *Monitor* and discuss metric conversion with my co-workers, I can't help wishing that the writers for the *Monitor* would be a little more objective and complete in their reporting.

The articles describe SI and conversion only in a positive light, with all the pluses and successes and none of the negatives, failures and problems which undoubtedly exist. This one-sided approach makes conversion seem like a con-job, rather than the good idea it is.

Please, respect the intelligence of your readers and give us the real picture. Who knows, someone reading of a problem may have the answer to it. Someone else reading of a solution may be able to adapt it to his problem. At any rate, it will make the *Monitor* more interesting to read.

Todd Pennington
Metric Coordinator
Marine Directorate
Public Works Canada

Editor's note: If you have a problem to solve or want to tell how you solved your problem, please write to us.

Peterborough architect says metric is simpler

The following is part of a series prepared by the Public Awareness Sub-Committee on Construction (PASCON) made up of volunteers from the construction industry.

Building in metric isn't difficult once everyone learns to speak the same (SI) language, says the architect of Peterborough's new metric public library.

In fact, it has been easier than many anticipated.

The building in question is, according to the library representative Pat Godden, "the best-looking building in Peterborough (Ont.)."

Architect Raymond Moriyama's striking design is a 12,000 m², two-level structure based on a series of radial and curved lines stemming fan-like from a central point.

"It was our first metric project," says Anson Finlay, architect with the firm Moriyama and Teshima Architects. "In our view, construction is simpler in metric. But we had to gear up for it."

With a number of reservations and the desire to comply with metric conversion within the construction industry, the firm wrote its standards and specifications in SI (International System of Units). Now the firm drafts their designs in metric whenever possible. (Sometimes it isn't feasible for renovation projects on older buildings.)

"Personally, I think metric dimensions are as efficient (as imperial) if not more so," reports Finlay. "Dimensioning is simple —

it's a division of 10. The whole thing is to get your head thinking metric. The trick is to imagine space in metric terms."

He estimates it took three or four months into the project before all connected with it were thinking in metric units. Until then, many workers kept a calculator or a conversion guide in one of their pockets.

The decision to build with metric dimensions was spurred by the selection of Peterborough some years ago as a pilot city for general metric conversion.

"There weren't too many problems working in metric," he reports. "But, there was the normal wish to convert all the time."

"The job was entirely in millimetres and metres," he adds. "We haven't had nearly the trouble I'd anticipated."

Godden had an advantage, however. He was taught the metric system in school in England so he already spoke SI.

"Most of us from Europe have had some schooling in metric," says Godden.

He wasn't the only one with this advantage. Ken Pickthall, Ontario manager for Pentagon Construction, the general contractor, reports that many of the laborers shared Godden's knowledge of the SI language.

"Metric conversion is new to the native Canadian worker, the carpenter and the laborer on the job site," he explains, "but a lot of carpenters and laborers from Germany and Scandinavia fit in readily."

"They've been working in the

imperial system in Canada but they were brought up using metric. They found it quite easy to revert back to the metric system. We were fortunate enough to get a carpentry foreman with a Scandinavian background. He was fully conversant in the metric system."

Working in metric hasn't resulted in materials savings for this project. Says Pickthall, "It doesn't make any difference if you're working in feet, yards, inches or millimetres. It's the size of the building and the height that dictates the amount of product going in."

Nor has using metric saved time — perhaps because the custom design offers few repetitive features. Instead, credit for being ahead of schedule has been given to Pentagon Construction for their good management. In short, it made little difference to the contractor, but it had made the architect's job easier.

Pickthall does have one bit of advice for contractors venturing into metric construction — watch suppliers who have soft-converted.

He explains: "Some suppliers in soft metric feel there is a certain amount of play from the required metric dimension, which there isn't."

"When an architect designs in metric, he wants that exact dimension. Some of the suppliers felt there would be an inch or so play in the standard size they've been used to."

But a few words when ordering should prevent delivery of unusable material.



Glenn Nishimura



Joyce Miller

Meet the U.S. Metric Board

The Monitor continues its series of short biographical notes on the members of the U.S. Metric Board.

Glenn Nishimura, representing consumers on the U.S. Metric Board, is executive director of Arkansas Consumer Research in Little Rock, a private organization researching and advocating consumer interests in utilities, health care, food costs, tenants' rights, and citizen participation in decision-making.

Mr. Nishimura is vice-president of the Consumer Federal of America, and serves on the Boards of the Central Arkansas Health Systems Agency and the State Advisory Board on Weatherization. He has served on the Arkansas Attorney General's Consumer Advisory Board since 1975. He holds a B.A. degree in mathematical economics from Brown University.

Joyce Miller, a member-at-large on the Metric Board, is Vice-President and Director of Social Services of the Amalgamated Clothing & Textile Workers Union. She holds a Master's degree from the University of Chicago, and taught psychology and sociology at Wilkes College in Wilkes-Barre, Pennsylvania. She served on the staff of the National Consumers League in Cleveland, Ohio, and the Cooperative League of the U.S.A. (in Chicago, Illinois).

Ms. Miller is national president of the Coalition of Labor Union Women and serves on the AFL-CIO Standing Committees on Civil Rights and Community Services. She is a trustee of both the George Meany Labor Study Center and the German Marshall Fund of the U.S. Active in many other equal rights and labor organizations, she serves on the Executive Board of the Girls Clubs of America, the Settlement Housing Fund, the Rochdale Institute, the Jewish Labor Committee's National Trade Union Council for Human Rights, and the National Consumer League.



Peterborough's new library

Tool and die shops go metric

Sector plan flyers with details of key events and a bar chart showing the timetable for metric conversion developed by the representatives of a particular industry are published by Metric Commission Canada after concurrence by sector committee representatives, the relevant steering committee, and the Commission itself.

The plan flyer for Sector 2.33, Metal working machines, machine shops, tool and die shops and cutting tools was published recently. This sector plan is aimed at the industry becoming predominantly metric in all phases of operation by June 1982. Various practical considerations necessitate that in some instances dual business operations will continue for a considerable period thereafter. Notwithstanding the June 1982 industry target date, a large number of tool and die and machine shops associated with automotive and agricultural

equipment manufacturers have already converted in order to keep pace with customer requirements.

The sector plan broadly describes the industry's approach to metric conversion and defines those areas that individual companies should consider when pre-

paring their own more detailed plans.

If you would like to receive the summary of the plan please write to the Canadian Tooling Manufacturers' Association, Box 2204, Walkerville Postal Station, Windsor, Ontario N8Y 4R8.

Metric a matter of method

I perused with some amusement a recent Gallup Poll (*Citizen*, Oct. 18), according to which the difficulty of Canadians has increased in digesting successfully the application of the metric system. Galileo, if he could emerge from his grave, would certainly be surprised that almost four hundred years later his discovery would still cause headaches in our advanced society.

As one who has taught engineering for years on the sideline, my personal experience is that students who had difficulty using

the metric system lacked proper training at high school in handling and understanding the system of decimal fractions. Many of the mathematics teachers themselves are on uncertain grounds when it comes to building a passable bridge between the students and themselves.

There is nothing to be learned about mathematics. Everything has to be understood. It could be a beautiful, intellectually satisfying subject when properly taught and understood, instead of a boring,

How can I start?

The following is taken from the new MCC leaflet "Building in Metric" made available to the construction trades in Canada. Copies are available free of charge from Metric Commission Canada, Box 4000, Ottawa, Ontario K1S 5G8.

"How can I start building in metric when all the materials and products I need aren't available yet in hard metric sizes?"

This question is frequently asked by people in the construction industry who are newly aware of the industry's metric conversion plan and the developments associated with it. It is a question that was addressed just over five years ago by the industry committee planning metric conversion in construction, namely Sector Committee 5.01 of Metric Commission Canada. At that time, the committee prepared a report on the standard metric-sized materials and products needed to build a metric building.

As has been said, you don't need a metric-sized spade to dig a metric-sized hole. The most obvious illustration of this is the wood stud. The actual dimensions of a stud have no bearing on the dimensional framework that governs a building's size. Indeed, the

actual size of a standard wood stud — nominally two inches by four inches — has changed on more than one occasion in the past without changing either the dimensions of buildings or the construction technology employed. What is critical, however, is the spacing between studs because this does affect the dimensional framework. It follows, therefore, that for a metric building, it is critically important for the panel materials fixed to the studs to be in rational metric dimensions.

In considering the matter, the construction industry's metric committee carefully studied the entire construction process to determine which materials and products were in fact "essential" to metric building. The report which resulted contained a list of such materials. The list was surprisingly short and is shown below, suitably revised to reflect the industry's experience over the five years since it was first presented.

The following materials and products are considered necessary to be in rational metric dimensions. All items have a functional effect on either the dimensional framework of a building or its structural design:

- precast concrete components
- rolled steel sections
- metal siding
- unit masonry (brick, block and tile)
- panel products (surface dimensions only)
 - plywood
 - particle board and other wood-based panels
 - gypsum
- non-ferrous metal extrusions
- glass (surface dimensions only)
- wood and metal windows
- wood and metal doors
- ceiling panels and tiles
- prefabricated partitions
- recessed light fixtures

feared and hated hour on the syllabus.

I guess a lot of money has been spent on such nonsensical polls. I would suggest that this money should be spent on tuition, free for the students of all ages and those interested. Naturally, the instructor should be someone who was educated and grown up in a community where the metric system was commonly used.

J.W. Mullner
Ottawa
(The *Ottawa Citizen*, 80-10-27)

The effects of change on society (From p. 1)

deception during the conversion period.

Metric conversion in the private sector of our country was occurring prior to the formation of the U.S. Metric Board, and has continued its progress without very much support from the Board. However, the Board has developed private sector guidelines which are available to all who would care to submit their plans, or request assistance. The Board's Office of General Counsel has prepared a handbook on antitrust implications in metric planning and conversion. This document was prepared in consultation with the Antitrust Division of the Department of Justice and the Bureau of Competition of the Federal Trade Commission. It offers to metric planners a guide to the antitrust implications of the metric conversion process.

This handbook should prove valuable to those in the private sector who are developing metric plans. It is available on request from the U.S. Metric Board Office.

The Board is also working cooperatively with organizations such as the American National Metric Council (ANMC) and the U.S. Metric Association (USMA) both of which are private sector

organizations dedicated to assisting those who choose voluntary metric conversion.

One of the most significant programs in which the Board has become involved is the conversion of motor fuel dispensers to measure by the litre. The Board sponsored a two-day open forum at which time all interested parties were invited to come and present their views on the subject of converting conventional motor fuel dispensers to sell by the litre as an alternative to changing the dispensers to compute at over \$1.00 per gallon. Participation in this forum was good, and led to the development of a metric conversion plan by the Petroleum and Natural Gas Sector Committee of the ANMC. A growing number of stations in our country are opting for metric conversion as an economically viable alternative to installing a computer capable of pricing above \$1.00.

The private sector is moving ahead in metric conversion because they are finding economic incentives. This is especially true of the multinational companies engaged in foreign trade, and the result is causing a ripple effect on domestic manufacturers. However, there still seems to be little acceptance of the

metric system in the marketplace. This is particularly true in food items which, although most carry dual labeling, show little evidence of rationalized metric sizes, which is one of the real benefits of metric conversion in packaging. This hesitancy to accept metric in the marketplace may be due to our inability to educate - or reeducate - the current population. We may have to wait until the generation of students who are being taught the metric system in the schools begin to take their place as the buying public.

The soft drink industry went to rounded metric sizes several years ago and it was quite well accepted, but when the wine and distilled spirits industries made their conversion some unfortunate decisions to raise prices at the same time were perceived by the consuming public as an effort to take advantage of the confusion during the changeover period. The U.S. Metric Board is doing a case study on this situation with the hope of learning how to avoid similar occurrences in future conversion programs. Also in the private sector the Board is conducting research on the plans for metric conversion of the Fortune Five Hundred Companies as well as the impact of metric conversion on

small business, and a program is being conducted to determine what problems may be caused by workers having to invest in metric tools.

One of the major responsibilities of the Board is to increase public awareness of metric conversion and this is being undertaken in a number of ways. The Board itself is working at this by holding its meetings at different locations around the country on a regular basis. At each meeting an effort is made to develop maximum awareness throughout the area in which the meeting is held. This is accomplished by holding a public forum as a part of each meeting, and developing extensive media exposure so as to reach as many people as possible. It is our hope to continue this effort in the future, although we will have to scale down our activities due to the limited funds provided us for this fiscal year.

In conclusion let me say that in spite of the obstacles we have encountered, and the knowledge that many more lie ahead, I remain optimistic. The need for a universal measurement system for this shrinking world in which we live leads me to believe that metric conversion is inevitable, and ultimately will be very beneficial.

Major industries are converting, and others are making plans to convert as the advantages to them become clear. Federal agencies are preparing for the day when they must keep pace with industry, although not necessarily lead them. The decision to convert, and the time span for making the conversion will vary from sector to sector, and we will live in a dual system of measurements for a long time to come. Those of us who understand the metric system and truly believe that a universal measurement system is in the best interest of our country have a responsibility to assure that the climate exists for an orderly conversion, and that the process will be as cost effective as possible.

How often have we said to ourselves "Why didn't the country convert back in 1866, when Congress first legalized it. It would have been much easier then." We must not let down future generations and allow them to say in a hundred years from now, "Why didn't they make the conversion when Congress provided the opportunity back in 1975. It would have been so much easier then." We have made much progress. We have a chance for real success. Let's not let the opportunity slip away from us!

The metric system: something in the wind

Wind speed shifts to metric.

The metric system has much in common with the wind. Like the wind, it is an international phenomenon. And like the wind, it has become part of our daily experience. So it is very natural that wind speed and the distance of our weather systems.

From now on, the International Environment Service of Geneva will publish its reports on wind speed in kilometers per hour. It will also publish its reports on atmospheric pressure in kilopascals (kPa). This is not to say that any of the names in this section will ever change! Only our way of talking about them will.

The adoption of these metric units for wind speed, distance and pressure to degrees Celsius (°C) for temperature and millimeters mercury (mm Hg) for atmospheric pressure will make the metric conversion of our weather reports. We hope you will make this conversion somewhat easier for you. Remember only the names have changed. What will stay on the page and what will stay on the page will stay the same. But they'll do so in metric units. So at a sign of Canada's switch to the metric system, the system used by the majority of our customers abroad.

Light winds (1-5 km/h)
Moderate winds (6-10 km/h)
Strong winds (11-15 km/h)
Gale winds (16-20 km/h)
Storm force (21-25 km/h)
Hurricane force (26-30 km/h)

You too can measure up

It's easy to think metric

kilograms (kg) degrees Celsius (°C) centimetres (cm)

84 85 86 kg
 100 cm
 150 cm
 175 cm
 200 cm

a measure of excellence

Canada metric Canada métrique

Body temperature: 37°C
 Body height: 1.75 m
 Body mass: 70 kg
 Air temperature: 24°C
 Pool temperature: 24°C
 Pool dimensions: 21 m wide, 50 m long, 2.5 m deep

Commission du système métrique Canada

Metric on the farm

Beef Cattle **Dairy Cattle**

Call farm weight: 35-40 kg
 Call birth weight: 40 kg
 Call weaning weight: 200 kg
 Call weight (4 months): 170 kg
 Weighing (12 months): 360 kg
 Heifer weight (12 months): 300 kg
 Slaughter (18 months): 500 kg
 Heifer (18 months): 485 kg
 Cow (18 months): 500 kg

If you would like one or all of the above posters, please write to Metric Commission Canada, Box 4000, Ottawa K1S 5G8.

Australia's program almost completed

The following are excerpts from the Australian Metric Conversion Board Tenth Annual Report for the year 1979-1980.

Introduction

The change to metric weights and measures in Australia is all but complete. Whether in work or play, learning or communicating, travel or shopping, the predominant language of measurement now encountered is metric.

The Metric Conversion Board has instigated, encouraged or coordinated metric conversion in virtually all sectors of the community so that there remain only a few isolated activities requiring initiatives, some others where problems have arisen in implementing agreed programs and some for which a long conversion period is optimum and the change must, therefore, be allowed to run its course.

The metric climate to which all have been increasingly exposed over the last three years has engendered a marked change in the attitude towards metric. Whereas three years ago a significant proportion of the inquiries directed to the Board criticised or complained about the need to change, such comments are now very rare indeed despite the large number of requests for information (over 10 000 in 1979-80) still being received.

The object of the Metric Conversion Act is progressive conversion to the sole use of the metric system of measurement and while a very large part of the action needed to bring this about has been taken or put in train it must be

recognised that Australia is far from being wholly metric. This is evident from the everyday language of the majority of those adult Australians who have spent most of their lives thinking and talking in old imperial units.

An individual can hardly be expected to change until the new units become implanted in his memory bank in place of the old units. This will occur only as the once familiar imperial units are phased out of common use.

The Board is confident this will occur in due course. The process can be expedited by the selective withdrawal of imperial units from prescribed classes of transaction such as in the description of real estate or of goods described by measurement.

This is a matter for Federal, State and Territorial administrations. Governments must now decide whether or for how long units still in use should continue to have legal status. Some will be required for years to come. Others may be withdrawn to the national benefit and without disadvantage to anyone. Ultimately they must be withdrawn but the timing is a political decision which may not be exercised by some governments until after the MCB goes out of existence in 12 months time.

The Board aims to devote most of its last year in business to the task of alerting all sections of the community to the imminent end of the imperial measurement era, offering assistance to those who feel they need more help with the metric system and searching out pockets which may have been bypassed in the mainstream of metric conversion activities.

The government has decided that it will be unnecessary to extend the life of the Board beyond June 1981.

•••

The major factor in effecting the current acceptance of metric conversion has undoubtedly been the use of metric units for the pricing and selling of foodstuffs measured out in the presence of the customer. Once this was introduced nationally it was quickly recognised by both shopkeepers and customers that the use of the new units could quickly be learned and adopted. True, it was necessary to replace the law which once required trading to be in imperial units with one requiring the use of metric units but this has proved neither onerous nor unacceptable.

•••

As in previous years information and advice on the basis of the planning and implementation of our programs, often with reference to particular activities, have been in frequent demand from the many countries which are actively converting to SI. It would seem the comparative ease and speed with which Australia's change has been effected is the envy of many other countries which are finding that progress is inevitably slower and hence more confusing and less efficient if changes such as those affecting the weighing of goods in the presence of the customer are not supported by mandatory requirements.

The extension of the appointment of the Executive Member, Mr A. F. A. Harper, as Chairman of the National Standards Commission beyond 30 June 1981, when the Board expects to be disbanded, should facilitate the assumption of responsibilities for residual ongoing metric conversion activities by the Commission.

•••

Retail trading

Shopping provides the most overt and all-pervasive manifestation of the metric change. For many, not otherwise much concerned with measurement in their daily lives, the impact of metric conversion was minimal until they were faced for the first time with buying meat and vegetables by the kilogram. This has now been the experience of all shoppers.

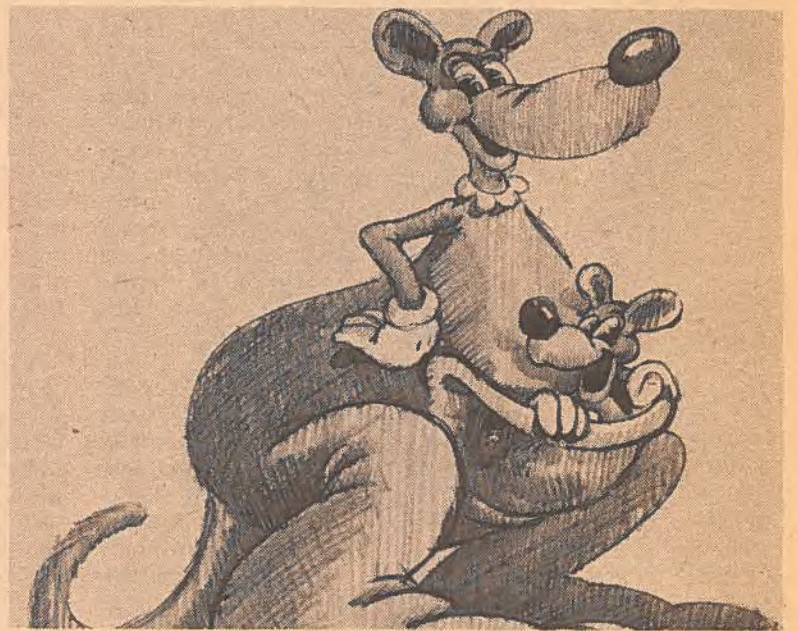
Throughout the whole of Australia the measuring instruments used for trade are now graduated in metric units, the pricing of goods is per kilogram, per metre or per litre as appropriate and goods are weighed or measured in terms of these units.

This metrically significant and satisfactory situation is the culmination of some five years of conversion in the shops. It commenced with the voluntary conversion of some measuring instruments and a requirement by weights and measures authorities that new instruments be graduated in metric units. As the population of metric scales increased so did the confused trading, except where advertising and pricing in terms of metric units was mandated by the weights and measures authorities.

Now that metric trading has been required through the whole of Australia this temporary confusion has been replaced with orderly shopping in which price comparisons are facilitated.

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Associated with the change to metric shopping is an apparent increased acceptance by the community at large of metric conversion as an accomplished fact.



Australia is just a hop ahead.

Experience with the use of metric units for the retailing of goods weighed or measured in the presence of the customer has clearly demonstrated that:

- in a fiercely competitive situation it is most unlikely that voluntary conversions will succeed;
- given adequate preparation

and aids in selected districts, spread over a few weeks, shopkeepers and shoppers quickly accept compulsory conversion and conversion is achieved without trauma or disadvantage;

- such a change does much to reassure the public that metric need hold no fear for them and hence makes other changes more readily acceptable.

Delay hurts housing

The following letter indicates the concern felt about delays in implementing metric conversion in the Canadian housing industry.

Mr. D.R.B. McArthur
Chairman
Metric Commission Canada

You may recall that when I wrote to you in June last year about CMHC's policy of requiring exclusively metric submissions under the National Housing Act, I pointed out that the successful conversion to metric of the residential construction industry depends on the active support of all segments of the industry.

I had in mind that everyone concerned with housing would have to make a conscious decision to implement the industry's conversion plan if the transition period were to be kept as short, and therefore as inexpensive, as possible.

I believe that both the supply side of the industry — manufac-

turers and distributors of building material, and the demand side — builders and developers — must recognize the damaging effects that delays in their full implementation of metric use may have on the construction industry as a whole. Moreover, with codes and standards now mostly in exclusively metric terms, the continued use of imperial terminology is becoming increasingly onerous.

CMHC's policies are designed to support the industry's plan for a change to fully rational metric use, to the greatest degree that our position in the industry affords. I am hopeful that the application of these policies serves to illustrate the federal government's commitment to the industry's plan.

1980 - 07 - 31

R.V. Hession,
President
Canada Mortgage and Housing Corporation

Senior citizens get help

Metric Commission Canada's Speakers Bureau is a volunteer organization made up of men and women from all walks of life, who have volunteered their services to speak on behalf of metric conversion in Canada. The Bureau was established for the purpose of creating an awareness and introduction to metric conversion on a direct basis to groups of professionals, associations and educational institutions.

Some of the professional groups which have in the past year enlisted the services of the Metric Commission Speakers Bureau are:

- Bell Canada, Ottawa
- Shell Canada Limited, Toronto
- Canadian Chamber of Commerce
- National Secretaries Association, Charlottetown
- Data Processing Association, Dartmouth, N.S.

In addition to professional groups, MCC has fulfilled requests from church groups and golden age clubs across Canada for speakers on metric conversion. We consider requests from golden age groups as particularly important as the retired segment of the population is not normally in a position to learn about metric through various associations or at their place of work.

Speaking engagements can be arranged at no cost through the Speakers Bureau office. For more information, please contact:

Metric Commission Canada
240 Sparks Street, 01 East
Ottawa, Ontario K1A 0H5
Attention: Lise George
Promotional
Projects Coordinator.

Upcoming Meetings

DATE	COMMITTEE	PLACE
81-03-03	Sector Committee 61.03, Poultry	Toronto
81-03-03	Sector Committee 9.73, Funeral Services	Winnipeg
81-03-05	Sector Committee 9.10, Health & Welfare	Winnipeg
81-03-06	Sector Committee 61.06, Fishing & Fish Products	Ottawa
81-03-10	Sector Committee 7.20, Clothing	Montreal
81-03-11	Sector Committee 3.08, Chemicals & Chemical Products	Toronto
81-03-17	Sub-Committee 9.10, Kilojoule Awareness	Ottawa
81-03-18	Sector Committee 7.20, Clothing	Winnipeg
81-03-18	Sector Committee 7.42, Sporting Goods	Winnipeg
81-03-19	Steering Committee 63, Beverages	Toronto
81-03-24	Steering Committee 9	Vancouver
81-03-25	Sector Committee 8.45, Paper & Allied Industries & Printing & Publishing	Ottawa
81-04-07	Sector Committee 4.05, Non-ferrous Metals	Toronto
81-04-08	Sector Committee 9.21, Amusement & Recreation (Sports)	Ottawa

Metric Commission Canada Meetings

81-03-31	Advisory Committee on Information Policy	Calgary
81-04-01/02	62nd Meeting	Calgary

Exhibits

81-02-21 to 03-23	Salon de l'Habitation	Montreal
81-03-11/15 to 04-01	Home Expressions Batimat	Winnipeg Montreal
81-03-24/26 to 04-04	Contra '81 Manitoba Agricultural Winter Fair	Calgary Brandon