Report of the

48th NATIONAL CONFERENCE ON WEIGHTS AND MEASURES 1963

U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
MISCELLANEOUS PUBLICATION 254

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Report of the 48th National Conference on Weights and Measures 1963

Sponsored by the National Bureau of Standards
Attended by Officials From the Various States, Counties, and Cities, and Representatives From U.S. Government, Industry, and Consumer Organizations.
Washington, D.C., June 10, 11, 12, 13, 14, 1963.

United States Department of Commerce
Luther H. Hodges, Secretary

National Bureau of Standards
A. V. Astin, Director

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*W. S. BUSSEY, Executive Secretary of the Conference, is *ex officio* nonvoting secretary to each committee.

COMMITTEE MEETINGS, MONDAY, JUNE 10, AND TUESDAY MORNING, JUNE 11, 1963

All day Monday and the morning of Tuesday were set aside for meetings, both open and executive, of the Conference committees. Announcements of these meetings were carried in the National Conference Announcement sent out May 1963, and in the printed program.

A large number of delegates took advantage of the committee meettings and, as a result, attendance and participation were exceptionally good.

The Conference committees that met on Monday were the Committee on Laws and Regulations and the Committee on Specifications and Tolerances. The committees that met on Tuesday morning were the Executive Committee and the Committee on Education.

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REPORT OF THE FORTY-EIGHTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES [1]

FIRST SESSION—AFTERNOON OF TUESDAY, JUNE 11, 1963

(C. H. Stender, Chairman, Presiding)

The invocation was delivered and the memorial service for departed members was conducted by the Conference Chaplain, Rev. R. W. Searles, Deputy County Sealer of Weights and Measures, Medina County, Ohio.

Mr. J. P. McBride, of Belmont, Massachusettts, led the delegates in the Pledge of Allegiance.

INTRODUCTION OF HON. J. N. BEHRMAN BY A. V. ASTIN, NATIONAL BUREAU OF STANDARDS

Ladies and gentlemen, we are privileged and honored to have with us today as the representative of the Office of the Secretary of Commerce the Assistant Secretary for Domestic and International Business and a distinguished economist in his own right, Dr. Jack Newton Behrman. He is a native of Waco, Texas. He attended college at Davidson College in North Carolina. He received his Master's degree from the University of North Carolina and a Master's degree and Ph.D. in economics from Princeton University.

Before joining the Department of Commerce, Dr. Behrman was Professor of Economics and Business Administration at the University of Delaware, a consultant to corporations and to such organizations as the Pan-American Union and the Committee for Economic Development. He was and is a published author in the field of International trade and finance.

Dr. Behrman was appointed Assistant Secretary of Commerce for International Affairs by President John F. Kennedy in November 1961, after having served as Deputy Assistant Secretary by the appointment of Secretary of Commerce Luther H. Hodges, in March of that year. On October 30, 1962, Secretary Hodges named Dr. Behrman, the Assistant Secretary of Commerce for Domestic and International Business to reflect a broadened and unified trade expansion program, embracing the domestic and international activities of the Department.

It is my pleasure to present to you the Honorable Jack N. Behrman.

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[1] With the exception of formal papers and committee reports, the record of the 48th National Conference on Weights and Measures has been rearranged, consolidated, condensed, and, in some cases, comments have been eliminated wherever necessary to reduce the printed report to essentials for future reference.

Forty-eighth National Conference on Weights and Measures, Sheraton-Park Hotel, Washington, D.C., June 10-14, 1963, Sponsored by U.S. Department of Commerce

ADDRESS BY HON. J. N. BEHRMAN, ASSISTANT SECRETARY FOR DOMESTIC AND INTERNATIONAL BUSINESS, DEPARTMENT OF COMMERCE

Certainly, this is a meeting of individuals who are important to us in our work in the Department on a continuing basis. In fact, as I thought about the invitation which Assistant Secretary Hollomon, who has responsibility for science and technology in the Department, extended me, I cast around a bit to see really what I knew about the role of weights and measures in my own work, and as I thought about it, I realized that, although my responsibilities have increased and are rather vast, sometimes staggering to myself in the Department, most of what I do would fall flat on its face if you yourselves were not successful in the continuing work, in the objectives you have before you in weights and measures.

I remember studying the works of Monsieur Colbert in the 16th century, when he tried to develop for French industry a standardization program, not only for the purpose of selling more readily in France, but also for export, and this, of course, was based or had to be based on good weights and measures. And we really did not succeed in standardization programs until we succeeded in weights and measures. So we have a long history of close relationship of business promotion and export promotion, both of which seem to be singular responsibilities of mine, necessarily reliant upon the success of standardization of weights and measures.

May I brief for you the extent to which your work affects my work, and, therefore, describe a bit to you the scope of the operations of one section of the Department of Commerce.

Dr. Astin mentioned that my title now is Domestic and International Business. I am the first Assistant Secretary to bear that title. It does represent the fact that this Administration believes that it is no longer possible to disassociate international economic problems from domestic problems, or more critically, domestic business from international business.

American business faces now a challenge from the rest of the world, either from Europe, the Common Market, or from the less-developed countries, or from the Sino-Soviet bloc, a challenge that must be met in each of those markets, in third markets, in competition with others outside of that third market, and inside the United States. And this is a competition which can be met only through quality and through being able to sell that quality, quality of product and quality of service. Quality of product, in turn, depends upon the preciseness with which that product is produced, and ability to sell depends upon the ability of the salesman to guarantee that that product will meet standards for which it was designed and with which he is able to persuade the consumer to purchase.

Those basic abilities, therefore, to rely upon quality and to be able to sell effectively, depend upon the work which you yourself do.

If we had to start all over again, everything that I am trying to do would be greatly hampered in terms of developing appropriate standards and high quality levels. How do we use these roles of the high-quality standardization which are based upon your own operations? Internally, domestically, one of the challenges which we are trying to face now is our higher employment through greater investment, through modernization.

I have under my jurisdiction an entire set of industry offices, com-

posing the Business and Defense Services Administration. We cover 275 different industry classifications, different industry groups. There are another 150, which we do not cover. We do not have manpower to get around to them. These industry divisions have the responsibility to persuade business to modernize. They have the responsibility in time of war or mobilization to guide the industry in priorities. Here again, you know more than I do about the necessity for standards, quality control, and so on, in setting priorities. They have the responsibility for long-range development in that industry, and here again, technological changes, quality changes, are important.

And finally, they have the responsibility for international commodity analysis, what is happening in the commodity areas of the world.

One of the problems which we run into, of course, there is the fact that our technical standards, our specifications, are not the same, and we ourselves in our end of the Department have a very strong interest in commonality of specifications, in a common international set of standards, metric system, and so on.

This is something I have been interested in ever since I studied the steel industry right after the war and what needed to be done there, because I personally had to translate long tons into short tons and then metric tons time and again, in order to make things comparable for what I was doing, to say nothing of the specifications in the steel items themselves, with which I was concerned.

So, knowing what is going on worldwide, it is necessary for us to make rather long strides in standards and measurements. In many countries, they simply do not have appropriate systems or means of controlling them. We are trying to work ourselves, the Bureau of Standards, with the AID agency, for the purpose of disseminating better control systems in weights and measures and, therefore, be able to move into better standards.

I briefly described to you the industry setup we have. We have also a foreign geographic section in the Bureau of International Commerce, which gathers information from all the countries of the world, including the Sino-Soviet bloc, on commercial, economic, financial information, to be able to feed into the business community what opportunities there exist overseas for sales, for investment, for licensing. There again we get very deeply into the technical aspects of products. We also have an Office of Export Control, which may be of some interest to you, because the Secretary, through delegation from the President, has the power to prevent export from the United States of any item which we consider to be detrimental to the foreign policy or the national interest or the national welfare of the United States.

How do we judge this? We judge this on a technical basis, which depends upon the quality, the technological advancement, the uniqueness of the product, and the contribution to be made to the Sino-Soviet bloc. Here again we must rely on as good information as to the technical capacity and the capabilities of the production, and this again, as I have indicated, depends upon how well we know what is in that product, its standardization, and so on. That is the way, in fact, you measure uniqueness against some standard, and we are also looking for the difference, what makes this product unique as compared to the Germans, British, French, or whoever else will enhance supply.

Our East-West trade operations are fundamentally based on technological differences which again rely on the sort of work which you yourselves do.

We have a rather large operation of trade promotion, which again has the purpose of telling the rest of the world that United States products are better, their quality is better, they stand up better, and so on. You hear a lot about the fact that the United States is pricing itself out of the world market, and in my experience (I have been to a good many of the markets since I have been in this position), this is not true. But the United States is not selling itself *into* world markets. Most of the markets of the world will take United States products, because they are in most instances better on a quality scale.

I was even in one of the Iron Curtain countries a year ago, and I said, "Why do you keep wanting United States products?" This was a steel mill we were visiting. We walked through it, and they said, "Look at that one, big stamp rolling section, down, taken apart." It was being worked on, repaired.

He said, "It is a German machine, high quality, but, in fact, the down time on that item has been much greater than we expected, and we are told that an American machine of the same kind would provide continuous performance longer than the German machine. Although the German machine is cheaper, that is why we want the American—quality, built-in quality, technological differences, based on standards measured and applied."

This is where we can sell and are selling in those particularly more advanced areas. In fact, if you will look at the manufactured exports of the United States, you will find that they predominate in those industries which are the more technically advanced and the industries, incidentally, which pay higher wages. You hear a lot about the fact that low wages are undercutting United States products. They are flooding our market, and so on—foreign low wages. In fact, those low wages are low relative to our low-wage industries, and, obviously, they are relative to our high-wage industries. The high-wage industries are the export industries. This is quite logical. High wages are paid in the export industries because the laborers are productive, because of the methods they are using and the techniques that are applied to that industry, and they are, in fact, the export industries because they are more efficient. It is all quite logical. If you will just stop to think it through, what we need to do is to get more industries which are more productive, more technically advanced, and we will find that we not only can export but we can pay our wages as we are.

This, then, is the sort of brief outline of our interests and what I see as the causal relationship between your work and ours. It takes many hands. Without all of us doing our jobs, we cannot meet the challenges which exist abroad in carrying our burdens in the military and the AID area, which themselves are dependent upon our ability to export and our ability to export depends on technological advance, so keep pushing in your area. We will in ours and together I hope we can do the job.

ADDRESS OF THE CONFERENCE PRESIDENT AND APPOINTMENTS TO STANDING COMMITTEES

By A. V. Astin, *Director, National Bureau of Standards*

As the *ex officio* President of the Conference, a position that goes with the directorship of the National Bureau of Standards, it is my

duty at this time to give you a brief report on the status of things at NBS because it is your institution. The responsibilities of the Bureau continue to grow at an amazing pace. This is due to at least three factors. First, the general growth of our economy requires that our responsibilities grow apace. Second, the increasing complexity and diversity of technology in our economy increases the complexity and diversity of the services NBS must provide. The third reason for growth is an increasing awareness of the fundamental importance of the types of services that we are supposed to provide to the strength and vigor of our economy.

This last reason has been helped in no small measure by recent developments in the Department of Commerce, specifically the establishment of a position of Assistant Secretary of Commerce for Science and Technology, and the filling of that position with Dr. J. Herbert Hollomon.

A major effect of establishing the position now occupied by Dr. Hollomon has been a very close merging of the responsibilities of the National Bureau of Standards with the goals and purposes of the Department of Commerce. The relationship between the goals of these two organizations is very easily demonstrated. Commerce is concerned with the exchange of goods and services. Standards are important, and frequently essential to such exchange, in order to have a basis for determining the quantity and the quality of the things exchanged.

Certainly, all commerce is faciliated if adequate and reliable standards are available. Similarly, progress in science and in the application of science and technology is based upon the exchange of information, and particularly of quantitative data, quantitative aspects of which are derived from the use of measurement standards.

Thus we set the central NBS mission as one of conducting research and providing services in the area of physical measurements in order to facilitate the reliable and progressive exchange of quantitative data in science and engineering, and of technological products and services in science and industry. In this context, an adequate standards effort becomes an essential part of any broad national program aimed at stimulating technological development and economic growth.

Consistent with our statutory responsibility and with the needs of modern technology, NBS is concerned with three distinct but related types of standards: First, standards for the physical quantities and units basic to physical science and engineering; second, standards for the determination of quantity, quality, or performance of technological products and materials of commerce; and third, standard reference data.

Our work on measurement standards is the oldest and by far the largest of our standards activities. The dynamic nature of such standards requires that this part of our standards program be a continually expanding one. Factors contributing to the growth of measurement standards are: The ever-increasing requirements for more accurate measurements, the need to extend measurement techniques and associated standards to ever larger and ever smaller quantities, and the need to measure these quantities under ever more variable environmental conditions. This work in measurement standards provides, of course, a core of the area in which our work at NBS has been associated with your work in weights and measurements

throughout the Nation.

In the second area, industrial and commodity standards, NBS has had a rather static program for many years. During the past year we have concluded that this area must be greatly strengthened. Such increased emphasis will permit much stronger support by NBS for the overall mission of the Department of Commerce. Adequate commodity standards greatly facilitate the exchange of goods and services, since their purpose is to remove ambiguity from the determination of what is bought and what is sold. In today's highly complex technological economy, the exchange of products tends to assume the aspect of barter rather than commerce if standards essential to the determination of quantity and quality are not available.

The Nation's major private standards organizations, the American Standards Association and the American Society for Testing and Materials, have long been urging greater attention by us to industrial and commodity standards.

As part of our implementation of the decisions to strengthen our work in this area, we are now transferring back to the National Bureau of Standards from another part of the Department of Commerce the Commodity Standards Division. After twelve years of separation of this activity from the NBS, we are convinced that this activity needs to be an integral part of a technology laboratory organization and needs to be greatly strengthened. This transfer, which is now in process, will bring back to our organization an old friend of the Conference, Dr. A. T. McPherson, whom we loaned to that other part of the Commerce organization a little over a year ago. His return, of course, will be most welcome and will assure our opportunities for strengthening our work and this type of standards activity. This type of effort is of great importance to expanding the opportunities for foreign markets for American products, through greater participation in the actual formulation of international engineering and commodity standards. We expect that we can influence their form and content in a way which will make them much more favorable to American products.

A further step that we are taking in this general area is to establish a national advisory committee to look into broad problems of industrial and commodity standards. This committee will have as its major charge a determination of national needs in the area of standards, and identification of activities essential to fulfilling these needs. Particular attention will be given to the role of the Department of Commerce and the National Bureau of Standards in meeting national needs for industrial and commodity standards. The committee will also look at the vast private standards activity in the United States and the relationship of government standards activity to this private effort. In addition, the committee will give substantial attention to the problem of international standards.

Our third standards activity is that dealing with what we call standard reference data. This activity consists of the accurate and systematic measurement of the properties of matter and material, the compilation of material from our own and other sources, the evaluation of data in order to assess their reliability and accuracy, and the dissemination of data, usually in the form of handbooks. Such data serve as a critical link in the application of science to technology and in addition provide the basic means of communication among scientists.

NBS has been for many years a major compiler of such data; however, we have within the past few months concluded that the national interest demands that we assume the central national responsibility for standard reference data, that we seek funds to extend our own in-house activities, to support, through grant and contract, a collaborative effort throughout the Nation.

This was disclosed in one of the rare announcements from the Office of Science and Technology in the Executive Office of the President last Friday.

I would like to read the first paragraph of that announcement:

> Dr. Jerome B. Wiesner, Director of the Office of Science and Technology in the Executive Office of the President, today announced the establishment of a National Standard Reference Data System. This national effort will be administered by the National Bureau of Standards, which is already compiling standard data. The system integrates to a single point of responsibility the present data compiling activities of the National Bureau of Standards, the Department of Defense, the AEC, the NASA, the National Science Foundation, and several other agencies.

I think you can see from this and my earlier comments on this program that we have here a very substantial responsibility indeed. This, coupled with our first standards activity, and our hope of an expanded effort in industrial and commodity standards, means that we are going to very definitely have a busy time in the future.

Next, I would like to report to you on the status of our relocation from our Washington laboratories to Gaithersburg, Maryland. The first buildings, those for our engineering mechanics' work and for the utilities distribution, will be ready this summer. The next unit of buildings will be occupied early next year, beginning with the facilities for nuclear physics study and standards for measuring ionizing radiation. During the summer of 1964, I expect that most of our administrative work will be moved to the new site, together with our mathematical activities. Most of the laboratories, however, will not be available until early in 1966, and some of the special purpose laboratories will not be available until late in 1966.

Thus we will be in the process of transition for approximately the next 3½ years.

These new laboratories will, of course, greatly facilitate our ability to carry out the components of the mission I just mentioned. In addition, we are seeking to strengthen our staff. During the past year we added one of our distinguished scientists, Dr. L. S. Taylor, to our Associate Directors' staff, giving him responsibility for our international programs and for some of our publication and personnel functions. We were fortunate in acquiring from outside of the government service a new Chief for our Building Research Division, Dr. Allen Bates, who was formerly Director of the Portland Cement Association Laboratories and Director of the Building Relocation Project for NYU. He joined our staff last October.

In addition we have a number of other senior scientists now in the process of being appointed. We have been aided in this effort, in no small degree, by the pay reform bill, which was passed by the Congress last October. This bill recognizes, for the first time, the principle that the government should pay competitive salaries and it outlines the procedure to make this possible. Acceptance of this principle is good, although it still has to be implemented. We feel, however, very encouraged with this step forward.

An item of general administrative interest concerns the absence from this meeting of some of the individuals that you would normally expect to be here; namely, our Associate Director for Measurement Services, the Chief of our Metrology Division, and a few others. These individuals are now in Russia. After about two years of effort, we finally succeeded in bringing about an exchange of metrologists between our country and the Soviet Union. Our team arrived in Moscow a week ago Sunday and is now in the midst of a one-month tour of metrology and weights and measures facilities in the Soviet Union. We will be honored with a return visit of metrologists from the Soviet Union in the early fall or late summer of this year. Certainly, we at NBS anxiously are awaiting to have our group's evaluation of measurement capabilities and facilities in Russia, and I am sure that such a report will also be of great interest to you.

Several years ago you brought to our attention the need for better methods of measuring the moisture content in grains and flours. We have been studying this problem for a number of years. We feel we have now cracked the hard part of it and feel the problem is substantially solved. A report on our achievements in this area will be given to the Conference on Thursday.

Another recommendation of this Conference a few years ago was that we seek authority to furnish the States of the Union with sets of up-to-date standards. This problem has been studied for some time. We have determined, through discussions with counsel, that we need not seek special legislative authority. We merely need seek the funds. But that is no small job because our estimate is that it will cost some $2 million and it has not yet been possible to include this item in our budget. We are hopeful that before too long it will be possible to do this.

We are convinced that if such standards are provided, and used effectively by the States, it will do much, first of all, to relieve the workload upon the National Bureau of Standards and, secondly, and more importantly, to extend measurement competence throughout the Nation. This should assist not only in your enforcement activities, but also in possibly providing new services to local industry throughout the country.

We are in the process of buying the first model set of standards we hope ultimately to distribute. Funds from another source have been made available in order to get an experimental set and these should be very helpful to us in acquiring experience for the major distribution program, which we expect to come at a later date.

In the field of legal metrology, you have urged that we seek to bring about the admission of this Nation to the International Organization for Legal Metrology. This is a matter which is currently under study. It is too early to give any indication as to the prospects, but we are hopeful that progress in this direction can be made.

You have also been interested in efforts to conduct a systematic study on the problems of possible conversion to the metric system. Bills have been introduced in the Congress to direct NBS to make such a study over the past few years. None has yet passed, but the bills were reintroduced in this session of the Congress, and there is some hope that they might get through.

Our training activities in our Office of Weights and Measures continue to occupy a major portion of the time of our staff, but from the

reports I get on this activity, it is my feeling that it is very much worthwhile.

In the personnel area, I am sorry to report to you that a distinguished metrologist on our staff, one well known to you, namely, Dr. Lewis Judson, has retired. However, I think, in spite of his retirement, we are still going to have access to his services, at least I hope so.

I was very pleased that one of the things Dr. Judson succeeded in doing before his retirement was to finish an extensive revision of our history of weights and measures in the United States. The old one, which we have been using for some time, has been out of date and obsolete, and I am sure all of you welcome an up-to-date version of this, especially one that has been prepared by such an expert as Dr. Judson.

I would like to conclude my report to the Conference by a brief review of some of the services output of the National Bureau of Standards. These figures always impress me when I see them. They provide some indication of the nature and extent of the measurement services which we provide to industry and commerce.

More than 3200 industrial organizations, including virtually all of the major ones and representing firms in 48 States, made use of NBS services during 1962. We sold to these groups 66,000 standard samples. These were used primarily to control the accuracy of measurement on production lines and in the quality control of products. Forty-five new standard reference materials were added to our service, bringing the total to 578. We made over 48,000 individual calibrations of instruments and control devices. There were 42 new calibration services added during 1962, either completely new services or important extensions in accuracy or range.

A further service included nearly 54,000 individual tests upon production items. Direct assistance to commerce, industry, and science, in the form of professional consultation and advice, has been very extensive.

On the scientific front, the results of our research investigations were presented in 989 formally published papers and documents and 367 reports to other government agencies.

I believe this gives you some indication of the nature and extent of the services we provide. We at the National Bureau of Standards are here to work with you on a cooperative effort to improve the nation's technological base in order to aid commerce and to carry out these activities more effectively.

It now is my duty and pleasure as the *ex officio* President of this Conference to make appointments to the standing committees. There are three terms expiring this year. Fred True of Kansas has completed a term on the Committee on Education, as has John Gustafson, of Minneapolis, Minnesota, on the Committee on Laws and Regulations, and Robert Searles of Medina County, Ohio, on the Committee on Specifications and Tolerances. To fill these vacancies, I am appointing to the Committee on Education, L. A. Gredy of the State of Indiana; to the Committee on Laws and Regulations, Lawrence Barker of West Virginia; and to the Committee on Specifications and Tolerances, J. F. McCarthy of Boston, Massachusetts.

The new appointments to these three committees are for five-year terms.

I wish to thank the retiring members of these committees for their

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very valuable and capable services during the past five years. They have been devoted to their tasks and responsibilities and unstinting with their time. They have served the Conference with honor and distinction. To the new members, I wish complete success and contentment in the work that lies ahead of them.

I wish you success in these meetings and do not hesitate to let us know what your problems are.

Thank you very much.

PRESENTATION OF HONOR AWARDS

Dr. Astin presented "Honor Awards" to 19 members of the Conference who, by attending the 47th Conference in 1962, reached one of the four attendance categories for which recognition is made—that is, attendance at 10, 15, 20, and 25 meetings.

HONOR AWARD RECIPIENTS

25-Year Certificate

G. F. Austin, Jr.

20-Year Certificate

A. O. Oslund (posthumously), H. H. Russell.

15-Year Certificates

A. C. Becker, J. F. Blickley, J. M. Boucher, E. A. Reussenzehn, R. F. Straw, W. W. Wells.

10-Year Certificates

J. T. Bennick, B. S. Cichowicz, John Dimase, C. E. Joyce, J. F. McCarthy, F. L. McIntyre, O. A. Oudal, R. C. Parks, W. M. Sawers, W. I. Thompson, H. L. Zupp.

THE CONSUMER ADVISORY COUNCIL: INNOVATION IN CONSUMER REPRESENTATION

by Dr. Robert Lampman, *Staff Member, Council of Economic Advisers*

The Consumer Advisory Council, which is comprised of eleven private citizens, was appointed by Chairman Walter W. Heller of the Council of Economic Advisers at the specific request of President Kennedy. The appointment of this group symbolizes a new relationship between government and consumers. As a staff member at the Council of Economic Advisers I have had an assignment to work with this group of persons designated to represent or speak for consumers. And it is my assignment here today to review the first year's activity of this group and to indicate something of what it may mean for the future.

I am quite aware of an identity of interest between members of this conference and the members of the Consumer Advisory Council and I am sure that you were pleased when, on March 15 a year ago, President Kennedy sent his Consumer Message to Congress. And it was in that Message that he directed the Council of Economic Advisers

to create a Consumer Advisory Council to "examine and provide advice to the Government on issues of broad economic policy, on governmental programs protecting consumer needs, and on needed improvements in the flow of consumer research material to the public . . . ." He further stated that this Council would ". . . give interested individuals and organizations a voice in these matters."

One of the recurring themes of that Presidential Message was that consumers should participate in government. In the opening paragraph the President remarked upon the fact that consumers "are the only important group in the economy who are not effectively organized, whose views are often not heard." In the closing paragraph he said, "Their voice is not always as loudly heard in Washington as the voices of smaller and better organized groups—nor is their point of view always defined and presented." In the middle of the same message he referred to "the failure of governmental machinery to assure specific consideration of the consumers' needs and point of view."

It was with this "failure of governmental machinery" in mind that he called for the creation of a Consumer Advisory Council and that he also directed the head of each agency whose activities bear significantly on consumer welfare to designate a special assistant in his office "to advise and assist him in assuring adequate and effective attention to consumer interests in the work of the agency, to act as liaison with consumer and related organizations, and to place increased emphasis on preparing and making available pertinent research findings for consumers in clear and usable form . . . ."

It is of interest to note that, in setting up this network of advisers and special assistants, President Kennedy was crossing a new frontier in consumer representation. There have been consumer advisers in specific departments and agencies before, and there have been consumer advisers and consumer counsels in some State governments, and there is even a Department of Consumer Protection in one State. Moreover, there are some parallel developments in other democratic nations. But there has never before been a government-wide effort of this sort at the Federal level in this country.

The rationale behind the new departure in consumer representation would seem to be of several parts. *First*, that it is appropriate to call attention to the fact that one of the important functions of the Federal Government is to protect, serve, and promote the interests of consumers, who do two-thirds of the final spending in our economy. This is a function similar to that performed on behalf of business, agriculture, and labor. *Second*, that it is important to recognize consuming as an activity distinct from producing and the consumer interest in governmental affairs as distinctive. *Third*, that there is a better chance that the public interest will arise out of a clash of producer interests if it is joined to the explicit statement of a consumer interest. This statement, which should be audible to elected and appointed policymakers in the Government, should come from advisers outside government. To supply the advisers, the President called for the Consumer Advisory Council.

The first Consumer Advisory Council was appointed by Chairman Heller in July of last year. Its membership includes several academic persons who have worked in the fields of home economics, marketing, and consumer economics, a businessman who has specialized in financ-

ing retail operations, a State attorney general, one who formerly was and one who presently is a State Consumer Counsel, and several persons who have extensive knowledge of the thinking and operations of voluntary organizations interested in consumer problems. The Consumer Advisory Council members are: Mr. David W. Angevine, Dr. Persia Campbell, Dean Helen G. Canoyer (who is Chairman of the Council), Mr. Stephen M. Du Brul, Mrs. John G. Lee, Dr. Edward S. Lewis, the Honorable Walter F. Mondale, Dr. Richard L. D. Morse, Mrs. Helen E. Nelson, Dr. Caroline Ware, and Dr. Colston Warne.

Work of the Consumer Advisory Council

The Consumer Advisory Council has worked closely with the special assistants for consumer affairs who were appointed last July in 22 departments and agencies. The Council has divided itself into several working committees, each of which has taken a subject-matter area for study. These areas are rather broad. For example, one committee is dealing with the whole field of consumer standards, grades, and labels. Other committees have the following assignments: two-way flow of information between Government and consumer; effective consumer representation in Government; consumer credit and economic welfare; and interrelationships among Government agencies in consumer protection.

This Council has now held five two-day meetings in addition to its organizational meeting in July. President Kennedy met with the Council in July and again in January. It will hold its next meeting in August.

The activity of the Consumer Advisory Council to date has centered around study and gathering of information by the several committees. In this effort they have consulted with numerous in-government experts. In addition, the Consumer Advisory Council has communicated its views on a number of legislative and other proposals to the Chairman of the Council of Economic Advisors, who has, in turn, communicated those views to the President or other appropriate members of the Administration.

The Consumer Advisory Council has issued statements favoring "truth-in-packaging" and "truth-in-lending" and opposing "quality stabilization." They have endorsed proposals to assure the safety, effectiveness, and reliability of therapeutic, diagnostic, and prosthetic devices, and to extend to cosmetics the premarketing testing for safety that is in effect in the fields of drugs and food additives. They have also urged new requirements for cautionary labeling of hazardous substances and containers regulated under the Food, Drug, and Cosmetics Act. They have set out a list of principles which they would like to see used as guides in housing policy. They have urged that consumer rights be extended to Negro customers of stores, hotels, and restaurants. They have called for more funds for consumer research and information work by the several departments and agencies. This Council has also evaluated and made recommendations on the basis of the pilot project carried out by the Government Printing Office and the Post Office whereby over a quarter of a million special order blanks for consumer publications were distributed through a sample of 100 out of the Nation's 35,000 post offices.

Since this Conference's Committee on Laws and Regulations has made a tentative report on packaging and labeling, I believe you

would be interested in the full statement of the Consumer Advisory Council on the Hart "Truth-in-Packaging" Bill. That statement is as follows:

The Consumer Advisory Council endorses the principles and purposes of the Hart Truth-In-Packaging Bill (S. 387).

1. We believe that legislation to bring order into the field of packaging is necessary at the present time, in the interest of both consumers and honest producers, and in order to promote the effective, rational functioning of the American free enterprise system. The need for such legislation has been made abundantly apparent by the testimony before the Senate Judiciary Committee, and our own experience fully confirms the evidence there presented. Present legislation is inadequate to cope with the confusion and deception which has come to characterize the packaging of a large proportion of the goods sold to American consumers.

2. It is true that existing means of eliminating deceptive packaging are not being fully used. If manufacturers and distributors chose to use the simplified practice and commercial standards procedures of the Department of Commerce, they could eliminate much of the confusion in packaging by voluntary agreement, as was done with respect to many industrial products under the simplification and standardization program introduced by Herbert Hoover as Secretary of Commerce 40 years ago. But manufacturers and distributors have not taken advantage of this machinery and have, rather, continued to proliferate unnecessary variety and forms of packaging which impede intelligent consumer choice.

3, If the Food and Drug Administration had a larger budget, it might pursue more cases that could be identified as misbranding. The Federal Trade Commission, in the interest of fair competition, might institute cease and desist proceedings in additional cases involving packaging. But many practices which are quite legal at present contribute to the pattern of confusion and deception. And what is needed to break the pattern is a broadscale attack on the problem as a whole, not merely a case-by-case pursuit of individual practicers of deception.

4. We endorse the bill's requirements with respect to the kinds of information which must be clearly and prominently displayed on the label and the prohibition of misleading words, phrases, illustrations, or price statements. We also endorse the authorization for the promulgation of regulations relating to permissible sizes and shapes of packages, standards for the designation of sizes and net quantity, and information as to ingredients and composition of commodities.

5. The proposed legislation is in the line with the historic exercise of government responsibility to provide a framework within which the American economy can operate rationally, in terms of honest competition and intelligent consumer choice. It is designed to meet the conditions of today, when the package has become the salesman for the vast multitude of complex goods. It carries out the well-established principles reflected in government's establishment of weights and measures, protection of the public against fraud, promotion of fair competitive practices, establishment of standards of identity and quality, and requirements of labeling under the Food, Drug and Cosmetics Act. The Standard Container Acts of 1916 and 1928, and the Alcoholic Beverages Administration Act of 1936 have applied the kind of regulation proposed by this bill to the packaging of fruits and vegetables and of alcoholic beverages.

The bill authorizes the kind of regulations which other countries have found necessary and conducive to the proper functioning of their economies. Great Britain for 35 years has limited the packages of many standard foods to multiples of two ounces up to half a pound and multiples of four ounces up to two pounds. Canada's labeling requirements for foods, recently revised with the support of industry, correspond to the kinds of labeling requirements proposed by this Bill.

6. We would like to see the Bill strengthened in two respects:

   a. We believe that regulations with respect to sizes and shapes of containers and related matters should be mandatory under the law with respect to items basic to the family budget and not left to the discretion of the Secretary of Health, Education, and Welfare or the Federal Trade Commission in their respective jurisdictions to determine whether they are necessary. The labeling provisions of the bill are mandatory, but it is precisely the multiplicity and irregularity of

packages that prevent rational consumer choice and have brought the need for this legislation.

b. We believe that the bill should apply to as wide a range of consumer commodities as possible and therefore that the coverage should be broadened. In particular, we do not think that meat and meat products and materials used for the maintenance and repair of housing and home furnishings should be excluded.

7. With respect to enforcement, we think that the method of enforcement and penalties should be the same for all commodities which come under the act regardless of which agency is responsible for them. The Food and Drug Administration and the Federal Trade Commission have different procedures, neither of which wholly fits the needs of this Bill. We believe that the Bill should provide uniform, rapid and strong enforcement procedures, to be applied by both agencies with respect to the commodities in their respective fields.

The Consumer Advisory Council has expressed interest in seeing studies or investigations undertaken on a number of topics. Among these are the following (some of which are now the subject of active inquiry) : The nature of guarantees and warranties within major areas of consumer expenditure; the establishment of standards for sizes of clothing and clothing patterns, especially for children's clothing and knit garments; the possible adoption of Federal safety standards for electrical equipment; the possibilities for more intensive and extensive work by private and governmental agencies in strengthening and unifying standards and simplified practices programs; the promotion of national standards looking toward highway safety; and the development of uniform warning labels on toxic substances. The Council has also asked that research be undertaken on causes of consumer bankruptcy and on indexes of the diffusion of consumer welfare.

Alternative Emphases for the Future

Up to this point we have reviewed the origins and early developments of the Consumer Advisory Council. Let me now suggest what some of the alternatives are for this organization and what new directions it might conceivably take. It will be useful first to review some of the requests, advice, and criticism which have come the way of the Council. Some good number of citizens seem to have concluded from the name of the organization that the Consumer Advisory Council was set up as a service organization to help individual consumers with their specific problems. Since the Consumer Advisory Council is not designed to deal with such problems, requests for help on specific problems are referred to appropriate operating departments or agencies. In addition to requests, the Consumer Advisory Council has received advice of almost every conceivable kind. Some people apparently believe the Consumer Advisory Council is the ideal organization for achieving the end to unionism, the demise of big business, or the abandonment of the present monetary system; still others believe that the Consumer Advisory Council should legislate prohibition or vegetarianism. While some of this advice taps the reservoirs of ill will, most of it is what I would classify as "constructive." But the scattered nature of the suggestions indicates that there is no consensus on what the consumer interest in government is. Like any other organization, the Consumer Advisory Council has received a share of criticism. Much of this criticism suggests that the authors feel the Consumer Advisory Council should be "doing more," and exerting more influence. It is easy to predict that if it were "doing more" (and some of this criticism seems to overlook the fact that the

Consumer Advisory Council is advisory and is made up of nongovernment people who are volunteering their time out of demanding personal schedules) there would be no less criticism.

By taking account of the requests, advice, and criticism, and by looking at what has happened in the first year, I think it is now possible to indicate three possible lines of activity for the Consumer Advisory Council in the future. All three may be developed simultaneously; on the other hand, one may be emphasized at the expense of the others. These lines of activity are:

(1) functioning as an expert committee on integrating and improving the existing Federal programs in consumer affairs,

(2) providing a forum for new ideas concerning the responsibilities of government to consumers,

(3) performing as a vehicle for consumer-oriented organizations to learn more about government and to communicate their point of view on specific issues.

Interestingly, all three of these directions would appear to be compatible with the President's charge in his consumer message. The decision concerning the emphasis to be given each of these three will be, I suspect, only a gradually evolving one.

Improving Existing Programs

There are a number of factors that urge the Consumer Advisory Council toward emphasizing the first line of activity, namely, that of being an expert committee on integrating and improving existing Federal programs.

It is a real challenge for any group, even as expert and knowledgeable a one as we have in the Consumer Advisory Council, to gain a working understanding of the role presently played on behalf of consumers by the Federal Government. I suspect if you were to ask the typical man-in-the-street what the Federal Government does for consumers, he would have some trouble giving a satisfactory answer. And he would certainly have trouble with giving detailed answers about, say, the relationship between the Department of Justice and the Federal Trade Commission, or the distinction between the Food, Drug and Cosmetic Act and the Meat Inspection Act, or the role of the National Bureau of Standards in the weights and measures field. Our man-in-the-street probably would not have a very clear idea where and on what problems something over 20,000 Federal employees are working to provide consumer protection, consumer services, and consumer information.

The Consumer Advisory Council members have had a unique opportunity to gain an overview of what the Federal Government is doing to meet its responsibilities to almost 190 million consumers. But it is important to note that this process necessarily takes time, and it is easy to get lost in the trees. Few advisory groups have had such a wide sweep of issues before them and it has been difficult to single out the particular issues which merit special attention. The President in his Consumer Message showed some reluctance to draw a narrow line around consumer activities of government. The President noted that

"Nearly all of the programs offered by this Administration—e.g., the expansion of world trade, the improvement of medical care, the reduction of passenger taxes, the strengthening of mass transit, the development of conservation and recreation areas and low-cost power—are of direct or inherent importance to consumers." However, he went on to detail the specific areas which he felt fell within the consumer realm. These included food and drug protection, transportation, financial protection, the work of the independent regulatory agencies, housing, consumer information and research, truth-in-lending, manufacture of all-channel television sets, laws promoting competition and prohibiting monopoly, and truth-in-packaging.

I would emphasize that the Consumer Advisory Council, in its first year has come to know the nature of the effort made by the Federal Government in the consumer field and has developed new appreciation for what the government is doing to protect the rights of the consumer enunciated by President Kennedy in his message as:

> (1) The right to safety—to be protected against the marketing of goods which are hazardous to health or life.
>
> (2) The right to be informed—to be protected against fraudulent, deceitful, or grossly misleading information, advertising, labeling, or other practices, and to be given the facts he needs to make an informed choice.
>
> (3) The right to choose—to be assured, wherever possible, access to a variety of products and services at competitive prices; and in those industries in which competition is not fraudulent, deceitful, or grossly misleading information, assurance of satisfactory quality and service at fair prices.
>
> (4) The right to be heard—to be assured that consumer interests will receive full and sympathetic consideration in the formulation of Government policy, and fair and expeditious treatment in its administrative tribunals.

Experience thus far demonstrates that there is a useful integrative role for an advisory council of this kind. It is important to take a governmentwide look at a number of consumer problems. It is not surprising that, in the long history of government activity on behalf of the consumer, there has been divided and fragmentary effort along some lines. Just to cite one example, there is no general plan to assess the publications of the numerous departments and agencies from the point of view of the consumer. Hence we find that while there are many good publications on foods and food preparation, there are few on, say, consumer budgeting, finance, or insurance. There are other examples to be found on lack of uniformity in government activity in consumer matters, and the Consumer Advisory Council can help in achieving a more balanced overall program. The Consumer Advisory Council can thus play a useful and integrative role within the Government.

New Lines of Policy

Rather than functioning primarily as a coordinating and trouble-shooting committee giving its attention to what is already governmental policy, the Consumer Advisory Council could turn its attention more exclusively to new policy proposals and new departures in response to new needs. It would be consistent with this thought to

consider taking the Federal Government out of some lines of activity which it presently pursues. If this function were to be emphasized it might mean that the Consumer Advisory Council would transform itself into a review committee on the basic philosophic questions of what consumers should expect of their government in a scientific age of relatively high-income levels and rising educational attainment, of what alternative views of the producer-distributor-consumer complex should be called to the attention of the President and his key appointees in the executive branch. What meaningful distinctions can be drawn among types of consumers and consumer situations? Is it useful, for example, to distinguish between rural and urban consumers, between young and old, to single out for special attention such groups as working wives and widows, the so-called "problem debtor," and so forth? Should special attention be directed to the types of expenditure which are most rapidly increasing? This would urge special consideration to such fields as education, health, insurance, and recreation.

If the Consumer Advisory Council were to evolve in this direction, it would mean turning away somewhat from contact with governmental persons responsible for on-going programs and spending more time with the "idea people" from all around the Nation both in and out of Government.

Clearing House for Voluntary Organizations

The third possible emphasis is that of serving as a focal point for interchange between government and voluntary organizations interested in consumer matters. You will recall that the President said that the Consumer Advisory Council would give "interested individuals and organizations a voice in these matters" and that the Government should promote the consumers' "right to be heard." In practice this idea is rather hard to reconcile with the status of an advisory committee, but it is possible to imagine a series of conferences and hearings aimed at informing groups of consumers about governmental programs and policies and encouraging such groups to consider and state views concerning the issues of the day. This might be the most difficult of the three functions to perform successfully, in part because of the lack of organization of consumers and in part because of the complexity and variety of the issues which are of interest to various parts of our large and growing population. But it is also urged by some critics that this would be the function that would have the greatest payoff in the long run in terms of achieving what the President emphasized in his message, namely, a hearing for consumers.

Conclusion

Those, then, are several alternative routes for the Consumer Advisory Council as I see them. The Consumer Advisory Council has undertaken a very difficult assignment; they have moved cautiously in defining their purposes. I think we are justified in marking the President's consumer message and the beginnings of the Consumer Advisory Council as significant steps in the on-going effort by Americans to combine the efforts of business, government, and consumers to produce an ever higher standard and quality of life for all our citizens.

ADDRESS OF THE CONFERENCE CHAIRMAN

By C. H. Stender, *Deputy Commissioner, South Carolina Department of Agriculture*

It is a profound pleasure to welcome you to this opening session of the 48th National Conference on Weights and Measures.

I extend greetings to each of you, through you, best wishes to weights and measures officials and industry associates throughout the entire Nation.

Fifty-eight years ago, this past January, the first Director of the National Bureau of Standards, Dr. S. W. Stratton, issued the invitation and presided over the first national meeting of weights and measures officials. The meeting was called the "First Conference on Weights and Measures of the United States".

This group assembled today is astounding evidence that the hopes and dreams of that first dedicated group have come true.

Forty-eight duly organized Conferences have been held since the first meeting in 1905. To have the personal privilege and honor of serving as Chairman of this 48th Conference leaves me proudly conscious but humbly grateful.

For this opportunity I am not only indebted to you but also to my Commissioner of Agriculture, Mr. William L. Harrelson, for permitting me to have the opportunity of being associated with this group.

Frankly, I hold no reservation when I say the active, advisory and associate membership of this National Conference is comprised of a conscientious body of men and women who are continually striving to cooperatively serve the interest they represent. I say this for industrial associates equally as well as for official delegates.

Program.—I hope each of you join with me in recognizing that the program for this Conference has been carefully arranged. The subjects covered are comprehensive and the selection of the speaker is in keeping with the importance of the subject.

I can visualize much of value for you and me to take back to our respective jurisdictions that can be used to promote progress in our service to agriculture, to commerce, to industry, and to consumers in the markets of the world.

It is for that purpose that we have assembled at this Conference. It is for that purpose that the jurisdictions we represent have imposed confidence in our leadership.

It should be for that purpose that, individually, we extend full cooperation to the officers and committees of this Conference. We can display that cooperation by our consistent attendance and full participation at each session of this meeting.

Guests.—We are again honored by the presence of visitors and colleagues from other countries. I join with you in welcoming them to share with us in our deliberations. In the past, these visitors have contributed materially to a broadening of our concepts of universal weights and measures services.

In our national picture, city, county, and State lines are practically nonexistent. Equally so, universal lines grow less pronounced each year.

Commerce—the all important vehicle between the producer and the consumer—is making it mandatory that weights and measures officials

and associates in industry promote a growing understanding and appreciation of their mutual services to all people.

To take liberty with some written poetry:

> We have an obligation that makes us brothers,
> None of us can travel his way alone.
> All that we contribute into the lives of others,
> Comes back into our own.

Since our 1962 Conference, your Chairman admits to having been a reasonably busy person. Last October he attended the 17th Annual Conference of the Southern Weights and Measures Association held at Nashville, Tennessee.

In April of this year, he attended the 50th Anniversary Conference of the Indiana Association of Inspectors of Weights and Measures. I might mention that the group picture of that conference would remind one of a meeting of the National Conference.

As an active member of the NSMA, your Chairman attended the 1962 fall meeting and the 1963 spring meeting of the Southeastern Chapter of that organization. At each of the conferences that have been mentioned, the affairs, importance and value of the National Conference were discussed.

During the months of January and February, I was privileged to attend, observe, and participate in the interim meetings of the Conference Committees on Specifications and Tolerances, and Laws and Regulations.

On March 19 of this year your Chairman, under authority of the Executive Committee, appeared before Senator Hart's Subcommittee to present a statement on S 387, the "Truth-in-Packaging" Bill.

I certainly want to pay respects to the members of our standing committees. I cannot admit to being entirely uninformed as to committee activities but, this year, I was deeply impressed with the dedication of our committee members. They labored (that is the only word I know how to describe their work) from early morning until late at night and I know they tried to bring forth recommendations to make our Conference deliberations of realistic value.

We also owe a debt to Federal agencies and many segments of industry who attended the committee meetings. This is democracy in action. A type of action that makes our Conference productive.

I would like to repeat:

> All that we contribute into the lives of others,
> Comes back into our own.

The Committee on Education started its program for 1963 by holding its first meeting on the last day of the 1962 Conference. Later a majority of the committee members met at the Southern Conference in October 1962. The copies of letters I have are most convincing that every day since the last Conference, the Committee on Education has been in action.

I have always thought if weights and measures officials would convince themselves of their important contribution to the public's welfare, these officials would be conquering the first hurdle toward gaining the desired goal of public appreciation.

All of us owe "thanks" to the few who have so successfully promoted the "Week." We can express our appreciation by a broader participation in future programs. Remember, National Weights and Measures Week is a program of "casting your bread upon the waters."

At this point, I would like to pay respects to our Executive Secretary, Bill Bussey, also to Malcolm Jensen and his capable staff.

I call Bill Bussey "the balance wheel"; he will dig and dig for an answer to our problems. If the problem needs more time, he has the wisdom and patience to wait and further study for a possible and appropriate solution.

Malcolm Jensen and his staff are continually giving their services to various jurisdictions, or conducting field tests and studies to augment our general needs. Their assistance in technical training has been a forward step toward uniformity of both thought and action.

It has been my privilege to review some activities of our Advisory Committee. I am deeply impressed that the profession of weights and measures, generally, is encompassed with basic research, extension and scientific direction.

It would be amiss not to recognize the continuing interest of the Office of the Secretary of Commerce. As the parent organization of the National Bureau of Standards, which sponsors these Conferences, we need and appreciate the active support of the Secretary of Commerce and his staff.

I view with keen interest that expressed desire on the part of the National Association of State Departments of Agriculture to participate more actively in these Conferences.

Regardless of whether your jurisdictional administration is vested in city, county, or State government, the interest and support of your administrator is essential to you personally and, most important, to the value of your weights and measures program to all segments of our economy.

I speak the desires of weights and measures officials as I say—we definitely implore all segments of industry to continue their most welcome interest in the National Conference.

During this past year and several years preceding, I have had the opportunity to visit industrial plants either experimenting with or in actual production of weighing and measuring equipment. I also saw dreams stretched out on drawing boards. Industry is in action.

Mass merchandizing and jet-age commerce will progressively impose new demands on both industry and weights and measures officials. We face a continuing challenge to intelligently meet future demands. These National Conferences have in the past assisted and, I have no doubt, will continue to assist each one of us to be prepared in meeting the challenge.

Do not discount the possibility that soon we may be checkweighing green cheese from the moon.

Today I am most conscious that the crying need in our profession is the lack of uniformity in action. I now realize that desires and capabilities are only half the tools. I, personally, am ready to agree with the outstanding leaders in weights and measures that to gain *uniformity of compliance* we must conduct similar programs of *uniform requirements.*

As expansive as this great Nation is, we are to be congratulated that our standards for weight and measure are uniformly recognized throughout the States. However, there is a noticeable difference in the requirements for packaged products. In this area, we do need a greater meeting of minds. There is need for unbiased studies between industries and officials.

We are now at the threshold of the formal proceedings for this 48th National Conference. The plans are carefully laid. The officers have performed their duties and met their responsibilities without exception.

I am most grateful for the assistance and support that they and all others have given me. The success or failure of the Conference is now in your hands. With your full participation it will be a success. Without your participation, our efforts will have been in vain.

Now I would like to steal last year's closing statement of our Past Chairman, Bob Williams of Nassau County, New York. Bob said and I concur: "Please be on time for each session. I implore you do not wait in the lobby to be *urged* into the meeting room. The time scheduled for all sessions is shown in the program. I especially urge everybody to remain and attend the Friday morning session."

To all of you, please participate fully throughout the Conference. This is a democratic "congress"—this is your meeting. Again remember:

> All that we contribute into the lives of others,
> Comes back into our own.

REPORT OF THE EXECUTIVE SECRETARY OF THE NATIONAL CONFERENCE

By W. S. Bussey, *Assistant to the Director, National Bureau of Standards*

Activities of the States, Counties, and Cities

General.—I am pleased to report that the weights and measures services, throughout the United States, have continued to improve and expand during the past year.

Laws.—The principal legislative achievement has been the enactment of the Model Law by the State of Arkansas. We are delighted to welcome the official delegate from that State, Mr. Andrew L. Little, to this Conference. I know all of us look forward to the opportunity of working with him in the months to come. The new Arkansas law will go into effect on July 1, 1963. Other significant legislative action has taken place in the States of California, Connecticut, Kansas, Maine, and New York. Others may have taken similar legislative action that has not come to our attention.

Only one State now remains without a reasonably comprehensive weights and measures law and one additional State has a law but is without administrative effort at the State level. I would hope that these two situations could be corrected in the very near future.

Regulations.—Important improvements in weights and measures regulations have been made in the following States:

1. Connecticut
2. Florida
3. Iowa
4. New York
5. Nevada
6. North Carolina
7. North Dakota
8. Pennsylvania
9. South Carolina
10. Utah

The promulgation of adequate and modern regulations is an area in weights and measures administration that needs immediate further study and improvement. I would urge all States to take a close look

at their weights and measures regulations and consider the early promulgations of all needed amendments.

Specifications and Tolerances.—The situation regarding the official adoption of the Handbook 44 codes has continued to improve. At this time, some 42 States, the District of Columbia, and Puerto Rico have officially adopted the Handbook 44 Codes, either in whole or in part. I would hope that the few remaining States will follow suit soon. I should like to emphasize the importance of keeping these codes current, in all States. Please do not neglect or delay the adoption of the amendments each year, if this is the required procedure in your State.

Standards and Equipment.—Recent reports indicate that weights and measures standards and equipment have been purchased in some abundance by weights and measures departments during the past year. A particularly important factor in weights and measures administration is the improvement and expansion in laboratory facilities that is being achieved at State and local levels. Several jurisdictions deserve commendation for their recent achievements in this area. Numerous other jurisdictions deserve credit for their progress in obtaining expensive equipment, such as vehicle and livestock scale testing units and LP gas and other petroleum meter provers. All jurisdictions should constantly review their physical facilities and make every reasonable effort to keep them up to date, as is dictated by the needs and demands for weights and measures service.

Unusual Experiences.—Several jurisdictions have had especially interesting and somewhat unusual experiences during the past year. I think of three particular cases in this category. This is the activity in California pertaining to deceptive packages of cosmetics; the action in North Dakota against fraudulent weighing at a few grain elevators; and the new program in Wisconsin whereby commercial weighing and measuring devices are tested on a "sample" basis. You will hear more about this program from Mr. Claire L. Jackson on Friday morning. I am certain that Mr. William A. Kerlin and the other members of the California delegation will be glad to talk with you about their experiences in the cosmetic field.

Package Labels.—Another important activity has been the rather tremendous efforts in New Jersey and Virginia to bring about proper labeling of packaged commodities. It would seem that all jurisdictions should become equally active in this area.

Truth-in-Packaging.—Public interest in packaging and labeling has continued at a very high level. Hearings on Senator Hart's "Truth-in-Packaging" Bill were complete in April. Committee action should be forthcoming in the near future.

Office of Consumer Protection.—Senator Estes Kefauver introduced a bill on June 6, 1963, designed to create an Office of Consumer Protection, at subcabinet level. This bill could prove of great value to the consumers of the United States of America.

Technical Training.—Technical training has continued to be a major factor in weights and measures administration throughout the Nation. Many States have been active in the training area. Also, the Bureau's Office of Weights and Measures has continued and increased its activity in this field. Office of Weights and Measures staff members have helped conduct State training schools in 14 States since the 47th Conference. No national training school for senior and super-

visory personnel was held this year. Such a course was offered by the Office of Weights and Measures in both Washington, D.C., and Boulder, Colorado. Unfortunately, not enough students applied, in either place, to make the school feasible. OWM plans to reoffer the course at a later date. I do hope that the response will be much better.

A new type of training effort in the weights and measures field was undertaken in the State of Pennsylvania. The course was sponsored by the Department of Public Instruction and was offered in Pittsburgh, to the State and local inspectors in that area. The classes were held in the Allegheny County Court House, on Wednesday afternoon of each week, from April 17 until June 19, 1963. I am confident that the venture proved to be worthwhile.

Cooperation of the National Bureau of Standards.—I can assure you the National Bureau of Standards will continue to render every practicable assistance to the Conference, to weights and measures officials in general, and to business and industry on matters concerning weights and measures. Also, I pledge you my best efforts in the months to come.

SECOND SESSION—MORNING OF WEDNESDAY, JUNE 12, 1963

(J. F. McCarthy, Vice Chairman, Presiding)

REPORT OF THE COMMITTEE ON EDUCATION

Presented by J. E. Bowen, *Chairman, City Sealer of Weights and Measures, Newton, Massachusetts*, and S. H. Christie, Jr., *Deputy State Superintendent, Division of Weights and Measures, State of New Jersey*

Mr. Bowen: The official statement of the Organization and Procedure of The National Conference on Weights and Measures, including its constituent committees, delegates to the Committee on Education consideration of matters embracing the technical training of weights and measures officials, the education of the general public with relation to weights and measures matters, and the education of users of weighing and measuring devices.

Your Committee on Education has been active, during the past year, with reference to a number of projects in the three fields of assigned Committee authority, and of interest and concern to every weights and measures official.

The Committee met in Washington during the final days of the National Conference a year ago. Through the year there has been much Committee business transacted by correspondence, and some by long distance telephone communication between its members. The Committee Chairman and the Chairman of the Subcommittee on National Weights and Measures Week were able to confer in person during attendance of both at the New York State Weights and Measures Association Conference in Massena, New York, in July, and the Committee Chairman and the Secretary met for a conference in Boston, Massachusetts, in August. All Committee members, except one, were present at a meeting called by the Committee Chairman in Nashville, Tennessee, in October, when these members were in attendance at the Conference of the Southern Weights and Measures Association.

Two nationwide surveys were conducted by means of questionnaires to a representative number of weights and measures officials at State, county and municipal levels of government, including large, medium, and small weights and measures offices. The surveys contemplated the formulation of revised salary recommendations and the collection of certain other information related to personnel performance, equipment, etc. The second survey served to a certain degree the demand for an outline for a home study course for weights and measures officials.

Your Committee acknowledges appreciation, and offers its thanks for the valued assistance of our Secretary, Mr. William S. Bussey, in conducting these surveys, and for providing authoritative assistance in the analysis of the data obtained.

Salary Schedules for Weights and Measures Positions

With reference to the Salary Questionnaire, 136 were mailed, and replies were received from 93, or better than 68 percent.

Similar salary information had been collected, on a nationwide basis,

in 1952, and the salary schedule recommendations were presented to the 37th National Conference. Two years later, revisions were recommended to the 39th National Conference. The most recent study and salary schedule recommendations were presented to the 43rd National Conference in 1958.

Inasmuch as there has been an elapse of five years, during which periodic economic conditions have changed considerably, involving increased living costs and increased salaries and wages in general, it has been deemed timely to reevaluate the recommended salary schedules for weights and measures officials.

Salaries at the present time, in far too many places, are less than the "prevailing wage" for other positions whose responsibilities and duties can be considered in the same rank. To secure, and retain, competent career personnel, to preclude and combat instances of "conflict of interest," and to encourage strict integrity in office, it is imperative that underpaid situations be remedied.

The step-advancement plan, which provides for annual increases in salary over a period of years, has demonstrated its worth as an incentive for continuous service. Provision for several grades of employees in the larger departments, the higher grades being filled normally from the lower ranks by promotional examinations, acts to encourage the ambitious man who is striving at all times to do a better than average job.

Recommendations for salaries have been upgraded in amounts that are commensurate with increases disclosed by the questionnaires, and are compatible with current Federal salaries, and with industrial salary increases in fields of comparable requirements. Having considered the above factors it is the Committee's judgment that the following tables are realistic and equitable and will assist in the justification of such recommended salaries before such governmental officials as budget analysts, executive administrators, and appropriating authorities. The following salary schedules are recommended as minimum amounts to be paid when first entering that grade of service, with automatic increases to take place at the completion of each year of satisfactory service until the maximum is attained. By "minimum amounts" it is meant that no salaries for full time positions should be less than those stated. There will undoubtedly be some instances where, owing to living conditions or other considerations, entrance salaries will be higher. The Committee recommends, as equitable in today's labor market, the following schedules:

CHART 1

Personnel	Departments (20 or more employees) monthly 5-step rates				
	1	2	3	4	5
Trainees	$400	$425	$450	$475	$500
Deputies	550	575	600	625	650
Chief deputy	*700	750	800	850	900
Chief deputy	*900	950	1000	1050	1100
Division chief (director)	*1100	1150	1200	1250	1300
Division chief (director)	*1300	1350	1400	1450	1500

*According to size of Department.
If a "Three-step plan" is used, take the amounts shown under 1, 3, and 5.
Some larger departments may also have other classifications such as "Junior Deputies", "Investigators", etc. Salaries for these classifications can be established in accord with the above.

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CHART 2

Personnel	Departments (10 to 19 employees) monthly 5-step rates				
	1	2	3	4	5
Trainees	$400	$425	$450	$475	$500
Deputies	550	575	600	625	650
Chief deputy	*700	725	750	775	800
Chief deputy	*800	825	850	875	900
Division chief (director)	*900	950	1000	1050	1100
Division chief (director)	*1100	1150	1200	1250	1300

*According to size of Department.

CHART 3

Personnel	Departments (6 to 9 employees) monthly 5-step rates				
	1	2	3	4	5
Deputies	$500	$525	$550	$575	$600
Chief deputy	600	625	650	675	700
Division chief (director)	800	850	900	950	1000

CHART 4

Personnel	Departments (2 to 5 employees) monthly 5-step rate				
	1	2	3	4	5
Deputies	$500	$525	$550	$575	$600
Division chief (director)	700	725	750	775	800

CHART 5

Personnel	Departments (1 man) monthly 5-step rate				
	1	2	3	4	5
Sealer or inspector	*$500	$525	$550	$ 575	$600
Sealer or inspector	*600	625	650	675	700

*According to size of jurisdiction.

The aforementioned Salary Questionnaire was also utilized in the collection of certain other information of value, for possible future use and after further study.

Recommended Manpower Requirements

For some years the Committee on Education has advocated that, in general, one inspector should be employed for each 50,000 population, or major fraction thereof. Though there are fewer "Mom and Pop" type corner grocery stores than in the not-too-distant past, present mass-distribution type retail supermarket establishments present new problems. They are pneumatic, hydraulic, mechanical, and electronic principles. The metering of petroleum products through very high-speed devices, the supervision of measurement of liquified petroleum gas, and other practices and problems of the day, have elevated weights and measures administration far above any concept of "horse and buggy days operations." Weights and measures operations today require more time, more technical skill, and more ability than ever

before. Your Committee reaffirms its recommendation of the necessity, for proper performance, that one inspector be provided for each 50,000 population or major fraction thereof.

Home Study Course for Weights and Measures Officials

Self-education for weights and measures officials is a matter that has received consideration of the Committee for several years. During the past year a survey, on a nationwide scale, was instituted to ascertain the probable degree of acceptance, upon the part of weights and measures officials, of a home-study course. Response to a proposal to provide an outline for such a course was unanimously favorable, and in most instances enthusiastic.

The Office of Weights and Measures has prepared an outline of recommended reading and suggested examination questions.

For practical reasons involved in publishing, mailing, conducting examinations, etc., and because of differences in State statutes, rules and regulations and enforcement practices, it is proposed that the course outline be offered, primarily, through heads of State Divisions, in order that they may edit or tailor the material to suit local requirements, duplicate it, and then circulate to all interested officials in the jurisdiction. This general procedure is not intended to preclude providing such educational material to heads of county and city departments, or providing material to other individuals, in instances where such action may be indicated.

Your Committee stands greatly indebted to Mr. M. W. Jensen, Chief, of the Office of Weights and Measures, and members of his staff for their capable cooperation in the preparation of the course. And especially to Mr. R. N. Smith of that office.

Technical Training Schools for Weights and Measures Officials

The Office of Weights and Measures has continued its established program of conducting technical training schools for weights and measures officials at the State level, and by offering classes at the NBS technical training laboratory in Washington. It is the purpose of schools at the Bureau to train students so that they may, in turn, be qualified to conduct similar classes locally. The Committee on Education commends this activity upon the part of the National Bureau of Standards and highly recommends widespread acceptance of the opportunity for weights and measures officials. It is regrettable that an insufficient number of students applied to make such classes feasible, either in Washington or Boulder, Colorado, when last offered.

Initiation of Weights and Measures Courses at Colleges and Universities Educating Future Supermarket Personnel

For several years the Committee has been engaged in investigating the possibility of securing inclusion of weights and measures instruction in training schools for food store personnel, as are conducted in several colleges and universities throughout the Nation.

During the past year success was attained in two instances wherein weights and measures officials lectured to classes of students being trained for retail food management operation. One such lecture was arranged by Mr. J. L. Littlefield, Chief, Division of Foods and Standards, State of Michigan, before class at the Michigan State University, and was presented by Mr. R. M. Leach, Assistant Chief. The

lecture covered (1) Michigan weights and measures laws and their interpretation; (2) methods employed by inspectors in checking weighing devices and in checking prepackaged foods for correct weight; (3) management's responsibility in the maintenance of weighing devices; (4) in the packaging of foods (especially shrinkage-prone merchandise); and (5) the conspicuous labeling of prepackaged foods with proper declarations, etc. The program created considerable student interest and provoked the asking of questions for a period of forty minutes after termination of the lecture. Mr. J. E. Bowen, Sealer of Weights and Measures, City of Newton, Massachusetts, lectured on "Local Weights and Measures Enforcement Related to Retail Operations" before a two-year class in food distribution at the University of Massachusetts. He stressed the merchant's responsibility with regard to weights and measures laws and regulations, and the effect of faulty weighing and measuring equipment, carelessness, etc., upon profits. In addition to the lecture the Bureau's film, "Assignment-Weights and Measures," and the Newton-produced film, "Your Weights and Measures Department in Action," were exhibited. The professor in charge has written commendation to the speaker for providing the program, and stated that the University would, in all probability, request a repeat performance in the future. Favorable reception of these two programs, at the university level, suggests and encourages further pursuit of this type of promotional activity.

Household Weights and Measures Card

Reports of successful usage of the Household Weights and Measures Card by numerous jurisdictions prompts the Committee to reiterate its past recommendations of this vehicle of communication with the public. The card is an 8½ x 11″, white postcard stock, compendium of information and advice of particular value to the housewife, complete with weight and measurement tables, and is suitable for kitchen use. It is a publication of the National Bureau of Standards, entitled "Household Weights and Measures." Reproducible copies are offered at no cost by the Bureau, and it has been reproduced by numerous State and local weights and measures offices by the photo-offset method, including the desirable insertion of local agency identification. This card has proven a popular giveaway item wherever offered. The Committee urges weights and measures officials to take advantage of this valuable adjunct to public educational or public relations efforts.

National Weights and Measures Week

As was done in the year 1962, the entire Committee on Education functioned as a whole for the promotion of National Weights and Measures Week 1963. However, this nationwide activity was headed by Mr. S. H. Christie, Jr., Deputy State Superintendent, of the State of New Jersey, who served as Chairman of National Weights and Measures Week. Mr. Christie directed this whole promotional operation from start to finish, and every weights and measures official is indebted to him for his devoted leadership and skillful direction of this nationwide project. It will now be our pleasure to have Mr. Christie present the part of this report bearing on National Weights and Measures Week 1963.

Mr. Christie: We are all aware of the fact that the National Conference on Weights and Measures has just closed the book on its Sixth

National Weights and Measures Week. Perhaps the word chapter instead of the word book would be more appropriate under the circumstances, since this program is one of a continuing nature and not one which has been brought to a final conclusion at this time.

At the 1962 meeting of the Committee on Education, during which time the "Week" was discussed, it was decided to continue the program of direction, guidance, and assistance by means of subcommittee action and the use of area coordinators, since this method had proven so effective in the past. It has been demonstrated that this form of committee activity is one which proves successful, since it is highly susceptible to the wants and needs of various geographical conditions and the pulse of the human beings involved, which varies in several States. This program also makes the most efficient use of the kinetic energy developed by the enthusiasm of the local officials of weights and measures and its consequential impact directly upon those who are being served and benefited by weights and measures laws and activities.

It was also decided to make an attempt to have the "Week" recognized in national publications and national programs on radio and TV. An effort dear to the hearts of all weights and measures officers and one which has been under discussion for several years was to be pressed in an effort to bring it to a successful conclusion, and that which I speak of was the issuance of the United States commemorative postage stamp to celebrate National Weights and Measures Week.

An effort was also going to be made to obtain a release of a painting which was carried on the front cover of the *Saturday Evening Post* a number of years ago and which so dearly intrigued the hearts and minds of weights and measures officials, in addition to being an eye catcher that could be put to efficient use during our program.

Our men throughout the entire United States apparently have responded with enthusiasm, for a representative sampling of the reports has indicated this year's National Weights and Measures Week was a huge success. Of course, this varied from a low of no participation to that of those whose efforts and their corresponding results overwhelmed one and all. Not only Governors' proclamations and statements were issued, but various governing bodies of counties, parishes, and municipalities participated in this respect. Thousands of inches of space were utilized by the newspaper fraternity in acquainting their readers with actions on their behalf by weights and measures officials. Excellent use was made of newspaper mats by advertisers who were desirous of having the public become acquainted with this important governmental operation. Thousands of pieces of mail bore either a seal, a weights and measures stamp, an imprint of the emblem, or an imprint of the cancellation slug, helping to convey the message to others who do not have normal contact with our duties. Exhibitions, lectures, pictures, and the showing of movies to both adults and school children took place by the score. Handouts furnished by industry or developed by the officers themselves were distributed. The ideas used were limited only to the capacity, funds, and equipment available to the individuals involved, and in many areas the successful appearance, either live or taped. made on radio and television programs. Our Committee chairman was successful in having United States Senator Saltonstall of his State read into the Congressional Record material relating to weights and measures work and the National Weights and Measures Week.

We have been somewhat disappointed on matters pertaining to the possibility of the issuance of the United States commemorative stamp. United States Postmaster General J. Edward Day was contacted and the issue was pressed on our behalf by numerous United States Senators and Congressmen. All this activity on our behalf did, however, bring the matter to a head to such an extent that we are now positively aware of the fact that it will be impossible to have a commemorative stamp issued on behalf of the "Week." We were informed that the Citizens' Stamp Committee of the United States Post Office Department had taken this matter under advisement a year ago and found they could not conscientiously advocate such a printing. This conclusion was based on the fact that they could not do so in all fairness not only to us, but to the other various organizations and citizens of the United States who are also interested in promoting an issuance in behalf of their favorite week program.

It has been brought to our attention that a matter of historical significance would be necessary—one which would have an anniversary date of at least 50 years or multiples thereof. The occasion would have to be of direct interest to the majority, if not all, of the citizens of the United States and one which would not indicate any selfish motive being involved. In a discussion relating to this matter, it was suggested that the Committee be given an opportunity to consider the advisability of making a new approach to the Post Office Department using the legalizing of the metric system by Congress in 1866 for this purpose. The reason behind this was that it should satisfy the historical requirement, the vital interest of the matter to all our citizens today in all walks of life, in addition to satisfying the requirement relating to time. It is thought that, if the approach is started now, the problem may well be resolved for the year 1966, which would be the 100th anniversary and would provide the Citizens' Stamp Committee ample time to study and review the matter and possibly permit its introduction into circulation during the week of March 1 to 7.

Meanwhile, we trust that our own weights and measures officials will give this matter serious consideration and present their ideas in regard to the issuance of a commemorative stamp in order that all avenues relating thereto may be fully pursued.

On the matter pertaining to the *Saturday Evening Post* cover, we were informed that the company had no plans at present for reproducing the same, but we would, however, be advised if this were contemplated at some time in the future.

It is our considered opinion that the larger newspapers and national publications are more or less reluctant to become involved with our program. It appears that members of the editorial staff, as well as the writers, relegate our work in their minds to the investigation of the butcher's thumb which has been applied to a scale during a retail sale only. This thought must be broken down. This thought must be overcome if we are going to obtain consideration in this field. We must make them aware of our other responsibilities and that our main purpose is to establish and maintain equity in all commercial transactions. From the experience of this past year, it appears that the ice has been broken by means of contact with individuals holding more responsibility in the publishing field, and this must be further exploited.

At this time it is recommended that at its reorganizational meeting the Committee on Education set aside, if available, certain funds to

be used for designated promotional materials to be procured and forwarded to the area coordinators as soon as possible after the meeting of the National Conference, in order to facilitate and expedite the movement of such into their hands and to eliminate the time lag.

The Committee is studying the possibility of procuring professional services for the "Week." Of course, this would take money. It is estimated that there are approximately 3900 active weights and measures officials in the United States, who, in order that such a program could be placed into effect, would have to be assessed a nominal fee of one or two dollars. This subject has great possibilities, and at the same time has numerous drawbacks. Many of us are inclined to be resentful of an assessment, even though our positions or we ourselves will ultimately benefit insofar as both prestige and monetary returns are concerned. Due to the ethics involved, a public relations operation would of necessity have to have its material reviewed and okayed by the Committee in charge. However, men in this field do have the contacts to recognize the so-called gimmicks that are required and have a specialized knowledge as to the requirements, and also through their personal contacts are in the position on many an occasion to have their material reach the public when others like ourselves have the same item rejected.

It is also recommended to our successor Committee on Education in particular and the Conference group in general that a review of the possibilities of participating in the World's Fair be made. The use of the term "World's Fair" in this instance should not be pushed aside lightly since the Fair will be located in the New York City area which is not only located in the most highly populated region in the United States, but also is an unusually attractive and proven drawing card for visitors in all walks of life and occupations from all over the United States. This, too, would have to be done on an assessment basis, and if a booth could not be had in its entirety by weights and measures officials alone, there is a possibility that one may be shared by interested members of industry. Individual participation could be on a sort of competing block program on an area basis which could be placed on display to indicate the activity of the group throughout the entire nation.

This report cannot be brought to a conclusion without taking the opportunity to thank members of our Conference, both the weights and measures officials and associates who, through their enthusiasm, are actually responsible for the success of the occasion.

Mr. Bowen: In conclusion, the Committee wishes to acknowledge its grateful thanks for the many suggestions that have been offered, and for the excellent cooperation of weights and measures officials, weights and measures associations, business organizations, representatives of industry, and others, and takes this opportunity to register officially its sincere appreciation therefor.

J. Ellis Bowen, *Chairman*
J. Fred True
Carl H. Stender
John T. Daniell
Samuel H. Christie, Jr.
William S. Bussey *Secretary.*

(The Report of the Committee on Education was adopted by voice vote.)

INTRODUCTION OF MR. WILLIAM GRAY BY J. F. McCARTHY, VICE CHAIRMAN

In 1923 a young man, then 17 years of age, presented himself before the Fife County Council in Scotland, an organization similar to a State Department of Weights and Measures, requesting the opportunity to start training for what has become his life's work in the weights and measures field.

The Chief Inspector of the Council recommended a course of practical training in outside industry as a beginning.

Arrangements were made for the young man to be trained by W. & T. Avery Ltd., a company comparable to one of the large scale companies in this country. After a training period of three years, both in Glasgow, Scotland, and Birmingham, England, he joined the Fife County Council in Scotland.

In 1930, after having passed the Board of Trade examination, he qualified as an inspector of weights and measures and served as an inspector with Fife County for two years.

In 1932 a vacancy existed as an inspector in the City of Leicester, England. He applied for and received the position in this City located in the industrial Midlands of England whose principal industries are clothing, hosiery, boots and shoes, printing and light-engineering.

He served as inspector until 1938 when he was appointed Chief Inspector and is serving in this position at the present time.

From 1949 till 1955 he was Secretary of the Institute of Weights and Measures Administration, an organization comparable to the National Conference on Weights and Measures.

On resigning as Secretary, he was elected Vice Chairman of the Institute, and the following year he served as its Chairman.

In recognition of his services in the field of Weights and Measures the honor of Member of the British Empire was conferred on him by the Queen of England in 1956. During this same year he was elected a Fellow of the Institute of Weights and Measures Administration.

The Conference is fortunate that the City of Leicester, England, has made it possible for the next speaker to come here and deliver one of the principal addresses of the Conference.

It is a privilege for me to present to the Conference Mr. William Gray, Member of the British Empire and Fellow of the Institute of Weights and Measures Administration, Chief Inspector of Weights and Measures of the City of Leicester, England, whose address is titled "Consumer Protection in Great Britian."

CONSUMER PROTECTION IN GREAT BRITAIN

By William Gray, *Chief Inspector of Weights and Measures, Leicester, England*

Historical

From earliest times the rulers of England have made laws which attempted to bring into use a uniform system of weights and measures, and to protect the consumer respecting the quality and quantity of food and drink—bread and ale—and staples such as wool, hides, grain,

etc. The history of the realm is rich in records of statutes and proclamations designed to this end. Unfortunately, the Royal Warrant did not always command respect throughout the country. Local custom was often stronger than the law, as borough records of assize towns show. The boroughs were continually in trouble with the King's Marshall, and fines were imposed for failure to maintain proper standards of weight and measure. It was not uncommon for standards to be debased, merchants to cheat regarding the measurement and quality of cloth and wool, millers and bakers to adulterate meal and flour and bake underweight loaves of bread.

According to Salzman [English Trade in the Middle Ages] the Mensural system was one wild welter of confusion, partly due to the same term having a varying significance when applied to different commodities, and partly to local variations.

While it is important that our eyes should be turned to the future, it is necessary to a complete understanding of the purpose of legislation to study history, including the social history of earlier times. [Medieval English History.] Trading in medieval times, as the records show, was, if anything, more hazardous than it is today, and it is significant that laws were just as necessary in those days to safeguard the consumer against deceit and short weight as they are today. [Extracts from Annual Report of the Warden of Standards 1871–76.]

Trading was mainly conducted within small communities, of which the market town was the hub, goods being brought in from surrounding districts and haggled for in the open market places. The degree of control from the seat of government was perhaps less because of the small range and value of the commodities dealt with, and also because of the difficulties of communications. The industrial revolution in the 19th century, and the improvements in transport opened up the country and made trading over greater distances possible. A uniform system of weights and measures became a fundamental necessity to deal with new methods of trading arising from the industrial expansion—trading by "sample," as it was known—by merchants separated by distance as distinct from haggling for lots in the open market places. The Act introduced for this purpose was the Weights and Measures Act, 1878.

The Weights and Measures Act, 1878

The principal Act under which inspectors operate today is the Weights and Measures Act, 1878. The Act generally consolidated and reenacted the legislation of the previous 50 to 60 years, and, as stated, it was the outcome of the industrial revolution and improved communications and trade between widely separated parts of the nation. The transition from purely local to national trade which followed the introduction of the Act brought to light the great variation in the units of weight and measure in different parts of the country, and in certain cases the quantity of goods bought and sold represented by units of the same name.

The Weights and Measures Act, 1878, and the Statutes of the 18th and 19th centuries aimed at one thing—the achievement of nationwide uniformity and accuracy in the units used in trade. A system of weights and measures based on two material standards (Imperial Standard Yard and Imperial Standard Pound) was defined and pro-

vision made for its enforcement on a uniform basis throughout the country by officials (Inspectors of Weights and Measures) appointed by local authorities. This principle was followed in Part I of the Weights and Measures Act, 1889, and culminated in the Weights and Measures Act, 1904. The latter Act made provision for the examination of candidates for the office of Inspector of Weights and Measures, certification of patterns of appliances for use in trade, etc., and the Weights and Measures Regulations, 1907, made thereunder prescribed the requirements for the verification and inspection of all types of weights, measures, weighing and measuring appliances for trade use. It still remains one of the most important duties of the Inspector of Weights and Measures to preserve and enforce the accuracy of the weighing and measuring appliances used in trade.

Trade practices have changed considerably since the 1878 Act was introduced. At that time, and in the early years of this century, most retail trade was done personally, shopping was a leisurely affair, and the housewife regarded it as a duty to go to the shop or market, select her purchases, including meat, cheese, bacon, etc., and what was more important, she would see the goods weighed or measured in her presence. The purchaser was in fact her own watchdog regarding the quality and quantity of her purchases, and it was generally sufficient for the Inspector of Weights and Measures to ensure that traders kept accurate appliances.

By its nature, coal did not lend itself to personal shopping. The need to protect the consumer against deception and short weight in the sale of coal led the Government to introduce legislation to prohibit the giving of short weight as early as 1889, hence the special provisions in Part II of the Weights and Measures Act, 1889, regulating the sale of coal and imposing penalties for short weight, frauds by draymen, etc.

The "Order" trade which became fashionable during and after the 1914–1918 war arose from the advent of the telephone and the growth in the number of women going out to work in offices and factories. This period marked the virtual end of personal shopping, and as this fashion changed, so did the shopkeeper change his methods. Indeed, the change was gradually forced upon traders by the pressure of increasing population and the demands of the industrial era. The first World War merely hastened the process which was caused by shortage of manpower; the shopkeeper found that it saved time if he weighed up goods into packets of the size he was likely to require for weekend orders, rather than follow the old practice of making up and weighing each order separately, hence the "prepacked article" was born—commonplace today, but except for tea, which by the Sale of Tea Act, 1922, was required to be sold by retail by net weight, almost unknown before 1914. As previously stated, bread was the only other article of food which from early times was required to be sold by weight.

As might be expected, short weight and measure in prepacked food became rife during and after the 1914–1918 war, since there was no legal sanction to protect the consumer against it as such. The consumer could no longer be her own watchdog against short weight, and *caveat emptor* (let the buyer beware) became a meaningless principle.

Sale of Food (Weights and Measures) Act, 1926

Pressure of public opinion led the Government to set up a Royal Commission on food prices. The recommendations of the Commission (based largely on evidence given by the Incorporated Society of Inspectors of Weights and Measures [now the Institute of Weights and Measures Administration]) resulted in the Sale of Food (Weights and Measures) Act, 1926. This Act marked a change in Government policy; it recognised the change in shopping habits which long before had taken place, and it no longer contented itself with the provision by the trader of correct appliances, leaving purchasers to see that they were properly used. The Act of 1926 made the giving of short weight, measure, or number in the sale of food by retail an offence; and what is more significant, it recognised the prepacked article—i.e., the article "made up *in advance* ready for retail sale in a wrapper or container." The Act also required, *inter alia*, prepacked articles of a number of common essential foods to be made up in specified weights, and in certain cases to be marked with a statement of weight.

The Sale of Food Act did not apply to wholesale dealings except prepacked articles, or to horticultural commodities with the exception of potatoes, and it limited the foods required to be packed in specified weights to certain staple foods prescribed in the Schedules. Despite its limitations, the Sale of Food Act remained for 20 years the only protective bulwark between the consumer and dishonest trading in foodstuffs. Its success, despite forebodings to the contrary by trading interests, paved the way for an extension of the principles prescribed in the Act.

The Prepacked Food (Weights and Measures: Marking) Regulations, 1957

The Labeling of Food Order, 1946 (now the Prepacked Food [Weights and Measures: Marking] Regulations, 1957, as amended), made under the Defence Regulations during the last war extended certain of the principles of the 1926 Act (with certain exceptions) to the generality of food sold by retail. The main principle laid down by the Order, and the Regulations which replaced it, is that prepacked articles of food are required to be marked with a *true* statement of the minimum content in terms of net weight, measure, or number.

This wartime legislation represented a considerable advance in consumer protection, and undoubtedly it afforded the consumer a greater degree of protection at a vital time, when prepackaging attained new heights, pending complete revision of Weights and Measures law. The Regulations filled a vital gap in consumer protection, and it is not overstressing the position to say that without the Regulations deception of the public in the new ranges of food commodities might have assumed serious proportions.

The weakness of the present law is that it does not apply to wholesale dealing, prepacked horticultural items, chocolate and confectionery, fish, cheese, etc., nor nonfood articles of any kind.

The Committee on Weights and Measures Legislation

In 1948 the President of the Board of Trade set up a Departmental Committee:

To review the existing weights and measures legislation and other legislation containing provisions affecting weights and measures and the administration

thereof and to make recommendations for bringing these into line with present-day requirements.

The then Incorporated Society of Inspectors of Weights and Measures had been pressing the Board of Trade to set up an inquiry into weights and measures, and had submitted evidence in a detailed report prepared by a special Reconstruction Committee of the Society in 1945.

The Report of the Departmental Committee on Weights and Measures Legislation is perhaps the most detailed examination of the construction and needs of weights and measures administration ever undertaken in Britain. The Committee, which was the first of its kind for over 70 years, was in session for two years, and in the course of 48 meetings evidence was heard from 187 different sources, most of which were national associations representing scientific, weights and measures, trade and consumer interests. The most important recommendation is the suggested replacement of the Imperial system of weight and measure by the Metric system. It was perhaps no surprise when the President of the Board of Trade informed Parliament that the Government was in no way committed to the proposal. The Committee rejected centralisation of the Weights and Measures Service in favour of administration by local authorities, but made proposals to improve the efficiency of the Service, including increased powers of inspection and supervision by the Board of Trade. Proposals were made to change and extend the law respecting types of weighing and measuring appliances not hitherto subject to weights and measures control, and to improve the machinery of verification and inspection. The Committee also made recommendations designed to protect consumer interests. These included an extension of the principle of sale by net weight to a larger range of articles of food, extension of control to fresh fruit and vegetables, wholesale transactions in general, and to such nonfood articles which lend themselves to sale by weight, measure, or number.

There followed a decade between the report of the Departmental Committee on Weights and Measures Legislation and the introduction of a Weights and Measures Bill to implement the Committee's recommendations. The period marked the development of consumer protection as a movement which rapidly gained force. The movement was a spontaneous reaction against deceptive packaging, false trade descriptions, misleading claims, and the power tactics of suggestive advertising. In Britain, with outdated legislation, the soap manufacturers, prepackaging associations, and supermarket developers, backed up by slick advertising campaigns, had things their own way with a gullible and not too discerning public. Almost overnight some commodities previously sold by weight were introduced in attractive prepacks sold by price and description. Horticultural items such as tomatoes, carrots, onions, beetroot, apples, pears, etc., in such packs are sold in odd unmarked weights, the vast majority at higher prices than the ruling price per pound. Manufacturers of soap powders, soap flakes, and detergents introduced selling gimmicks, such as "3d off," "Giant size," and other deceptions, and varied the sizes and quantities in the packs to suit their campaigns, all, of course, without reference to weight.

As might be expected, the public reacted; a state of awareness, not perhaps very discriminating, but becoming more discerning and vocal

as Consumer Associations and Councils reported the facts. The Government sought to stem criticism by praising the good judgment and buying sense of the British housewife. The Government also instituted a social survey which the Parliamentary Secretary to the Board of Trade stated was designed to ascertain public preference in the matter of buying.

It appears the momentum and strength of the consumer protection movement surprised the Government and brought about an acceptance that a Weights and Measures Bill was necessary and could no longer be delayed.

Weights and Measures Bill

The Weights and Measures Bill was introduced into the House of Lords on 1st November, 1960, and having completed its various stages it was brought to the House of Commons on 13th February, 1961. Four hundred and thirty-nine amendments to the Bill were put down, not all of which were moved, and of those 122 were agreed, the majority being Government amendments. The Government decided to withdraw the Bill, possibly because of the nature and scope of the amendments, although the reason given was lack of Parliamentary time. The Government did, however, introduce a No. 2 Bill into the Commons which had its First Reading on 17th July, 1961. This Bill contained all the amendments to the No. 1 Bill agreed in the House of Lords, together with further amendments put in by the Government, and when he introduced the Bill the Government spokesman said the Bill had been introduced to give all those who were interested in it the opportunity to study and comment on the amendments.

It is not proposed to comment at length on either the No. 1 or the No. 2 Bill, except to give one or two pointers about the shape of things to come. In the Upper House amendments moved by some of the Noble Lords seemed to be aimed at lessening the impact of weights and measures control on manufacturers, wholesalers, and retailers. Government spokesmen paid lip service to the principle of sale by net weight, and reiterated their belief that "net when packed" prejudiced the interests rather than the protection of the consumer. Time after time, Government spokesmen, when amendments were moved which would have benefited the consumer, stated "it is not possible to do this" and gave one reason or another why manufacturers could not do it. One example is the amendment which sought to reduce the exemption limit of chocolate from 3 ounces prescribed in the Bill to 2 ounces. The technical difficulties which the Government were at pains to describe are held not to exist, especially as British manufacturers pack chocolate bars, etc., marked with a statement "net weight 1½ oz." for export to America where net weight marking is compulsory. A second example was an amendment exempting wood fuel from sale by net weight in a quantity exceeding half a ton. The Government's acceptance of this amendment means that sales of wood fuel exceeding 10 hundredweight can be made by price or by the load.

A third Weights and Measures Bill was introduced in the House of Commons in November, 1962. This Bill, although it appears to be the same as its predecessors, has been heavily amended, particularly in Part IV—Regulation of Certain Transactions in Goods, and the

Schedules which set out the detailed provisions affecting particular commodities.

The Bill is a massive document containing 60 pages of clauses and 56 pages of Schedules worded in complex language which requires careful study and which it is felt will create many headaches for the inspectorate as well as for traders.

Taken as a whole the Bill is a measure which if it comes on the statute book will considerably strengthen the law affecting weights and measures. With one or two exceptions, the clauses are generally good and it is perhaps regrettable that too much emphasis has been put on the commodity provisions which most directly affect the consumer, thus diverting attention from the improvements in other aspects of weights and measures. It may be said, however, that all weights and measures legislation, directly or indirectly, is a form of consumer protection and critics of the Bill can hardly be blamed for concentrating on the defects of the commodity provisions of Part IV and the fourth to eighth schedules, particularly as the Government told the country that the Bill was a "housewives charter" and the Board of Trade in their press handout said "its object is not to take the skill out of buying, but to take out the guesswork as far as quantity is concerned so that the trader competes in *price*, *quality*, *and service*, rather than by giving an exaggerated or false impression of the quantity being sold."

The Bill follows a present-day trend by setting out the general legal requirements in the clauses and the position with regard to particular commodities in the schedules. This, in addition to the language in which the Bill is cast, does not help to make the meaning clear, although it may have other advantages from a legal and constitutional point of view. It is not proposed to go through the Bill clause by clause, but rather to deal with certain aspects, concentrating in more detail on the obvious consumer protection provisions.

Part I—Units and Standards of Measurement

The yard and pound are defined by reference to the metre and kilogramme, thus assuring a constant relationship between Imperial and Metric units. The primary standards are prescribed and provision is made for authorised copies to be made and deposited at the Royal Mint; the Royal Society; the Royal Greenwich Observatory; immured in the Palace of Westminster: Standard Weights and Measures Department, Board of Trade. The purpose of making copies and depositing them in different places is a safeguard against the destruction of a primary standard. The Board of Trade is also required to provide and maintain Board of Trade Standards and Weights and Measures authorities are required to provide and maintain Local Standards and Working Standards.

Provision is also made for the establishment of a Commission and the implementation of its recommendations by Order. This will enable the Board of Trade to act on expert advice on such highly scientific questions as the definition of derived units and the maintenance of standards which will ultimately be translated into physical operations of weighing and measuring.

Part II—Weighing and Measuring for Trade

The expression "use for trade" is defined. That which constitutes "trade" is most important in weights and measures and the Board

took great care in drafting this clause to ensure that transactions by reference to quantity are brought within the term.

This part replaces the legislation enacted from 1878 to 1936 respecting weights, measures, and weighing and measuring appliances for use for trade. It also provides for the examination and approval of patterns by the Board of weighing and measuring appliances for use for trade, and prescribes new arrangements whereby the Board may prescribe general specifications which will permit appliances to be used for trade without the need for a certificate of approval.

Schedule 1 made under this part provides a list of defined units in which trading transactions must be conducted and Schedule 3 lists the actual physical weights and measures which are to be used by traders for weighing or measuring goods for sale. Other changes effected are the omission of the rod, pole, or perch, and the deletion of the bushel, peck, pennyweight, and the apothecaries' systems of weights and measures.

Part III—Public Weighing and Measuring Equipment

This part makes provision for local authorities to install and maintain weighing and measuring equipment for use by the public. Keepers of public weighing machines are required to hold a certificate from a Chief Inspector of Weights and Measures certifying that they have sufficient knowledge for the proper performance of their duties. As it is drawn, the Bill does not give powers to a Chief Inspector to revoke a certificate for misconduct or any other cause, but a person refused a certificate may appeal against the refusal to the Board, who may if they think fit direct the Chief Inspector to grant a certificate.

Provision is also made for the prosecution of a keeper of a public weighing machine who without reasonable cause (a) fails to carry out the weighing on demand, or (b) carries out the weighing unfairly, or (c) fails to deliver to the person requiring the weighing, a statement of the weight ascertained, or (d) fails to make a record of the weighing and retain the record for a period of two years, and to produce any such records for inspection by an Inspector, subject to the production, if requested, of the Inspector's credentials. The certification of weigh clerks and the prescription of penalties for offenses by weigh clerks, for the first time in weights and measures law, should add to the protection which it is intended the Act should afford to consumers.

Part IV—Regulations of Certain Transactions in Goods

This part of the Bill contains the commodity provisions which are of most direct consumer interest.

Schedules 4, 5, 6, 7, and 8 derive their effect from this part of the Bill and most be read in conjunction with clauses 21 to 33. These clauses prescribe the general requirements, individual responsibility, and legal liability, and the schedules lay down the special requirements which apply to different goods: Schedule 4, Foods; Schedule 5, Sand and Ballast; Schedule 6, Solid Fuel; Schedule 7, Miscellaneous goods other than foods; Schedule 8, Composite goods and collection of articles.

Short weight, etc.—It is made an offense to give short weight, measure, or number subject to certain qualifications which appear to

be in addition to the defences available to traders who are proceeded against for offences.

Quality to be stated in writing.—There is also a requirement which does not exist in the present law which is to insure that when goods, with certain exceptions, are delivered to the home of the purchaser, a statement of the quantities being delivered accompanies the goods.

Pleading warranty—Defences and safeguards to traders.—The present defences and safeguards to traders who are proceeded against for offences are repeated and extended in the Bill. Thus a trader can plead "warranty," or that "the offence was due to the act or default of a third person." "Additional defences" are incorporated which are unique insofar as they provide a defence for proceedings taken in respect of any excess in the quantity of goods, and an "averaging" procedure which applies where proceedings are taken respecting prepacked articles or goods made in particular quantities, e.g., bread. In any such case the person charged shall not be convicted if it is proved that at the same time and place other articles of the same kind were available for testing and a reasonable number of those other articles was also tested. The court, (i) if the proceedings are with respect to one or more of a number of articles tested on the same occasion, shall have regard to the average quantity in all the articles tested; (ii) if the proceedings are with respect to a single article, shall disregard any inconsiderable deficiency or excess; and (iii) shall have regard generally to all the circumstances of the case. No doubt, it is necessary to provide defences and safegnards to traders to protect them against prosecution for trival or technical offences or for offences which they had taken all reasonable steps to avoid, but only time will determine whether "averaging" will go so far as to prejudice the interests of consumers.

Another provision new to weights and measures legislation prescribes that where a corporate body is being sued, if the offence is proved to have arisen as the result of the neglect of or is directly due to action on the part of a director, secretary, or other officer, he also incurs liability in addition to the company.

Powers of Inspector With Respect to Documents, Check Weighing Road Vehicles, Test Purchases

Inspectors of weights and measures, under certain circumstances, are empowered to weigh goods, break open containers for the purpose of weighing, etc., and to inspect and detain documents relating to goods. In specified cases, an inspector may require goods carried on a vehicle to be unloaded and the goods and the vehicle to be check-weighed. Provision is also made for an inspector to make test purchases of goods on behalf of his local authority.

Selling by quantity—Making quantity known—The quantity of any goods sold must be made known to the prospective buyer before the sale is completed either by weighing, measuring, or counting the goods in the presence of the purchaser; or by marking the quantity in writing in the case of prepacked goods; or by delivering a statement of quantity in writing to the purchaser.

Schedules 4 to 8 prescribe the goods to be sold in a particular manner, and the clause describes three ways, referred to above, of making the weight known to purchasers.

This was the position in the No. 1 Bill until the Government introduced a subclause in the No. 2 Bill and amended the subclause in the present Bill by adding two words, namely "gross weight." This Government amendment, put in, it is stated, on the representations of a packaging association, is perhaps the most disputed clause in the Bill. It permits the sale of prepacked goods which are not marked with a statement of quantity provided the shopkeeper makes available weighing equipment, for use by the purchaser, for the purpose of determining for himself the *gross weight* of any such goods.

The practical effect of this ingenious method of making known the weight to the buyer is that it transfers responsibility for making the quantity known from the seller to the buyer. The gross weight ascertained by any person who uses the scale becomes the basis of the sale, and he can take no action if the weight so ascertained is less than he expected to receive for the price paid.

The amendment does not do away with other ways of making known the weight to buyers, and traders who do not provide weighing equipment for the sole use of the buyer will still require to mark the weight on goods or employ one of the alternative ways of making known the weight.

The effect of one subclause on a major measure should not be overemphasized, but the impact of the clause on the schedules cannot be disregarded, any more than the fact that it transfers responsibility for determining the quantity of goods, to which the conditions are applied, from the seller to the purchaser.

Comment on the part of the paper which deals with the Bill is all the more difficult because, at the time of writing, the Bill is passing through Parliament and it is still subject to amendments. Force is given to this observation by the fact that at the Report in the Commons the Government moved an amendment which considerably modified and restricted the application of the subclause. The effect of the amendment is that the subclause will apply, for the present, to all fruits, mushrooms, and vegetables prepacked by gross weight, and the Board has been given power by Order to apply the terms of the subclause to such other goods in such circumstances as are specified in the Order. The amendment put in by the Government undoubtedly resulted from pressure from all sides in Standing Committee, and whilst it goes some way towards improving the position, it is considered that the principle on which the subclause is based is fundamentally wrong.

Schedules.—The detailed provisions affecting particular commodities are set out in Schedules 4 to 8. The Board has been given power by Order under Clause 21 to amend the requirements, vary the goods, or to apply similar requirements to additional goods. This allows for changing conditions of manufacturing and packing goods and should give the Act greater flexibility.

Schedule 4—Foods.—This Schedule includes commodities not hitherto covered by weights and measures legislation, such as fish, poultry, and sausages (Part II), some types of cheese (Part III), intoxicating liquor (Part VI), fresh fruit and vegetables (Part VII), and cereal breakfast foods (Part VIII). Part XI prescribes certain foods which are exempted from the general requirement that prepacked foods be marked with a statement of quantity, but the list has been reduced and items such as sweets, chocolates, and soft drinks above a prescribed quantity will have to be marked.

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The Bill follows the Departmental Committee's recommendation that sale by weight and measure should be extended except where articles specifically lend themselves to sale by count. The number of articles required to be sold by net weight has been increased, but the Bill does not entirely follow the Committee's recommendation for an extension of sale by net weight in wholesale and retail dealings, and that the inclusion of wrappers (gross weight) should be discontinued as far as possible.

The Committee also recommended an extension of the requirement to pack foods in certain specified weights. This recommendation has not been followed, and in certain cases foods which at present are required to be sold in specified quantities have been removed from the list.

The Schedules are too involved to repeat or discuss in detail in this paper, but table A gives some indication of the different ways in which food and nonfood commodities are required to be prepacked and marked for sale.

The reader will perhaps agree with the writer that the classification is too large, and certainly more complex than it need be. For nearly 50 years inspectors of weights and measures have advocated "net weight" instead of "gross weight" and produced sufficient weight of evidence to satisfy the Departmental Committee that net weight was the most desirable and fair method of sale for the consumer. The inspectorate, through the Institute, has continued to press for sale by net weight during the passage of the Bill, and has opposed the requirements which prescribe sale by gross weight and the increased wrapper weights for containers, particularly those prescribed in Part XII, table C, for the sale of fresh fruit which proposes a weight allowance of 1¾ ounces for the punnet in a sale of one pound of soft fruit.

Schedules 5 and 6—Sand and Ballast: Solid Fuel.—Both Schedules contain many changes of detail, particularly in respect to the sale of solid fuel. In addition to the information required on weight tickets at present, the document which the seller is required to give to the person in charge of the vehicle where solid fuel is made up in containers must state the number of those containers and the net weight in each container except where the whole load in the vehicle is going to a single buyer. New provisions cover the carriage of solid fuel by rail which should afford protection to coal merchants from whom complaints have frequently been received of short weight in wagon loads. The Bill also extends the law, which previously was confined to coal, to include coke and other smokeless fuel. Many local authorities under local Acts already possess powers covering smokeless fuels and containing provisions more stringent than the requirements proposed by the Bill. Schedule 9 provides for the repeal of the local enactments referred to.

Schedules 7 and 8.—Schedule 7 is wholly new and covers liquid fuel (e.g. paraffin, petrol and oil for central heating); some of the heavier goods such as ready-mixed cement and ready-mixed concrete, agricultural lime, etc.: wood fuel; and a large range of nonfood commodities such as detergents, paints and polishes, perfumery and toilet preparations, and goods required to be sold by number.

Reference to table A shows the diverse ways in which the various goods may be sold.

Wood fuel has been exempted from the requirement to be sold only

by net weight in a quantity which does not exceed 14 pounds or which exceeds half a ton.

Schedule 8 covers composite and collections of articles, certain of which are required to be sold by net weight, capacity measurement or volume; aerosol products containing any goods required under any other provision of the Act to be prepacked only if the container is marked with an indication of quantity expressed in a particular manner; collections of two or more items which contain one or more articles to which any marking requirement applies.

Part V—Local Administration

Generally the Bill provides that County Boroughs, County Councils, non-County Boroughs, or Urban Districts with a population of 60,000 or more shall be weights and measures authorities. Non-County Boroughs with a population of less than 60,000 will cease to be weights and measures authorities, but they may appeal to the Board to continue to exercise their weights and measures functions. Boroughs with a population exceeding 60,000 who are not weights and measures authorities will become responsible for weights and measures enforcement for the first time.

The Bill empowers local authorities to enter into agreements to combine for all or any of their functions, and requires weights and measures authorities to submit a report to the Board of Trade in such form and containing such particulars as the Board may direct on the operation of the arrangements made to give effect to the purposes of the Act.

The Board has been given powers to appoint officers to carry out inspections of the arrangements made by local authorities for the purposes of the Act, and such officers may examine equipment or records, require inspectors to give assistance and information, and make reasonable enquiries of any person who is in a position to give information concerning the operation of arrangements for the purposes of weights and measures within the area. The officer appointed to make the inspection is required to report to the Board in writing, and the Board is required to send a copy of the report to any weights and measures authority concerned, and to any Chief Inspector responsible for the arrangements inspected; and the Board may publish any report in whole or in part. Provision is also made for the Board to institute a local enquiry in any case where complaints are made to the Board that the functions in any area are not being properly discharged, or where the Board is of the opinion that an investigation should be made as to whether all or any of the functions are being properly discharged.

Inspectors of weights and measures.—Weights and measures authorities are required to appoint from qualified persons a Chief Inspector and such number of Inspectors (including a Deputy Chief Inspector, if the authority so desire) as are necessary for the efficient discharge of weights and measures functions, and shall pay them reasonable remuneration. A Chief Inspector is made responsible to the weights and measures authority for the custody and maintenance of local and working standards and equipment, and generally for the arrangements to give effect to the purposes of the Act. As at present, the Board is responsible for examining candidates and granting certificates of qualification to persons who are found to possess the neces-

sary skill and knowledge for the performance of the functions of an Inspector.

New arrangements have been made for the adjusting of weights and measures. Generally an Inspector shall not act as an adjuster of weighing and measuring equipment, but the weights and measures authority may provide and place under the supervision of the Chief Inspector an organization for the adjustment of weights and measures, and shall charge the fees prescribed for the service.

It is made an offence for any person who is not an Inspector to act or purport to act as an Inspector, and an Inspector who wrongly stamps weighing or measuring equipment or who derives profit from adjusting, making, or selling such equipment, or who knowingly commits any breach of duty or misconducts himself in the execution of his office shall be guilty of an offence. The Board is given powers to make regulations with respect to the performance by weights and measures authorities and Inspectors of their functions.

Part VI—Miscellaneous and General

The powers of an inspector to enter premises, inspect equipment and goods, and to seize and detain any article which is liable to forfeiture are repeated and extended.

Inspectors who hitherto have not been prevented from stopping vehicles for the purpose of inspection of equipment or goods are now prohibited from stopping any vehicle on a highway. It is generally considered that the prohibition will increase the cost to local authorities and reduce the effective enforcement of commodities, particularly as regards solid fuel and sand and ballast. It will certainly add to the inspector's difficulties, slow down inspection, increase the amount of traveling, and possibly hinder the detection of offences.

The offence of obstructing an inspector is repeated, and is extended to include failure by a person to comply with any requirement made of him under the Act or who without reasonable cause fails to give an inspector information or assistance which he may reasonably require of him for the purposes of the inspector's functions.

As previously, the prosecution of offences are to be instituted by or on behalf of the weights and measures authority, or the chief officer of police for a police area. Except where the person is a street trader, legal proceedings for offences under Part IV, with certain exceptions, shall not be instituted unless within 15 days the person charged has been served with a notice in writing of the date and nature of the offence, and where the proceedings are in respect of articles of the same kind tested on the same occasion, the results of the tests of all the articles.

During the passage of the Bill, objections were taken to the authority given to chief officers of police to institute legal proceedings for weights and measures offences. Amendments to delete this authority were not accepted by the Government.

Finally, the Bill provides that the Board shall from time to time and not less than every five years report to both Houses of Parliament on their proceedings under the Act.

In the Committee and Report stages in the House of Commons about 280 further amendments, mainly in detail, were made in the Bill. As my paper concludes, the Bill has had a second reading in the House of Lords, and although it is still subject to further amend-

ment being made, it is not thought that any fundamental principles will be involved. Indeed, it is anticipated by the time I present this paper to the National Conference in America that the Bill will have received Royal Assent and will have become statute law.

Report of the Committee on Consumer Protection

This paper is concerned with consumer protection as it affects weights and measures, but it would not be complete without a brief reference to other aspects of protection which affect the consumer.

In July 1959 the President of the Board of Trade set up a Committee on Consumer Protection under the Chairmanship of Mr. J. T. Molony, Q.C., "to review the working of the existing legislation relating to merchandise marks and certification trademarks, and to consider and report what changes, if any, are desirable for the future protection of the consuming public."

The Committee issued an Interim Report in 1961 dealing with Safety Standards, largely as the result of fires and accidents caused by paraffin stoves in homes. Acting on this report with commendable speed, the Government introduced the Consumer Protection Act 1961, which empowers the Secretary of State to make regulations dealing with safety aspects of any class of goods.

The Committee presented the final report to the President of the Board of Trade in April 1962 and it was made public in July of the same year. The report, of some 330 pages, is of great importance to the consumer and local authorities, as well as being a document of great social significance.

In view of the vast scope and nature of the inquiry the Committee exempted from consideration complaints regarding services, price control, resale price maintenance, weights and measures, food and drugs, marking schemes and nationalised power industries (with certain exceptions). These subjects were not regarded as coming within their conception of their terms of reference, or matters such as weights and measures and food and drugs, which had already been the subject of investigation and report, or as being too specialized in character, etc.

The Committee examined a great weight of evidence and criticised the existing law and systems of consumer protection. Despite coming down on the side of the consumer, the Committee gives clear indication that consumers are expected to safeguard their own interests to a great extent, and that, in some respects, legal reform must take second place to matters of cost and interference with production and distributive methods.

Considerable reliance on voluntary methods of improving the position is proposed by encouraging manufacturers to do away with false and misleading claims for goods, and to agree to standards by reference to British Standard specifications. Perhaps the most important recommendation of this nature is the proposal to set up a National Consumer Council of independent people, which will coordinate the work of consumer protection and through local Citizens' Advice Bureaus disseminate advice, deal with complaints, and make reports to the enforcing authority. The Council will be entrusted with powers to ascertain and review consumers' problems, and to devise means of resolving them. It is not, however, to be entrusted with the respon-

sibility of carrying out comparative testing of appliances, criminal or civil enforcement, or the promulgation of regulations possessing statutory force, which will be the responsibility of the local authorities and the Board of Trade. A further responsibility devolving upon the Council will be to act as a watchdog on inadequate enforcement by local authorities and to use its influence to correct deficiencies.

Part V of the report is perhaps the most important so far as local authorities are concerned. It recommends that merchandise marks law should be greatly extended, simplified, and made uniformly applicable throughout the country.

The laxity of present enforcement of the Merchandise Marks Acts is severely criticised, the Committee being of the opinion that the number of prosecutions taken bears no relation to the number of offences committed. The majority of cases taken by the local authorities relate to offences which might have been prosecuted under weights and measures or food and drug law, and but for the supervisory powers conferred by other Acts, the majority of such cases would never have been detected. It should be stated, however, that the powers of local authorities to prosecute are at present permissive rather than mandatory.

Table A.—Manner of

By net weight only (1)	By net weight only and, if prepacked, in specified quantities (2)	By net weight or gross weight (3)	By net weight or gross weight if prepacked by net weight and in specified quantities (4)	By net weight or gross weight or by count (5)
Food Bread (other than a whole loaf) *Articles other than food* Wood Fuel Soap (cake, bar, etc.) Distemper Pet foods Nails Paste paint Seeds (other than pea and bean seeds) Portland cement* Cleansing powder* Scouring powder* Detergents (other than liquid)* Paint remover (other than liquid)* Aerosol products containing goods which themselves are required to be sold in a particular manner	*Food* Bread (whole loaf) Potatoes Cereal breakfast flakes, etc. Tea, coffee, cocoa, etc. Preserves Salt (other than cut lump) Sugar (castor, cube, icing, granulated) Dried peas, beans, lentils, etc. Barley, rice, sago, semolina, tapioca, macaroni, etc. Flour, cake mixtures, sponge mixtures, etc. Cornflour *Articles other than food* Coal, coke, or fuel made from coke or coal	*Food* Meat Articles consisting mainly of meat Fish, poultry Sausage meat Articles consisting mainly of fish, poultry or sausage meat Certain cheeses including processed	*Food* Butter, cooking fat, dripping, lard, margarine Shredded suet Butter/margarine mixtures Dried fruit, etc. Oatmeal, etc. Sugar (other than those in (2))	*Food* Certain fresh fruit and vegetables

*Only when prepacked.

The Committee criticised the use of deceptive containers, but considered the question to be more related to weights and measures.

It is recommended that that abuse of deceptive containers should be checked, and the Committee expressed the hope that powers will emerge in the Weights and Measures Act to curb the evil by requiring the quantity of contents to be declared on packets and extending the requirement that prepacked goods be sold in specified quantities.

Whilst recognising that a true comparison of price is an important element in buying, the Committee opposed goods being required to be labeled with a declaration of price per unit quantity. Instead, the Committee reiterated the view that weights and measures law should be drawn to require goods to be sold only in specified quantities, and directed attention to the powers available in the Weights and Measures Bill to give effect to their recommendations.

It is now proposed that local authorities who are weights and measures authorities should be entrusted with enforcement of Merchandise Marks legislation as distinct from the present enabling powers. It is recommended that weights and measures departments should be expanded to combine the new legislation which will ultimately be made. The Committee recommends that the officers appointed by

Selling Particular Articles

By net weight or capacity liquid, dry or volume) (6)	By net weight or gross weight or capacity liquid, dry or volume) (7)	By capacity only liquid, dry or volume) (8)	By count only (9)	By length measure only (10)
Food Cow's milk (not prepacked) Articles not otherwise specifically covered by some other schedule *Articles other than food* Sand, gravel, shingle, ashes, clinker, broken slag, etc. Granite chippings, limestone chippings, slate chippings other stone chippings coated with tar Bitumen or cement. Other material commonly used as hardcore or aggregate Coal, coke, etc. when sold in Scotland Liquid fuel, lubricating oil, etc. Lubricating grease Perfumes, toilet waters, etc. Dentifrices Polishes, etc. Pea and bean seeds Certain composite goods and collections of articles	*Articles other than food* Agricultural lime, etc. Agricultural salt Inorganic fertilizer (other than in pellet form)	*Food* Cow's milk (prepacked in specified quantities) Beer, cider, spirits (not prepacked in specified quantities) Beer, cider, spirits (prepacked in any quantity) *Articles other than food* Ready-mixed cement mortar and concrete (specified quantities) Liquid soap Anti-freeze fluid Linseed oil Paint (other than paste paint) Turpentine, thinners, etc. Varnish Wood preservatives Fungicides Insecticides Enamel* Lacquer* Liquid detergents* Liquid paint remover* Petrifying liquid* Rust remover*	*Food* Cereal biscuit breakfast foods Fruit preservative tablets Rennet tablets Saccharin tablets Soft drink and sweetening tablets Shell eggs Vanilla pods *Articles other than food* Cigarettes Cigars Cheroots Postal stationery Inorganic fertilizer in pellet form Animal feed in biscuit or cake form	*Articles other than food* Bias binding Elastic Ribbon Tape Sewing thread

NOTE: The goods listed above are subject to certain exemptions (e.g. sale in petty amounts—diabetic jams—ballast when sold from ships, etc.).

local authorities be given powers to enter premises, inspect goods, check and take samples, make test purchases, arrange for the analysis and expert testing of goods, and institute legal proceedings.

The Committee recommends to the Government that the setting up of a Consumer Council be given first priority, followed by higher purchase reform, revision of Merchandise Marks law and the law relating to the sale of goods, and finally by measures to deal with certification trademarks.

It is not anticipated that there will be early revision of the law, but the Government has already taken some action towards implementing the recommendation to set up a National Consumer Council. The President of the Board of Trade has announced appointments of the Chairman and Secretary-Director of the Council, and no doubt when the other members are appointed the Council will begin to function. The Council is a paid body, and while it may not possess positive "teeth," it is not devoid of powers to influence protection of consumers in the future, and there can be no doubt that any Government measures will be largely influenced by advice and recommendations from the Council.

DISCUSSION OF FOREGOING PAPER

MR. BOWEN: First, I would like to compliment Mr. Gray for his able and enlightening presentation on Consumer Protection in Great Britain. I found it most interesting.

I have three questions that I would like to ask Mr. Gray. First, do you collect fees for testing and sealing (verifying) weighing and measuring devices in England?

MR. GRAY: Yes. When new devices are verified, a fee is charged. Most new devices in Great Britain are verified and stamped by the local inspector in the manufacturing works. Also, after rejection and subsequent repair, reverification is required and a fee is again charged. This may be carried out at scale manufacturers' premises, service stations, or elsewhere throughout the country.

MR. BOWEN: Do you have the responsibility of testing and verifying taximeters and odometers?

MR. GRAY: No.

MR. BOWEN: Who does have that responsibility?

MR. GRAY: The local police.

MR. BOWEN: Do you consider counting scales used in a factory to pay wages for piece work, as being commercial devices and do you test them?

MR. GRAY: Yes. All types of scales for use in factories or factory operations are verified and stamped in the same way as trade machines. The vast majority of them have the same tolerances as trade machines but certain types, where the operations are perhaps not so important, are approved by the Board of Trade for factory use only, and such devices are boldly marked on the face of the scale, "For Factory Use Only," and these machines would not be permitted in ordinary trade use. These might have a slightly larger tolerance. We might allow a different weight value on the chart or something of that kind. But they would still be verified and stamped in the same way as all other weighing machines in factories are verified and stamped.

MR. BOWEN: Thank you, Mr. Gray.

MR. GERSZ: I was very much interested in your fine talk, Mr. Gray, especially because, in the State of Connecticut, we have a Department

of Consumer Protection. I hope that in the future we may exchange correspondence with you and others in Great Britain, and that we may get to know each other better.

Mr. Gray: In my paper, although I did not refer to it in my oral presentation, another of the principal recommendations of the Molony Committee is that the food and drugs, fertilizers and feedstuffs, merchandise markings act as it applies to false trade descriptions pertaining to weight, measure, size, quantity, quality, and so on, of goods, should become a responsibility of the weights and measures department in the future. We have, in fact, recommended this. I think this would bring the position very much in line with what Mr. Gersz has in Connecticut.

This would have the effect of expanding the weights and measures departments in Great Britain, if it becomes law, into what we might term consumer protection departments. I don't know how you view a proposal of that kind here. I am interested that some of the jurisdictions in the United States appear to embrace these other duties. This is certainly the recommendation arising from the report of the Molony Committee.

Mr. McCarthy: Mr. Gray, in your paper you say that inspectors of weights and measures in your country now have the power to stop vehicles on the highway to inspect commodities that are to be sold by weight and measure. The proposed legislation will take away this power of inspectors to stop vehicles on the highway. Would you care to comment on this?

Mr. Gray: First of all, Mr. Chairman, I don't know whether inspectors in the United States have the power to stop vehicles or not. The present law does not prohibit inspectors from stopping vehicles. We can stop coal vehicles, sand and ballast vehicles, and itinerant hawkers, under our existing powers. This bill proposes to take away that power. In fact, it would not only take it away, but it would make it an offense and impose a penalty on an inspector who stops a vehicle. You might, therefore, ask how the inspector could do his job.

The short answer is, wait until the vehicles stop. In Britain, if not in America, incidentally, we sell an awful lot of coal. We don't have anything like the sale of fuel oils for domestic heating that you have here. We sell a lot of processed fuels as well as solid coal, and the vast majority of our weights and measures prosecutions in Britain are in respect to frauds in the sale of solid fuel. It is quite a simple matter for a coal man, especially if he is engaged in a fraud, to slip into a neighboring authority, or to lead the inspector a lively chase and possibly get away from him.

The reason for this change in the law is that the police, the Ministry of Transportation, and the peace commissioners in Britain feel that no one but a uniformed officer should have the power to stop vehicles.

Mr. Glendenning: In reference to your gross weight statements on packages, I would like a little further information on just how this program works. How does the purchaser know what he actually receives?

Mr. Gray: The range of commodities which can be sold by gross weight is confined to certain staple foods, etc., and the wrapper weights (tare) are very strictly controlled. The types of food in which gross-weight marking is permitted would be such items as

butter, farinaceous foods, fruits, dried foods, and things of that kind, and the wrapper weights may not exceed, 4½ grams per pound of the article sold up to a limit of 3 pounds, 3½ grams from 3 pounds to 7 pounds, and 3 grams per pound in quantities of 7 pounds and above.

If the wrapper weight exceeds these limits, in the case of foods which are permitted to be sold by gross weight, such packages would be required to be sold by net weight. Not only is there a very rigid control over the types of foods which may be sold by gross weight, but, over the weights of the wrappers in which these foods are packaged.

Mr. Meek: Sometime ago, Mr. Gray, I read in one of our American newspapers where a baker in England had been assessed a rather heavy fine for baking an overweight loaf of bread. I am wondering if that is generally done in England, that is, prosecution for overweight loaves of bread? If so, what would be the circumstances that would warrant the prosecution and the rather heavy fine for this baker?

Mr. Gray: As you know, Mr. Meek, press reports can be misleading. I happen to be familiar with the case to which you refer. In Britain it is an offense to sell any loaf of bread unless its weight is 14 ounces or a multiple of 14 ounces or is 10 ounces or less. In other words loaves of bread under 10 ounces can be of any weight, but if the weight exceeds 10 ounces the loaves must be 14 ounces or multiples of 14 ounces. If a person bakes a loaf which is 12 ounces in weight, is that a 10-ounce loaf overweight, or is it a 14 ounce loaf underweight? That is how this particular prosecution arose. The man was charged with making a loaf that was underweight. He claimed that was a 10-ounce loaf and that he had baked it overweight and that it was not a 14 ounce loaf that he baked underweight. That was his claim.

Mr. Saunders: Are eggs sold in England by the dozen or does the law require that they be sold by weight?

Mr. Gray: Eggs are sold by the dozen, but the law requires that they be graded "large," "medium," "standard," and "small." The required minimum weight for a large egg is $2\frac{3}{16}$ ounces, with a tolerance of plus or minus a quarter of a dram. The minimum weights for the other sizes are $1\frac{7}{8}$, $1\frac{5}{8}$, and $1\frac{1}{2}$ ounces, respectively. Weights are determined on egg grading and weighing machines.

All of these egg weighing machines are subject to test by weights and measures inspectors and the machines are verified and stamped.

Mr. Allen: Mr. Gray, I would like to hear an explanation of just what the situation is in Great Britain relative to the use of decimal fractions of the pound on commercial weighing machines. I understand that this system is beginning to be introduced in Britain. Also, I am interested in the prospect of the decimalization of your monetary system. I have quite a bit of trouble multiplying 12 pence to the shilling, etc. I would appreciate a discussion on "decimal weight" and "decimal coins."

Mr. Gray: I think that if Britain had gone into the Common Market, we might have adopted the decimal system for coins within twelve months. The fact that we haven't, of course, will certainly delay its introduction. I wouldn't care to say how long. And, if we had gone into the Common Market, possibly force of circumstances would have required adoption of the metric system of weights and measures, as well. However, we have not gone into the Common Mar-

ket, and so far as the governments are concerned unless there is pressure, then there is no need to act.

However, I believe that the introduction of a decimal system for our money and, possibly, the metric system for weights and measures, will not be too long delayed in Britain. I certainly feel that in Britain we are perhaps nearer to the adoption of the metric system than you are here in the United States.

On the question of the decimal fractions of the pound and particularly the hundredths of a pound, there is a movement in Britain today to get around to units of 10's. All of our factory weighing machines are in units of 5, 10, 20, 50, and 100 pounds, as opposed to the stones, hundredweights, and so on. Therefore, I imagine that development toward the hundredth of a pound is only a short step away.

I cannot speak for the Board of Trade, because, in Britain, it is our Board of Trade that examines and approves all weighing and measuring devices for use in trade. Mr. Allen, you will have to approach the Board of Trade and sound them out about the adoption of hundredths of a pound on what we term self-indicating scales. Personally I see no reason why hundredths of a pound should not be used.

Mr. McCarthy: I have one more question, Mr. Gray. In your paper you stated that an extension of the requirement that certain foods be packaged in specified weights had been recommended and that additional items be added. It is my understanding that a number of amendments have been offered to your new weights and measures bill. Also, if some that have been proposed are adopted, it will result in certain foods that are now required to be packed at specific weights being removed from this list. Would you care to comment on that?

Mr. Gray: I have been away from home for over a fortnight. Anything could have happened in my absence. However, I have no knowledge of anything during the passage of the bill that would alter the range of food items required to be sold by net weight or in specified weights, as these were listed in the original draft of the bill. I don't think that, at this stage in the passage of the bill, the government would accept an amendment of this kind.

I think what the Chairman is referring to is one part in my paper where I say that the Departmental Committee also recommended an extension of the requirements to pack foods in specified weights and I comment: "This recommendation has not been followed and in certain cases foods which are required to be sold in specified quantities have been removed from the list." That is perfectly true. They have removed certain of the foods in the existing list in the Sale of Food Act of 1926, from the group of articles which will be required to be sold in specified weights under the new bill. However, they have added a great many others which hitherto have not been required to be sold in specified weights. So the new list is, in fact, greater than the old.

Mr. Robert Williams: Mr. Gray, in your talk, you mentioned that some items are permitted to be sold by gross weight. Is this a requirement and does it prohibit sale by net weight? If so, does this apply to an over-the-counter sale also, or is it limited to prepackaged items?

Mr. Gray: First, if gross weight is sold, then the package should be marked to indicate gross weight. Sale by net weight is not prohibited, however. In the same manner, if a sale is by net weight, this should be so indicated. If a package is marked gross weight, any

inspector is then free to check the wrapper weight to assure that it does not exceed the limits prescribed. If the wrapper weight is exceeded the article should have been sold by net weight and an offense has been committed.

Secondly, in weighing over the counter, in respect of these foods which are permitted to be sold gross weight, the trader may include the wrapper weight without marking the weight statement on the wrapper.

What is done, in effect, in respect of certain goods for sale over the counter to the purchaser, is to include these wrapper weights, provided they don't exceed the limits prescribed.

Mr. Jackson: Mr. Gray, I wonder if you would state again to what extent your law specifically goes into the question of moisture content.

Mr. Gray: The weights and measures law does not deal with moisture content in foods. The British courts have held, in respect to commodities such as bread, that no evaporation allowance is permitted, that the loaf of bread must be of the correct weight at the time it is sold, not merely at the time of baking.

With respect of solid fuel, we sell tremendous quantities of processed fuel. Coke and other types of processed fuel can absorb vast amounts of moisture, if they are subjected to certain atmospheric conditions or, possibly, by standing in stockpile over the winter. To deal with this not strictly as a weights and measures matter but as a consumer protection problem, and largely because the retailers of processed fuels complain about it, the processors of these fuels have agreed, under British standards, to a specification of a maximum of 9 percent moisture in coke. Therefore, when coke is sold by the processor to the retail distributor, it must be sold with no more than 9 percent moisture with a limiting value of 12 percent for individual determinations. This does not apply to the sale by the retailer to the purchaser, however, because the specification is not extended to retail sales.

A special committee is sitting at the present time with a view to investigating the problem, to see whether a specification can be agreed upon for retail sales. We have had many cases of excessive quantities of moisture in items such as coke. I have had one example with as much as 38 percent moisture and successful prosecutions have been taken in respect to a false trade description applied to such coke. I don't know that this answers the question fully, but our law does nothing about moisture contents of commodities, other than that which I have described to you.

Mr. McCarthy: Thank you, Mr. Gray for your very interesting address, and I wish to compliment you upon the informative answers which you have given in response to our questions.

May I suggest that the Conference tender to Mr. Gray a rising vote of thanks for his interesting talk and his patience in answering our many questions.

THE PACKAGER'S VIEWPOINT ON TRUTH IN PACKAGING

By Lloyd Stouffer, *Editor, Modern Packaging Magazine*

My purpose here is to interpret, as best I can, the packager's viewpoint toward Senator Hart's "Truth in Packaging" Bill and other prospective packaging regulations. You are not likely to find unanimous agreement in a complex of industry so vast that it covers thousands of companies in more than 100 different product fields producing

more than 250 billion packages at a cost of close to $25 billion a year. But someone has to speak. As to my qualifications, I can only say that, as Editor of *Modern Packaging* for almost 20 years, it has been my business to find out what packagers think, what they want to know, how they propose to act. For two years now, it has been my special purpose to report to packagers the growing controversy over the Hart Bill and other regulatory proposals, and to relay back *from* them their thoughts as to the merits of these proposals.

In view of the fact that packagers have taken a public position almost solidly alined against the Hart Bill, it may surprise you if I say that most of them see some good in it, and that almost all, in my opinion, would welcome simple, explicit, uniform ground rules to assure fair practice by all. But what would be simple, explicit, uniform, and assuring? Certainly not the Hart Bill as it now stands. It goes much too far and is much too vague. Although I understand that there have been some changes in the bill as approved by the subcommittee just last week, there is still the fear that it is going to leave vital packaging questions up to administrative interpretation without specific legislative authority and without provision for adequate judicial review.

But the Hart Bill as we see it offers no improvement over existing packaging regulation because it has the same basic fault—it does not adequately define the rule it seeks to enforce, and without adequate definition of legislative intent, enforcement of the law is powerless, as our courts have many times made clear. The Hart Bill as it stands would have an effect quite opposite to its stated purposes. Instead of protecting the consumer, it would cost him money. Far from being an antitrust measure—(what a deceptive label *that* is!)—it would breed monopoly by restricting competition and freedom of choice. Unless the Hart Bill is radically changed and drastically simplified, beyond its present status, I can assure you that packaging companies will fight it with all their strength.

The fight has already been hot and heavy, and what we need now is more light and less heat. Perhaps a reasonable solution would have been found long before this had not the Senate hearings been launched on a note that was guaranteed to create angry resentment in every packaging man.

When Senator Hart started off by referring to packagers, literally, as "pickpockets"; when his committee gave the floor and the headlines to the type of consumer agitator who is convinced that all business is engaged in a conspiracy to cheat the consumer—he did not exactly establish a climate for reasonable cooperation. For that reason, if no other, I think that anything called the Hart Bill will always be an anathema to packaging people and that, if a solution is to be found, it had better be through some other medium.

The professional zealots alone held the floor at the first sessions of the Hart Committee hearings in 1961. Television screens and newspaper headlines across the country repeated their one-sided, misguided, and misinformed testimony. I have a stack of newspaper clippings from this period with headlines such as these: "Modern Housewives are Frequent Victims of Packaging Trickery" and "Cheat Wave Hits Nation."

Packaging people who could readily expose the gross exaggeration in these charges and explain the reasons for certain misconceptions

were barred from these initial hearings and, by the time they did get to the microphones some time later, the press and TV had tired of the story and gone away. The defendant in this case has never yet had his day in the court of public opinion.

When I protested the one-sided nature of the program, before the first hearings opened in June 1961, I was told that the committee wished first to get on the record the "consumer's side" of the story, and that packagers could appear later. I pleaded that the first session should not be closed without at least one explanatory statement on behalf of packagers. I volunteered to appear. I was not allowed to appear, but a statement which I had prepared was, at the last moment, accepted for the record—*but not read.* Hence, it did not figure in the day's stories.

You, as regulatory officials dealing with packagers, would agree, I think, that my statement was truthful. I can assure you that it does summarize the industry viewpoint. In it, I said, in part:

> The phrase "deceptive packaging" can be interpreted in almost any way. Packaging and labeling have been operating for years in a legal vacuum, because of lack of definition of this and other terms. Lacking a clearly defined standard to which all could adhere, it is entirely possible that, in the heat of competition, some packagers have slipped into practices which in the most extreme interpretation of the word could be called "deceptive."
>
> No packager, *except a stupid one*, would be intentionally dishonest. But like all business men in our competitive, free-enterprise system, a packager will go *as far as the law allows* in meeting competition. The trouble here is that there has been no law and no rule that will say: "This is deceptive; this is not."
>
> The consumer complaints you (the committee) are hearing are, I am sure, based not on dishonesty of the package, but on failure to understand certain technical limitations and requirements of packaging and merchandising, and, in the final analysis, on failure to *read the label.* For labels must, by law effective in every State in this Union, honestly state the weight, volume, or quantity of contents, or else the merchandise is subject to seizure and the packager to heavy penalties under the law. This happens rarely, and only then, you can be sure, because of some mechanical malfunction in weighing or filling.
>
> If the average conscientious packager can be criticized on any point, it is that the contents statement is often relegated to small type on the back side of the package. Here, the packager is following a design trend and following the practice of his competitors. *If a standard were fixed by law*, requiring that the contents statement appear in type of a specified size at a specified position on the package, giving all packagers an equal standard, I am sure all would cooperate.

In the months that have passed since this statement was made, I have become more than ever convinced that the real nub of the matter is in that matter of clearly specified contents statements. How can any package be dishonest or deceitful if a true statement of the content appears so that it can be easily read, in an expectable position on the

package? With the important exception that it does not specify legibility and position, this requirement already appears in the Federal Food, Drug and Cosmetic Act and in other laws applying to packaging. (You know, of course, that soaps were from the beginning ruled exempt from the Food, Drug and Cosmetic Act, and are, therefore, not required by Federal law to state the weight of contents. It is interesting that the soap companies are the most insistent that there be no change in the law and have been instrumental in spiking several moves within the packaging field to make constructive suggestions on the Hart Bill.)

I sincerely believe that 95 percent of all consumer complaints about deceptive packaging could be met to every reasonable degree if there were a simple, enforceable, legal standard, applicable to all consumer products across the board, spelling out size of type to be used for the contents statement and its position on the package or label. It is just as simple as that. But the Hart Bill does not do it. It says something about evolving type standards in the future—but no one knows what they will be. And the many other provisions that the bill *does* make are, to my mind, trivial in comparison to this one which it lacks.

How, I ask you, can any consumer claim to have been deceived by the shape or size, or any other feature of a package, if a truthful figure as to the amount of contents is there and she has read it? We cannot expect to provide for someone who cannot or will not read. It seems to me that *Consumer Reports*, which has led the hue and cry against what it calls deceitful packaging, would be better advised to teach its readers how to read a label. After all, its subscribers are presumably the most intelligent of shoppers, and they know how to read.

I am glad to see that the National Conference of Weights and Measures is well ahead of the Hart Committee in its understanding of what is needed on this score. The report of the Committee on Laws and Regulations does precisely what I have recommended in defining prominence, placement, and legibility. It logically defines "principal display panel," which is a much better term than "front" or "main" panel. I was pleased to see that in the Committee's preliminary report, last year, it further specified type size for the declaration of net quantity of contents, which would be required to appear on the principal display panel *in relation to the size of that panel*, which is the logical way to do it. It gave a range of relative sizes for contents type through seven stages, ranging from $\frac{1}{16}$ inch on areas of 15 square inches or less, up to one inch for areas of more than 480 square inches. As you probably know, a similar regulation for foods and drugs was adopted in Canada two or three years ago, and from all reports it is working well. This specification has been withheld in this year's report but only for further study and refinement with industry's advice.

So the National Conference on Weights and Measures is taking the view that this improvement—and others—can best be effected in this country through existing regulatory agencies, with industry cooperation and agreement, and with the final enforcement at State level. Nowhere in the final report to the 47th Conference, or in this year's tentative report to the 48th Conference, do I find even a mention of the Hart Bill.

Packagers certainly will welcome more positive guidance. But the Food and Drug Administration apparently does not share the view that it already has ample legislative authority to do this. I under-

stand from lawyers in this field that the intent of Congress must be spelled out more clearly and more definitely if FDA rulings are to hold up in court. And then there is the fact that the jurisdiction of the Food and Drug Administration is restricted by present law to food, drugs, and cosmetics. What about all the other consumer products, such as household chemicals, paints, hardware, paper products, etc.? FTC has authority over fraudulent advertising, but its authority does not duplicate or even parallel that of the Food and Drug Administration.

I do believe that an act of Congress is necessary to accomplish the purposes we are discussing. And if this can be done very simply by broadening the authority of, and more clearly defining the powers of, the Food and Drug Administration, it will be much more acceptable, both to you as State officials and to packagers, than anything called the Hart Bill or anything involving the Clayton Act or the Federal Trade Commission. After all, we are all used to working with the Food and Drug Administration, and we must give them credit for greater understanding of industry and State problems than we would expect to find in other quarters. If this can really, effectively be done by a uniform model State law, effective in all 50 States, I think that might work too.

Although I have laid the greatest stress here on the clear and conspicuous contents statement as being the key to most problems, there are other provisions which, with proper safeguards, might be acceptable to most packagers. In the February issue of *Modern Packaging* we suggested five simple rules which, if uniformly observed by all packagers, should answer all legitimate consumer criticisms and remove from packagers the necessity for following some practices they do not particularly like, but which are forced upon them by competition. I have heard not a single objection to these rules from any of our 36,000 packager readers. I will quote them here, with a little parenthetical comment on each.

> POINT ONE, of course, is the provision for clear and conspicuous contents statement: That the statement of weight or quantity of contents must appear with unquestionable legibility on the main label panel, *without qualifying adjectives.*

("Unquestionable legibility," of course, needs to be defined, and it could well be done by the formula suggested by the National Conference. "Main label panel" is perhaps better defined by "Principal display panel." That final phrase, "without qualifying adjectives," is meant to answer the repeated consumer criticism of such phrases as "jumbo half quart"; the rule is intended to apply only to the official legal statement of content and would not bar the use of adjectives elsewhere in label copy.)

> POINT TWO: That size and shape of the package must be kept in reasonable ratio to the contents consistent with economical filling, convenient handling, and product protection.

(Not much more need be said about this. A clear and accurate contents statement will prevent any actual deception. And believe

me, economics will prevent any packager from using a single square inch of packaging material that is not needed or useful.)

POINT THREE: That product illustration should show nothing that is not contained in the package unless accompanied by an explanatory line.

(In other words, in answer to one of Senator Hart's pet peeves, if the package illustrates a frosted cake and the package contains no frosting, a simple line of type under the illustration could say just that.)

POINT FOUR: That "cents off" the "regular price" should not be used on labels *unless* the regular price is also stated on the label.

(This seems to me a simple answer to a practice that can indeed be deceptive. Since the retailer in almost all cases sets his own prices anyhow, the consumer has a clear right to know that she is not paying *more* than the intended cut price. The same principle can and should be applied to "twofer" deals and combination deals; the regular price of each item and the intended price for the combined deal can just as well be shown, as is now done in many cases.)

POINT FIVE: That "economy size" should be banned from manufacturers' labels, since the retailer's pricing may make the statement untruthful.

(In commenting on this, I need only remind you that a few months ago General Foods Corporation was the innocent victim of a well-publicized FDA seizure of Maxwell House instant coffee on the grounds that in certain retail stores consumers had paid more per ounce for the coffee in "economy size" jars than for the same coffee in regular-size jars. Investigation showed that the stores had decided to run a "loss leader" on the regular size. Obviously, in the absence of fair trade laws, General Foods cannot control prices charged by retailers. The FDA release did not explain this, but left the implication that General Foods was a cheating, deceptive packager. The words "economy size" have now disappeared from the Maxwell House label, and in the light of this incident I am sure that other packagers would gladly give them up also.)

These five rules, suggested for voluntary action by industry, appeared in print *before* the second Hart Bill (S. 387) made its appearance on January 21. So it is interesting to note that, in his statement accompanying the new bill, the Senator made six main points, the first four of which agree strikingly with the suggestions by *Modern Packaging*. Here are the Senator's points:

1. Net weight would have to be printed prominently on the front panel of all packages.
2. Packages should carry no illustrations that could deceive the consumer as to content.
3. No more "cents-off" deals or "economy-size" designations.
4. Prevent the use of packages that might deceive the consumer as to content.
5. Regulatory agencies will be authorized, if marketing conditions require, to set up weights and measures in which a certain product line may be sold.
6. Establish "serving" standards.

In the last two points, the good Senator is getting into very deep water, and any possibility of industry agreement begins to vanish. Let us examine these two points.

First, let us examine point 6, because it is relatively simple—or could be. It is true that the ideas of individuals and families of how much food constitutes a "serving" vary widely; therefore, defining a "standard serving" for any food would be difficult if not impossible. The Hart Committee regards this as a very thorny problem. But may I suggest a very simple solution? Let the purchaser decide how much and how many to serve. If the package says "Serves six," the packager need only add a line underneath: "*Six individual servings of X ounces each.*" If the housewife thinks this is too much or too little, she can buy and serve accordingly. She will at least know where she stands.

But point 5 is more serious. It aims at standardization of weights and measures, "*if marketing conditions require*," and leaves it up to Federal regulatory agencies—including both FDA and FTC—to decide when marketing conditions require it and to promulgate the standards and enforce them. These are provisions which industry will never accept—and for very good reasons. Standardization of weight and measure generally would be impossible without standardization of product—which in most lines would be unthinkable. It would destroy the very lifeblood of competition, which is in the *differences* between brands of the same product.

The maker of detergents, the maker of shortening, the maker of almost anything you can think of prides himself on his own private formula—which he thinks makes a product better than that of his competitors. Almost invariably this involves differences in density of the product. Ten ounces of one brand may very well do the same job as 12 ounces of another. Forcing these competitors to package either to standard weight or to standard size would upset balances one way or the other and would be a distinct disservice to the consumer.

At one of the hearings of the Hart Committee, Lee Bickmore, the president of National Biscuit Company, summed it up in words that ought to be engraved on the minds of everyone engaged in this debate. He said: "You can have standard weight. Or you can have standard size. But you can't have both." Think about it. . . .

There is another and equally important angle to standardization. Packaging machinery is designed and built to handle a package of certain precise dimensions at a very high speed—sometimes as high as 1,200 a minute. Changing the machinery to handle a package of different dimensions—just for the sake of standardization—would involve a capital expenditure so enormous that the consumer would have to pay a much higher price for the product, or the packager would be forced out of business.

It is for the same reason that we often cannot avoid fractional weight—another point against which senators and consumers inveigh so heavily. Suppose, for example, that a carton is designed to hold exactly 12 ounces of a certain product. Heavy and expensive machinery is installed to handle this carton. An improvement in product formula then lowers the density, with the result that the standard carton—the only one that will run on this machine— will hold only 10⅞ ounces.

Would it be better for this packager to drop to an even 10 ounces and have slack fill? I think not. Yet, says Mrs. Sarah Newman, of the National Consumers League: "I see no reason why we cannot have everything in even ounces." Mrs. Newman should realize that it means money in her pocketbook if a careful packager can fill a number of different products in a standard package on the same standard machine—although the weight of fill will inevitably vary among products.

O. A. Oudal, director of laboratories for General Mills, pointed out that his company markets 11 dry cereals—each of a different net weight—in one size of carton. If a standard 8-ounce package were required by law, he said, six different package sizes would be needed, and the added costs to General Mills would be $10 million in new plants and machinery. Who would pay for this? The customer would pay for it.

So there is one type of standardization we like. Reducing the number of package sizes and types, standardizing on high-speed machinery, making one package serve for more than one product—these are the objectives of cost-cutting programs that go on continuously in every packaging plant. But you cannot have this economy and still standardize on weights, or have the weight come out in even ounces.

To sum up: Packagers generally are willing to accept clearcut regulation that will eliminate certain evils of competition without destroying the benefits of competition. But they do not want the Hart Bill or anything like it that would put powers almost of life or death over their business in the hands of Government bureaus which may lack understanding or responsibility. It is still the hope of many that reasonable and desirable regulations can be worked out on the basis of voluntary industry-Government agreements. It is probably unnecessary to remind this audience that whatever is done *must* be done on a uniform national basis. Differing standards for different States would play havoc with interstate commerce. You know that; that is why you are at this meeting.

Yet we are alarmed by such incidents as the sudden ruling by California's attorney general that the double-wall plastic jar for cosmetic creams is a deceptive package—after this package has been used for some 25 years and has become virtually the standard of the industry. I understand the action has been stayed by an injunction, but for a while it looked like any company that expected to sell cold creams in California would have to produce a special package for that State. The purpose of the hollow wall, of course, is to save weight. The plastic jar is no more deceptive than the opal glass jar which it replaced—the total wall thickness is the same or less—and the saving on shipping weight on a jar of product shipped, say, from New York to California, is something that will figure pretty big in the retail price if this saving is denied.

As a closing comment on the Hart Bill, I would like to read a few sentences from a letter written by an attorney in Wisconsin to a member of the Senate Judiciary Committee. He says, in part:

> The advocates of the (Hart) bill think that many, or maybe all, of this country's sellers of packaged consumer commodities cheat, as a standard practice and as a way of life; that consumers are gullible, defenseless, and lacking in ability to make discriminating buying judgments; and that only a new law setting up a governmental proctor to compress packaging conduct into a rigid, uniform mold will protect the otherwise helpless consumer against the widespread fraud of the vendors who sell him his household goods.

If any of those assumptions are right, then only direct intervention by the Divinity can save the Republic, because no law and no government employee will suffice to redeem it.

Fortunately for all of us, those assumptions are not correct. Manufacturers of household goods and foods neither want to, nor would they be able to, build their businesses on deception. . . .

Even the cynics who strive to believe the worst about business motivation will have to acknowledge that fraud is an unworkable tactic in a competitive economy. . . . It is inconceivable that deceit can be successfully practiced on a sustained basis on anyone but a fool. . . .

This country doesn't need the Hart Bill or the new bureaucracy which its contemplated administration would require. Industry—our mainspring of income generation—cannot afford the stultifying effect of the bill's stringencies, nor can it swallow the loading charge that will be required for staff to check out every packaging move against the yardstick of bureaucratic rule-making.

The cumulation of direct and indirect costs to consumers created by the bill if it becomes law are certainly going to be more than any savings to consumers which its most ardent proponents can reasonably represent will result from its enactment and enforcement.

To which I can only say Amen, and thank you for listening.

ADDRESS

By L. Y. Ballentine, *Commissioner, North Carolina Department of Agriculture, and President, National Association of State Departments of Agriculture*

I am grateful for this opportunity to meet with you, not only as the Commissioner of Agriculture from North Carolina, but as the President of the National Association of State Departments of Agriculture, who in the past few years have taken increased interest in working more closely with the various segments of the departments of agriculture. We are very proud of the Weights and Measures Division of the North Carolina Department of Agriculture, and of Carson Baucom. He is, in our opinion, one of the finest weights and measures directors in the United States.

I want to express my appreciation to Bill Bussey for what he has done in helping the weights and measures division of North Carolina's Department of Agriculture, and for his leadership in the National Conference on Weights and Measures, and particularly for his day-to-day efforts to develop better programs for weights and measures throughout the United States.

The departments of agriculture throughout the Nation have in recent years recognized that they have been derelict in keeping abreast with the activities of the various segments of their departments, derelict particularly in their associational work, such as your Conference on Weights and Measures. We, as department heads, deal with the problems in our divisions more or less in general, and when we meet as an association, we certainly deal with them in general, because there we are trying to blend the thinking of representatives of all the States. We are trying to find an area in which we can have a meeting of the minds of these representatives. When you meet as a Conference on Weights and Measures, you deal with specific problems, and in this Conference and the Conferences past and the Conferences to come, you have had and will have the opportunity to formulate, and consider many new ideas as to how we can improve the service rendered by weights and measures officials throughout the country.

I think that uniformity is a great thing and I go along with uniformity as far as it is practical. I believe we ought to think in terms

of developing the standards on a uniform basis, on a high level, and on a very practical level. It is through your advice and counsel that the National Association of State Departments of Agriculture can do its best work in considering the programs of the weights and measures divisions of the several States, and can support the improvement of those programs. So, in organizing a division of weights and measures within the National Association, we have recognized that the weights and measures program can be supported much more directly if we make representatives of your Conference active participants in the committee work of our National Association. So, I extend here a very cordial and an urgent invitation to official representation from the Conference on Weights and Measures to meet with the National Association of State Departments of Agriculture in Winston-Salem, North Carolina, beginning Sunday, September 22d and lasting through the first half of the day on Thursday, September 26th. We hope you will come. We hope you will come and help us deal with some of the confusing elements that are perplexing almost every State and National agency.

I am sorry Mr. Stouffer had to leave, because I did want to make an observation about the "Hart Bill." I am not going to argue the merits or the demerits of that bill here today, but any bill that can create as much interest and as much study as the "Hart Bill" has created, among packagers and among the people who administer packaging laws is well worth the effort which has been put behind it, even if nothing is ever passed.

So I suggest to you that all is not lost in the "Hart Bill," that the effort and response from it will certainly serve a wonderful purpose in bringing about a better packaging system.

I couldn't quite go with Mr. Stouffer all the way, in saying that competition makes everybody honest. I believe that most people are honest, everything else being equal, and I think most people will pay their debts if they have the money to do so. But I have a kind of sneaky feeling, based on my experience, that everybody won't do it.

Today, some of us are awfully conscious of State's rights, and I believe in State's rights, but I believe also that we miss many opportunities to work as closely with Federal agencies as we could because we are a little afraid that the Federal Government might usurp some of our authority, or power, or prerogative. That should certainly not be the aim of the Federal agencies, nor should the State agency be too fearful that it might happen. The National Association of State Departments of Agriculture is doing more each year in an effort to coordinate and to bring into focus not only their own individual responsibilities as States, but to bring into focus the joint responsibilities which we do and may share with Federal agencies. In most cases, we deal, of course, with the United States Department of Agriculture. The North Carolina Department of Agriculture has written agreements of cooperation in about 39 different areas. We also work with the Food and Drug Administration, the Commerce Department, and other agencies. And so it is well that we give consideration to both sides—both as Federal and as State agencies—toward the proposition of working more closely together.

The work that is being done by Congressman Fountain from North Carolina is most important at this particular time when the cost of services are so awfully high and the taxpayer's contribution so heavy. We need to think about how we can work together for efficiency and

economy. His committee is doing a remarkably good job in trying to study and to present in simple language so many things that should be done with respect to cooperating agencies of the Federal government and the States, on various levels, and this work on intergovernmental relations is a big job, and it is a long-drawn-out one, one which we will never solve completely.

The National Association of State Departments of Agriculture has in the last year joined with the United States Department of Agriculture in setting up a task force—our association providing five members and the Secretary of Agriculture providing five members, plus a director or manager. That task force has assumed a year's work in an effort to bring about a better relationship. It is a mutual kind of proposition and the Secretary is very much interested in it. The State Departments are interested in it also, and we are trying to work through this maze of bureaucracy in order to get to the core of a working agreement. We are trying to determine as best we can what we should recommend to the Congress concerning the State's responsibility from the standpoint of service, and from the standpoint of contribution to the United States Department of Agriculture.

We have been working more closely with the Food and Drug Administration than we have ever worked before. We are now considering how we may set up some kind of joint committee. Our problems are getting larger, not smaller. As we solve one, apparently two will come back in place of the one. We know the packaging problem is greater than it has ever been before. More packages are weighed behind the wall, in the rear of the retail outlet. So we have to think in terms of how we can handle millions of packages, and I know there is some deception in packaging; how to describe it is a difficult thing.

I know that Mr. Baucom and the Division of Weights and Measures in North Carolina have been most successful in bringing about an improvement along this line, and I say, to the credit of the business interests, those who package foods in this nation, we have had splendid cooperation. We have had only a few resisting. They have told us more than once that one of their problems is that they are dealing with multiple States, maybe all the States in the Nation, but all the States do not give the same interpretation, do not have the same regulations, and packagers, therefore, are at a disadvantage when they begin to package a commodity. So there again I suggest that uniformity is to be desired, provided you don't have to compromise quality of economy or efficiency.

So in closing, Mr. Chairman, and ladies and gentlemen of the Conference, I say again, my purpose here today is to express to you our keen interest in the work of your Conference. I assure you that we recognize, as you do, that we are all part and parcel of the same package, and that we must work together more efficiently. We, as heads of departments, need to know more about how to help you improve the program. I have appeared on a number of occasions in support of the National program and in support of a State program. All States are not designed and are not organized to do exactly the same job or to do it in the same way. We have accepted every possible opportunity that we could to cooperate with the Federal agencies, as well as to do the job on an independent basis. I think we, in North Carolina, got way ahead of the field in working with industry to bring about more realistic and more receptive types of packages. When the

stockyards became a part of our program in North Carolina, they came to us and said, "We have to have our scales tested twice a year." Mr. Baucom said to me, "We can't do that, because we don't have the equipment." I said "Well, we will do it if I am man enough to get the equipment."

I moved in and we got a special unit to augment what we already had. And we have lived up to our promise, because we feel that a man running a stockyard should have his scales tested, as the Federal or the State governments require, and he ought to have it like the other fellow. Charged to the taxpayers and not to him as an individual.

I give you this only as an example of how we are trying to move ahead and I again compliment Mr. Baucom's operation and compliment all of you on the part you are playing.

Now, back to Bill Bussey, I have asked him for the Bureau's efficient cooperation and now ask you to tell us, as individual heads of departments and as an organization, what you think ought to take place. How can we do a better job in weights and measures, keeping always in mind the consumers for whom you are regulating the packages?

AFTERNOON OF WEDNESDAY, JUNE 12, 1963

—No Business Session—

OFFICIAL LUNCHEON—WEDNESDAY, JUNE 12, 1963

(C. H. Stender, Chairman, Presiding)

ADDRESS

By Hon. J. H. Hollomon, *Assistant Secretary for Science and Technology, U.S. Department of Commerce*

I should like to take the opportunity today in the midst of a serious national problem to speak to you who represent all of the States of the Union and relate the question of equal opportunity for all our people to the question of the economy and the technical resources that support it. I shall try to bring to you in as objective a way as I can some of the things that I have learned in the last year participating in decisions on the development of programs which relate the growth of our economic strength to the technical and manpower resources of our Nation.

First, let's look at the American economy at the present time in some historical perspective. As a result of the enormously bountiful natural resources, the great growing markets of our people, the industry of our workers, and the investments that we received from abroad, particularly from Europe in the form of trained people and capital, we are now the wealthiest people in the world. We have the highest standard of living, which means we produce more goods and services per person that any other nation in the world.

We have done this largely by applying ingenuity to the development of mass production techniques in the manufacture and distribution of goods, and by an enormously productive agriculture, a segment of our economy in which 7 percent of the workers produce the food for all

the rest of us. This means that approximately one person in 20 working on the farms produces enough food for all of the rest of us. Compare this to a less-developed country, such as India, where 90 percent of the workers produce only an inadequate supply of food. Or compare it to the Soviet Union, where half the workers are still engaged on the farms.

The great development of the American economy came primarily from these two developments—one, the combination of government, the farmer, the university and industry making the American farm the most productive in the world, and secondly, the high development of mass production techniques, of which the automobile industry is a prime example.

Within recent times—in the last 10 years or so—the American economy has grown at a lower rate. The rate of improvement of our productivity, that is, the output of goods and services per worker in the United States, has been less than that of the last 50-year average, and less than that of any major industrialized nation of the world, with the exception of Great Britain and Canada. Furthermore, although we have improved the productivity of certain industries, we see a changing pattern of growth, from industries that depend largely on the development of primary resources—minerals, coal, iron and of agriculture, to industries that depend largely on the technical component added in manufacturing and distribution. Thus, great regions of our country formerly dependent on primary resources now find themselves without the industry which would absorb the labor of the people of that region.

As technology advances, and as we become more productive in producing the basic necessities of life, we need to produce those new technical products—computers, television sets, radios, mass transportation, and recreational and cultural items—in which the value of the material used is inconsequential compared to the value of the human ingenuity which has been added to the product.

A computer costs thousands of dollars a pound while a piece of steel costs only a few cents a pound. The difference between an economy which depends upon computers and one that depends upon steel for the major source of its income is the difference between a highly trained technical people and a labor force which is essentially semi-skilled and unskilled. As our economy has developed and improved its productivity, there has been an advancement in the level of the contribution of technology to the product, and as a consequence of this improvement in technology, large regions of the country have found themselves unprepared for the forward march of industrial development. The unemployment rate in West Virginia is more than 10 percent. There are large regions of Pittsburgh where the unemployment rate is 25 percent. Regions of Pennsylvania find no substitute for the coal miners, and some of the textile milltowns of New England still suffer from the unemployment arising from the moves of textile mills to the South. Even the textile mills in the South face competition—and a complicated competition it is—from textiles from abroad, although they are protected now by restrictions on some imports.

As a consequence, we see continuous improvement in the productivity of the automotive industry, but we do not see new employment in new industries developed from the technical resources of Michigan.

Many of the great agricultural States of the Midwest are not yet industrialized sufficiently to absorb the workers removed from the farms. Six billion dollars of subsidy softens the impact of technological advances in agriculture and the transfer of farmers to an industrialized community.

At the same time that these developments are taking place, we look abroad and see the markets of Europe expanding, and opportunities for Europe to enjoy mass markets and relative advantages that come from the great economy of large productive facilities. Modern science and technology are not our exclusive province. The Japanese know well how to apply technology to make high-quality products that compete with our own. The Japanese loom is more efficient than some of the same looms manufactured in the United States. Machine tools manufactured in Switzerland and Germany compete in the United States for part of the United States market. The competition from abroad is not only a competition based on a lower wage rate in countries with lower standards of living than our own, but increasingly comes from products which have within them the fruits that science and technology can contribute to a modern highly developed economy.

Thus, as we automate—if you wish to use that word—to reduce the labor content and make manufacturing and distribution more efficient, a process, by the way, that's been going on since before the Industrial Revolution—we must recognize that there is nothing novel about it. Automation means the improvement of the output of workers and if we didn't improve the output of workers you and I and the workers and owners would not become wealthier. It is only through automation that the strength of the United States or any industrial nation of the world can continue to improve. Automation is the goose that lays the golden egg of national security and national strength and it's the source of our affluence.

But in order to enjoy the fruits of automation, we need to be able to provide for the displaced, to give the really skilled individual an opportunity to contribute his own talent to the higher values of the product, to engage not only his strength and his brawn, but his ability to think and figure and be ingenious. The advance of the economy through automation must be accompanied by investments in education and in technology if we are to enjoy the fruits of that development, and if the country is to grow without having economic wastelands in States and regions that are technologically bypassed. We cannot hold back the advance of technology for economic development any more than you can hold back the desire of people for equal opportunity. Education, and technical training for technicians, scientists and engineers are necessary if we are to enjoy the fruits of the advance of technology.

Now this education has to be of a special kind. It used to be that the natural resources of our country—the minerals, the land, the woods, and the timber, fisheries from the ocean—provided the means and basis for the establishment of industry. Technical resources, technical knowledge, technical skills, engineers, scientists, computers, new designs, now provide the basis and the resources of America for economic development. And these technical resources are largely based on great universities and great laboratories like the National Bureau of Standards. Unfortunately, these technical resources are insufficient to meet all of our national needs simultaneously, the need to defend ourselves

and our system, the need to explore space as a national objective, and the need to provide the technical basis upon which industrial development depends.

In recent months we have initiated a new program called Civilian Industrial Technology which is aimed at supporting the technical activities pertinent broadly to industrial development. Industry will participate and local government will participate to create the technical knowledge and the skills whereby we can improve the quality and the standards of our products and improve the means by which they are produced and distributed. This will not interfere with the private individual activities of a firm at the market place, because in our system we believe that the most sensible decisions about what you shall manufacture and how much and at what price, are the legitimate concerns of people who face the customer from day to day. The individual and the individual firm must have the maximum opportunity for choice of development. This new program is aimed at helping to provide technical resources throughout America, so that new businesses can be generated based on science and technology, utilizing the complex electronics and computer technology which is the basis for the future economic development of America. This movement, if successful, will, I hope, have the same character as the great experiment in cooperation between agriculture, government and the individual farmer, in the past. Now we shall place this in a new setting, where industry, and government, State, local, and federal governments, can cooperate to insure the good health and the viability of American industrial enterprise.

I should like to make another point about education. Every 15 years the American scientific and technical knowledge as a result of research, doubles. You have heard, I am sure, that 90 percent of the scientists who have ever lived are now alive. And the number of scientists and engineers doing technical work in the United States now will double in the next 15 years. The amount of money we spend on research and development will probably double in the next eight or nine years. We are now spending about $17 billion and we may be spending $35 billion ten years from now. This increase of technical activity means that everybody is going to have two or three or four jobs in his lifetime because the old job is going to disappear and he's going to have to learn a new skill. Since the technical knowledge doubles every 15 years or so, if he doesn't learn how to go back to school and be continuously educated and upgraded, he's going to be in trouble. He's not going to be able to enjoy the fruits of economic development. This means that all our people have to have the opportunity for education and that it be a continuous process. We have now, as you know, about 5 million people unemployed in the United States. We always have some unemployment, for various reasons, but today there are large numbers of people actively seeking work who are unable to find it, and a third or more of those people are young people—teen-agers, who are entering the market for the first time.

They face the harrowing disappointment of not being able to find a job in this great and growing America. A large number of those people are colored. They do not have an equal opportunity for employment. Nor will they have an equal opportunity for employment unless initiative is taken by those of us who do have the opportunity, to insure that they can share it. The 5 million people who are unem-

ployed, if we could put them back to work in the United States, would have the effect of giving you $200 more income a year. The drain on the American economy of not having those people at work is $30 billion a year and that's about $200 for each of you. So unemployment and unequal opportunities are connected in our economy. It's a shame and a disgrace that the great American dream can't be enjoyed by all of us. The educational system of America must be such that it provides the technical skills, the literacy, the scientific and engineering skills which are needed for an industry and commerce that is based upon the most sophisticated technology. Technical resources are the basis for the growth of the American economy. They are provided by education and they must be provided by education which can be enjoyed by all working in a free and growing America.

THIRD SESSION—MORNING OF THURSDAY, JUNE 13, 1963

(P. I. Morris, Vice Chairman, Presiding)

REPORT OF THE COMMITTEE ON NOMINATIONS AND ELECTION OF OFFICERS

Presented by R. E. Meek, *Chairman, Director, Division of Weights and Measures, Board of Health, State of Indiana*

As provided in the organization and procedure of the Conference, the Director of the National Bureau of Standards, Dr. A. V. Astin, is the President of the Conference, and he is authorized to designate the Executive Secretary. All other officers are to be elected by vote of the Conference with the exception that vacancies occurring during the Conference year may be filled by the Executive Committee.

In selecting active members of the Conference to nominate for elective officers as presented in this report, consideration was given by the committee to several factors, such as attendance records, geographical distribution, conference participation, and interest shown in promoting weights and measures administration.

The Nominating Committee submits the following report, nominating for office for the 49th National Conference on Weights and Measures and to serve during the ensuing year or until their successors might be elected, the following:

Chairman: D. M. Turnbull, Seattle, Washington

Vice Chairmen: B. S. Cichowicz, South Bend, Indiana; W. E. Czaia, Minnesota; A. H. Dittrich, New Hampshire; F. M. Raymund, Los Angeles County, California

Treasurer: C. C. Morgan, Gary, Indiana

Chaplain: R. W. Searles, Medina County, Ohio.

Executive Committee: E. W. Ballentine, South Carolina; C. D. Baucom, North Carolina; H. L. Goforth, Illinois; W. C. Hughes, Massachusetts; C. L. Jackson, Wisconsin; J. F. Madden, New York; F. D. Morgan, Utah; M. J. Santimaure, Bergen County, New Jersey; G. P. Smith, Washtenaw County, Michigan; J. G. Williams, Jr., Richmond, Virginia.

R. E. Meek, *Chairman*
V. D. Campbell
H. E. Crawford
E. R. Fisher
H. H. Houston
A. D. Rose
Robert Williams

(There being no further nominations from the floor, nominations were declared closed and the officers nominated by the committee were elected unanimously by voice vote.)

REPORT OF THE EXECUTIVE COMMITTEE

Presented by C. H. Stender, *Chairman, Deputy Commissioner of Agriculture, State of South Carolina*

The Executive Committee of the 48th National Conference on Weights and Measures held its final session on Tuesday, June 11, 1963, at 9 a.m. Conference activities for the year were reviewed and discussed.

The Conference chairman reported on his appearance before the Hart Committee of the U.S. Senate at the request of this Committee. In preparation of this statement, members of the Executive Committee were contacted for their views and suggestions. Based upon a majority consensus of the Executive Committe, your chairman supported the bill in principle.

He reported on his attendance at the interim meetings of the Committees on Laws and Regulations and Specifications and Tolerances held in Washington, D.C., in January and February 1963. He expressed his feeling that these committee meetings are helpful to the chairman in that he may be more fully informed and kept abreast of issues before the Conference.

It was his privilege during the year to attend a number of official and industry State and regional weights and measures conferences and other important meetings. At these meetings he used every opportunity to emphasize the important role of the National Conference and the necessity of active participation by all jurisdictions and industry and consumer groups.

The Executive Committee reaffirmed its support for action to provide all States with new standards. They requested the National Bureau of Standards promptly to initiate a plan to accomplish this, which can be supported by all jurisdictions.

The Committee reaffirmed its support for U.S.A. membership in the International Organization for Legal Metrology.

House Bill 5792 has been introduced in the U.S. Congress to amend the Federal Standard Fruit and Vegetable Container Act by adding several new sizes of standard containers. During the meeting of the Executive Committee it was pointed out that the addition of intermediate sizes would tend to destroy the basic objectives of standardization. The Committee felt that the matter of this bill warranted further study and referred it to the Committee on Resolutions for consideration and appropriate action.

Several members of the Committee commented on the increasing interest and participation in committee sessions and recommended that these sessions continue to receive high priority in the Conference program.

A member of the Committee thanked the Conference secretary and the Conference for scheduling meetings of the newly formed Weights and Measures Division of the National Association of State Departments of Agriculture. He indicated that one of the principal objectives of this organization is to strengthen the National Conference.

C. H. Stender, *Chairman*
C. L. Jackson
Nathan Kalechman
G. W. Bay
E. H. Black
W. R. Copeland

J. F. McCarthy
P. I. Morris, Jr.
C. C. Morgan
R. W. Searles
H. E. Crawford
R. E. Meek
Robert Williams
R. J. Cord
W. R. Cornelius
W. E. Czaia
J. L. Littlefield
A. T. Smith
W. S. Bussey, *Secretary*

(On motion of the committee chairman, seconded from the floor, the report of the Executive Committee was adopted by voice vote.)

PROBLEMS IN THE DETERMINATION OF MOISTURE

By J. K. Taylor, *Chief, Applied Analytical Research Section, Division of Analytical and Inorganic Chemistry, National Bureau of Standards*

Water is undoubtedly the most abundant chemical compound. It exists in nature in all three states—liquid, solid, gas. Bodies of water cover about three-fourths of the earth's surface. Combined or loosely associated, water is a significant component of terrestrial matter. In living things it is an all-important major constitutent. For example, about 70 percent of a man's weight is water. Cucumbers and tomatoes contain about 95 percent water.

In view of the above-mentioned facts, one would assume that many investigations have been concerned with methods for the determination of water, and this is true. A book appropriately titled *Aquametry* [1] covers the subject in 444 pages. A recent monograph [2] includes 135 pages and 356 references. Methods that have been developed may be classified as chemical (based on chemical properties) or physical, in which the variation of some physical property is correlated with water content.

The large number of methods that have been developed range in scope from ones of high sensitivity, permitting the detection of minute traces of moisture, to quantitative methods of medium precision, providing results reproducible to perhaps a part in one thousand, for example. Methods of very high accuracy are not available, due perhaps to the fact that water is ordinarily a minor constituent that needs not be known with greater precision. Another reason is that the water content of many materials is both uncertain and variable for reasons discussed later, and hence accurate determinations of water are neither possible nor significant.

With this introduction, I would like to discuss a few of the problems concerned with the determination of water as they appear to an analytical chemist. The examples mentioned will be largely related to determinations in organic media and specifically to grains, inasmuch as this is in the field of interest of this Conference.

Of the various methods available, those based on physical testing are the most enchanting because they are nondestructive, cheap, rapid, and require little if any manipulative technique. Moreover, they are ordinarily amenable to automation. Unfortunately, meter readings are not absolute and must be related to water content by calibration with material of known water content.

In utilizing such methods, it must be established that the variation in the measured quantity is directly related to the water content.

Ideally, the meter reading would be solely a function of the amount of water present. However, the indication need not be specific, providing substances that would interfere are present in constant amount.

Some of the problems concerned with relating electrical moisture-meter reading to the water content of grain are described by Zeleny and Hunt [3, 4] for the case of electric moisture meters. Long experience with these meters has shown them to be instrumentally reliable, but the interpretation of their readings is fraught with difficulties. Calibration values may vary with place of origin of the grain as well as with the crop year. Daily changes in electrical properties of grain have been noted, even while other methods have indicated no change in moisture content. There is little doubt but that such variations are due to the nature of distribution of the water within the grain.[5]

Other physical methods probably have similar shortcomings. Accordingly, when highly reliable values are required, one is forced to seek chemical methods for water determinations.

In the determination of the composition of a material by chemical means, the most satisfactory methods are based upon reacting the desired constituent with a selected reagent, preferably specific for the constituent. The analysis is then based upon a measurement of the amount of reaction that takes place, or upon determination of the amount of reaction product that is obtained. Unfortunately, the elements hydrogen and oxygen are constituents both of water and of most organic materials. Accordingly, one cannot use an elemental analysis for water determination, but rather it must first be separated from the host material before a determination can be made.

It is a sad fact that many materials, and particularly agricultural products, undergo partial to complete decomposition upon heating, one of the easier ways for water removal, and this is one of the shortcomings of oven-drying methods. Solvent extraction is the next method of choice, and fortunately anhydrous methyl alcohol appears to be a satisfactory extractant.

By extracting a known quantity of grain with a known amount of methanol, there remains the necessity of determining the water content of the resulting solution. One way that this may be done is by the Karl Fischer titration method, in which water is reacted with iodine contained in a suitable reagent. This method has high specificity for water and is capable of high accuracy and precision. It is time-consuming, however, and has the further disadvantage of using a reagent which is subject to change its titer on the slightest contact with moisture, so that it must be frequently restandardized. Moreover, a considerable amount of experience and technical skill are required to obtain results of high reliability.

In recognition of the disadvantages noted above, our laboratory has sought other methods, and one based upon gas-liquid chromatography appears promising not only because of the reliability of the results, but because of the ease with which it can be performed.[6]

In gas-liquid chromatography, a vaporized sample is passed through a tube containing an inert supporting material coated with a thin layer of a suitable high boiling-point liquid. The sample, pushed by a stream of carrier gas (usually helium) is continually being absorbed and desorbed by the liquid phase, resulting in a fractionation, so that its components emerge from the exit end of the tube in successive fractions. These fractions may be detected and recorded as a series of peaks known as a chromatogram.

A moisture determination involves extraction of the water with a known amount of anhydrous methanol, injecting a sample of the extract into the chromatograph, recording and integrating the peaks from which the final calculations are made. The method is calibrated by first running samples of methanol to which known amounts of water have been added. This calibration, once established, should hold indefinitely.

Like the Karl Fischer titration method, the new procedure involves extraction of water with methanol. Other investigations have shown that a wet-grinding technique accomplishes this quite satisfactorily. Extractions at ordinary temperatures in the cold of ordinarily ground material is also satisfactory, but takes a longer time.

The new method, excluding extraction time, takes about one-half hour. For this reason, and also because of the kind of equipment involved, it is not a field method, but rather is suitable as a labora-

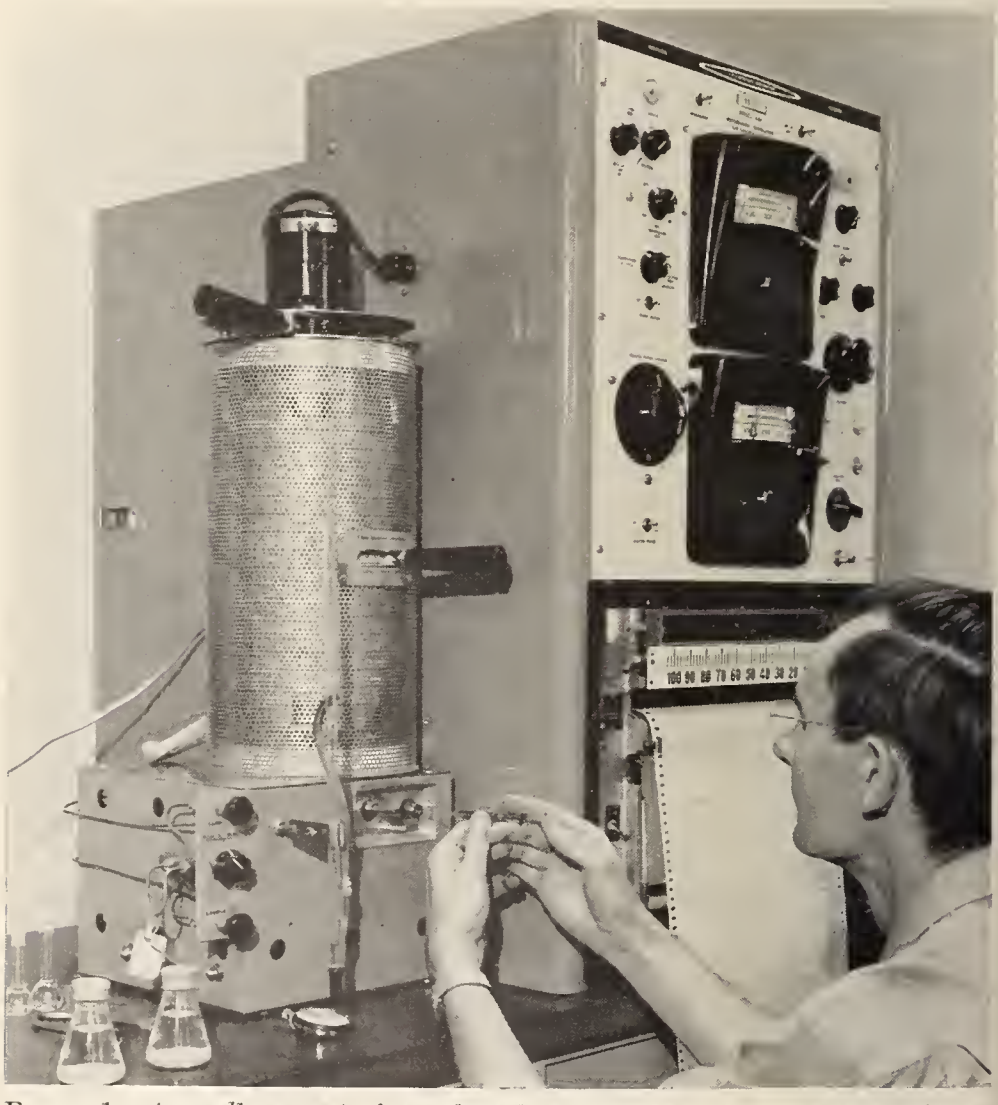

FIGURE 1.—*A small amount of an alcohol-water extract from grain is injected into a gas chromatograph. The relative amounts of water and alcohol are recorded as separate peaks on a chart.*

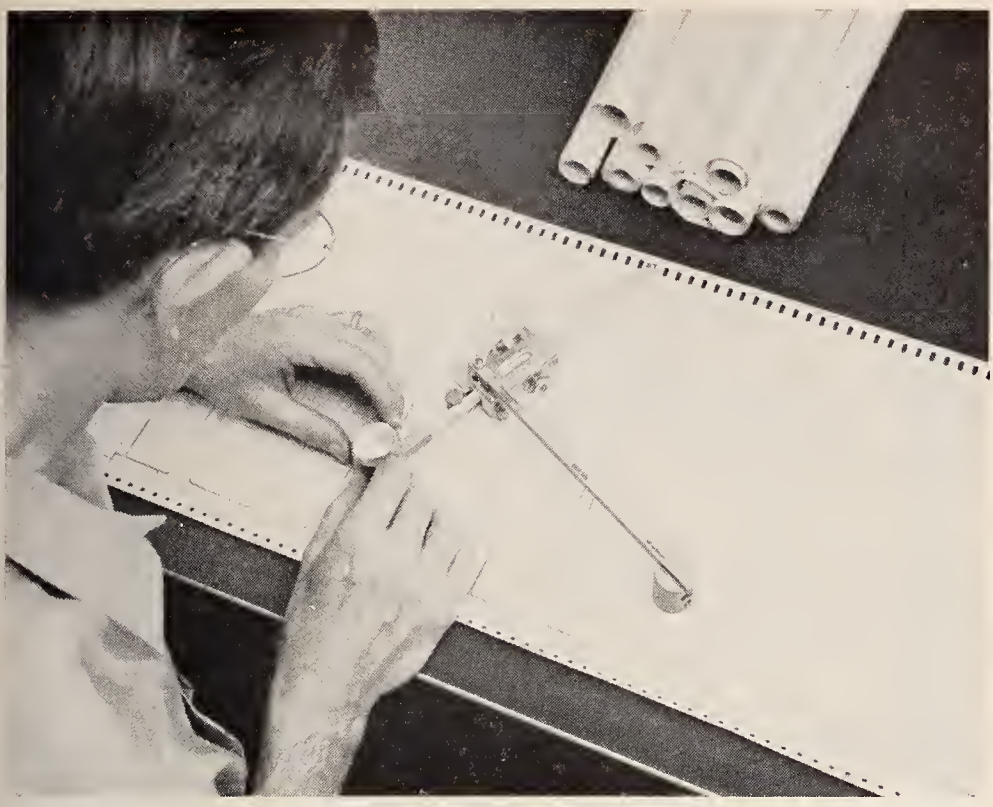

FIGURE 2.—*The areas of water and methanol peaks obtained by gas chromatography of an extract are measured to determine the moisture content of the grain.*

tory reference method. Its reliability is of the order of a few parts in a thousand (better than 0.1 percent absolute for a grain containing 14 percent water).

The new method has the advantage over earlier methods in that it is largely instrumental and involves no difficult chemical techniques. Furthermore, it is free from the requirement of frequent standardization in contrast to the Karl Fischer titration method, for example. It does not eliminate one basic problem common to all known methods for water determination. This problem is the definition of what constitutes the actual water content of a given sample. The method is believed to furnish a reliable value for the water extractable by methanol, and there is good reason to believe this consists of all but that chemically combined with the sample.

There is one further problem that needs to be mentioned in any discussion of water determination. Many materials are hygroscopic, and their water content will be largely dependent on the relative humidity to which they have been exposed. Thus, a determination of yesterday will agree with one made today only if the sample was in equilibrium with an unchanging environment during the period. This hygroscopicity imposes problems of interpretation of analytical data and even aggravates the problem of representative sampling. All of this could add up to require sampling and analytical procedures which could be costly, and hence need to be examined carefully as to the real significance of the results.

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DISCUSSION OF FOREGOING PAPER

Mr. J. G. Williams: I gathered from your talk that the oven method has some limitations. However, will not the oven remove mechanical water and isn't this our primary interest? In other words isn't it the mechanical water rather than the hygroscopic water that concerns us?

Dr. Taylor: Your question concerns the problem of definition—what is the water content of a given material. Every sample is a different problem. The water content of coke as mentioned by Mr. William Gray yesterday is different from the water content of a potato, for example. Analytical methods need to be consistent with such definitions. Fortunately, the oven-drying method and such absolute methods as gas chromatography and the Karl Fischer titration can be made consistent with each other. Electrical moisture meters are empirical and can be calibrated to agree with the above methods. The meters, of course are convenient to use and, with proper precautions, extend laboratory methods to field situations.

Mr. Meek: Our problem (and I think it is a problem of most jurisdictions) has to do with the testing of moisture meters in the field. I am not a chemist, but as I followed your talk, it appeared to me that the method you developed is practically a laboratory procedure.

Dr. Taylor: Yes.

Mr. Meek: How could such a method be used in testing devices in the field? Is it your thought that we could test a sample with an instrument in the field and send a portion of the sample to the laboratory for analysis to determine the accuracy of the device? I am trying to get down to the basic use of the method rather than the best method for determining the sample.

Dr. Taylor: I am sure you are familiar with the Department of Agriculture's extensive procedure for checking moisture meters. Our method could certainly be used in the way you have suggested for performance verification. However, there are practical problems concerned with the stability of most commodities and any time lapse between intercomparison of samples in the field and in the laboratory raises questions as to the validity of the results.

Mr. J. G. Williams: I am not sure that you understood the second part of my question. Are we not interested only in the mechanical water as far as evaporation is concerned? I speak of hygroscopic water which is part of the organic structure of the commodity.

As far as weights and measures officials are concerned, are we not concerned only with superficial water—perhaps that absorbed during processing or which would be subject to variation or control through humidity conditions, in other words, evaporation? Is not this the problem of primary concern in weights and measures? Isn't this kind of water spoken of as hygroscopic water?

Dr. Taylor: Your question emphasizes that the water content of a material is a matter of definition. Perhaps weights and measures officials are not concerned with the actual water content of a material but deviations from "normal water content." This latter state is certainly a matter of definition.

Mr. Stender: At the Indiana Conference there was a company from Indiana, by the name of Avionics, that had a demonstration of some type of electrical machine that would detect moisture. I had some recent correspondence with the gentleman in charge of the display, and he said that they had made tremendous progress. I believe that they are conducting some tests at Purdue.

My question is: By chance has any information on that matter come your way?

Dr. Taylor: I do not know of the Purdue experiments.

A complicating factor in many cases is that the determination of water may be the wrong approach; however water may be easier to measure than the value desired. In the case of coke, for example, the real thing of interest may be the heating value per pound of material and this should be the measurement that is made. The determination of the water content is easier, however. In an iron ore, the iron content is the question of interest and fortunately can be determined directly. In the case of food, perhaps it is the food value per unit of weight that is of concern but a measurement of a diluent, water, is more convenient.

Mr. Morris: Are there other questions for Dr. Taylor?

Mr. Landvater: I would like to know what you consider to be the primary standard of reference at the Bureau so far as moisture is concerned. We have a reference of weight, but what do you use as a primary reference standard for moisture content?

Dr. Taylor: No primary reference standards for moisture content are available and it does not appear feasible to produce such standards. There would need to be standards for each commodity and stability considerations make the maintenance of such standards difficult if not impossible. Pure water is the standard against which procedures such as our chromatographic method and the Karl Fischer titration may be standardized.

Mr. Landvater: How do you calibrate a test procedure?

Dr. Taylor: Calibration solutions may be made by combining weighed amounts of water and anhydrous methanol, with corrections being made for the residual amount of water in the methanol. Both the chromatographic method and the Karl Fischer method may be calibrated by such solutions. Some investigators have recommended using weighed amounts of salt hydrates for calibration of the Karl Fischer method but we prefer the procedure described above.

Mr. Landvater: Let's suppose we are talking about a particular grain sample. We want to determine the moisture content of it. Are you saying that Karl Fischer's method of titration is the reference standard to determine how much moisture there is in this grain, or is it an air, oven-drying method that is the basic standard method?

There has to be some basic reference method of determining moisture content of this grain by which you then calibrate all other methods.

Dr. Taylor: The papers by Zeleny and Hunt (references 3 and 4) point out that grain standards are based on oven drying for specified times and temperatures. These conditions are chosen to give agreement with absolute methods such as the Karl Fischer method or our gas chromatographic method. It should be emphasized that the latter methods determine the water which can be extracted by methanol and this is considered to be all except that actually chemically combined with the material. In other words, further removal of water would result in decomposition of the material.

Mr. Morris: Are there any other questions to direct to Dr. Taylor?

Dr. Taylor, we certainly thank you for that most interesting message with your slides and thank you for coming here today and taking up your time. We appreciate it.

INTRODUCTION OF DR. JOSEF STULLA-GÖTZ BY P. I. MORRIS, VICE CHAIRMAN

It is a great privilege to have one with the background of training and experience and possessing the keen interest of Dr. Josef Stulla-Götz of Austria, travel so far to address this Conference today. I have learned a lot of nice and complimentary things about our distinguished speaker. Time will not permit me to relate many of them, because I do not wish to encroach upon his time.

Dr. Stulla-Götz was born in Vienna in June 1901, just one month before our own Bill Bussey was born in Hutchins, Texas. He studied physics and mathematics at the University of Vienna, where in 1924 he graduated and took a doctor's degree. In 1925 he won a research assistantship in the Physical Institutes of the Technical University of Vienna where he worked for four years on various problems of radioactivity and temperature measurement.

In December 1928 he transferred to the Federal Office of Metrology and of Surveying Affairs, to which office he still belongs, as Director of the Metrological Service.

In 1949 Dr. Stulla-Götz was made chief of the General Metrology Section. He also became chairman of the committee that had been set up to work out a new Weights and Measures Law. This law, the Austrian Weights and Measures Act of 1950, is internationally considered as one of the most modern weights and measures laws.

In 1959 Dr. Stulla-Götz became Director of the Metrological Service, simultaneously he was appointed "Privy Councillor." Also, on the international level, Dr. Stulla-Götz has had many honors bestowed upon him:

He is a member of

(1) The International Committee of Weights and Measures

(2) The Consultative Committee for the Definition of the Meter, and

(3) The International Committee of Legal Metrology, and since 1962 he has been President of this organization.

Ladies and gentlemen of the Conference, it gives me extreme pleasure to present to you, as our next speaker, Dr. Josef Stulla-Götz, Director of the Metrological Service of Austria, and, President of the International Committee of Legal Metrology.

THE GOALS AND PURPOSES OF THE INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY

By Josef Stulla-Götz, *Privy Councillor, Director of the Austrian Metrological Service, and President of the International Committee of Legal Metrology, Vienna, Austria.*

Just a year ago the second Conference of the International Organization of Legal Metrology was opened in Vienna, my native city; the delegates of 34 member-states, and of 5 international organizations attended the meetings. It was a great privilege for Austria and for the Austrian Weights and Measures Administration to organize this Conference; moreover, it has been considered a great honor that a representative of the Austrian Weights and Measures Administration was elected as President of the International Committee of Legal Metrology. In consideration of the extraordinary accomplishments of the founder and first president of this organization. Dr. M. Jacob, the former Chief Inspector of the Belgian Weights and Measures Service, the adequate fulfillment of this task will not be easy.

In the course of the opening session, the Conference was informed of a letter from the National Bureau of Standards in which the Executive Secretary of your esteemed Conference extended best wishes for a good success of the Viennese negotiations.

The forementioned letter included also the invitation for a representative of the Organization to attend the 48th National Conference on Weights and Measures. So I have come now to you, and I have the honorable privilege to address this Conference explaining the goals and purposes of our organization.

Before I enter into the discussion of my topic, permit me to make some remarks on the concepts "Metrology" in general, and "Legal Metrology" in particular.

As a collective term for all problems of measurement, no matter in which sphere of the human life these problems may occur, the term "Metrology" has become familiar; it is understood all over the world. Metrology comprises

(a) the measuring units and their standards,
(b) the measuring instruments, and
(c) the methods of measurement.

We use the term "Legal Metrology" when, on the part of the public authorities, influence is exercised in the treatment of measuring problems by enactment of legal regulations. If and to what extent this shall be done, if and to what extent one can rely on the responsibility of the individual citizen, these things can only be verified by experience. It will also differ from country to country. And experience demonstrates clearly that almost everywhere it is recognized, the public authorities have the obligation to provide in any way conditions assuring that on a uniform basis correct measurements can be and must be effected.

Since the national regulations in this field have developed independently of each other, they have sometimes become very different.

In the United States special attention is attached to well-organized supervisory activities in order to insure that equity prevails in all commercial transactions involving determinations of quantity, but also commercial weighing and measuring instruments are subject to necessary control within the scope of the mechanical activities.

In most countries there exists mandatory verification for a great number of measuring instruments, which are bound to be tested officially either before they are sold, or at least under certain conditions of use. In this connection a thorough type-approval test is considered necessary, in order to guarantee a correct performance of the instruments over the legal inspection period.

In some countries measuring instruments, which are liable to mandatory verification, are tested by private persons, while weights and measures authorities restrict themselves to the execution of sample tests.

In all these cases the opinion prevails that as much freedom and initiative as possible must be granted to the manufacturers and users of measuring instruments; however, restrictions must be imposed whenever these are in the public interest—that is, when necessary for the protection of the individual citizen in commercial transactions, personal security, or public health.

On the other hand, we can observe that in some countries, owing to the ruling economic principle, all affairs of metrology are under complete governmental control, and that, due to the lack of any commercial competition, even the production of measuring instruments is directed by the government by means of detailed specifications.

Nevertheless, the problems of metrology are almost the same in all countries. Of course, there exist differences originating from tradition, local customs, diverse climatic conditions, and even by personal preferences; but as a rule the technical concerns are of the same kind. The question: "Metric or non-metric system?" shall interest us here in the second order.

The world has become small nowadays, as we say, and the horizon and the scope of activity of man are increasing steadily. Economic relations are of increased importance for the existence of all countries. Streams of commodities, of electric energy, of petroleum products are passing the various frontiers. "It is evident," stated Dr. Fritz Bock, Austria's Secretary of Commerce, in the opening address to the forementioned Conference, "that the measurement of all these commodities is establishing a necessary basis of trustworthiness between the commercial partners, and helps to detect and eliminate possible losses. The more we succeed in unifying measuring methods, measuring instruments, and weights and measures legislation all over the world, the more the frontiers will lose their character of economic barriers."

The accomplishment of this metrological task, namely the unification of legal metrology on an international level, has been entrusted to a special intergovernmental organization, the O.I.M.L., which is short for "Organization Internationale de Métrologie Légale." In English—"International Organization of Legal Metrology." This Organization was established on the basis of a diplomatic agreement that was signed by 22 signatories on October 12, 1955, and which became effective on May 28, 1958; the instruments of ratification are deposited with the government of the Republic of France.

The tasks of the Organization may be divided into two groups:

1. The Organization shall form a center of documentation and information in the field of Legal Metrology, it shall establish close relations with the respective national weights and measures services and other services in charge of legal metrology, and shall furnish advisory assistance to interested states.

Even states where legal metrology has arrived at a high standard will derive advantage from such an information center, because the knowledge of the method and the legislation of other countries very often casts new light on the rutted paths of their own practice. The assistance of the Organization is of special value for those countries that are planning to establish a metrological service.

2. The Organization shall therefore issue uniform international recommendations of legal requirements for measuring instruments with respect to their use and control; in particular it shall set up a code of specifications and tolerances with which measuring instruments have to comply in order to acquire international approval. It shall work out model drafts of laws and regulations in the field of legal metrology, for instance on the establishment of a national weights and measures service, and on the necessary control and supervisory activities.

All countries are encountering the same metrological problems; would it not be practical to seek common solutions, and to impose the same requirements on all instruments in all countries? The O.I.M.L. would be a suitable forum to accomplish this.

In this connection I wish to stress expressly that according to Article VIII of the Convention, the decisions of the Organization have the character of recommendations. The supreme legislative powers of the member-states cannot be eliminated by the Conference; of course the member-states remain free and sovereign in their decisions. On the other hand, the Convention in question is a diplomatic agreement, that has been concluded on a governmental level. Therefore, it was necessary to stipulate in the Convention that member-states "take the moral engagement to put these decisions into effect as far as possible."

Now a few remarks on the question of the measuring system: The text of the Convention at no time speaks of a "metric" organization—this being based upon the principal idea that the quality of a measuring instrument does not depend on the employed system of units of measurement. So we are pleased to learn that since August 1959 the Commonwealth of Australia, and since May 1962 the United Kingdom of Great Britain and Northern Ireland, have become full members of the Organization. But I should like to confess, ladies and gentlemen, that I am, for my own part, an enthusiastic supporter of the Metric System, and am very hopeful that one day the motto of the French founders of the Metric System will become reality "*A tous les temps et ă tous les peuples.*"

The O.I.M.L. is in close cooperation with other international organizations taking interest in metrology: e.g., with UNO, UNESCO, with the General Conference of Weights and Measures, which is the governing body of the Metric Convention; moreover with other organizations, as the International Electrotechnical Commission, and the ISO, the International Standardizing Organization.

Very often the question was raised: Why O.I.M.L., when we already have the ISO? An answer would be: Although standardization is not possible without metrology, the operations of the two organizations overlap in just a very small zone. The purely legal questions of legal metrology, the questions of the organization of a weights and measures service, the prosecution of violations, and so on, are absolutely outside of the competence of the ISO. Moreover, in most countries standards specifications have private character, while the stipulations of *legal* metrology, as the name implies, must be considered as *legal* acts.

Perhaps it is now practical to have a look at the world map in order to comprehend the distribution of the present 34 full members and the 6 corresponding members. In *Europe* almost all countries are members, since Great Britain has entered the Organization; in *Asia*, India, Indonesia, Iran, Japan, Lebanon, and the Asiatic part of the Soviet Union belong to the Organization. Australia is also in the Organization, as are the African *members*: Guinea, Morocco, Tunisia, and the United Arab Republic. In the *Western Hemisphere* we have as members: Cuba, the Dominican Republic, and Venezuela. The corresponding members are indicated on the map by hatched areas: Jordan, Israel, Luxembourg, Greece, New Zealand, Pakistan, and Turkey.

A comparison of the numbers of inhabitants yields that of 3 billion people in the world, 1.2 billion people belong to the member-states of the Organization. I believe this is quite a remarkable success for an international organization which has been in existence for less than a decade. You must consider that the Metric Convention, founded in 1875, comprises 38 member-states with approximately 1.4 billion inhabitants today.

In 1955 the text of the Convention was submitted by France to 81 states, with the invitation to join the Organization. France has also become trustee of the original text of the Convention. In appreciation of the contributions that France has made to the fundamentals of metrology in general, and to our Organization in particular, by furnishing financial and personal assistance especially in the primary stages, the Organization decided that its headquarters should be in Paris.

The International Bureau of Legal Metrology, the central executive body of the Organization, is operating in Paris under modest circumstances, and headed by its Director, Mr. Costamagna, who is assisted by an Associate Director, and an administrative staff of 3 persons. The Bureau does not execute scientific research or technical experiments, and therefore has no laboratories or technical equipment.

Thus, the annual contributions of the member-states may be held to a low minimum. There are 4 classes of contributions according to the population of the members.

Class 1 : 10 million or less
Class 2 : 10 to 40 million
Class 3 : 40 to 100 million
Class 4 : over 100 million.

Depending on the class, contributions are proportional to the ratio of 1, 2, 4, and 8, one share amounting to 950 U.S. dollars, so that the maximum annual contribution is $7,600.00.

Electrical measurements: e.g., Electricity meters—Instrument transformers—Wattmeters.
Acoustic measurements.
Measurements of ionizing radiations: e.g., Dosimetry and protection.
Measurement of air pollution.
Assessment of grain qualities: e.g., Density and moisture.

Certain subjects are treated directly by the International Bureau; in this case all members are collaborators; e.g., the subjects: General

rules for the administrative and technical establishment of a legal metrology service—Directives for documentation.

The scope of the work as yet begun may be characterized as very broad. When a study group, consisting of the Secretary-Reporter and of the collaborators, achieves certain agreement on a draft proposal, this is submitted to the International Bureau which forwards it to all member-states for consideration; the comments are again handed over to the Secretary-Reporter who may possibly have to make amendments. Thus, step by step, an amended draft recommendation evolves which is finally submitted to the *International Conference of Legal Metrology* for approval; this Conference consists of the official delegates of the member-states, and is the governing body of the Organization.

The elaboration of such international drafts very often takes a long time; it is not easy to coordinate the sometimes very divergent opinions. In these cases compromises must be achieved, we must manage to fuse different ideas stemming from different origins. But we must succeed in reaching common solutions. First of all, it is important to solve partial questions. For instance, considering the wide field of questions concerning the scales, we at first endeavoured to reach an agreement on the tolerances. Moreover, it is necessary to deal with those measuring instruments which are in a state of rapid technical development. Only then can we hope to avoid conditions of conflicting regulations which would impede international agreement later on.

The results of the Second International Conference on Legal Metrology in Vienna have demonstrated that we are on the right track in several branches; this Conference has approved "Preliminary International Recommendations" in the following fields:

Weights of Brass and Iron—Tolerances of Weighing Instruments—Printing Devices in Scales—Sphygmo-manometers—Medical Syringes.

In other fields the draft proposals of the respective study groups have proceeded very far, so that they already may be submitted to the member-states for consideration:

Instrument Transformers—Manometers and Vacuometers—Material Testing Equipment—Hardness Test—Organization of a Metrology Service.

An accelerated establishment of uniform international regulations for measuring instruments of any kind is especially of importance for countries that are joining in a great economic union, such as the European Common Market. In this case it is the manufacturer himself who is interested in a unification. Great interest in the metrological concerns of our Organization is taken by the East European governments; the principles of planned economy seem to necessitate this.

On this continent there is the U.S.A., a huge union of states, a gigantic reservoir of highly developed metrology. Could we not speak of an American Organization of Legal Metrology comprising a population of about 180 million people? What a high standard you have already attained in your legislation concerning the super-

vision of "Pre-packaged Commodities," in the detection and prevention of fraud and deception in this field. How far you have advanced in the control of weighing and measuring devices. Indeed, what a rich treasure of experience you have available in the fields of scales, weights, of measuring devices for length, area, and volume! Should not these experiences be utilized internationally all within the scope of the International Organization of Legal Metrology?

May I give you now a brief survey on the historical development of our organization. The U.S.A. has participated actively in the creation, the establishment, and the extension of the first diplomatic, metrological world organization, namely of the Metric Convention which was founded in 1875. It was one of the signatory states. Since 1875, representatives of the U.S.A. served on the International Committee of Weights and Measures without interruption till the last years of the war. The United States was represented at all General Conferences by diplomatic and scientific delegates. With the exception of a few General Conferences, questions of legal metrology were always on the agenda. The 8th General Conference even passed a resolution commissioning the International Committee of Weights and Measures to study the question of establishing within the scope of this Committee a "Consultative Committee of Practical Metrology" which should deal with the respective problems of legal metrology.

If this project would have been put into effect, then we would have today a single world-comprising organization competent of handling *all* questions of metrology, and the U.S.A., as signatory of the Metric Convention, would automatically be linked up with all concerns of international legal metrology. I, myself, would have regretted this, for egoistic reasons, as in this case I would not have had the good fortune to speak to you as President of the O.I.M.L.

But it was decided then to restrict the tasks of the Metric Convention to the definition and realization of physical units, and to create a special organization, the O.I.M.L., which should be responsible for the treatment of the questions of practical, legal metrology.

In conclusion, I would like to leave you with two statements made last June on two different occasions:

Senior-President Jacob has emphasized in his summary report held at the Conference in Vienna, that the most encouraging aspect of our activity lies in the fact that all our colleagues, wherever they are active as metrologists, are united by common ideas.

Hon. J. H. Hollomon, Assistant Secretary of Commerce for Science and Technology, declared in this very conference hall here in Washington that the community of countries, nationalities, and peoples is based on a special, common, language, the "language of weights and measures."

Let us, therefore, as Hon. Hollomon declared, "establish a community of interchange and cooperation in the fields of standards, weights and measures."

How does the Organization achieve its technical aims?

The treatment of the technical subjects is undertaken by the metrological services of the member-states in the form of Secretariats; on the grounds of correspondence and verbal deliberations with the collaborating member-states, the Secretary-Reporter works out the draft. At present about 60 technical subjects have been shared among 14

states which are acting as Secretary-Reporter, they comprise the following studies:

General problems of legal metrology: e.g., Vocabulary of legal metrology—Methods of approval of types, models, and systems of measuring instruments—Stamping and marking of measuring instruments—Prepackaged commodities—Methods of sample testing.

Measurement of length: e.g., Linear measures—Tape or wire measures for long lengths—Measuring devices for fabrics, cables, and wires.

Measurement of area: e.g., Devices for measuring leather and animal skins.

Measurement of the volume of liquids: e.g., Volumetric glassware—Medical hypodermic syringes—Water-meters—Hydrocarbon volumetric measuring instruments—Stationary storage tanks—Tank vehicles and barge tanks—Liquefied petroleum gas measuring devices.

Measurement of gaseous volumes: e.g., Domestic and industrial gas-meters—orifice meters.

Measurement of mass: e.g., All kinds of weights—All kinds of scales—Baby and domestic scales—Antomatic weighing machines—Totalizing weighing machines—Electromechanical scales—Printing devices.

Instruments for density measurements: e.g., Hydrometers—Alcoholometers—Saccharometers—Butyrometers.

Measurement of force and pressure: e.g., Material-testing equipment—Dynamometers—Manometers.

Measurement of temperatures and heat quantities: e.g., Clinical thermometers—Optical pyrometers.

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W. Mühe, Some aspects on Legal Metrology in Germany, Report on the 43d National Conference on Weights and Measures, Washington, D.C., June 10, 1958.

DISCUSSION OF FOREGOING PAPER

(Although Dr. Stulla-Götz presented his paper in English, he chose to answer the questions that followed through an interpreter. Dr. Wolfgang Haller of the National Bureau of Standards assisted in this connection.)

MR. TURNBULL: Dr. Stulla-Götz, I wish to compliment you upon your wide knowledge of weights and measures administration throughout the world and upon your most able presentation of a widely informative paper in *our* native tongue. Please accept our sincere appreciation.

Now, Dr. Stulla-Götz, with your kind permission, I would like to ask you a question. I know that you are well informed concerning those countries that have recently changed to the metric system. What do you see as the greatest difficulties that the United States would encounter, should we change to the metric system?

DR. STULLA-GÖTZ: I cannot really answer that question since I have never been faced with that problem. I do not see any particular difficulties, however.

MR. SANDERS: Dr. Stulla-Götz, I too wish to compliment you upon your excellent paper and am very much interested in the International Organization of Legal Metrology. We have followed your activities for a number of years and our organization, the Scale Manufacturers Association, has recently endorsed United States membership in your organization.

I think everybody in this room has a fairly good understanding of what the International Organization of Legal Metrology is. I understand that it is roughly comparable to our own National Conference on Weights and Measures and we all understand how it operates.

I have a couple of questions that our people are interested in and I believe everyone in this room will be interested.

First, you say there is a *moral* engagement on the part of members of O.I.M.L. to adopt the model laws and model regulations that are developed. I would like you to comment on why couldn't those stand just as recommendations, rather than as moral obligations?

If we are morally obligated to adopt them all, we have a very serious problem, because we are a nation of fifty States, and each State has its own weights and measures laws, and its own regulations. And I don't see how our Federal Government could commit all fifty States to the adoption of the international recommendations.

DR. STULLA-GÖTZ: May I read you what the Conference has decided—"According to Article VIII of the Convention, the decisions of the organization have the character of recommendations."

They are only recommendations, but since the activities are conducted on a diplomatic level, this other paragraph obviously has been put in saying that the member-states take the moral obligation to put these decisions into effect, "as far as possible." There is no binding obligation, but there would not be much sense in countries joining this

organization if they would not be interested in putting some of these recommendations into effect.

Mr. Sanders: Then the answer is that they are not actually bound to adopt the recommendations?

Dr. Stulla-Götz: That is correct.

Mr. Sanders: I am sure that in the United States they would be adopted insofar as possible, but I don't think we should be even morally obligated, because moral obligation is sometimes very strong, like a father is morally obligated to support his children. And it is enforceable in court.

Dr. Stulla-Götz: They are only recommendations.

Mr. Sanders: Thank you Dr. Stulla-Götz.

I believe you mentioned "type approval" or "pattern approval" in your paper. Does O.I.M.L. now have or is it expected to develop a committee or an instrument within the organization to exercise type approval of scales and measuring devices for universal application? If so, would that be binding on the United States or on our own States within the United States?

If a device is approved by O.I.M.L. would it be eligible for entry into the United States and for sale here?

Dr. Stulla-Götz: The method of approval has not been worked on yet in O.I.M.L. So far only technical details have been worked on. Recommendations for approvals have not been made yet.

Mr. Bussey: I think possibly I might help clear this point up. I have visited in Europe and the situation there is that each European country exercises its own weights and measures control, including type or pattern approval.

As I understand from my discussions with Dr. Stulla-Götz and others, and from reading the material of O.I.M.L., they are working in a manner very similar to the way this Conference operates. Although this Conference has nothing specifically to do with pattern approval in the various States, it does work out a uniform code of specifications and tolerances, with the hope that the various States will, through their participation in this Conference, feel a moral responsibility to adopt, insofar as it is possible and practical in the jurisdiction. It is expected, also, that the States will follow these recommendations as they exercise their own pattern approval programs. We do feel that the States participating in the National Conferenc have some *moral* obligation to effectuate the recommendations of the Conference, insofar as they are entirely practical and applicable in the individual State. It is my understanding that this is the same as the present situation in O.I.M.L.

Mr. Sanders: In other words, Mr. Bussey, as you understand it, if they should recommend type approval, it would not have to be binding on the United States, if we were members.

Mr. Bussey: That is correct, Mr. Sanders, and as Dr. Stulla-Götz said, there has been no recommendation that each State, or each country, exercise pattern approval. This is a choice of their own. It so happens that practically all of the countries of the world, with which I am familiar, that exercise active pattern approval, weights and measures control at the national level do just as some of our States do. It is up to the individual State. But, regardless of whether or not you exercise advance pattern approval, it would be hoped, as in our case, that the regulations in H 44 would be followed by all of the

States, so the manufacturer would know what he was to be confronted with.

All of the decisions and actions of O.I.M.L. are similar to the actions of this Conference. They are recommendations and it is hoped that participating members will feel a *moral* obligation to follow them as closely as is practical and proper in the particular jurisdiction.

Mr. Sanders: I thank you. I now understand. Thank you very much, Mr. Bussey.

Mr. Gray: First of all, may I be permitted to say how much I enjoyed Dr. Stulla-Götz's paper, which I have read with great interest. Since Great Britain became a member of O.I.M.L., I have had the opportunity to study some of the specifications for weights and different appliances, and most interesting specifications they are. I can assure the representative of the scale industry who spoke last that so far as the scale industry is concerned, any adoption of such specifications can do nothing but good to that industry.

The specifications which I have been privileged to examine range from such things as sealing devices; you in this country adopt generally, the "sticker," whereas in Britain we have a lead plug inserted into the scale at some vital point. O.I.M.L. has been dealing with a new type of sealing device, which the member countries would possibly adopt as an international standard for sealing or stamping.

In the same way, new methods for adjusting and sealing weights are being studied, and so on.

I had wanted to ask the same question as that asked by Mr. Sanders. I now have had the answer. I would like to ask one further question, however, which follows on that same point. Dr. Stulla-Götz, I assume that the countries which comprise the member-states debate and discuss all of the specifications, but what happens if the member-states cannot agree on a specification? Does the majority vote prevail, and is the specification then binding on all the member-states?

Dr. Stulla-Götz: First, a body is formed within the organization called a "Secretariat," of voluntary member-states who are especially interested in this particular specification or other problem. This Secretariat produces a proposal, for example, a draft for the specification. This is discussed fully, within the Secretariat. This proposal then is distributed to all member-states. The member-states then comment upon the proposal and tell what they think about it. These comments and opinions are returned to the Secretariat. The new suggestions are then considered and a new draft is worked out. This is sent again to the different states, and if it seems that sufficient agreement is reached, the proposal goes before the Conference. This is voted on in the conference and four-fifths of the members present or represented must agree to its adoption.

What I have just told you is in the statutes of O.I.M.L. and you are invited to read it.

In the text of the convention it is stated in Article VIII, that the Conference shall decide on recommendations to be made for common action by member-states in the fields designated. The decisions of the conference may only be effective if the number of member-states present be at least two-thirds of the total number of member states, and if the proposal shall have received a minimum of four-fifths of the vote cast. The number of votes cast shall be at least four-fifths of

the number of member-states present. Abstention and blank votes shall not be considered as votes cast.

Mr. Christie: Dr. Stulla-Götz, do corresponding members of O.I.M.L. have a vote on vital issues?

Dr. Stulla-Götz: No, Mr. Christie, corresponding members have no voting rights.

Mr. Bussey: If any member of the Conference has any doubt about what Dr. Stulla-Götz has gone through this morning and the amount of preparation he has made to be of assistance to us, might I suggest that you ask him to furnish you a copy of his paper written in German, and then you try to present it to a large group in a German-speaking nation. I wonder how successful you would be in reading it. I know how successful I would be.

I certainly think that it is a marvelous gesture for our friends in different parts of the world, who are our colleagues, to go to the extreme trouble, not only to prepare these papers, but to translate them into English, bring them here and present them to us in our native tongue. It is a wonderful gesture on their part.

REPORT OF THE COMMITTEE ON LAWS AND REGULATIONS

Presented by J. H. Lewis, *Chairman, Chief Weights and Measures Section, Department of Agriculture, State of Washington*

The Committee on Laws and Regulations of the 48th National Conference on Weights and Measures respectfully submits its final report. The Committee is grateful for the many constructive suggestions received by mail and during its open meeting on Monday, June 10.

INTERIM MEETING

The Committee held an interim meeting in Washington, D.C., on February 19 and 20, 1963. One open session on the "Standardization of Package Sizes" was held on February 19. Private hearings and executive sessions were held throughout the remainder of the two day period.

1. *Standardization of Package Sizes*

1.1 *General.*—This continued to be the major item on the Committee's agenda. The Subcommittee on Standardization of Package Sizes continued its activities, together with the assistance of the other two members of the Committee. Active contact with the (1) National Coffee Association, (2) Institute of Shortening and Edible Oils, Inc., (3) National Macaroni Manufacturers Association, and (4) International Potato Chip Institute was continued. Also, contacts were established in a few other areas. The Committee suggests that all readers of this report review this item as it appeared in the Committee's final report to the 47th National Conference on Weights and Measures.

1.2 *Open meeting.*—The open hearing on Standardization of Package Sizes, at the interim meeting of the Committee, was well attended. The entire afternoon of Tuesday, February 19, was devoted to this subject. All four of the trade associations mentioned in the preceding item were represented. Spokesmen for three of these asso-

ciations made statements or comments, as did representatives of other segments of industry. Most of the speakers representing industry pointed out some of the difficulties involved in the standardization of package sizes, in certain areas and with particular products. All industry representatives indicated their desire to cooperate with the Committee in its effort in this field. Some of the speakers indicated that, in their opinion, their particular companies had standardized package sizes in all areas where such standardization is appropriate and desirable. The Committee is not in complete agreement with these statements. The Committee is of the opinion that further standardization of package sizes is practical and desirable. The Committee is most appreciative of the generous offers of cooperation, however.

1.3. *Cooperative effort.*—When the Committee reestablished this project on its agenda, it was understood that it would be pursued as a cooperative and voluntary effort with business and industry. It is the intention of the Committee to continue to vigorously pursue this project and the full cooperation of all segments of the packaging industry is earnestly solicited.

1.4. *Opening statement.*—At the opening of the Tuesday afternoon session the Committee Chairman read the following statement:

> The desirability of practical package standardization has long been recognized, not only by weights and measures officials, but by the prepackaging industry and consumers. Some twenty-five years ago, during the late thirties, a great deal of concern was expressed, surveys were made, and a Committee on Package Standardization served ably and well to alert the members of the National Conference on Weights and Measures to the importance of this matter. Almost the entire 29th National Conference (1938) was devoted to a study of package standardization. At that time, representatives of industry recognized the undesirability of producing a needless and wasteful multiplicity of sizes and the resulting consumer reaction. The responsibility of manufacturing, warehousing, and marketing all of the many containers needed to meet the growing demands, encouraged a sincere effort to standardize sizes and quantities.
>
> The position taken by weights and measures people was the same then as it is now: (1) the consumer is best served and true competition exists when it is possible to make easy price comparisons. To facilitate this, the consumer must be able to make comparisons based on packages of like commodities packed in standard units. (2) Commodities should be packed in even multiple units of weight or measure, the ideal being packages in binary submultiples of standard units of weight, measure, or count. (3) It is realized that there are practical limits with respect to certain commodities, but even in these, packaging to serve the benefit of the consumer, rather than packaging to price or to confuse the consumer, is a desirable end.
>
> Many can remember the commendable way the industries responded and cooperated, and in numerous instances, voluntarily took steps to eliminate odd sizes, odd shapes and misleading or confusing deviations from standard weights and standard measures. This desirable action resulted from the cooperative approach taken through the auspices of the National Conference some twenty-five years ago.
>
> Today, we face many of the same undesirable practices our predecessors faced at the inception of the prepackaged way of merchandising. Today, the magnitude of the problem is emphasized by the manifold increase in the number of prepackaged items on the market. Today the same amiable solution seems to be the best. We of this Committee strongly advocate a program of effective voluntary cooperation between industry, weights and measures officials, and others, to solve these challenging problems. By working together to achieve desirable goals in the field of package standardization, we will in my opinion, build a stronger free enterprise system. We extend our deep appreciation to the industries meeting with us on this occasion and have every confidence our efforts will not be in vain.

In this opening statement, the Chairman recognized that "even multiple units" and "binary submultiples of standard units of weight, measure, or count" represent the "ideal" in package sizes. He recognized, also, "that there are

practical limits with respect to certain commodities" and indicated a willingness on the part of the Committee to be practical in the further consideration of this subject.

1.5. *Review suggested.*—While the Committee is not making any specific recommendations at this time, it does most earnestly solicit the full cooperation of business and industry in reviewing the prevailing situation objectively and in taking necessary steps to improve the situation which currently confronts the prospective purchaser in the market place.

1.6. *Commodity standards section.*—The Committee has been assured of the cooperation of the Commodity Standards Section of the United States Department of Commerce in this cooperative effort to achieve a better degree of standardization of package sizes. This offer of cooperation is appreciated and the Committee suggests that business and industry take full advantage of the opportunities offered thereby.

1.7. *Continue activity.*—The Committee is pleased to report that definite progress has been observed in the area of package standardization. The members of the Committee will continue their interest in, and very close association with, this phase of wide weights and measures interest and will report again to the Conference in 1964. Several segments of the packaging industry have demonstrated their concern with this matter and their willingness to take immediate steps to bring about standardization of packages within their control. The Committee lauds this effort and urges that all those concerned with management in the consumer package industry conscientiously explore the many advantages of standardization.

2. *Conspicuousness and Placement of Quantity Statements on Packages, Deceptive Packages; Slack Filling; etc.*

In the Committee's final report to the 47th Conference, item 2.3., under the above title, read as follows:

2.3 Conspicuousness and placement of quantity statements on packages, deceptive packages; slack filling; etc.—The matters covered under this title are of great interest to weights and measures officials, to food and drug officials, and to all consumers. From whatever direction the Committee approaches the problem, it comes directly to the conclusion that the problem is nationwide and that the only way that uniformity in requirements and in enforcement can be brought about is through the efforts of the Federal Government and its Food and Drug Administration. It is the belief of the Committee that the Food and Drug Administration has ample legislative authority and a firm obligation to initiate immediately such actions as will bring about corrective measures in an area of commerce that does no credit to the United States.

The Committee urges that the officials of the Food and Drug Administration make a thorough study of their regulations, organization, and enforcement procedures, and that there be brought about positive guidance to packagers with a general elimination of indefinite terms such as "clear," "conspicuous," and "reasonable," that are difficult of interpretation and almost impossible of enforcement. The Committee offers its cooperation and undoubtedly that of all weights and measures officials, to the end that packaging in the United States be honest and that labeling be so as to reflect, beyond doubt, the contents.

After considerable discussion, particularly centering around the statement in the second sentence of paragraph 1 of the item, upon motion from the floor, and by voice vote of the Conference, this item was held over for one year for further study. Although the Committee's basic thinking has not changed, it is probable that too much emphasis was placed upon the words "only way," in the above mentioned sentence. The Committee continues to feel that the Federal Food

and Drug Administration does have both "authority" and "responsibility" in this important area. It also feels that complete and satisfactory national uniformity cannot easily be achieved without the full cooperation and objective leadership of the Federal Food and Drug Administration, in this area.

In taking this item under further advisement, the Committee requests that all readers of this report review item 2.3., page 53, Report of the 47th National Conference on Weights and Measures—1962, National Bureau of Standards Miscellaneous Publication 244, and register their comments and suggestions relative to this item, with the Committee Secretary.

The Committee now recommends to this Conference for consideration and adoption, the following:

The matters covered under this title are of great interest to weights and measures officials, to food and drug officials, and to all consumers. From whatever direction the Committee approaches the problem, it comes directly to the conclusion that the problem is nationwide and that uniformity in requirements and enforcement can be best brought about by State and local jurisdictions with guidance from the National Bureau of Standards and cooperation with Federal officials working with the National Conference on Weights and Measures.

In addition, other agencies of the Federal Government, such as the Food and Drug Administration and the Federal Trade Commission, could be of valuable assistance by offering consultation and advice to State and local weights and measures officials by establishing guidelines for proper labeling of commodities to achieve conspicuous labeling and proper placement of quantity statements on commodities. It is the belief of the Committee that the Federal Government, through its appropriate agencies, has ample legislative authority and a definite obligation to initiate the necessary action to bring about proper corrective measures in an area of commerce that will do proper credit to the United States.

Accordingly, the Committee urges that the officials of the Food and Drug Administration make a thorough study of their regulations, organization, and enforcement procedures, and that there be brought about positive guidance to packagers with a general elimination of indefinite terms such as "clear," "conspicuous," and "reasonable," that are difficult of interpretation and almost impossible of enforcement. The Committee offers its cooperation and undoubtedly that of all weights and measures officials, to the end that packaging in the United States be honest and that labeling be so as to reflect, beyond doubt, the contents.

3. *Model Law.*

3.1. *Sec. 26. Same: Packages: Declarations of quantity and origin; Variation; Exemptions.*—In order to modernize and strengthen this important section of the Model Law, the Committee recommends that it be amended to read as follows:

SEC. 26. SAME: PACKAGES: DECLARATIONS OF QUANTITY AND ORIGIN; VARIATIONS; EXEMPTIONS.—Except as otherwise provided in this Act, any commodity in package form introduced or delivered for introduction into or received in intrastate commerce, kept for the purpose of sale, or offered or exposed for sale in intrastate commerce shall bear on the outside of the package a definite, plain, and conspicuous declaration of (1) the identity of the commodity in the package unless the same can easily be identified through the wrapper or container, (2) the net quantity of the contents in terms of weight, measure, or count, and (3) in the case of any package kept, offered, or exposed for sale, or sold any place other than on the premises where packed, the name and place of business of the manufacturer, packer, or distributor: *Provided*, That neither the qualifying term "when packed" or any words of similar import, nor any term qualifying a unit of weight, measure, or count (for example, "jumbo," "giant," "full," and the like) that tends to exaggerate the amount of commodity in a package or the size of the package,* shall be used: *And provided further*, That the director shall, by regulation, prescribe (a) the minimum type size, style, and placement of any statement required by this section to appear on the

*——— indicates new material.

package, (b) reasonable variations to be allowed, which may include variations below the declared weight or measure caused by ordinary and customary exposure, only after the commodity is introduced into intrastate commerce, to conditions that normally occur in good distribution practice and that unavoidably result in decreased weight or measure, (c) exemptions as to small packages, and (d) exemptions as to commodities put up in variable weights or sizes for sale intact and either customarily weighed or measured at time of sale to the consumer.

The Committee recommends no action on this matter at this time, but plans to retain the item on its agenda for further study. (Thus, according to the Committee's recommendation, Section 26 of the Model Law will presently stand as is.)

4. *Model State Regulation Pertaining to Packages: Exemptions, Marking Requirements, Variations.*

4.1. *General.*—The Committee has given much attention to the Model Regulation Pertaining to Packages and is of the opinion that several strengthening and clarifying amendments are desirable. While none of the amendments are designed to appreciably alter the original basic intended meaning of the regulation, it is believed that they will facilitate uniform and effective enforcement of the regulation. The most pronounced change that is being suggested is in relation to Section 6., having to do with prominence and placement of required declarations. It has long since been felt by many weights and measures officials that more specific guidelines should be provided in this area. The Committee is endeavoring to do this in the recommendations that will follow.

4.2. *Section 2. Declaration of identity.*—Amend to read as follows:

2. DECLARATION OF IDENTITY.—The declaration of identity shall positively identify the commodity in the package by its common or usual name, description, generic term, or the like, unless the commodity may easily be identified through the wrapper or container.

4.3. *Section 3.6. Reduction of fractions.*—Amend to read as follows:

3.6. REDUCTION OF FRACTIONS.—Declarations of quantity may employ only binary submultiple common fractions or decimal fractions. A common fraction shall be reduced to its lowest terms, and, except in the case of drugs, a decimal fraction shall not be carried out to more than two places: *Provided*, That, if there exists, with respect to a particular commodity, a firmly established general consumer usage and trade custom contrary to the requirement for the use of only binary submultiples of common fractions or for the reduction of a common fraction to its lowest terms, the declaration may be made in accordance with such usage and custom.

4.4. *Section 6. Prominence and placement.*—Amend to read as follows:

6. PROMINENCE AND PLACEMENT.—All information required to appear on a package shall be prominent, definite, and plain, and shall be conspicuous as to size and style of letters and numbers and as to color of letters and numbers in contrast to color of background. The declaration of identity, if required, and the net quantity statement shall appear on the principal display panel of the package. The name and address of the manufacturer, packer, or distributor shall appear either on the principal display panel or on any other appropriate panel. Any required information that is either in hand lettering or hand script shall be entirely clear and equal to printing in legibility.

In making this recommendation, the Committee is exhibiting its agreement with the strong consensus of those representatives of the

packaging industry, trade associations, and weights and measures agencies who appeared before it during the Committee's open hearing. It is the Committee's view that definitive type sizes need to be developed and agreed to as either legal stipulations or administrative guidelines for designers of packages and package labels. The Committee is impressed, however, with the strong representations made by many delegates from the industry that time, cooperation, and collaboration will be necessary before a completely acceptable solution can be realized. The Committee, therefore, recommends that the Office of Weights and Measures of the National Bureau of Standards initiate during the coming year a serious technical study in this area and, working with qualified representatives of the packaging industry, develop specific recommendations for the consideration of the Committee.

5. *Model Regulation for Paper Products.*

5.1. *Section 7. Supplementary quantity declarations.*—For a number of years, and at the request of The Tissue Association, Inc., the Model Regulation has permitted a supplementary quantity declaration, in addition to the quantity of contents statement required by law, on packages of multiple-ply tissue products. Specifically, this means that in addition to the required quantity statement of the number of "usable units" in the package, the manufacturer could include a supplementary declaration giving the total number of "single sheets" in the package. The Tissue Association has now notified the Committee that this privilege of supplementary labeling will not be necessary after December 31, 1963, and has recommended that this section be amended accordingly.

The Committee recommends that, to become effective January 1, 1964, section 7. of the Model Regulation for Paper Products be amended by changing the period at the end of the section to a colon and by adding the following:

Provided, That no supplemental declaration of the number of "single-ply sheets" in a package containing a "multiple-ply" product shall be permitted.

6. *Quantity Statements on Packages of Notebook Paper, Paper Tablets, and Similar Paper Products.*

A State weights and measures official informed the Committee during its open meeting that there still are appearing on the market many examples of labeling on packages of notebook paper, paper tablets, and similar paper products—the major quantity statement being in number of pages (counting each side of a single sheet as one page) rather than the number of single sheets. It is the opinion of the Committee that this matter is adequately covered in the Model Regulation for Paper Products and that, if the States would promulgate this Model Regulation and enforce its provision, this problem would disappear.

The Committee expresses its sincere appreciation to all who made known their recommendations in writing and to all who appeared in person before it, and is particularly grateful for the orderly manner in which the many intelligent recommendations were made. It is a simple truism that the success or failure of this or any other committee

of the Conference rests on the delegates, their experiences, and their views.

J. H. Lewis, *Chairman*
J. G. Gustafson
Matt Jennings
J. L. Littlefield
H. M. Turrell
W. S. Bussey, *Secretary*
Committee on Laws and Regulations

(The Committee Chairman made a motion, seconded from the floor, that the report of the Committee on Laws and Regulations be adopted and that the Committee and the Executive Secretary be authorized to make any necessary typographical corrections or editorial changes without changing the intended meaning of the report. The motion carried and the report was adopted by voice vote.)

FOURTH SESSION—AFTERNOON OF THURSDAY, JUNE 13, 1963

(C. L. Jackson, Vice Chairman, Presiding)

REPORT OF THE COMMITTEE ON RESOLUTIONS

Presented by J. F. True, *Chairman, State Sealer, Division of Weights and Measures, Board of Agriculture, State of Kansas*

Resolutions of appreciation were adopted as follows:

1. To Dr. J. N. Behrman, Assistant Secretary of Commerce for Domestic and International Business, for his constructive contribution to the program of the 48th National Conference on Weights and Measures.

2. To Dr. Robert Lampman, Council of Economic Advisers, for his most interesting and enlightening talk.

3. To Dr. J. H. Hollomon, Assistant Secretary of Commerce for Science and Technology, for his constructive presentation at the Conference Luncheon.

4. To Mr. William Gray, Chief Inspector, Weights and Measures Department of Leicester, England, for his splendid address and for contributing to the success of committee hearings by participating in the deliberations.

5. To Dr. Josef Stulla-Götz, Director of the Austrian Metrological Service and President of the International Committee of Legal Metrology, for his educational contribution.

6. To all program speakers.

7. To business and industry for cooperating with the Conference, for attending and participating in the Conference through their participation and their gracious hospitality.

8. To all State and local governing agencies that have arranged for or made possible the attendance at this meeting of one or more representatives of their organizations to participate in the deliberations directed toward the betterment of weights and measures controls throughout the Nation.

9. To the Director and staff of the National Bureau of Standards for their tireless efforts to insure a successful Conference in planning and administering the program and other details so essential to an interesting educational meeting.

10. To Senator Saltonstall of Massachusetts for his recognition of the importance of weights and measures service and for his courtesy in inserting such an excellent statement in the *Congressional Record* during Weights had Measures Week on March 4, 1963.

11. To Senator Hart and the Anti-Trust and Monopoly Subcommittee of the Judiciary Committee for their interest and activity in connection with "Truth in Packaging."

RESOLUTION ON METRIC SYSTEM STUDY

Whereas, H.R. 18, designed to provide for a thorough study of the possible desirability of changing from our customary system of weights and measures to that of the Metric System, including the inherent problems connected therewith; and

Whereas, the ever-increasing expansion of world trade and other developments in international affairs indicate that early action should be taken in this regard: Therefore, be it

Resolved, That this 48th National Conference on Weights and Measures, in conference duly assembled, in Washington, D.C., on this 13th day of June, A.D. 1963, does hereby endorse the enactment of H.R. 18; and be it further

Resolved, That the Chairman of the Conference cause copies of this resolution to be sent to the appropriate Committee or Committees of Congress and that additional copies be made available to members of the Conference for transmittal to their individual Congressmen and Senators.

Whereas, H.R. 5792, designed to add three additional sizes of hampers, round stave, and splint baskets to those now provided in the Standard Container Act of 1928; and

Whereas, it is the consensus of this Conference that these sizes are unnecessary and that they would tend to destroy the intended effectiveness of this act: Therefore, be it

Resolved, That this 48th National Conference on Weights and Measures, in conference duly assembled in Washington, D.C., on this 13th day of June, A.D. 1963, does hereby register its opposition to the enactment of H.R. 5792; and be it further

Resolved, That the Chairman of the Conference cause copies of this resolution to be sent to the appropriate committee or committees of Congress and that additional copies be made available to members of the Conference for transmittal to their individual congressmen and senators.

REPORT OF THE WEIGHTS AND MEASURES ADVISORY COMMITTEE

Presented by R. E. Meek, *Director, Division of Weights and Measures, Board of Health, State of Indiana*

The Weights and Measures Advisory Committee met at the National Bureau of Standards on April 2, 1963. Those present were: Mr. W. S. Bussey, Chairman; and committee members: Miss Genevieve Blatt (Secretary of Internal Affairs, Commonwealth of Pennsylvania); Mr. J. H. Chaloud (Associate Director, Product Development Division, Ivorydale Technical Center, Procter & Gamble Co.); Mr. C. G. Gehringer (Vice President, Howe-Richardson Corp.); Professor L. J. Gordon (Director, Weights and Measures Research Center, Denison University); Mr. R. E. Meek (Director, State Division of Weights and Measures, Indianapolis, Indiana); Mr. D. M. Turnbull (Director, Division of Licenses and Standards, City of Seattle, Washington). NBS staff members present for all or part of the meeting were: Dr. A. V. Astin (Director); Mr. G. E. Auman (Assistant to the Director), who serves as secretary of the committee; Mr. M. W. Jensen (Chief, Office of Weights and Measures): Mr. A. G. McNish (Chief, Metrology Division).

Comments and Suggestions

Progress on Publications.—Since the last meeting of the Committee, former NBS Handbook 26 has been republished as NBS Handbook 82. The title remains the same, "Weights & Measures Administration." A revision of NBS Handbook 37, "Testing of Weighing Equipment," with increased emphasis on techniques, is almost completed. The target date for publication is late fall or early winter 1963. NBS Handbook 45, "Testing of Measuring Equipment," is being revised with the target date for publication by the end of this year. NBS Miscellaneous Publication 64, "Weights & Measures Standards of the United States—A Brief History," has been rewritten and is now in the hands of the NBS Publications Section for final preparation for printing. Two technical reports, one on odometers and one on slow-flow meters, are also being written by the Office of Weights and Measures. The Committee expressed its pleasure at the amount of progress being made in the publications area.

More Frequent NBS Visits to Weights and Measures Laboratories.—Mr. Jensen expressed the hope that two additional people may be added to the NBS Weights and Measures staff so that every State

laboratory may be visited at least once during each two-year period. NBS would inspect the standards and instruments and brief the personnel on the techniques of laboratory operations and offer a program of interlaboratory comparison. One of the principal aims would be to increase the measurement capabilities of the States themselves. The Committee endorsed the concept of roving personnel to inspect, train, and intercompare standards in State and other laboratories more frequently than is now possible. This would promote precision and accuracy and more uniform use of the standards available throughout the country.

State Standards.—The Committee reviewed and reiterated its recommendation of last year that the National Bureau of Standards make every effort to obtain and provide the States with sets of the new standards as soon as possible.

Standards for Central and Latin America.—NBS shortly will undertake the construction of a pilot set of weights and measures standards to be used for demonstration and educational purposes in the nations of Latin America and elsewhere. The Committee believes that such a program would be beneficial to those countries, and gave endorsement to the program.

The U.S. Membership in the International Organization for Legal Metrology.—The Committee endorsed the action of the National Conference on Weights and Measures advocating U.S.A. membership in the International Organization for Legal Metrology. It commended the National Bureau of Standards and the Department of Commerce for recommending such action to the State Department and urged that NBS and the Department of Commerce continue to do all possible to secure State Department approval of such membership.

NBS Weights and Measures Training Program.—The Committee commended the NBS and its Office of Weights and Measures for its technical training program for State and local weights and measures officials. It suggested, also, that additional correspondence courses, home study courses, and audio-visual instructional material be developed and made available for such purpose.

Metric System.—The Committee reaffirmed its opinion expressed last year, that it is necessary for the United States to change to the metric system of weights and measures in order to continue to operate most effectively in world commerce. A comprehensive study by the NBS with respect to the ramifications, costs, and problems of conversion should be authorized at the earliest possible date.

Engineering Standards.—The Committee noted NBS plans to give increased emphasis to work on commodity or engineering standards with the transfer of the Commodity Standards Division, now at the Department of Commerce, back to the NBS. In carrying out this activity the NBS plans to encourage and assist organizations such as the American Standards Association, the American Society for Testing and Materials, and similar nationwide or trade associations in the development and issuance of appropriate commodity and engineering standards and standards of practice. The NBS will provide technical assistance, and will be concerned with the production of standards for all segments of U.S. commerce and industry in which these are needed. NBS plans to encourage the issuance of standards by appropriate trade and industry associations, and, except where

standards are specifically required by law, will not promulgate them directly. The Committee expressed its favor of the increased emphasis on standards affecting the quality and quantity of commercial products. The Committee also expressed its favor of the NBS plan.

Government-University Cooperative Training Programs.—The Committee was quite interested in the novel approach taken by the Bureau in establishing a Joint Institute for Laboratory Astrophysics staffed by both government and university employees located on the campus of the University of Colorado. There are a number of such technical areas in which the government has experts with unique competence. When an educational institute can be administered jointly by a government agency and a university to provide advanced technical training of graduate students along with a research program, such efforts would seem to be decidedly in the National interest. The Committee complimented the Bureau on its leadership in this area.

Meeting Arrangements for the Committee.—Members of the Committee felt that the practice of establishing meeting dates a year in advance, the first Tuesday in April, was working very well. It was therefore decided that the meeting of the Weights and Measures Advisory Committee in 1964 would be held on April 7. The committee thanked Mr. Bussey, Dr. Astin, Mr. Auman, Mr. Jensen, Mr. McNish, and other members of the NBS staff for their many courtesies and helpfulness in connection with these meetings.

SIMPLIFIED STATISTICAL QUANTITY CONTROL

By W. J. Youden, *Consultant, Applied Mathematics, National Bureau of Standards*

Introduction

Statistical quality control is a well recognized phrase that designates a technique used in industry to improve quality and to reduce waste. Whoever made up this program has hit upon an apt modification of the phrase by substituting the word "quantity" for the usual "quality"! The members of this Conference are certainly checking items to insure that the *quantities* found in packages live up to the weight or volume claims placed on the package. Such checking is necessarily made on rather small samples. Vast industrial experience has long since demonstrated the efficacy of sampling procedures to keep check on the dimensions and other attributes of manufactured items. Customs are similarly assessed on the results obtained by examining a very small portion of a shipment. Equally, the assessment of the strength of concrete used in dams, structures, and roads is made on the basis of samples of the cement and corings from the finished product. The same mathematical principles involved in all these accepted applications also hold for the sampling activities of weights and measures officials.

The American Society for Quality Control is just about twenty years old. So we are talking about something that has happened since many of us left school. The mathematical principles were long known, but the *application* of these principles on a large scale is a relatively recent phenomenon. A few years ago, during the rapid expansion of quality control, many well meaning amateurs essayed

the role of teachers by writing expository articles. Quite often these well-meant attempts to be helpful only confused those seeking guidance. Even well-informed people are not necessarily good expositors or teachers. Competent expositors on the topic of quality control are now available. Weights and measures officials may, if they choose their sources, be spared the fumbling guidance of amateurs. There is cause for concern, because I have recently read papers presented before weights and measures meetings that demonstrate the need to be on guard against writers who seem to me not well intentioned. These papers were directed against the use of sampling procedures or, perhaps, any check on certain classes of commodities. The cleverness with which some of this material is presented makes me quite sure that it is intentionally misleading and not the result of being uninformed regarding these matters.

How Reliable is Statistical Quantity Control?

Statistical quantity control is a flexible technique that achieves fair and proper protection to both parties in a transaction and does this at minimum cost. Of course, by destroying every package and using ridiculously sensitive measuring devices, we can guarantee that neither party would have lost or gained in the transaction. Anything less than such complete and expensive inspection means that both parties run some risk of suffering a loss. The firm place that statistical sampling holds in industry rests on the following fact. The risk of any given loss to the manufacturer and to the buyer can be fixed in advance and is subject to the usual sort of negotiation of what is fair and practical and not overly costly. The alternative is to depend upon the generosity or naivete of one of the parties.

It must not be forgotten that, in the purchase of a package, consumers are not on equal terms with the one doing the packaging. True, if a purchaser, by home checking, discovers that a particular brand is consistently in short measure, that purchaser can try another brand. This does not put purchasers on even terms unless they organize and institute a program of checking similar to the present official one. And it might come to this if official inspection were rendered impotent.

There can be no valid objection to negotiating a system of inspection that protects both parties and then using the regularly constituted government officials to insure that the negotiated agreement is observed. You will all note that the packager is in a better position to violate the agreement than is the purchaser. But it is possible and proper for the packager to be defended against an occasional complaint when inspection shows that the packager is, in fact, living up to the agreement.

What are the Items to be Negotiated?

We may set as an ideal goal the acceptance of all lots where the average content of all packages in the lot at least equals the claimed amount. Another ideal goal is that each and every purchaser gets full measure. It is neither practical nor necessary to achieve such ideal goals with no exceptions. It is quite impossible to make the contents of all packages identical in weight. If the *average* content of all packages does equal the claimed amount, then we must expect half of the individual packages to be more or less underweight. We may, with

justice, argue that the purchaser, viewed over all items of different products, would still break even because half of the items he buys would exceed and half of the items would fall short of the labeled weight. This is only true provided all packagers manage to make the averages for their whole output equal to the labeled values.

A lot that has the correct average over all packages is vulnerable during inspection, because half of the samples, be they of 5, 10, or 50 packages, will average below the claimed contents. This appears to put the packager at a disadvantage. A choice of two evils presents itself. The packager may purposely raise his average above the claimed content and increase his cost, or the negotiated agreement may allow a small shortage. Unless this tolerance is very carefully set, some packagers may purposely package below the claimed contents and profit at the expense of the purchaser and put other packagers at a disadvantage. There is, here, ample opportunity for negotiation. In place of protesting that it is impossible to devise a fair agreement, packagers should seek to work out agreements that are fair to all concerned.

We have, as a rule, just two ways to evaluate a sample. There is the average of all the samples and the arithmetic average of the absolute amounts by which the individual packages depart from the claimed amount. Given these two numerical values for a sample, it is a simple statistical problem to calculate the chance of getting such a low sample average when the lot does, in fact, meet the requirement that the average of all packages in the lot be equal to the label value. If the calculated chance is very small, say one in fifty, the reasonable presumption is that the lot does not qualify. To complain that the lot may, in fact, be O.K. ignores the fact that a lot that is somewhat below on the average still has a very good chance of passing. There is always risk for *both* seller and buyer.

The above simple test would not likely be agreed to by an informed body of purchasers. The packaging could be consistently short measure with very little rejection of the output, particularly when we remember that only a small proportion of lots is sampled at all. We can do considerably better than the above proposal. What is needed is some record of a number of lots to provide some firm measure of the variation that exists among packages. This combined estimate of the variation is a better quantity to use than the variation as estimated from a single sample. In packaging there is far more likely to be fluctuation in the average content than in the variability. It is not efficient to use small samples to provide individual estimates of the variability for each lot. The use of an established figure for the overall variability would substantially narrow the zone of uncertainty and reduce the amount at risk.

One other avenue is worth exploring. It is simply this: We recognize that it is not feasible to pack exactly the same amount in every item. We accept that there will be as many packages below the lot average as above the lot average. We maintain that it *is* feasible to keep the *lot average* very close to the labeled contents. Countless manufacturing companies do succeed in keeping the average dimension of an item practically on the button by the use of control charts. Generally they must also keep tight control on the scatter around the average. It is not enough that automobile parts have the correct average. Pistons too big will not go in an engine cylinder. Pistons

too small will not give adequate compression. Fortunately, it is not so important in packaging to insist on a very small scatter. It is very important to insist on making the *average* close to the label, otherwise somebody loses.

If we adopt this approach, we avoid endless wrangles over setting allowable tolerances—a battle for every commodity and package. Instead, *we ask only for symmetry about the labeled value.* By symmetry, we mean that there are as many packages overweight as there are packages underweight. Symmetry centered on the correct value guarantees no loss or gain to both packager and consumer because, over any reasonable number of items, the losses and gains will tend to cancel out. To suggest that it is impossible to make the lot average virtually identical with the label value is to deny what is achieved in tens of thousands of manufacturing processes.

Fortunately, it is easy to set up simple tests for both packager and inspector to detect systematic departures from the correct amount. A run of several underweight or overweight items warns the packager. A predominance of underweight items in a sample alerts the inspector. It would not be difficult to work out simple rules that would provide protection to both parties.

Consider the following probability statement. If we know for a lot the percent of items that are underweight, we can calculate the chance of getting a sample that will average underweight. If the lot has fifty percent of its items underweight, then half of the samples will average underweight. So one sample tells us little. But a *run* of samples, all averaging underweight, becomes more and more improbable the longer the run. The odds are more than 1,000 to 1 against a run of ten samples, all averaging underweight, if the lot is in fact O.K. Such a run suggests that more than fifty percent of the lot items are underweight, and hence the lot average would be below the correct amount.

It is interesting to calculate the chance of getting a run of underweight samples for different assumptions regarding the percent of samples underweight in the supply being inspected. We will assume that a sample consists of ten items and we will calculate the odds of getting a run of ten samples all averaging underweight. (These samples may come from different lots.) Table 1 shows for various

TABLE 1. *A sample of ten items is taken from a lot and the average weight found for the sample. The table shows the odds that all ten sample averages from ten successive lots will be underweight when different percentages of the items are packed underweight.*

Percent items packed underweight	Odds against all ten sample averages being underweight
50	1,023 to 1
55	68 to 1
60	10 to 1
68. 22	1 to 1
70	1 to 1.5
80	1 to 25
90	1 to 395
95	1 to 50,600

percents of underweight items in the lot (or lots) how the odds change for getting a run of ten samples all averaging underweight. The odds are 1,023 to 1 *against* such a run if the lot is O.K. The odds are one to one if about two-thirds of all the items are underweight. Persistent underweight packing quickly reveals itself in the sample averages.

Note that there is no need to get individual weights. There is no bother about tolerances. There is only an insistence that the item weights be symmetrically distributed about the *correct* weight. This will happen if the packing is performed so that the lot *average* is held close to the correct value. Modern quality control methods are well established to make it easy to meet this requirement. Attention is now focused, not on the individual item, but on the overall performance.

The same approach may be applied to the examination of individual items. Table 2 shows how the chance of getting a run of items all underweight depends on the percent of underweight items in the lot being sampled.

TABLE 2. *Odds against getting a run of items all underweight*

Percent of items underweight in lot	Odds against a run of underweight items	
	Run of ten	Run of seven
50	1,023 to 1	127 to 1
55	394 to 1	65 to 1
60	164 to 1	35 to 1
70	34 to 1	11 to 1
80	8 to 1	4 to 1
90	2 to 1	1 to 1
95	2 to 3	1 to 2

NOTE: Odds are rounded off to whole numbers.

This table reveals that the odds are very much against getting ten (or seven) successive items underweight if the lot is at all close to having equal proportions of over and underweight items. Long runs of underweight items are not likely to turn up unless three-fourths or more of the items are underweight. If there is this percent of underweight items, it implies an average content below the correct value. All that the inspector is doing is to apply a well-known statistical technique that could equally well be used by the packer to keep his average where it belongs. We expect a fair coin to give equal chances for heads and tails. A run of heads arouses suspicion. Ultimately the player makes a choice. Either the coin is fair and a very improbable sequence of events has occurred, or else the game is rigged. A long run of either heads or tails leads to the latter conclusion, especially if playing with a stranger.

Summary

This discussion has made the following points:

(a) That the use of samples is an effective method of checking packaged items.

(b) That individuals experienced in statistical quality control should be consulted for the interpretation of the data obtained from samples.

(c) That agreements should be reached regarding whatever action should be taken on the basis of the sample results.

(d) That the need for setting tolerances may be avoided by substituting the simple requirement that the contents of the items packed should be symmetrically distributed around the correct value.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Presented by T. C. Harris, Jr., *Supervisor, Weights and Measures Section, Department of Agriculture and Immigration, State of Virginia*

The Committee on Specifications and Tolerances of the 48th National Conference on Weights and Measures submits its report—a tentative report as amended by this final report.

1. GENERAL CODE

1.1. *G–T.1. Acceptance tolerances.*—It has been suggested to the Committee that the provisions of general tolerance paragraph G–T.1. might be so revised as to make subsections (c) and (d) somewhat more practical and enforceable. It has been pointed out that the "3 months" period specified in (c) and (d) for overhauled or repaired equipment, appears to be somewhat excessive when compared with the new equipment usually anticipated under (a) and (b). The Committee believes that this suggestion has considerable merit and will propose the reduction of the 3 months period in (c) and (d) to "2 months" and "1 month" respectively.

Another suggestion reaching the Committee relative to G–T.1. has to do with the removal of a permanently installed device from one fixed location and its reinstallation in another fixed location in the same State. It was suggested that devices in this category be included under subsection (c). The Committee concurs in this suggestion.

To implement the revisions explained above, the Committe recommends that general tolerance paragraph G–T.1. of the General Code be amended to read as follows:

G–T.1. ACCEPTANCE TOLERANCES.—Acceptance tolerances shall apply to equipment of the following classes:

(a) Equipment that is about to be put into use for the first time in the State.

(b) Equipment that has been put into use within the preceding 3 months and is being officially tested for the first time.

(c) Equipment that is being officially tested for the first time within 2 months after major reconditioning or overhaul, or reinstallation in a new fixed location.

(d) Equipment that is being officially tested for the first time within 1 month after repair, adjustment, or other corrective service operation, following official rejection.

(Item 1, General Code, was adopted by voice vote.)

2. SCALE CODE

Since the 47th National Conference in 1962, the Committee has diligently studied all recommendations and suggestions received from

weights and measures officials, including State and regional weights and measures associations, the Scale Manufacturing Association, and others relative to the Scale Code. In its tentative report the Committee has attempted to implement these suggestions, especially those pertaining to simplification, clarification, and adjustment of tolerances. However, in light of the testimony presented during the open hearing on June 10, the Committee is convinced that this item should be given further study. Therefore, the Committee now recommends that item 2 be continued on the agenda of the Committee for another year.

(Item 2, Scale Code, was adopted by voice vote.)

3. LIQUID-MEASURING DEVICE CODE

3.1. SLOW-FLOW METERS

3.1.1. *General.*—In recent months there has been an increasing amount of interest in the so-called "slow-flow" meters, intended for installation in individual homes or at individual mobile homes in a trailer camp, for the commercial measurement, cumulatively, of the volume of liquid fuel being consumed. The fuel is supplied from a central storage facility. The rates of flow through such meters may range up to a maximum of 10 gallons per hour.

Normally, these devices would not be covered by public utility laws, but would fall within the jurisdiction of weights and measures statutes. For this reason, "slow-flow" meters are of interest and concern to weights and measures officials.

3.1.2. *Tests and equipment.*—The National Bureau of Standards has conducted extensive studies and tests of these new devices, in recent months. It has been concluded that special testing equipment is essential in the conduct of these tests. The Bureau has developed such special testing equipment and has conducted extensive tests on meters of four different manufacturers. The tests were designed to (1) prove the effectiveness of each of several special testing systems, (2) develop test procedures for slow-flow meters, (3) determine the accuracy of the meters, and (4) gather data necessary in the development of technical requirements for the meters.

It is expected that a detailed description of proper testing equipment and specific test procedures will be available from the Bureau's Office of Weights and Measures in the near future.

3.1.3. *Nature of tests.*—Owing to the intricate nature of these tests, connected with the fact that an installation of slow-flow meters may include as many as several hundred individual devices, tests are contemplated as laboratory operations, and testing undoubtedly will be accomplished on a sample basis. The individual testing of these devices in service appears to be completely impractical and uneconomical.

3.1.4. *Code amendments.*—It is evident that a few amendments to the Liquid-Measuring Device Code will be necessary to make it clearly adequate in its coverage of slow-flow meters. The major amendments, however, may be expected to include (1) special indicating facilities for test purposes, (2) special provisions concerning test procedures, (3) special marking requirements, and (4) proper tolerances to be applied to these new and different devices. On the other hand, many of the present requirements of the General Code and the Liquid-Measur-

ing Device Code will be applicable and should be enforced in all instances where they are clearly applicable. The Bureau's Office of Weights and Measures, based upon its tests and experiences thus far, has developed a tentative table of tolerances for slow-flow meters. This table is included in this report.

It is also suggested by the Committee that this table of tolerances will be useful to weights and measures officials and users of slow-flow meters, to serve as a guide during the interim awaiting final adoption by the Conference of all necessary amendments in this area.

3.1.5. *Tentative table of tolerances for slow-flow meters*

Indication	On normal tests				On special tests	
	Maintenance tolerances		Acceptance tolerances		Maintenance and acceptance tolerances	
	Percent	(*Minims*)	*Percent*	(*Minims*)	*Percent*	(*Minims*)
1 gill	1.00	(20)	0.75	(15)	1.25	(25)
0.05 gallon	1.00	(30)	0.75	(25)	1.25	(40)
½ pint	1.00	(40)	0.75	(30)	1.25	(50)
0.10 gallon	1.00	(60)	0.75	(45)	1.25	(75)
1 pint	1.00	(75)	0.75	(60)	1.25	(95)
0.20 gallon	1.00	(120)	0.75	(90)	1.25	(155)
		(*Fl. drams*)		(*Fl. drams*)		(*Fl. drams*)
1 quart	1.00	(2½)	0.75	(2)	1.25	(3)
½ gallon	0.75	(4)	0.60	(3)	1.00	(5)
1 gallon and over	0.75	(8 per gallon)	0.60	(6 per gallon)	1.00	(10 per gallon)

The Committee Chairman made the following motion relating to item 3.1:

(1) That item 3.1. of the tentative report be adopted; (2) that paragraph 3.1.5, which is the table of tolerances in the Committee's tentative report, be adopted as the tentative table of tolerances for slow-flow meters; and (3) that the National Bureau of Standards be requested to print and distribute in loose-leaf form the appropriate information contained in the paragraphs 3.1.1, 3.1.2, 3.1.3, and 3.1.4 of item 3.1 of the tentative report.

The motion was duly seconded.

(After considerable floor discussion and explanation by the Committee Chairman. item 3.1., slow-flow meters, was adopted by voice vote.)

3.2. MILK METERS

3.2.1. *General.*—Practically since the first use of farm milk tanks, there has been considerable interest in the dairy industry concerning the possibility of using meters, that would meet all weights and measures and sanitation requirements, for the measurement of fluid dairy products. This interest has continued to increase with the rather rapid expansion in the use of farm milk tanks and the bulk handling of fresh whole milk. Although the Committee is not aware of the availability of any specific complete metering system that has been clearly demonstrated to be entirely satisfactory for this purpose, it does appear inevitable that one or more such systems will be developed and made available in the not too distant future. The Committee does understand that considerable study and tests have been

conducted at Pennsylvania State University, University Park, Pennsylvania. Also, the National Bureau of Standards reported to the 47th National Conference relative to its experiences in this field.

3.2.2. *Tolerances.*—It now appears reasonably certain that these special meters for the measurement of milk can be expected to perform with the accuracy requirements now specified for wholesale liquid-measuring devices and vehicle tank meters. Also, it appears evident that many of the requirements contained in the General Code, the Liquid-Measuring Device Code, and the Vehicle Tank Code will serve adequately in the future official control of milk meters. These requirements should be considered and applied by weights and measures officers, insofar as the requirements are clearly applicable to milk meters.

3.2.3. *Commercial use.*—It would be anticipated that a large majority of commercial milk meters would be installed upon the vehicle tanks used in the collection of milk from the individual dairy farms. In some instances, however, it is probable that commercial use will be made of these meters permanently installed in a milk plant.

3.2.4. *Special problems.*—One of the complications offered by a meter for this use is a result of the very strict requirements of sanitation officials. These sanitation requirements make it necessary that a meter be dissassembled for cleaning and inspection. This situation dictates that all individual parts associated with a given meter should be permanently marked for indentification purposes.

Another problem peculiar to the operation of milk meters on vehicle tanks is that of the proper priming of the system prior to the first commercial measurement of product after the device has been disassembled and cleaned. Some people have expressed the opinion that the system should be properly primed before use, regardless of any inconvenience that might be involved. On the other hand, others have expressed the possibility of advanced determination, by the weights and measures official, of the actual volume involved in the proper priming of the device. In this case, the dairymen involved would be allowed, over and above the quantity registered by the meter, the amount required in the priming process. In the opinion of the Committee, this is a very important point and should be given careful consideration by all interested weights and measures officials and members of the dairy industry. Comments, suggestions, and recommendations in this area will be appreciated.

3.2.5. *Testing fluid.*—The Committee is not aware of the availabilty of any substitute for milk to be used as the official testing fluid. It is possible that some substitute material may be developed. At the present time, however, it appears that it would be necessary to use natural whole milk for official testing purposes.

3.2.6. *Standards and equipment.*—In the official testing of milk meters, it is evident that a weights and measures department would be required to obtain special sanitary standards and equipment. It is expected that the National Bureau of Standards will be able to furnish consultation and advice in this area through its Office of Weights and Measures, by the time such metering systems are employed in commercial use.

3.2.7. *Code amendments.*—It is evident that certain amendments to the Liquid-Measuring Device Code and the Vehicle Tank Code will be necessary. It is the expectation of the Committee to continue to

keep abreast with the developments in this area and recommendations will be made to the Conference as and when it is deemed necessary and appropriate.

(Item 3.2, Milk Meters, was adopted by voice vote.)

4. MILK BOTTLE CODE

4.1. *S.2.2. Capacity point of special milk bottle.*—The Milk Bottle Code, for many years, has contained a provision for a "special milk bottle" that was originally designed for the pasteurization of milk after it was bottled. The Committee has recently investigated this matter and can find no evidence of current use of this pasteurization process or of these "special milk bottles." In the light of these facts, the Committee can visualize no purpose to be served by the continuation of specification paragaraph S.2.2. and Table 1 in the Milk Bottle Code. Therefore, the Committee recommends that paragraph S.2.2 and Table 1 be deleted.

4.2. *S.2.1. Capacity point of regular milk bottle.*—With the deletion of paragraph S.2.2., the Committee recommends that the side title of specification paragraph S.2.1. be amended to read as follows:

S.2.1. CAPACITY POINT.—

4.3. *T.1. Tolerances.*—With the deletion of Table 1, the Committe recommends that "Table 2" be renumbered as "Table 1."

(Item 4, Milk Bottle Code, was adopted by voice vote.)

5. MILEAGE-MEASURING DEVICE CODE

5.1. *Odometers on rental automobiles.*—Much time and attention was given to the subject of odometers on rental automobiles by the 47th National Conference on Weights and Measures. The subject was dealt with in the tentative report of this Committee, as well as the Committee's final report. Also, the topic was discussed by two speakers on the formal program of the Conference, Mr. Nalls Berryman, Director, Division of Standards, Department of Agriculture, State of Florida, and Mr. T. J. McCook, Chief Engineer, Instrument Division, Stewart Warner Corporation, Chicago, Illinois. The Committee suggests that the readers of this report review the material heretofore referred to. The papers by Mr. Berryman and Mr. McCook will be found beginning on page 12, Report of the 47th National Conference on Weights and Measures 1962, NBS Miscellaneous Publication 244. The final report of the Committee, on this topic, will be found beginning on page 123 of the same publication.

5.2. *NBS tests and study.*—Since the close of the 47th National Conference, the National Bureau of Standards has conducted extensive tests and has made technical studies of the performance of odometers on rental automobiles and trucks. The Bureau's Office of Weights and Measures has made the information thus gained, together with its technical advice, available to the Committee. Furthermore, the Committee has continued to keep in constant contact with the Automobile Manufacturer's Association, the Society of Automotive Engineers, and other interested groups and persons.

The NBS tests employed three different methods: (1) "Road test" over a carefully measured highway course, (2) "Fifth-wheel test"

over unmeasured road courses in the city and in the open country, and (3) "Simulated road test" on a simulated road test machine. NBS technicians also investigated the possibilities of the "wheel test." The Bureau's findings relative to the wheel test were unsatisfactory. It was determined that this type of test is not sufficiently accurate for official use and the Committee will recommend that it be deleted from the Code for Mileage-Measuring Devices.

5.3. *Other tests.*—At the request of the Committee, the Weights and Measures Division of the City of Seattle, Washington graciously consented to conduct an appreciable number of tests on their simulated road test machine. Earlier, and prior to the preparation of his Conference paper, Mr. Berryman and his colleagues in Florida conducted a series of road tests over a carefully measured highway course. All of these tests were in substantial agreement as to magnitude of error, repeatability, etc.

5.4. *Odometer design.*—It is a recognized fact that the odometers on rental automobiles and trucks are quite inexpensive devices, designed primarily for noncommercial use. It is impractical to expect the same high degree of performance from these relatively inexpensive instruments that is normally expected of higher priced devices, designed primarily for commercial use. These and many other factors influencing the performance of odometers are dealt with in Mr. McCook's address to the 47th National Conference. The Committee shall not attempt to go into all of these details in this report.

5.5. *Odometer accuracy.*—Since the inception of its study of this subject, the Committee has found relative agreement among various interested persons, as to the accuracy performance of odometers. At the 47th National Conference and again at the interim meeting of the Committee in Washington, D.C., January 29–31, 1963, representatives of the automobile manufacturing industry indicated that a spread of 5 percent would be sufficient to accommodate current odometer performance. However, the more precise tests of NBS indicated that the 5 percent spread was hardly adequate. The NBS study indicates that a spread of 6 percent is necessary. In its continued effort to be fair and practical, the Committee is accepting the Bureau recommendation in this area.

5.6. *Tolerance structure.*—There has been some discussion as to how the allowable tolerance on odometers should be divided. Some have recommended that the tolerance values be equal on "underregistration" and on "overregistration." Heretofore, the tolerances allowed on taximeters and on odometers have been on underregistration only, except as is provided to allow for tire wear. This custom was established for several good reasons. There are, however, more compelling reasons to justify this position in the case of taximeters, than in the case of odometers. Practically all factors that operate to influence the registration of an odometer or taximeter tend to cause errors of overregistration. In addition, in the case of the taximeter, the passenger is precharged for the first increment of travel before he actually travels at all. The Committee is convinced that the present tolerances for taximeters are fair, practical, and equitable to all concerned and no recommendation is being made to change the present tolerances for taximeters.

5.7. *Odometer tolerances.*—The Committee is of the opinion that certain changes and improvements are desirable in the case of the tol-

erances for odometers. Also, the Committee is convinced that the same principle should be followed in the case of odometers, as is now followed in the case of practically all other commercial devices where comparatively liberal tolerances are allowed. This principle is to allow a larger tolerance on underregistration than is allowed on overregistration. This policy is followed in the Codes for LP Gas Liquid-Measuring Devices, Liquid Measures, Measure-Containers, Fabric-Measuring Devices, Cordage-Measuring Devices, Dry Measures, and Berry Baskets and Boxes.

Representatives of the manufacturing industry have assured the Committee and the Conference that there are no technical reasons to prevent the tolerance spread on odometers from being divided in any proportion desired. They do emphasize the necessity for the allowance of a reasonable spread. The devices can be set to register "from zero to 5 percent plus," "from zero to 5 percent minus," "from 2½ percent plus to 2½ percent minus," or in any other proportion that is deemed appropriate.

5.8. *Tire wear.*—Another important factor that has been carefully considered by the staff of NBS and by the Committee, is that of tire wear. It has been observed that this problem is actually not as great in the case of tires on rental automobiles as it is on taxicabs. The Committee is of the opinion that the manner of handling this problem as now prescribed in the code, is quite adequate insofar as taximeters are concerned, with one possible modification in the interest of simplicity in enforcement. On the other hand, the Committee is convinced that in the case of odometers, and by allowing a total tolerance spread of 6 percent, that a better and simpler method of handling the tire wear problem on rental automobiles can be attained.

Taking into consideration that most factors influencing the operation of an odometer tend to result in errors of overregistration, with the one possible exception of over-inflated tires, the Committee is convinced that the 6 percent tolerance spread should be divided as follows: (1) 4 percent on underregistration and (2) 2 percent on overregistration. The acceptance and maintenance tolerances are to continue to be the same. As an odometer is a purely mechanical "counting device," there should be no deterioration of accuracy from use.

Since it will be recommended that all official tests be made with the tires accurately inflated to the pressure recommended by the tire manufacturer and that tests will normally be conducted with only one or two passengers aboard, either heavier loads or lower pressures in the tires would normally result in errors of overregistration. Taking all factors into consideration, if the odometers are designed, installed, and adjusted, to a target of 1 percent error on underregistration with new tires, the devices should be expected to operate consistently within these allowable errors. This would be true even though a heavier load was being carried and even though the tires were worn a reasonable amount.

5.9. *Simulated road test machine and fifth wheel.*—The Committee has been informed by the Office of Weights and Measures that, in addition to appropriate diagrams for carefully measured highway test courses, they will have available to weights and measures officials and others, necessary information for the preparation of purchase specifications to secure simulated road test machines or fifth wheels, for the purpose of testing odometers and taximeters. Both of these devices

are commercially available and at reasonable prices. NBS also expects to have amended test procedures to recommend and instructions for the official calibration of these testing devices.

5.10. *Amendments to code for mileage-measuring devices.*—In accordance with the foregoing comments and explanations, the Committee has prepared and presents herewith, a series of amendments to the Code for Mileage-Measuring Devices, that it feels are necessary and proper. The careful study, consideration, and comments of each interested person reading this report are invited and encouraged. The Committee wants to publicly thank those representatives of industry, weights and measures officials, operators of rental automobiles and trucks, and the National Bureau of Standards for their wonderful cooperation in this project. The Committee respectfully presents and recommends the following amendments to the Code for Mileage-Measuring Devices.

5.11. *D.13. Bench test.*—Delete definition paragraph D.13.

5.12. *D.16. Wheel test.*—Amend definition paragraph D.16 to read as follows:

D.16. FIFTH-WHEEL TEST.—A mileage test similar to a road test except that the distance traveled by the vehicle under test is determined by a mechanism known as a "fifth wheel" that is attached to the vehicle and that independently measures and indicates the distance.

5.13. *S.3. Provision for security seals.*—Renumber specification paragraph S.3. as S.19., relocate, and amend to read as follows:

S.19. PROVISION FOR SECURITY SEALS.—Adequate provision shall be made for affixing lead-and-wire seals to a taximeter and to other parts required for service operation of a complete installation on a vehicle, so that no adjustments, alterations, or replacements affecting in any way the accuracy or indications of the device or of the assembly can be made without mutilating the seal or seals. The sealing means shall be such that it is not necessary to disassemble or remove any part of the device or of the vehicle to apply or inspect the seals.

5.14. *S.21. Indicating elements; S.21.1. Design; S.21.2. Readability.*—Renumber specification paragraph S.21.2. as S.21.3., and amend specification paragraphs S.21., S.21.1., and S.21.2. to read as follows:

S.21. DESIGN OF INDICATING ELEMENTS.

S.21.1. MINIMUM INDICATION.—*The value of the minimum interval on an odometer shall not exceed one-tenth mile.*

S.21.2. ADVANCEMENT.—The most sensitive indicating element of an odometer shall advance continuously, and other indicating elements shall advance intermittently. Means may be provided for reducing the indication to zero. The requirement of general specification G–S.4. for graduations and an indicator shall not apply to odometers.

5.15. *N.1. Forms of test.*—Amend notes paragraph N.1. to read as follows:

N.1. MILEAGE TEST.

N.1.1. FOR TAXIMETERS.—The mileage test of a taximeter, whether a road test, a simulated road test, or a fifth-wheel test, shall include at least duplicate runs of sufficient length to cover at least the third money drop or one mile, whichever is greater, and shall be at a speed approximating the average speed traveled by the vehicle in normal commercial service.

N.1.2. FOR ODOMETERS.—The mileage test of an odometer, whether a road test, a simulated road test, or a fifth-wheel test, shall include runs of at least two miles each at (a) approximately 25 and (b) approximately 55 miles per hour.

5.16. *N.2. Interference test for taximeters.*—Amend notes paragraph N.2. by deleting the words "the bench test if this is made, otherwise as a part of" in the first sentence, making it read as follows:

N.2. INTERFERENCE TEST FOR TAXIMETERS.—As a part of a test of a taximeter, a special test shall be made to check for possible interference between the time and mileage mechanisms, a condition that may develop at relatively slow vehicle speeds. The test consists of a comparison of taximeter performance for a nominal 1-mile interval when the taximeter is in "hired" (time-recording) condition, with its performance for a like interval when the taximeter is in "time-not-recording" condition; performance under these two conditions of operation shall agree within 1 percent. (See S.18.) Throughout this test the mechanism shall be operated at a speed corresponding to a vehicle speed of 2 or 3 miles per hour faster than the speed at which the basic mileage-revenue rate equals the basic waiting-time rate.

5.17. *N.3. Worn tires.*—Amend notes paragraph N.3. to read as follows:

N.3. WORN TIRES.—For purposes of tolerance application on a road test, a simulated road test, or a fifth-wheel test of a taximeter, a vehicle tire shall be considered to be "worn" when and after the tread wear is equivalent to approximately one-half the normal useful life of the tire. (Normally the half-life point of tire wear is reached only after the tire has been operated for at least 10,000 miles.)

5.18. *N.4. Mean effective tire circumference.*—Delete notes paragraph N.4.

5.19. *N.5. Vehicle lading and tire pressure.*—Amend notes paragraph N.5. by dividing it into two paragraphs to be numbered N.4. and N.5., making them read as follows:

N.4. VEHICLE LADING.—During a road test, a simulated road test, or a fifth-wheel test of a mileage-measuring device, the vehicle shall normally carry one or two persons. Tests may be made with heavier loads, however, but in no case shall the load exceed the amount recommended by the manufacturer of the vehicle as the maximum load for the vehicle under test.

N.5. TIRE PRESSURE.—At the beginning of each road test, simulated road test, or fifth-wheel test of a mileage-measuring device, the tires on the vehicle under test shall be inflated to the pressure recommended by the tire manufacturer.

5.20. *N.7. Security sealing.*—Amend notes paragraph N.7. by changing the words "mileage-measuring device" to "taximeter" making it read as follows:

N.7. SECURITY SEALING.—After approval of the complete assembly of an installed taximeter, suitable security seals shall be applied so that no part of the mechanism or of the connections leading thereto may be removed, or modified in such a way as to affect the accuracy of indication of the device, without mutilating the seal or seals.

5.21. *T.1.1. On mileage tests.*—Amend tolerance paragraph T.1.1. to read as follows:

T.1.1. ON MILEAGE TESTS.—Maintenance and acceptance tolerances for taximeters shall be as follows:

(a) On overregistration: No tolerance, except that if the actuating tires are worn (see N.3.), the tolerance shall be 1 percent of the interval under test.

(b) On underregistration: 4 percent of the interval under test, with an

added tolerance of 100 feet whenever the initial interval is included in the interval under test.

(The mileage error of the taximeter—to which the tolerance is applied—is the difference between the nominal mileage represented by the interval under test and the corresponding actual mileage traveled or indicated.)

5.22. *T.1.1.1. On bench tests.*—Delete tolerance paragraph T.1.1.1.

5.23. *T.1.1.2. On road tests, simulated road tests, and wheel tests.*—Delete tolerance paragraph T.1.1.2.

5.24. *T.2. For odometers.*—Amend tolerance paragraph T.2. to read as follows:

T.2. FOR ODOMETERS.—Maintenance and acceptance tolerances on mileage tests of odometers shall be as follows:

(a) On overregistration: 2 percent of the interval under test.

(b) On underregistration: 4 percent of the interval under test.

(The error of the odometer—to which the tolerance is applied—is the difference between the mileage indication of the odometer for the interval under test and the corresponding mileage actually traveled or indicated.)

5.25. *R.1. Inflation of vehicle tires.*—Amend regulation paragraph R.1. to read as follows:

R.1. INFLATION OF VEHICLE TIRES.—The pressure in vehicle tires that actuate a mileage-measuring device shall be maintained at not less than the normal operating pressure recommended by the tire manufacturer.

(DISCUSSION OF FOREGOING ITEM)

Mr. Harris: Since the noon recess the committee has received a message from Dr. A. V. Astin, Director, National Bureau of Standards, requesting that we bring to your attention a letter that he had just received from Mr. W. F. Sherman, Manager, Engineering and Technical Department, Automobile Manufacturers Association, Detroit, Michigan. The letter reads as follows:

June 13, 1963

Dear Dr. Astin:

As indicated in night letter of June 7 to W. S. Bussey, we again respectfully request that no final action on odometer tolerances be taken at this conference on weights and measures until the automobile industry has had a reasonable opportunity to submit comment.

In writing I first requested notification to the Automobile Manufacturers Association regarding meetings on this subject on May 25, 1962, prior to the 47th National Conference, and the AMA has attempted to keep in constant contact with the Bureau of Weights and Measures since that time. As recently as April, 1963, our representative was assured by Mr. Bussey by telephone that we would receive by mail a copy of recommendations, revised after the discussions in which we participated in January and correspondence on March 1, 1963. However, there was no subsequent communication from the Bureau of Standards to advise what the recommendations were going to be.

We are not at the present time disputing the specific tolerance proposal, but desire to advise that other public interest aspects of motor vehicle usage, including highway safety and impacts on the industry, are involved to a substantial degree and deserve adequate evaluation.

We therefore again state our request for a deferment of final action until such an evaluation can be made and discussed with you and bureau representatives.

Sincerely,
W. F. Sherman

Mr. KENNEDY: Mr. Chairman, can I make a motion?

Mr. JACKSON: We have no motion before the house.

Mr. KENNEDY: I move that item 5, pertaining to the mileage-measuring device code, be laid on the table for one year.

(The motion was seconded.)

Mr. HARRIS: I have not completed the presentation of the Committee report.

Mr. KENNEDY: I move you anyway.

Mr. JACKSON: I will declare Mr. Kennedy's motion out of order. This matter is not formally before the Conference for action until the Committee completes its presentation and the motion is made in the regular way.

Mr. HARRIS: For the information of the Conference, manufacturers were represented at our January meeting, as the tentative report indicated.

They said they need only a 5 percent tolerance spread. The NBS report indicated that they need a 6 percent spread. They also indicated that they had no suggestions to make on how the tolerance should be divided—whether it should be 3 under and 3 over, or 4 under and 2 over, etc. The Committee recommended that it be 4 percent under and 2 percent over registration. To my knowledge, none of the automobile manufacturers had representatives at the Committee meeting on Monday. We have received a number of letters, telegrams and telephone calls from interested groups. The operators of rental agencies were here. And you heard what they had to say. The comments that I have heard and people with whom I have talked with expressed recent interest particularly in highway safety and speeding. We are not legally concerned with the safety angle in this Conference.

So far as I have been able to ascertain, copies of this tentative report were mailed to the automobile manufacturers at approximately the same time that they were mailed to others. Also, they were notified of this Conference when they were here in January. I think they were reasonably and officially notified of Committee and Conference activities. Certainly there was no intent to avoid such notification.

Mr. Bussey, do you have any further comment that you would like to make at this time?

Mr. BUSSEY: The tentative report of the Committee was mailed out early in May. The mailing was somewhat later this year than it normally is. It was a much longer report and we got it in the mail just as soon as possible. We endeavored to mail it out to everyone on our mailing list at approximately the same time. On the 9th day of May, a delegation from the automobile rental agencies were in my office to discuss the tentative report. They had been mailed copies prior to that time.

We have been in correspondence with the Automobile Manufacturers Association since before the 47th Conference. They were in attendance at that meeting. They were in attendance at the Committee meeting in January. They offered no specific opposition upon either occasion. The main contention that they have made during the past few days, was that they were afraid that these proposed amendments might result in speedometers underregistering and thus causing accidents, careless driving, etc.

According to the record and to the testimony of manufacturers' representatives, the mileage-measuring portion of a speedometer (odometer) is controlled by the gear ratio, but the speed-indicating portion is independently adjustable. It can be adjusted to register as is desired—within reasonable limits. Of course, after both elements are set and installed in a car, if you change the gear ratio, it affects the indication of both elements. The automobile manufacturers have never asked for more than a 5 percent spread, not even at our hearing in January, when they were advised of the NBS findings.

The Automobile Manufacturers Association has officially requested the Conference to delay action in this area. This is the point that I think everyone should understand. It seems that the real situation is not fully understood by the automobile manufacturers themselves. There has been a code for odometers for 33 years—since 1930. The tolerances have continuously remained the same—the same as the tolerances for taximeters. If a motion similar to the one asked by Mr. Kennedy is adopted, it means that the tolerances for odometers will continue to be the same as they now are and as they have stood for 33 years—that is, no tolerance on overregistration (except one percent for tire wear), and that there will be a tolerance of 4 percent on underregistration. The Committee's recommendation is a considerable liberalization of the current tolerances for odometers and it does not aggravate the safety problem, as has been indicated. If anything, the reverse would be true, as a tolerance of 2 percent on overregistration is being proposed by the Committee.

After the Committee meeting here on Monday, I talked with the representatives of three large rental agency operators, together with the Executive Secretary of their national association. They stated to me, as they had stated previously on the floor, that they have one major concern. They do not want the responsibility of being compelled to purchase automobiles and trucks with inaccurate odometers and then being required to make individual mileage tests and adjustments on each individual odometer. They expressed a second concern that the code for odometers should apply to all such devices that are used commercially, even if privately owned, where expenses are collected, taxes are paid, etc., on the basis of the odometer reading.

Mr. Harris: Mr. Chairman, I now move the adoption of item 5, Mileage-Measuring Device Code, of the Committee report.

Mr. Jackson: The motion has been made and seconded, that item 5 of the report be adopted. Is there any discussion?

Mr. Kennedy: I want to talk on the motion. I do not doubt that the automotive people got this report. However, I was very much surprised when Hertz came in here, followed by Avis, willing to accept anything you gentlemen recommend. I think they forgot something. They forgot one thing, the word "condemnation." Now, I don't know how many jurisdictions are going to adopt this code. We are. We don't intend to fight it. We will go with what you adopt and recommend. We don't agree with you, as usual, but we will go along with it. However, gentlemen, there are 10,000 rental cars in the District of Columbia, including trucks, that are subject to inspection. It will take us some time to inspect them. They will not meet your 4 minus and 2 plus tolerance. So what are we going to do, condemn every one of them? That is what we will do. We will condemn them.

Mr. Chairman, I now wish to make a motion to amend the Com-

mittee report to make this item effective on July 1, 1965.

Mr. Jackson: The motion has been seconded.

Mr. Kalechman: What is Mr. Kennedy going to do two years hence? He will have to test the odometers at that time. What is the difference between now and two years from now? We have had much experience with taximeters and I ask you to vote against Mr. Kennedy's motion and vote for the Committee's report.

Mr. Turnbull: In my 37 years of work with the City of Seattle, I have been responsible for the testing of thousands of taximeters. We did some of the rather extensive research work for the Committee on the checking of odometers and made a report to them. I do not anticipate that this will create any problem whatsoever, if the Committee's report is adopted.

I urge that Mr. Kennedy's motion be turned down and the committee recommendation be adopted.

Mr. Howard: We have 1400 to 1500 for-hire cars in Miami, and we have been living with a 5100-foot mile for some time. This hurts my conscience. I endorse Mr. Turnbull's statement.

Mr. Berryman: They are worrying about fixing present cars. Couldn't this be made nonretroactive?

Mr. Bussey: This is a point that I would like to try to make clear, Mr. Berryman. The fact is, we have had a table of tolerances in the Handbook for 33 years. Therefore, it is not really a matter of "retroactive" or "nonretroactive." However, in any jurisdiction—in the District of Columbia or elsewhere—when a new program of this kind is begun, it should start gradually and an appropriate effective date, based upon the specific situation in the particular jurisdiction, should be established. Many times, this is necessary when a jurisdiction starts a testing service in a new field where testing has not previously been done. The point that I wish to emphasize is that these amendments provide a much more liberal situation than is now in the code. I feel that any jurisdiction starting a new program in this area should—and I am confident that they will—use good judgment and discretion as to how fast they will move ahead.

(After some discussion of parliamentary questions, the Chairman placed Mr. Kennedy's motion before the house. The motion lost by voice vote.)

(Item 5, Measuring-Device Code, was adopted by voice vote.)

6. LP GAS VAPOR METERS, ELECTRIC METERS, AND WATER METERS

6.1. *General.*—The Committee has received several requests that it give consideration to the possibility of developing codes of specifications, tolerances, and regulations, to be inserted in Handbook 44, covering (1) vapor meters for the measurement of LP gas, (2) electric meters, and (3) water meters, used in commercial services that do not normally come under the jurisdiction of established public utilities control commissions. The Committee has devoted considerable time and effort to a study of this situation as it now exists. It has been learned that formal specifications, accuracy requirements, and test procedures have been developed and are available, in all of these areas.

6.2. *Vapor meters.*—The American Gas Association, 420 Lexington Avenue, New York 17, New York, has developed and published a code entitled "Standard Purchase Specifications for Small Gas Meters of

the Diaphragm Type." Copies of this code should be available from this association.

6.3. *Electric meters.*—The American Standards Association has developed a code entitled "American Standard Code for Electricity Meters—Fourth Edition—1941," which has been published by the Edison Electric Institute, 420 Lexington Avenue, New York 17, New York. Copies of this code, which is designated "ASA—C12—1941," should be available from this institute.

6.4. *Water meters.*—This field is covered by two codes developed and published by the American Water Works Association, Incorporated, 2 Park Avenue, New York 16, New York. These codes are (1) "Tentative AWWA Standard for Cold-Water Meters—Displacement Type," and (2) "AWWA Tentative Recommended Procedure for Testing Cold-Water Meters." The first code is designated "AWWA C700–61T" and the second code is designated "AWWA C705–57T." Both of these publications should be available from the association.

6.5. *State of California.*—The Committee is advised that the State of California has developed code requirements and test procedures for vapor meters. This material should be available from the Division of Weights and Measures, State Department of Agriculture, Sacramento, California. Also, persons interested in the testing of vapor meters might wish to correspond with the California Division, for further detailed information concerning California's experiences in this field.

6.6. *Further study.*—The Committee intends to continue its studies in these three areas. It would be most helpful if weights and measures officials, and others, would write the Committee Secretary, giving the benefits of their thinking and experiences concerning these devices. It would be helpful to know the extent of anticipated commercial use, in the various jurisdictions, of each of these devices. How many officials expect to become actively engaged in this type of testing in the early future? All comments and suggestions will be gratefully received.

6.7. *Conclusions.*—The Committee has concluded that it is appropriate to give full consideration to the codes already developed in these fields, in the study and preparation of any proposed code material for inclusion in Handbook 44. The specialists and engineers that have participated on the committees of the several associations preparing these codes, undoubtedly, represent many years of experience. In the interim, and until it is deemed appropriate and code material has been developed and approved for inclusion in Handbook 44, the Committee suggests that any official interested in, or upon being requested to do official testing in, these areas avail himself of the code material heretofore mentioned, study it carefully, and adapt it to the needs and requirements in his jurisdiction, as he evaluates them. If the response from weights and measures officials indicates that the Committee should proceed immediately in the development of appropriate code material in these areas, such projects will receive the priority indicated.

(Item 6, LP Gas Vapor Meters, Electric Meters, and Water Meters, was adopted by voice vote.)

The Committee desires to record formally its sincere appreciation to all who have participated in its deliberations since the 47th National Conference, either through correspondence or in person, in-

cluding those conferring with the Committee during its interim meeting. The Committee needs and appreciates the full cooperation of weights and measures officials and representatives of business and commercial interests. Without such cooperation and assistance the Committee can not properly fulfill its many and varied responsibilities to the Conference. Continued cooperation, suggestions, and recommendations are earnestly solicited.

T. C. Harris, *Chairman*
A. H. Dittrich
G. L. Johnson
H. J. McDade
R. W. Searles
W. S. Bussey, *Secretary*

(On motion of the committee chairman, seconded from the floor, the Conference by voice vote adopted the report of the Committee on Specifications and Tolerances, comprising the tentative report as amended by the final report.)

Mr. Harris: Mr. Chairman, I have one additional motion to make. I wish to move that the Executive Secretary, the Committee, and the National Bureau of Standards be given authority to make any appropriate editorial changes in the report that you have just adopted without changing the intended meaning, including any necessary renumbering of paragraphs, in the preparation of the manuscript for printing.

(The foregoing motion was adopted by voice vote.)

FIFTH SESSION—MORNING OF FRIDAY, JUNE 14, 1963

(Nathan Kalechman, Vice Chairman, Presiding)

REPORT OF THE AUDITING COMMITTEE

Presented by P. J. Dwyer, *Chairman, Deputy Sealer of Weights and Measures, Detroit, Michigan*

Mr. Chairman, it is my pleasure to report to the Conference that the Auditing Committee has examined the books and the records of our Conference Treasurer and has found them to be in good order.

P. J. Dwyer, *Chairman*
A. J. Albanese
W. G. Sellers

REPORT OF THE TREASURER

Presented by C. C. Morgan, *Treasurer, City Sealer of Weights and Measures, Gary, Indiana*

Balance on hand: June 1, 1962		$1,907.47
Receipts:		
327 Registration @ $15.00	$4,905.00	
Luncheon Tickets	21.00	
Bank Interest Accrued	100.21	
Sub Total	5,026.21	5,026.21
Total		6,933.68
Disbursements:		
E. H. Ewing, Attendanee Awards	$8.80	
C. C. Morgan, Receipt Book	2.25	
The Chesapeake & Potomac Telephone Co	12.25	
Sheraton Park Hotel, Exeeutive Meeting Expense	69.60	
Sheraton Park Hotel, Mierophone & P. A. System	35.00	
Geo. W. Allen Co. Ine., Luneheon Tickets	13.39	
A. B. & W. Transit Co., 2 Sightseeing Buses	223.76	
J. Ellis Bowen, Stamps for Education	15.00	
J. Ellis Bowen, Stamps for Education	10.00	
Simeox's Flowers, Mr. Rodgers	10.00	
S. & T. Committee	972.86	
The American Electrotype Co. Inc., 1,000 Mats	36.05	
Blackistone Ine., Flowers, Matt Jennings	7.73	
Shoreham Hotel, Amplifieation, Publie Hearing	15.00	
Laws and Regulation Committee	846.93	
Credit to Mr. Tamano and Mr. Cairns	50.00	
Bank Charges	8.40	
Miscellaneous expenses (duplicating, printing, telephone, telegraph messenger, porter, maid, reporting, recording, photographs, taxi, drayage, hotel meeting and eommittee rooms, services, badges, registration desk, postage, cards, flowers, press desk and eonference luncheon)	1,643.00	
Sub Total	3,980.02	3,980.02
Total Balance on June 1, 1963		2,953.66

Depository:
Bank of Indiana
First Federal Savings and Loan

(Signed) C. C. Morgan,
Treasurer

(On motion of the Treasurer, seconded from the floor, the report of the Treasurer was adopted by the Conference)

REPORT OF THE INCOMING EXECUTIVE COMMITTEE

Presented by D. M. Turnbull, *Chairman, Director, Division of Licenses and Standards, Seattle, Washington*

On Friday morning, June 14, the newly elected Executive Committee and the chairmen of the standing committees met to study and reach decisions regarding the 49th Conference. The meeting was presided over by the newly elected Conference Chairman, D. M. Turnbull, of Seattle, Washington. The following decisions were reached regarding the 49th National Conference on Weights and Measures, 1964:

1. *Place:* Sheraton-Park Hotel, Washington, D.C.
2. *Date:* June 15–19, 1964.
3. *Duration:* Open committee meetings on Monday all day and on Tuesday morning. Opening session Tuesday afternoon. Wednesday afternoon free of any scheduled business sessions. Business sessions Thursday and Friday according to program plans.
4. *Official Conference Luncheon:* To be held again in 1964.
5. *Ladies' Entertainment:* To be continued at about the same level as in the past and left to the discretion of the Executive Secretary.
6. *Education Committee:* A budget item was approved in the amount of $400.00 to cover the expenses of National Weights and Measures Week and other items.
7. *Registration Fee:* $15.00.

(The report of the Executive Committee was adopted by voice vote.)

THE TECHNICAL PROGRAM OF THE OFFICE OF WEIGHTS AND MEASURES

The program of the Office of Weights and Measures, National Bureau of Standards, was described by members of the technical staff as follows: M. W. Jensen, Chief: The mission, the staff, the program philosophy, standards for Latin America, and publications. H. F. Wollin, Engineer: State laboratories, State standards, and technical training. D. R. Mackay, Engineer: Technical studies on slow-flow meters and odometers. R. N. Smith, Technical Coordinator: Aids for self training and a technical study on yarn. L. J. Chisholm, Technical Writer: The Weights and Measures Library, and units, systems, and history of weights and measures. John H. Griffith, Laboratory Mechanic, provided assistance throughout the presentations with projected visuals.

Mr. Jensen announced the issuance of a new Handbook, NBS H82, *Weights and Measures Administration*, the completion of manuscripts on a new Miscellaneous Publication, *Weights and Measures Standards of the United States*, and a new Handbook, *The Examination of Weighing Equipment*, and disclosed plans to issue a technical informa-

tion bulletin titled *Weights and Measures Tech Memo.* The *Tech Memo* will be issued at irregular intervals to weights and measures officials.

The *Statement of Mission* of the Office of Weights and Measures, as discussed, is presented here.

THE MISSION OF THE OFFICE OF WEIGHTS AND MEASURES—DIVISION 17—OF THE NATIONAL BUREAU OF STANDARDS

1. *Statutory Basis.*—Statutory authority for the operations of the Office of Weights and Measures is found in the Enabling Act of the Bureau, where, in the enumeration of Bureau functions, authorization is made for "the provision of means and methods for making measurements consistent with those [the national] standards," "the development of methods for testing . . . mechanisms," "cooperation with other governmental agencies and with private organizations in the establishment of standard practices, incorporated in codes and specifications," and "advisory service to Government agencies on . . . technical problems;" and in the enumeration of authorized activities there are named "the study and improvement of instruments and methods of measurements," "cooperation with the States in securing uniformity in weights and measures laws and methods of inspection," "the prosecution of such research in engineering . . . as may be necessary to obtain basic data pertinent to the functions specified herein," and "the compilation and publication of general scientific data resulting from the performance of the functions specified herein . . . when such data are of importance to . . . manufacturing interests or to the general public and are not available elsewhere."

2. *General Statement of Mission.*—The mission of the Office of Weights and Measures is the implementation, within a specific segment, of the second major component of the mission of the National Bureau of Standards as set forth in item 2 of "The NBS Mission," issued September 9, 1960: "Provision of essential services leading to accurate and uniform physical measurement throughout the Nation's science, industry, and commerce, and consonant with their advancing requirements."

The Office of Weights and Measures functions in the following fields of reference: (1) Technical services to the States and to business and industry in the area of measurement; (2) the design, construction, and use of standards of weight and measure and of instruments associated with such standards; (3) the training of State and local officials in the technical aspects of weights and measures programs; (4) the consideration of measurement problems; and (5) the collection, arrangement, and dissemination of technical data on units and systems of measurement. The Office of Weights and Measures provides liaison between State and local officials and Bureau scientific personnel, and participates in National and international activities concerning weights and measures standards and practical metrology, including those activities that lead to the adoption of specifications in this field.

3. *Statement of Specific Activities.*—In fulfilling its mission, the Office of Weights and Measures engages in the following activities, among others:

1. Technical assistance to the States and to business and industry directed to the establishment in each State of a competent

technical weights and measures service. This assistance involves:

1.1. The development and dissemination of design and performance specifications for various standards of mass, length, and capacity for use as State and local reference, laboratory, and field standards, and the encouragement of manufacturers to make available standards that conform to such specifications.

1.2. Consultation and recommendations on laboratory facilities, organization, instruments, and technical procedures.

1.3. The provision of formal and informal technical training for weights and measures officials.

2. The design of testing equipment and the development of testing procedures for weighing and measuring devices.

3. The study, including field investigations, of weighing and measuring equipment, the preparation of specifications and performance tolerances, and the establishment of standard practices involving the use of such equipment.

4. The study, including field investigations, of the measurement phases of merchandising and packaging facilities and methods, and the development of recommended practices and procedures.

5. The identification, analysis, and solution of special problems in the measurement area for weights and measures officials.

6. The provision, in conveniently usable form, of data on weights and measures units, systems, and equivalents, to satisfy the particular needs of the Federal Government, State and local governments, educational institutions, business and industry, and the general public, including the development and maintenance of archival and reference collections of published material.

7. The participation in national and international activities in the fields of weights and measures standards and practical metrology. Such participation includes (a) the development of and negotiation toward the adoption of both national and international specifications in the assigned area, (b) correspondence and other communication with experts of the United States and of other nations, (c) technical committee activities, and (d) attendance at and participation in appropriate meetings and conferences.

THE NEW WISCONSIN PROGRAM

By C. L. Jackson, *Chief, Division of Economic Practices, Department of Agriculture, State of Wisconsin*

When Mr. Bussey first asked us to appear on this program to discuss our Wisconsin program, we were somewhat reluctant. We have been talking about this subject at a number of meetings for a number of years. We are now in the action phase—in the first crucial year. We were wondering if we did discuss it here whether it would be misunderstood. So we want to make it very clear that we do not say that we have a complete answer or the right answer for every State or every jurisdiction.

We are going to talk about a program which we, in our best judgment and with our resources at the State level, have decided is the

right kind of a program. This discussion is going to have to be relatively sketchy. We will not be able to cover all aspects of the program. For clarity, my remarks will be divided into three categories. *What* is the program? *Why* the program? And *how* is the program operated?

What is the Program?

This program is designed, as we see it in Wisconsin, to yield the greatest return to the taxpayer of our State per dollar investment, to assure consumers, farmers, businessmen, industry, and weights and measures service people quantitative accuracy in commercial transactions.

The essential ingredient is returning to the users of weighing and measuring devices the full responsibility of selecting, of maintaining, and of using equipment correctly and accurately.

The Device Operator. What does this mean to the operator of a device? It means that he, first of all, has the responsibility to select a device and to purchase one which is built to meet the specifications, a device which has been tested according to the test procedures as outlined by the Office of Weights and Measures. He has the responsibility of using that device so as to assure accuracy.

Service Companies. What about the device service companies? They have a responsibility to develop, to represent and to test devices, both new and old, in accordance with the legal structure as outlined by the State law and, in turn, by Handbook 44.

The Inspection Authority. The job of the inspecting authority is to see that the law and regulations are adhered to; to see that the operator purchases legal devices; to see that these are properly tested; and to see that they are accurately used. To accomplish this, the inspecting authority has the responsibility of testing devices, of checking commodities, of maintaining the standards, of using the "tools" of weights and measures inspection.

Why this New Program?

Most of my attention will pertain to the "why" of this new type of program. First, we needed to develop a "test procedure" for our total weights and measures work. We tried to develop a criterion to test the efficiency, the effectiveness of what we were doing in weights and measures inspection. We went back to an old statement which may seem out of date, but it still makes quite a lot of sense. It is a statement by Lincoln, who said that "government should do only those things which the individual cannot do or cannot do as well as the government". We started thinking about the many demands on our office and the many things that we could do. We began putting these into perspective in terms of what is the most essential and what, under this criterion, we should be working on.

A number of years ago, when we were in the thinking stage of this program, we appeared at the Southern Conference of Weights and Measures and gave a paper, "Changing Times in Weights and Measures," to set the stage to the "why" of the program. I am going to quote from that paper.

> I am not a lawyer, but, as I understand the basic theory behind most laws, they are written as a guide to human behavior, using the approach of outlining or defining illegal behavior or activity. Laws generally do not blueprint or define all behavior or activity which is proper or approved. Laws prescribe all the

things that are prohibited, and those things which are not prohibited are presumed to be legal.

I will grant that there are a number of exceptions to this general principle, and, of course, weights and measures is one of the exceptions to this principle. Other exceptions to the principle are found in laws that deal with health and safety, and especially the government's role in regulating especially hazardous activities. Laws defining and outlining legal behavior and procedures to prevent fire and explosion, and those dealing with protection of human health and mental health are justified on the basis that major damage or injury to the public may be irreparable.

By this I mean that damage cannot be corrected or compensated for. Dollars and cents can never replace a life or a limb. Perhaps this is the primary reason that safety codes for buildings, for equipment, other installations where there are hazards and where safety precautions are necessary have been written into our laws.

This largely explains why we accept food and sanitation codes and environmental sanitation codes, and rigidly regulate drug and medical procedures. In these cases, even here where theoretically adequate inspection programs are supported, some accidents do happen. People do get sick and people do get injured.

Even where traffic safety programs are well enforced, accidents still do happen. Even here we are occasionally led into a sense of false security. But why do you suppose that weights and measures laws, regulations, and programs which deal strictly with economics were developed around the principle of sealing or approving all devices as a public responsibility? I suppose this was true because this was the right program at the time these laws were enacted. In those times, both the buyer and seller were present in the usual commercial transaction and were in a position to see what they were buying and selling and to barter on equal terms, and the only uncertainty in the transaction was the mechanical operation of the weighing or measuring device used.

It seemed to be good law at that time, therefore, to require that these devices be publicly approved. Another justification was the fact that the commodities bought and sold in those days were not prepackaged. Shortly after the sale, the product was consumed or otherwise disposed of, and consequently there was little or no opportunity for enforcement action to be based upon the weighing of the commodity itself.

But times have changed. We in Wisconsin are in agreement with every weights and measures official in the United States who believes that there is a real need and a greater need than ever to give buyers and sellers more protection in the accuracy of quantity determination. We are in favor of the best possible program which will reach this objective. We do not believe, when we look over our weights and measures inspection activity in our State, that we are giving the adequate public protection to buyers and sellers alike, and we were not sure that we were getting the "mostest" for the "leastest" for the limited funds that we have to work with.

Establishing weights and measures inspection in this country to a level to accomplish all the testing that may be necessary in the complex economy we are in today seems almost utterly fantastic. We have new demands on us every day for more service and for new projects and new equipment, and we do not seem to be able to keep pace. We work harder and harder, but we seem to get further and further behind in terms of giving the total protection that we are obligated by law to give to the citizens of our county.

Our work offers a real and challenging future if we have the courage and insight to read the signs of changing times. We are not positive that we are reading the signs correctly, but we are convinced that some of the ground rules must be changed if we are to progress. The services we are trying to give and the routine testing that we have gotten ourselves into are using up our energies and our funds, and we have little left for planning intelligent approaches to a very complex problem.

We said at that time the first step for improvement will be in our thinking. The second step will be in our planning. And the third step will be in our doing. We are here today to say that we have gone through step one and two, and we are well on our way in the third step of putting this program into effect.

In the remaining time we will go into the highlights of how this program is conducted. As we indicated earlier, we come back to using our "test" of our State program—the basic criterion of what the essential things are that the government should concern itself with. We had many things that we felt obligated to concern ourselves with, but which ones were the most important?

A New Laboratory. The first one that we came to, and one I am sure every one of you would agree with, was to provide the standards of weights and measures for the State of Wisconsin.

For the last 30 years our State had not given the proper attention to standards and to our laboratory facilities. In attempting to get this thing into perspective, we decided that, if we did nothing else in our State, we must bring our State standards and the ability of our State laboratory up to where we could provide the kind of measurement services that our inspectors, the city men, and the industry need today. We are very happy to announce that on July 15 we are moving into a new laboratory which will provide us a sound technical basis for our operation. We are not alone in this. I believe there are nearly 25 States that either have new laboratories or are working in this direction. With this modern facility, we intend to regularly test our inspectors' standards, those of the city departments, those of the service companies, and, of course, provide standards laboratory service to business and industry.

I only want to emphasize the fact that, when we got our thinking straightened out on our program, it did not take us too long to recognize that this laboratory was the first thing that we had to start really moving on. There is now basic recognition in our department that, if we are to meet today's and tomorrow's measurement needs, our laboratory facilities are going to have to be built on a considerably higher technical plane and cover more areas than they have.

Enforcing the Law. The second area of our State program that was "tested" was the enforcement of the weights and measures law. How are we to enforce effectively the law on packaging and how are we to enforce the law on devices? We have given our new inspection program on devices a new name. We call it a selective enforcement program. This means that all of our inspection work is completely analyzed from the standpoint of where we are going and what we are going to do and how far we are going to go in this selective enforcement program.

Sealing Discontinued. The first decision was a rather painful one, but one that had to be made, if we were to follow the principle of returning the responsibility to the scale owner. This was to eliminate the paper seal and the lead and wire seal. When we got right down to doing it, there was some hesitation. We took a firm position about six months ago that we will not use the seal in testing.

The other factor in enforcing the law concerning devices is planned enforcement testing. Three general criteria are used in planning the itinerary of testing. First we consider the economic importance of the devices. For example, our men are giving a rating of 1, 2, 3, and 4, on heavy scales, and that is used as a basis. The No. 1 scales are getting a high priority in the inspection program. An important factor in the priority establishment is what is the intent of the user or the owner of a device as to the maintenance of his equipment. Is he ac-

tually seriously recognizing that he must maintain his equipment? The owner is asked: "Do you have regular service tests on your scales? Do you have copies of test reports?"

Secondly, we redesigned and strengthened our test forms considerably. These new forms may be of interest to you. We have strengthened our form used when equipment fails to pass, and now require a signature of the repairman that he has performed the necessary tests to prove that this device is in compliance with the legal specifications and tolerances. Thus we have the serviceman on record as stating that he has performed the proper test.

We have developed a testing form that we are asking all service companies to use when they conduct service tests on both new equipment and equipment in service.

When we receive a letter or telephone call in the office stating, "I'd like to have you come out and test my scale", we tell the caller that we have changed our program, and we advise him that he is expected to maintain his own equipment. We suggest that he get in touch with his nearest scale equipment company. We are getting dozens of such calls every week even though we have written letters to the scale users around the State explaining this new policy of inspection and suggesting that they should in the future negotiate with a service company, not only to maintain their equipment, but to test it. Also, when they purchase a new scale, they should immediately demand a test conforming to state standards by a private company on that scale.

Let the Package Speak for Itself. As a part of the new approach, we are stepping up our package program under the philosophy of letting the package speak for itself. That is, of course, familiar to all of you, but wherever we can enforce the law on the end result of weighing and measuring—the package itself—we are making real headway.

As many States have, we have packaging specialists to work with our own State packers to assist them and to determine what their quantity control problems are and their level of compliance with the law.

Program Progress.—Probably the greatest progress we are making is through cases in court on the failure of a user of a device to take proper steps to maintain his own device. We had two such cases in court in the last few months where the operator indicated that he didn't believe in this "monkey business" of having his scale tested and maintained in proper and accurate condition. When we do not have our seal on a device, there can be little question as to whose responsibility it is to maintain that device. As long as we had a seal on it, we were in a compromising position, because the owner with some justification, would say that he had a State seal or a city seal on this device, and, therefore, it was not his responsibility. *There is no question about it now being his responsibility.*

A new clarification of what the government's responsibility is in weights and measures is now becoming understood for the first time. With this clarification we have found a new, refreshing thought on the part of operators and users of devices. We have seen more development on the part of service companies to get equipped to provide the scale users with the right kind of a service and tests in our State in the last six months than we have seen for fifty years. This looks

to us to be very, very healthy in terms of developing accurate weighing and measuring.

More Public Information.—The other area which I feel requires greater emphasis is that of providing more information about weights and measures to the general public. If we can sell to the general public the true economic significance of accurate weighing and measuring in this country, we will have a big part of the solution to our problems.

About two years ago, at the time of one of our State meetings, we called a press conference of the State press. We presented a statement, "Commercial Measurement—A Challenge to Wisconsin". I want to read just the last paragraph of that statement. This is the kind of information we feel must be gotten out to the public.

> It is our belief that all farmers, consumers, businessmen, and government need to be more alert to the dollars and cents effect of inaccurate measurement in today's economy. The small businessman can no longer afford the baker's dozen when faced with a small profit margin today. Small insignificant errors in big business operations can easily mean the difference between operating at a profit or loss in millions of dollars. But it is the farmer and the consumer who, we believe, are the most vulnerable. The farmer too often depends on someone else's scale and someone else's meter to measure quantities in his buying and selling. The consumer today in a package world is faced with making literally thousands of individual purchases per year, having some knowledge of price and quality, but little or no certainty of quantity and, unfortunately, too little concern about it.

We have also embarked, and necessarily so, on a complete training program of weighing and measuring service personnel. We are not trying to teach them anything about scales, but we are helping them understand the legal requirements for weighing and measuring devices in the State, as we must if they are to shoulder their new responsibilities. We started out with a meeting of all statewide service companies and scale and meter manufacturers. We had 80 representatives at the first meeting. We immediately took this program out to the field and to our inspectors in meetings with individual servicemen, spending half a day or more to go down through the critical requirements of Handbook 44, the test procedures as outlined by the National Bureau of Standards, and giving the service companies the kind of information that is necessary if this program is to work.

We are also on a concerted program of letting the device users know of their responsibility. Letters have gone out to all of the trade groups, including chain stores, independents, oil companies, service companies, and feed companies. The trade associations in the State are now aware of the change of policy and the reasons for it.

In conclusion, we are not necessarily suggesting that any State or local jurisdiction immediately adopt this program. Your judgment in your situation may be better and may be different than ours. In Wisconsin we felt it necessary to analyze and "test" our program in an effort to put the emphasis on the most important elements. We are very pleased with the reception of this program by the thinking people of our State. We do not anticipate any particular problem in getting this program across, and we expect that, through it, we are going to be able to return to the taxpayers of our State more in terms of accurate weighing and measuring per dollar invested than we ever did before.

Mr. E. W. Ballentine: Mr. Chairman, I wish to make a motion that the Executive Secretary and the Treasurer be authorized to pay all legitimate bills of this conference.

(The motion was duly seconded and adopted by voice vote.)

(The benediction was delivered by the Conference Chaplain, Rev. R. W. Searles. Thereupon at 12:15 p.m. the 48th National Conference on Weights and Measures adjourned *sine die*.)

PERSONS ATTENDING THE CONFERENCE

Delegates—State, City, and County Officials

ALABAMA

State—H. G. Cryer, Inspector, Route 3, Sommerville.
A. H. Lewis, Inspector, P.O. Box 665, Moulton.

ARIZONA

State—R. H. Helmick, Inspector, State Department of Weights and Measures, Capitol Building, Phoenix.

ARKANSAS

State—A. L. Little, Director, Division of Weights and Measures, State Plant Board, 421½ West Capitol, Little Rock.

CALIFORNIA

State—W. A. Kerlin, Chief, Bureau of Weights and Measures, Department of Agriculture, 1220 "N" Street, Sacramento.
V. V. MacKenzie, Administrative Adviser to the Consumer Counsel, Room 1030, State Capitol, Sacramento.

County:
Alameda—R. H. Fernstein, County Sealer of Weights and Measures, 333 Fifth Street, Oakland.
Kern—A. D. Rose, County Sealer of Weights and Measures, 1116 East California Avenue, Bakersfield.
Los Angeles—F. M. Raymund, County Sealer of Weights and Measures, 3200 North Main Street, Los Angeles.
San Bernardino—H. E. Sandel, County Sealer of Weights and Measures, 160 East 6th Street, San Bernardino.*
San Diego—H. J. McDade, County Sealer of Weights and Measures, 1480 "F" Street, San Diego.
Santa Clara—D. R. Pratt, County Sealer of Weights and Measures, 142 North Market Street, San Jose.
Ventura—E. H. Black, County Sealer of Weights and Measures, Post Office Box 1016, Ventura.

COLORADO

State—H. H. Houston, Director, Oil Inspection Department, 1024 Speer Boulevard, Denver.

CONNECTICUT

State—F. M. Gersz, Deputy Commissioner, Department of Consumer Protection, Room 250, State Office Building, Hartford.

City:
Hartford—Nathan Kalechman, City Sealer of Weights and Measures, 550 Main Street.

*Registered in Absentia

City—Continued

Middletown — Peter Grassi, City Sealer of Weights and Measures, Box 223.

New Britain — A. J. Albanese, City Sealer of Weights and Measures, City Hall.

DELAWARE

State — W. H. Naudain, Director, Department of Weights and Measures, State Board of Agriculture, Dover.
F. C. Colamaio, State Inspector.
F. D. Donovan, State Inspector.
Eugene Keeley, State Inspector.
Ralph Smith, State Inspector.

DISTRICT OF COLUMBIA

District — W. N. Dripps, Superintendent, Inspection Division, Department of Licenses and Inspections, District Building, Washington 4, D.C.

Weights, Measures, and Markets Branch, Department of Licenses and Inspections, Room 227 Esso Building, 261 Constitution Avenue, NW., Washington, D.C.
J. T. Kennedy, Chief.
J. M. Boucher, Supervisor.
J. T. Bennick, Inspector and Investigator.
R. E. Bradley, Inspector and Investigator.
W. R. Cornelius, Inspector and Investigator.
Kenneth Hayden, Inspector and Investigator.
H. P. Hutchinson, Inspector and Investigator.
W. H. Jennings, Inspector and Investigator.
G. P. Kosmos, Inspector and Investigator.
I. L. Wagner, Jr., Inspector and Investigator.
W. W. Wells, Inspector and Investigator.

FLORIDA

State — Nalls Berryman, Director, Division of Standards, Department of Agriculture, 107 Nathan Mayo Building, Tallahassee.

City:

Jacksonville — H. E. Crawford, Inspector, Department of Weights and Measures, Room 203, City Hall.

Miami — H. E. Howard, Supervisor, Division of Trade Standards, Coconut Grove Station, P.O. Box 708.

GEORGIA

State — P. I. Morris, Jr., Director, Weights and Measures Division, Department of Agriculture, 19 Hunter Street, S.W., Atlanta.

ILLINOIS

State — H. L. Goforth, Superintendent, Division of Feeds, Fertilizers, and Standards, 531 East Sangamon Avenue, Springfield.

City:

Chicago — E. E. Callahan, Supervising Deputy, Department of Weights and Measures, Room 302, 320 North Clark Street.
Luke Prendergast, Chief Taximeter Inspector, Public Vehicle License Commission, 1104 South Wabash Avenue.

INDIANA

State — R. E. Meek, Director, Division of Weights and Measures, State Board of Health, 1330 W. Michigan Street, Indianapolis.
L. A. Gredy, State Inspector.

County:	
Gibson	W. R. Sevier, County Inspector of Weights and Measures, Somerville.
Howard	I. R. Frazer, County Inspector of Weights and Measures, 113 North Washington Street, Kokomo.
Knox	W. D. Liddil, County Inspector of Weights and Measures, 840 State Street, Vincennes.
St. Joseph	C. S. Zmudzinski, County Sealer of Weights and Measures, Room 11, Court House, South Bend.
Vanderburgh	J. M. Brite, County Inspector of Weights and Measures, 10 South Lafayette Street, Evansville.
Vigo	R. J. Silcock, County Inspector of Weights and Measures, Room 5, Court House, Terre Haute.
City:	
Gary	C. C. Morgan, City Inspector of Weights and Measures, City Hall.
Indianapolis	W. R. Copeland, Supervising Inspector, Department of weights and Measures, 202 North Alabama Street.
South Bend	B. S. Cichowicz, City Inspector of Weights and Measures, City Hall.
Terre Haute	J. T. Harper, City Inspector of Weights and Measures, Room 205, City Hall.

IOWA

State	J. C. Boyd, Chief State Field Inspector, Weights and Measures Division, Department of Agriculture Capitol Building, Des Moines.

KANSAS

State	J. F. True, State Sealer, Division of Weights and Measures, State Board of Agriculture, State Office Building, Topeka.

KENTUCKY

State	G. L. Johnson, Director, Division of Weights and Measures, Department of Agriculture, Capitol Annex, Frankfort.

MAINE

State	H. D. Robinson, Deputy State Sealer of Weights and Measures, Department of Agriculture, State House, Augusta.

MARYLAND

State	J. E. Mahoney, State Superintendent of Weights and Measures, Department of Markets, State Board of Agriculture, University of Maryland, College Park. T. M. Stabler, Assistant Superintendent. L. H. Degrange, Inspector. J. R. Frye, Inspector. R. W. Glendenning, Inspector, Post Office Box 356, Chestertown.
County:	
Montgomery	W. E. Bucklin, Director, Department of Inspections and Licenses, County Office Building, Rockville. M. S. Soward, Chief, Division of Permits and Licenses. G. L. Fuller, County Inspector of Weights and Measures. L. B. Morton, County Inspector of Weights and Measures. J. P. Soltysiak, County Inspector of Weights and Measures.

County—Continued	
Prince George's	R. J. Cord, Chief Inspector of Weights and Measures, Court House, Upper Marlboro. Louis Grasso, Deputy County Sealer of Weights and Measures.
City:	
Baltimore	G. H. Leithauser, Chief Inspector, Division of Weights and Measures, Room 1106, Municipal Building.

MASSACHUSETTS

State	W. C. Hughes, Head Administrative Assistant, Division of Standards and Necessaries of Life, Department of Labor and Industries, State House, Boston.
City:	
Boston	J. F. McCarthy, City Sealer of Weights and Measures, Room 105, City Hall Annex.
Brookline	N. A. Sacknoff, Deputy Sealer of Weights and Measures, Health Department, 11 Prospect Street.
Cambridge	A. T. Anderson, City Sealer of Weights and Measures, City Hall.
Everett	L. L. Elliott, City Sealer of Weights and Measures, City Hall.
Fitchburg	W. T. DeLoge, City Sealer of Weights and Measures, City Hall.
Gardner	F. K. Hirons, Jr., City Sealer of Weights and Measures, Town Hall.
Newton	J. E. Bowen, City Sealer of Weights and Measures, City Hall, Newton Centre.
Somerville	J. F. Casey, City Sealer of Weights and Measures, Public Works Building, 6 Pleasant Avenue.

MICHIGAN

State	J. L. Littlefield, Chief, Division of Foods and Standards, Department of Agriculture, 607 Lewis Cass Building, Lansing.
County:	
Washtenaw	G. P. Smith, County Sealer of Weights and Measures, County Building, Ann Arbor.
City:	
Detroit	J. T. Daniell, Deputy Sealer, Bureau of Weights and Measures, 2693 Eighteenth Street.
Livonia	R. C. Baumgartner, City Sealer of Weights and Measures, Police Department, 15050 Farmington Road.
Pontiac	F. A. Stormer, City Sealer of Weights and Measures, 110 East Pike Street.
Royal Oak	G. E. Rutledge, City Sealer of Weights and Measures, (Michigan Association of Weights and Measures Officials), 211 Williams Street.

MINNESOTA

State	W. E. Czaia, Supervisor, Department of Weights and Measures, Railroad and Warehouse Commission, One Flour Exchange, Minneapolis. R. C. Zeyer, State Inspector.
City:	
Minneapolis	J. G. Gustafson, Chief Inspector, Department of Licenses, Weights, and Measures, Room 101–A, City Hall.

MISSISSIPPI

State	G. F. Vaughn, Chief Inspector, Division of Weights and Measures, Department of Agriculture and Commerce, Box 1609, Jackson. W. G. Seller, State Inspector, Route 1, Laurel. J. A. Davis, Petroleum Products Laboratory, State College.

MISSOURI

State — G. W. Bay, Chief Inspector, Weights and Measures Division, Department of Agriculture, Jefferson City.

MONTANA

State — G. L. Delano, Chief Sealer, Division of Weights and Measures, Department of Agriculture, State Capitol Building, Helena.

NEW HAMPSHIRE

State — G. H. Laramie, Director, Division of Markets and Standards, Department of Agriculture, State House Annex, Concord.
A. H. Dittrich, Chief Inspector, Bureau of Weights and Measures, Division of Markets and Standards, Department of Agriculture, State Office Building, Concord.

NEW JERSEY

State — S. H. Christie, Jr., Deputy State Superintendent, Division of Weights and Measures, Department of Law and Public Safety, 187 West Hanover Street, Trenton.
A. T. Smith, Supervisor of Technical Services.
J. R. Bird, Senior Technician.
J. P. Morris, Regional Supervisor.
Mario Masitti, Regional Supervisor.
M. N. Edmonston, Chief, Bureau of Fruit and Vegetable Service, Division of Markets, Department of Agriculture, P.O. Box 1888, Trenton.

County:

Bergen — M. J. Santimauro, County Superintendent of Weights and Measures, 66 Zabriskie Street, Hackensack.
E. E. Dawson, Assistant County Superintendent.

Burlington — D. F. Hummel, Superintendent of Weights and Measures, County Office Building, 49 Water Street, Mount Holly.

Camden — A. C. Becker, County Superintendent of Weights and Measures, 403 City Hall, Camden.

Cumberland — G. S. Franks, County Superintendent of Weights and Measures, Court House, Bridgeton.

Mercer — R. M. Bodenweiser, County Superintendent of Weights and Measures, Court House, Trenton.

Monmouth — W. I. Thompson, County Superintendent of Weights and Measures, Post Office Box 74, Allenhurst.
J. A. Bovie, Assistant County Superintendent.
W. G. Dox, Assistant County Superintendent, 40 Waverly Place, Redbank.
J. J. Elker, County Inspector, 1219 First Avenue, Asbury Park.

Passaic — William Miller, County Superintendent of Weights and Measures, 317 Pennsylvania Avenue, Paterson.

Union — E. G. Levers, County Superintendent of Weights and Measures, Court House, Elizabeth.

Warren — G. E. Connolly, County Superintendent of Weights and Measures, Court House, Belvidere.

City:

Fair Lawn — Oscar Haug, Municipal Superintendent of Weights and Measures, New Municipal Building.

Jersey City — H. J. Myers, Municipal Superintendent of Weights and Measures, City Hall.

Kearny — James Pollock, Municipal Superintendent of Weights and Measures, Town Hall, 402 Kearny Avenue.

City—Continued

Linden	L. T. Reagan, Municipal Superintendent of Weights and Measures, Room 206, City Hall.
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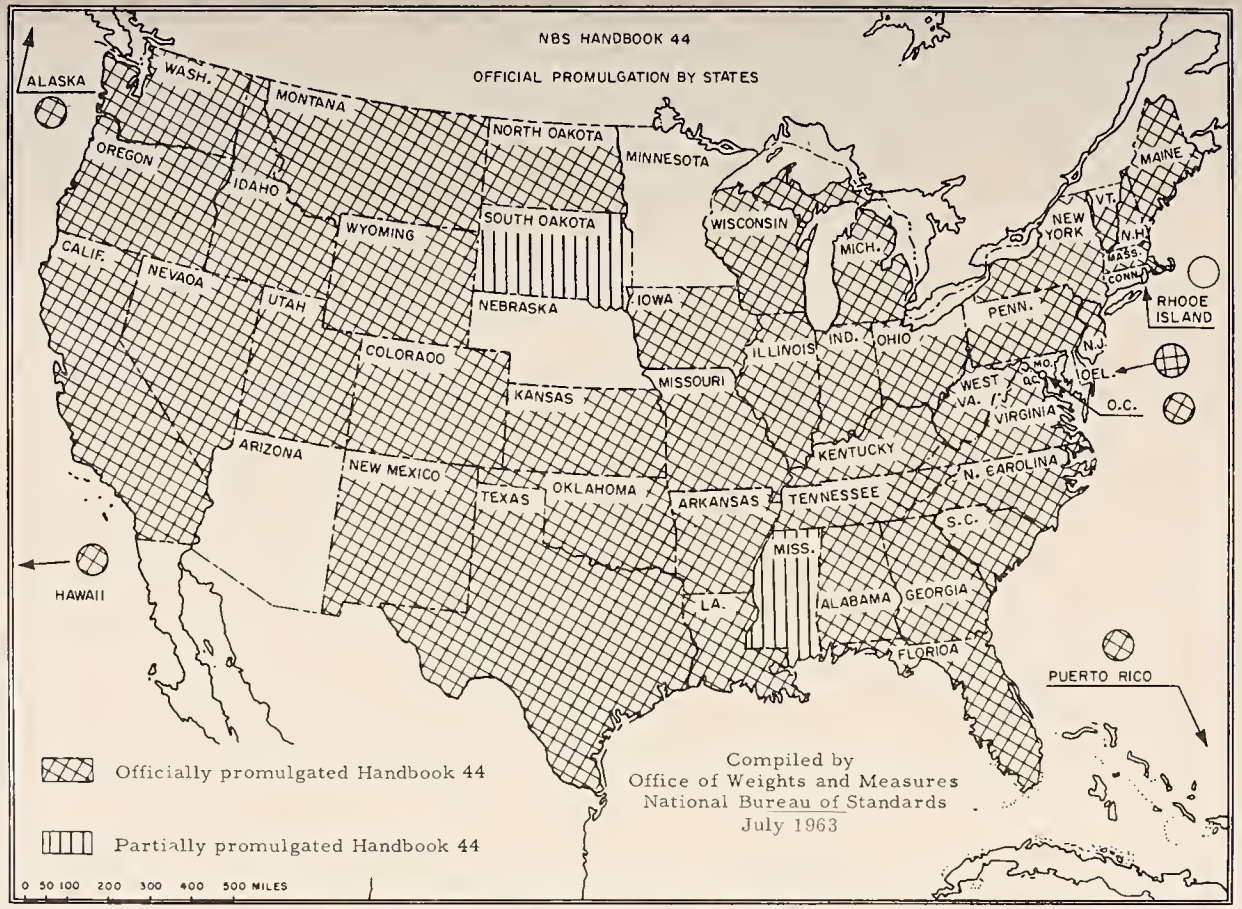

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Radio Standards Physics. Frequency and Time Disseminations. Radio and Microwave Materials. Atomic Frequency and Time-Interval Standards. Radio Plasma. Microwave Physics.

Radio Standards Engineering. High Frequency Electrical Standards. High Frequency Calibration Services. High Frequency Impedance Standards. Microwave Calibration Services. Microwave Circuit Standards. Low Frequency Calibration Services.

JOINT INSTITUTE FOR LABORATORY ASTROPHYSICS–NBS GROUP (UNIV. OF COLO.)

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THE NATIONAL BUREAU OF STANDARDS

Functions and Activities

The functions of the National Bureau of Standards include the development and maintenance of the national standards of measurement and the provision of means and methods for making measurements consistent with these standards; the determination of physical constants and properties of materials; the development of methods and instruments for testing materials, devices, and structures; advisory services to government agencies on scientific and technical problems; invention and developmet of devices to serve special needs of the Government; and the development of standard practices, codes, and specifications, including assistance to industry, business and consumers in the development and acceptance of commercial standards and simplified trade practice recommendations. The work includes basic and applied research, development, engineering, instrumentation, testing, evaluation, calibration services, and various consultation and information services. Research projects are also performed for other Government agencies when the work relates to and supplements the basic program of the Bureau or when the Bureau's unique competence is required. The scope of activities is suggested by the listing of divisions and sections on pages 142 and 143.

Publications

The results of the Bureau's research are published either in the Bureau's own series of publications or in the journals of professional and scientific societies. The Bureau itself publishes three periodicals available from the Government Printing Office: The Journal of Research, published in four separate sections, presents complete scientific and technical papers; the Technical News Bulletin presents summary and preliminary reports on work in progress; and Central Radio Propagation Laboratory Ionospheric Predictions provides data for determining the best frequencies to use for radio communications throughout the world. There are also seven series of nonperiodical publications: Monographs, Applied Mathematics Series, Handbooks, Miscellaneous Publications, Technical Notes, Commercial Standards, and Simplified Practice Recommendations.

A complete listing of the Bureau's publications can be found in National Bureau of Standards Circular 460, Publications of the National Bureau of Standards, 1901 to June 1947 ($1.25), and the Supplement to National Bureau of Standards Circular 460, July 1947 to June 1957 ($1.50), and Miscellaneous Publication 240, July 1957 to June 1960 (includes Titles of Papers Published in Outside Journals 1950 to 1959) ($2.25); available from the Superintendent of Document, Government Printing Office, Washington, D.C., 20402.