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Report of the

47th NATIONAL CONFERENCE ON WEIGHTS AND MEASURES 1962



U.S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
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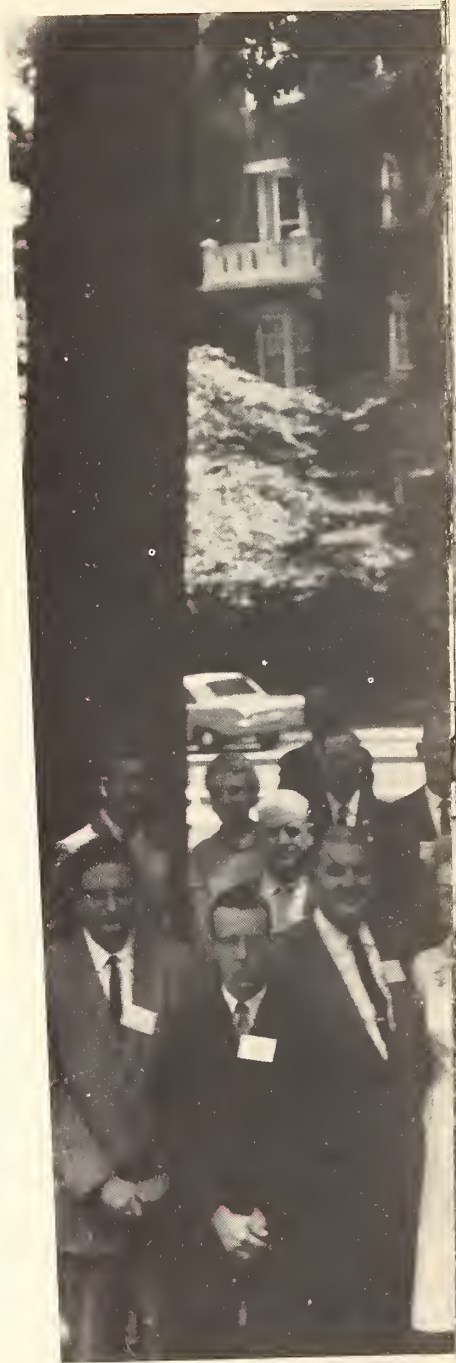
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Report of the 47th National Conference on Weights and Measures 1962

*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 4, 5, 6, 7, 8, 1962.*



*United States Department of Commerce
Luther H. Hodges, Secretary
National Bureau of Standards
A. V. Astin, Director*

National Bureau of Standards Miscellaneous Publication 244

Issued November 23, 1962



Forty-seventh National Conference on Weights and Measures, Sheraton-Park Hotel, Washington, D.C., June 4-8, 1962, sponsored by U.S. Department of Commerce



CONTENTS

Officers and Committees.....	Page v
Committee Meetings.....	vii

FIRST SESSION—MORNING OF TUESDAY, JUNE 5, 1962

Address, by Hon. J. H. Hollomon, Assistant Secretary for Science and Technology, Department of Commerce.....	1
Address of Conference President and Appointments to Standing Committees, by A. V. Astin, Director, National Bureau of Standards.....	3
Presentation of Honor Awards.....	8
Address of Conference Chairman, by Robert Williams, County Sealer of Weights and Measures, Nassau County, New York.....	8

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 5, 1962

Odometers, Rental Automobiles, Official Control, by Nalls Berryman, Director, Division of Standards, Department of Agriculture, State of Florida.....	12
Odometers, Rental Automobiles, Mechanical Capabilities, by T. J. McCook, Chief Engineer, Instrument Division, Stewart-Warner Corporation, Chicago, Illinois.....	13
Progress in the Measurement of Milk, by D. R. Mackay, Engineer, Office of Weights and Measures, National Bureau of Standards.....	22
Some Experiences in Type Approval, by R. W. MacLean, Director, Standards Branch, Department of Trade and Commerce, Ottawa, Canada.....	27
Japan's Transition to the Metric System, by Mitsuo Tamano, Director, National Research Laboratory of Metrology, Tokyo, Japan.....	31
Weights and Measures in Japan, by Bernard Wasko, Chief Engineer, Voland Corporation, New Rochelle, New York.....	38

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 6, 1962

Address, by Hon. P. A. Hart, U.S. Senator, State of Michigan.....	47
Statement, by R. W. Coyne, President, Distilled Spirits Institute, Inc., Washington, D.C.....	49
Report of Committee on Laws and Regulations, Presented by J. H. Lewis, Chairman, Chief, Weights and Measures Section, Department of Agriculture, State of Washington.....	50
Weights and Measures in Scotland, Ancient and Modern, by Thomas Cairns, Chief Inspector, Weights and Measures Department, Glasgow, Scotland.....	55
Package Control in Pennsylvania, by E. A. Vadelund, Assistant Director, Bureau of Standard Weights and Measures, Department of Internal Affairs, State of Pennsylvania.....	66

AFTERNOON OF WEDNESDAY, JUNE 6, 1962

Official Conference Luncheon

Address, by Hon. Sigurd Anderson, Commissioner, Federal Trade Commission.....	73
---	----

FOURTH SESSION—MORNING OF THURSDAY, JUNE 7, 1962

	Page
Report of Committee on Nominations and Election of Officers, Presented by R. E. Meek, Acting Chairman, Director, Division of Weights and Measures, Board of Health, State of Indiana-----	74
Address, by G. S. McIntyre, Director, Department of Agriculture, State of Michigan, and President, National Association of State Departments of Agriculture-----	75
Address, by C. T. Hubble, Director, Division of Case Control, Bureau of Enforcement, Food and Drug Administration-----	79
What are the Fundamentals of a Good Weights and Measures Program? by L. J. Gordon, Director, Weights and Measures Research Center, Denison University, Granville, Ohio-----	85
Report of Committee on Education, Presented by J. F. True, Chairman, State Sealer, Division of Weights and Measures, Board of Agriculture, State of Kansas-----	93
Report of the Conference Executive Secretary, Presented by W. S. Bussey, Assistant to the Director, National Bureau of Standards-----	95

FIFTH SESSION—AFTERNOON OF THURSDAY, JUNE 7, 1962

Report of the Committee on Resolutions, Presented by W. C. Hughes, Chairman, Head Administrative Assistant, Division of Standards and Necessaries of Life, Department of Labor and Industries, State of Massachusetts-----	99
Deception of Consumers Through Techniques in Packaging and Labeling, by F. J. Schlink, Consumers' Research, Inc., Washington, New Jersey-----	101
Report of the Committee on Specifications and Tolerances, Presented by C. L. Jackson, Chairman, Chief, Division of Economic Practices, Department of Agriculture, State of Wisconsin-----	110
Report of Executive Committee, Presented by Robert Williams, Chairman, County Sealer of Weights and Measures, Nassau County, New York-----	125
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-----	128

BREAKFAST MEETING OF THE INCOMING EXECUTIVE COMMITTEE OF
THE CONFERENCE, FRIDAY, JUNE 8, 1962

SIXTH SESSION—MORNING OF FRIDAY, JUNE 8, 1962

Report of the Auditing Committee, Presented by D.R. Pratt, Chairman, County Sealer of Weights and Measures, Santa Clara County, California-----	131
Report of the Conference Treasurer, Presented by C. C. Morgan, Treasurer, City Sealer of Weights and Measures, Gary, Indiana-----	131
Report of the Incoming Executive Committee, Presented by Carl Stender, Assistant to Commissioner, South Carolina Department of Agriculture, Newly Elected Conference Chairman-----	132
Symposium on Administrative Actions Under Model Law Provisions, R. N. Smith, Weights and Measures Coordinator, National Bureau of Standards, Moderator-----	132
(a) Organization—Personnel, by J. L. Clough, Acting Director, Division of Weights and Measures, Board of Agriculture, State of Delaware-----	133
(b) Advertising—Price Signs—Labels, by Matt Jennings, Director, Division of Marketing, Department of Agriculture, State of Tennessee-----	135
(c) Testing Devices and Commodities, by T. C. Harris, Jr., Supervisor, Weights and Measures Section, Department of Agriculture and Immigration, State of Virginia-----	138
(d) Package Standardization—Random Packages, by G. W. Bay, Chief Inspector, Weights and Measures Division, Department of Agriculture, State of Missouri-----	139

OFFICERS AND COMMITTEES

OFFICERS

(As elected by the Forty-sixth National Conference to serve during the Forty-seventh National Conference)

President: A. V. ASTIN, Director, National Bureau of Standards.
 Executive Secretary: W. S. BUSSEY, Assistant to the Director, } *Ex officio*
 National Bureau of Standards.
 Chairman: ROBERT WILLIAMS, County Sealer of Weights and Measures, Nassau County, New York.
 Vice Chairmen:
 PAUL DEVRIES, Municipal Superintendent of Weights and Measures, Passaic, New Jersey.
 H. H. HOUSTON, Director, Oil Inspection Department, State of Colorado.
 F. F. THOMPSON, Chief Chemist, Petroleum Products Tax Division, Department of Revenue, State of Louisiana.
 D. M. TURNBULL, Director, Division of Licenses and Standards, Seattle, Washington.
 Treasurer: C. C. MORGAN, City Sealer of Weights and Measures, Gary, Indiana.
 Chaplain: R. W. SEARLES, Deputy County Sealer of Weights and Measures, Medina County, Ohio.

(As elected by the Forty-seventh National Conference to serve during the Forty-eighth National Conference)

President: A. V. ASTIN, Director, National Bureau of Standards.
 Executive Secretary: W. S. BUSSEY, Assistant to the Director, } *Ex officio*
 National Bureau of Standards.
 Chairman: C. H. STENDER, Assistant to the Commissioner, South Carolina Department of Agriculture.
 Vice Chairmen:
 C. L. JACKSON, Chief, Division of Economic Practices, Department of Agriculture, State of Wisconsin.
 P. I. MORRIS, Jr., Director, Weights and Measures Division, Department of Agriculture, State of Georgia.
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 Treasurer: C. C. MORGAN, City Sealer of Weights and Measures, Gary, Indiana.
 Chaplain: R. W. SEARLES, Deputy County Sealer of Weights and Measures, Medina County, Ohio.

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(As elected by the Forty-seventh National Conference)

A. V. ASTIN	} <i>Ex officio</i>
W. S. BUSSEY	
C. H. STENDER	
C. L. JACKSON	
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J. F. MCCARTHY	
P. I. MORRIS, Jr.	
C. C. MORGAN	
R. W. SEARLES	

G. W. BAY, of Missouri.
 E. H. BLACK, of Ventura County, California.
 C. R. BRANCH, of Petersburg, Virginia.
 W. R. COPELAND, of Indianapolis, Indiana.
 R. J. CORD, of Prince George's County, Maryland.
 W. R. CORNELIUS, of the District of Columbia.
 W. E. CZALA, of Minnesota.
 J. L. LITTLEFIELD, of Michigan.
 A. T. SMITH, of New Jersey.
 C. W. VAN SCHOIK, of Ohio.

STANDING COMMITTEES

(As constituted at the conclusion of the Forty-seventh National Conference, the personnel and organization of each of the standing committees of the Conference are as listed. As reported, the membership of each committee reflects the appointments made by the President of the Conference to fill vacancies that have occurred from expiration of term, and the elections by the several committees of chairmen for the ensuing year. The remaining term of office for each committee member, in years, is shown by the figure in parentheses following each entry.)

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 J. F. TRUE, of Kansas (1).
 C. H. STENDER, of South Carolina (3).
 J. T. DANIELL, of Detroit, Michigan (4).
 S. H. CHRISTIE, JR., of New Jersey (5).

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 J. G. GUSTAFSON, of Minneapolis, Minnesota (1).
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COMMITTEE ON SPECIFICATIONS AND TOLERANCES*

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 R. W. SEARLES, of Medina County, Ohio (1).
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 GEORGE JOHNSON, of Kentucky (5).

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

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Committee on Resolutions: W. C. HUGHES, of Massachusetts, Chairman; C. D. BAUCOM, of North Carolina; J. L. LITTLEFIELD, of Michigan; R. C. PARKS, of Grant County, Indiana; J. J. PERSAK, of West Allis, Wisconsin; W. H. SCHNEIDEWIND, of Essex County, New Jersey; C. W. VAN SCHOIK, of Ohio.
Committee on Auditing: D. R. PRATT, of Santa Clara County, California, Chairman; J. T. BENNICK, of the District of Columbia; PETER GRASSI, of Middletown, Connecticut.

IN CHARGE OF LADIES' PROGRAM

MRS. W. S. BUSSEY, MRS. M. W. JENSEN, MRS. H. F. WOLLIN.

IN CHARGE OF REGISTRATION

MRS. F. C. BELL, MRS. M. M. BRODMERKEL, MRS. E. L. BRUECKNER, MRS. E. S. GRAYSON.

PRESS REPRESENTATIVES

J. F. REILLY, MISS MARGARET STACK.

COMMITTEE MEETINGS, MONDAY, JUNE 4, AND TUESDAY MORNING, JUNE 5, 1962

All day Monday and a part of 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 April 1, 1962, and in the printed program.

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

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



REPORT OF THE FORTY-SEVENTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES ¹

FIRST SESSION—MORNING OF TUESDAY, JUNE 5, 1962

(ROBERT WILLIAMS, 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. Fred True, of Kansas, led the delegates in the Pledge of Allegiance.

INTRODUCTION OF HON. J. H. HOLLOMON BY A. V. ASTIN, NATIONAL BUREAU OF STANDARDS

Ladies and gentlemen, this morning you have an unusual opportunity. You are about to hear from the first incumbent of an important new post in the Department of Commerce, that of Assistant Secretary of Commerce for Science and Technology. The role of the Department of Commerce is to stimulate and encourage the development of the Nation's commerce and industry. In these days there are few things more important than science and technology in stimulating industrial growth. Thus, it is very important that in the office of the Secretary of Commerce there be continuing and competent high-level attention to problems involving science and technology.

The first Assistant Secretary of Commerce for Science and Technology has been in office only a few weeks, but he comes eminently qualified for the position. He is a distinguished metallurgist, an outstanding expert in the important new science of materials, a recognized leader in utilizing science and technology for industrial development, the former manager of the General Engineering Laboratory of the General Electric Company.

It is my great pleasure to present to you the Assistant Secretary of Commerce for Science and Technology, Hon. J. Herbert Hollomon.

ADDRESS BY HON. J. H. HOLLOMON, ASSISTANT SECRETARY FOR SCIENCE AND TECHNOLOGY, DEPARTMENT OF COMMERCE

I bring you the greetings of Secretary Hodges and welcome you warmly to Washington and to your next several days of meetings.

¹With the exception of formal papers and committee reports, the record of the 46th 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.

I thought you might be interested to hear a bit about the job I occupy and some of the things I have found in this first few days to be important to you and, I think, important to our industry and commerce.

I have three sorts of jobs. They are all different. I am not sure if I am expected to do all three simultaneously.

The three jobs are these: first, I am a member of Secretary Hodges' staff to bring to his attention as Secretary of Commerce the importance of science, technology, research and development, invention, and standards so that he may be better able to serve the President.

Secretary Hodges needs advice as to how the technical community can best be served and how science and technology can be utilized in the national interest, particularly how it can be used to stimulate economic growth, international trade, and the development of newly emerging countries about which I will have something to say in a moment.

Secondly, in my capacity as Assistant Secretary, I also have an operating responsibility. By this I mean that I am the boss of something. I find that I am responsible for predicting the weather you have today. If you asked me, I would have told you it was going to be terrible, but I am sure that you wouldn't have appreciated it.

I also have responsibility for the Coast and Geodetic Survey, the organization responsible for the mapping of our coastal waters, determining the basic geodesy of the United States, furnishing the maps for aviation and, more recently, a major part of our deep-sea oceanographic research.

Another of my operating responsibilities is the Patent Office. I discovered that one of our major problems is that the Patent Office has not grown in its capability to handle the vast number of patent applications for inventions that come before it. The Patent Office faces serious problems before it can accomplish its function of stimulating invention and, through invention and the patent monopoly, innovation and industrial growth.

A major technical activity is that of the National Bureau of Standards. The Bureau functions in your field of establishing basic standards, weights, and measures for the commerce and industry of our country. It also is the outstanding Federal science laboratory in the Nation, with a spirit and a professional viewpoint unlike any other national laboratory. I hope it will serve as the springboard for the expansion of technical work in the Federal government of value to industry and commerce.

So my second job is one of helping to establish policy for these organizations.

My third job is being a member of the Federal Council for Science and Technology. Chaired by Dr. Jerome B. Weisner, the Council sets policy for the entire Federal establishment in matters having to do with research and development in the Federal government.

Now, what really is the job that I have to try to help do? It seems to me that our purposes are to bring research and development into more effective use to help industry and to help commerce in these times when, during the last 10 years or so, our rate of economic growth has been outdistanced, not only by the Soviets, but by the Japanese and the European common market.

If we are to afford a space effort, if we are to afford the vast military preparedness program of our country, if we are to afford the investment in the renovation of slums, if we are to afford the necessary

investment to eliminate the transportation chaos of our country, we will have to do it by a more rapid economic growth.

An important aspect of my three jobs is related to the development of foreign trade and the establishment of viable institutions in the newly developing countries. Many think that the commerce between countries, nationalities, and peoples, is mostly restricted by tariff walls or monetary policies. I rather think that is not the case. I think perhaps the most important community of interest between two countries is the establishment of a basic language which each of them speaks. This can be a spoken language or the language of weights and measures.

If we are to have increasing free traffic between us and the European common market, between us and the tremendous market in Indo-China, Africa, and Asia, it is absolutely essential we have compatible standards and measures in that commerce. Therefore, we not only must insure that our monetary policies are sound for a free flow of money in the trade, that our tariff policies are proper, but that we do everything necessary to establish a community of interchange and cooperation in the fields of weights and measures and standards.

We face, I believe, a peculiar and enormously important time in our lives. We are being pressed, not only by the Soviets, but by the rest of the world, to demonstrate that our system of free choice is the most viable system and the one that gives man the most opportunity. You and we have a job to do.

ADDRESS OF THE CONFERENCE PRESIDENT AND APPOINTMENTS TO STANDING COMMITTEES

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

I am very pleased to appear before you again and particularly pleased to be with you on the occasion of Dr. Hollomon's first appearance before this Conference.

As is my custom as your *ex officio* president, I should like to take this opportunity to report upon the activities of the National Bureau of Standards during the past year, particularly those activities which relate closely to the affairs of this Conference. One of the most significant developments of the year was the consumer message which President Kennedy delivered on March 14. In this message, the President directed those Federal agencies whose activities have a significant bearing on consumer interests to give increased attention to all of their responsibilities that affect the consumer. And in particular, the President directed that increased attention be given to the possible publication of available technical data bearing on consumer interests.

It is my belief that our weights and measures program affects the interests of the general consumer more directly than any other activity of the National Bureau of Standards. Thus I feel that the President's message should be of particular interest to this National Conference on Weights and Measures. I have asked the Weights and Measures Advisory Committee, which we have established in this Conference, to give attention to the President's request and to see if there are things that we at NBS might do in addition to those we are now doing, or things that this Conference might do, to carry out the general intent of the President's message.

I should like next to review briefly some of the changes in the management of the National Bureau of Standards during the year.

I reported a year ago on our plan to transfer Mr. Bussey directly into my office as Assistant to the Director for Weights and Measures Administration and to have the Office of Weights and Measures assume the status of a technical division under Mr. Jensen as chief.

This plan went into effect on July 1 last year, and it appears to be working extremely well. I have enjoyed my closer contacts with Mr. Bussey and my primary regret has been that an unfortunate illness withdrew him from circulation for much too long during the past year. I am, however, very pleased to see him back on the job looking fit and hearty once again.

One of our associate directors who has worked closely with Mr. Bussey, Mr. Jensen, and this Conference over the past ten years has moved to a new assignment. We have loaned Dr. McPherson to the Office of Technical Services of the Department of Commerce to work on the problem of standards as related to international trade. He will be especially concerned with standards important to developing industries in the Latin American countries and to trade with these countries.

This is an activity that has been very close to Dr. McPherson's heart and he has a long background and interest in it. I am sure he will do the job well. Even though his transfer to this new position is a loss to us directly, I am sure it is a gain to the Nation. So I would like to wish him success in his new assignment, and I am sure all of you will join me in extending such wishes.

Another of our distinguished associate directors, Dr. Edward Wichers, who had been handling international relations and chemistry programs for the Bureau, retired this past spring.

We have acquired one new associate director since your last meeting. This is Mr. W. A. Wildhack, whom I think some of you have met. He will have immediate responsibility for all of the measurement service activities of the National Bureau of Standards, and this, I trust, will make his activities of considerable interest to this Conference.

For a short time we had a new associate director concerned primarily with problems of physics. Dr. Charles Herzfeld held this position briefly last summer, until he was drafted for an important position in the Advanced Research Projects Agency. Specifically, he is now concerned with the problem of defending this country against ballistic missiles. Here again, although his loss is a severe one to us at NBS, I am sure we all wish him well in this important new post.

Since your last meeting, we have named three new division chiefs of the Bureau, all capable young men from within our organization, and I am sure some of you will have dealings with them. Dr. Ralph Hudson has been named Chief of our Heat Division, Dr. Harry Allen, Chief of our Analytical and Inorganic Chemistry Division, and Dr. Lawrence Kushner, Chief of our Metallurgy Division.

One of the things that has given us a great deal of concern at the National Bureau of Standards over the past several years is the increasing complexity and extent of the measurement standards problem. With the accelerating growth of our technical economy and the increasing diversity and complexity of the products we have to deal with, it is becoming more and more important that we have an ade-

quate base to our measurement system and that measurement services be widely available to assure uniformity, reliability, and compatibility. We feel that this broad problem can be adequately handled only if there is considerable decentralization of much of the measurement service. In this connection, we have talked to you in this Conference about the possibility of the States assuming increased responsibility for providing measurement services to local industries. I understand that some of the States are now studying this possibility.

It is our feeling that the Model Law for Weights and Measures would permit States' weights and measures activities to provide such measurement services to industry as the calibration of industrial instruments. But if any of you have problems in this connection, we should be glad to consult with you about them. At any rate, we think this is one important aspect of the problem of developing the Nation's total measurement capability.

In addition, we are encouraging the establishment of standards laboratories in defense plants and in industrial organizations. I had the privilege just a few weeks ago of participating in the dedication of one of these new industrial standards laboratories, and I was very much impressed by their capability and by the extent to which they can relieve the National Bureau of Standards of some of its more routine measurement services.

The growth in the activity of standards laboratories throughout the Nation has led to the formation of a National Conference of Standards Laboratories. To some extent, this National Conference has followed the pattern of the National Conference on Weights and Measures. In fact, the two organizations have some problems in common, but there are substantial differences in their objectives. Through mutual association and discussions, the participating laboratories of the NCSL hope to improve their management of measurement services, to identify the most urgent areas where extension of the state of the art is important, to develop improved means for using the central competence of the NBS, and generally to promote the use of better measurement techniques throughout industry.

These matters will provide the subject matter of conferences of the new association. The first such meeting will be held this summer at the Boulder (Colo.) Laboratories of the National Bureau of Standards. Perhaps some of the members of this Conference may wish to attend.

We are also concerned about new State standards. As many of you know, we have been studying this problem for some years. Our in-house development program has now reached the stage where we believe we have the know-how to provide much better State standards than have been supplied in the past. However, the mechanism for doing this and the extent to which we would do it are still undetermined, even though it was several years ago that this Conference recommended that NBS furnish complete new sets of standards to the States.

An important consideration here is that if the States should assume increased responsibilities for measurement services to industry, they might need somewhat different standards. This possibility, as well as some physical reasons, accounts primarily for our delay in seeking funds that would permit us to make new State standards available to the 50 States of this country. However, we have not forgotten it.

And even though your request is several years old, it still is very much on our agenda.

Another administrative action at the National Bureau of Standards during the past year was the initiation of an important new type of cooperative program with the University of Colorado. This program is in laboratory astrophysics—the use of laboratory techniques to study astronomical phenomena. It will be conducted by the Joint Institute for Laboratory Astrophysics, which the Bureau and the University established together last April on the University campus. We are transferring a group of people from our Washington laboratories out to the Joint Institute this summer.

In laboratory astrophysics we learn about the composition of the sun and stars through studying their spectral radiations and relating them to measurements made in the laboratory. This is a field that is vital to our national space program and one in which far too few people are being trained. It is concerned primarily with accurate, uniform measurement and thus is within the area of the Bureau's basic responsibilities. Through cooperation with the University in both advanced training and research in this field, we hope to better fulfill these responsibilities. And I think that this joint program may well set a pattern for future cooperation between the Government and the universities.

At last year's meeting, we announced that we were beginning construction of our Gaithersburg laboratories. This work is progressing quite well, although there have been delays in the schedule for some of the future activity. We are planning construction at Gaithersburg in four stages, and it was the first stage that began last June. We expect the laboratory that was started then to be completed next year. We plan to let the contract for the second construction phase within the next two weeks. This is a very large construction program amounting to about \$25 million and it should be completed sometime in 1964.

The third construction phase will probably be initiated early in 1963 with completion expected in 1965. The fourth phase, which will be a sort of "clean-up" phase to provide a few special-purpose laboratories, will begin late in 1963 according to our present schedule. This means that most of our moving should take place during 1965. We will keep you apprised of progress in that direction at your annual meetings, and ultimately, I expect, we shall invite you to meet with us at our Gaithersburg laboratories.

Coming now to our technical program, I should like to bring just a few of the significant developments to your attention. During the past year, international accord was reached on a new unified scale for atomic weights. Previously, there had been two scales; the physicists had used a scale based on the oxygen 16 isotope whereas the scale used by chemists was based on natural oxygen. These scales were in disagreement and neither approached the ideal. Both the chemists and physicists of the world have now reached agreement on a scale of atomic weights based on the isotope carbon 12. NBS staff members, particularly our retired associate director, Dr. Wichers, were very influential in bringing this agreement about, and we are very pleased to have participated in it. The new scale will, of course, be used in the scientific observations of the National Bureau of Standards.

Also, during the past year, we completed work on a photoelectric pyrometer for measuring temperatures up to about 1800 degrees Fahrenheit (1000 degrees Celsius) or higher. With this new pyrometer, we can make measurements much more easily and accurately. We can now make measurements to hundredths of a degree rather than to tenths of a degree as with the old equipment.

One of the Bureau's important activities is the standards samples program in which we distribute materials of certified composition or physical characteristics as a means of promoting uniformity of measurement. We have continued to extend our services in this area. In particular, we have increased both the range and accuracy of pH standards, used for measuring the acidity or basicity of solutions. Included in this program is an important new reference standard for measuring the pH values of water.

Coming more directly to your field of interest, we have made progress on the problem of moisture in grain, but it continues to be a subject of substantial difficulty. At your technical program last year you heard a report on our work using dielectric measurement techniques. We have chosen to abandon this approach for others we consider to be more fruitful. At present we are quite optimistic about an extraction process whereby grain is ground with methanol and examined with a gas chromatograph to determine the relative amounts of alcohol and water. This technique is capable of very high precision and reliability, and should ultimately prove quite useful.

For many years you have been waiting for a new version of the handbook on weights and measures administration. I am pleased to report that this handbook is finally in press, and it may be that shortly after your return to your respective offices you will receive copies of the volume or order blanks for it. It will be known as NBS Handbook 82, *Weights and Measures Administration*. Order blanks are also available at the registration desk.

Mr. Jensen's first year as Chief of our Office of Weights and Measures has been very productive even though there was an unfortunate interruption when a heart attack deprived us of his services for several weeks. One of his most interesting accomplishments was the conducting of a survey related to certain broad objectives of the Department of Commerce. In the current effort to promote international trade, the Department of Commerce is setting out to assist those countries which now have no central basis for weights and measures in setting up national standards laboratories. Mr. Jensen and Mr. Mackay, also of the Office of Weights and Measures, have just completed a preliminary survey of several Latin American countries on behalf of the Business and Defense Services Administration of the Department of Commerce. They found great interest in accurate standards on the part of everyone they visited. As the first step in providing technical assistance, Mr. Jensen and Mr. Mackay made preliminary arrangements for the translation of our own model laws, handbooks, and training materials into the languages of the hemisphere—Spanish, Portuguese, and French. Although French is not ordinarily thought of as a Latin-American language, it is used in Haiti. In addition, weights and measures literature in French will be of immediate value to a number of the new African countries.

It now is my privilege and pleasure as the *ex officio* president of this Conference to make appointments to the standing committees. There

are three terms expiring this year. William Kerlin of California has completed a term on the Committee on Education, as has Robert Williams on the Committee on Laws and Regulations. Mr. Williams, as you know, is from Nassau County, New York. And on the Committee on Specifications and Tolerances, the term of Claire Jackson of Wisconsin is expiring. To fill the first of these vacancies, I am appointing to the Committee on Education S. H. Christie, Jr., Deputy State Superintendent, Division of Weights and Measures, Department of Law and Public Safety, Trenton, New Jersey. To the Committee on Laws and Regulations I appoint Matt Jennings, Director, Division of Marketing, State Department of Agriculture, Nashville, Tennessee. And to the Committee on Specifications and Tolerances, I appoint George L. Johnson, Director, Division of Weights and Measures, State Department of Agriculture, Frankfort, Kentucky.

New appointments on these committees are for five-year terms.

I would like to thank the members whose terms are expiring on these committees for their very valued and important services over the past five years and to wish success to the new members.

And now, I would like to close by thanking all of you for the opportunity you have given me of appearing before you and telling you a few things about the work of the National Bureau of Standards. I thank you for your cooperation and for your support of the work of this Conference and of NBS activities in the field of weights and measures.

In addition, I would like to wish all of you a successful and interesting conference. Thank you very much.

PRESENTATION OF HONOR AWARDS

Dr. Astin presented "Honor Awards" to 22 members of the Conference who, by attending the 46th Conference in 1961, 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

20-Year Certificates

A. T. Smith, F. G. Williams.

15-Year Certificates

W. R. Cornelius, W. M. Hoxie, W. H. Jennings, J. T. Kennedy, Arthur Sanders, R. W. Searles.

10-Year Certificates

A. V. Astin, J. J. Brannick, Paul DeVries, R. W. Foster, J. C. Hughes, William Keay, John Marshall, H. J. McDade, A. T. McPherson, W. E. G. Rhein, D. M. Turnbull, E. F. Wehmann, D. H. Williams, R. J. Zierten.

ADDRESS OF CONFERENCE CHAIRMAN

By ROBERT WILLIAMS, *County Sealer of Weights and Measures, Nassau County, New York*

Greetings.—It is my happy privilege, as Chairman of the National Conference on Weights and Measures, to extend to all of you present

here today, and to weights and measures officials throughout the nation, a most cordial greeting. On behalf of your officers and committees, I welcome each and every one of you to this our 47th National Conference. My sincere hope and desire is that this might prove to be the most worthwhile meeting thus far sponsored by this organization.

Program and Speakers.—The program has been very carefully arranged. It includes an impressive group of eminent speakers. Collectively, they have traveled many thousands of miles in order to be helpful to weights and measures administration in the United States. I am certain that their messages will be interesting, informative, and educational. Not only do we owe them our sincere gratitude, we owe them also our undivided attention and our constant presence at all formal sessions of the Conference.

Foreign Guests.—At this point I wish to extend the warmest possible welcome of the Conference to our visitors and colleagues from other countries. We are extremely honored at this meeting to have official visitors from Canada, China, Japan, and Scotland. Several of them will appear on our program later, but I would like for you to meet them now. As I call their names I would like for each to stand so that he can be identified. I beseech each member of this Conference, whether an active, advisory, or associate member, to single out these distinguished guests during the week and get personally acquainted with them.

Conference Participation.—As most of you are aware, the First National Conference on Weights and Measures was held in January 1905. It was twenty years later, or in May 1925, when I first attended a meeting of this organization. That was 37 years ago. I was immediately and deeply impressed with the seriousness and thoroughness that went into the papers, the committee reports, and the discussions. I was doubly impressed with the character and devotion of the delegates that made up the Conference. During the intervening 37 years, I have attended 22 meetings of the Conference. It has been my privilege and pleasure to be closely associated with and to become quite intimately acquainted with many fine weights and measures officials and other fine people during this period. My first impressions of 1925 have withstood the test of time. These first impressions have not changed in the least. Little did I realize, on that May day in 1925, that I would devote my life to weights and measures work, and that I would be serving you as your Chairman in 1962. I am glad of my decision, and I am sincerely grateful for the honor that you have bestowed upon me.

It was somewhat of a surprise to me when I checked up recently and found that I am the only weights and measures official who attended the 18th National Conference in 1925, who is still actively engaged in weights and measures administration and the affairs of this Conference. I believe that Dr. Lewis V. Judson is the only National Bureau of Standards representative registered at that meeting who is still on active duty at the Bureau today. Dr. Judson is present at this meeting. Of course, our good friend, former Secretary, and only Lifetime Honorary Member of the Conference, Mr. Ralph W. Smith, is still with us and is quite active with the Bureau's Weights and Measures Library, although he is officially retired.

If my information is correct, Mr. T. A. Seraphin is the only industry representative present at the 1925 meeting who is still active

in the Conference. At that time he was District Supervisor in the Philadelphia Weights and Measures Department and his wife, Ida, was representing the Seraphin Manufacturing Company. One feature of the 18th Conference that made a lasting impression was an address by the Hon. Herbert Hoover, then Secretary of Commerce, who was later to become President of the United States.

Success of Conference.—In my opinion, the National Conference on Weights and Measures is one of the nation's most successful organizations of its type. We might ask, "What is it that has made the Conference an outstanding success?" My answer is that it is the attendance, active participation, and support of State and local weights and measures officers, Federal officials, representatives of business and industry, our colleagues from foreign countries, and the continuous sponsorship of the National Bureau of Standards and the Department of Commerce. I am confident that without the unselfish sponsorship and able leadership of the Bureau, we would not have achieved the success that has been ours.

Meetings Attended.—During my term as Chairman, I have been privileged to attend only two weights and measures conferences. One was the 54th Annual Meeting of the New York State Weights and Measures Association, held in Albany in July 1961. The other was the 16th Annual Meeting of the Southern Weights and Measures Association, held in Atlanta, Georgia in October 1961. Both meetings were excellently planned, and I was glad to participate. I made an informal talk at the New York meeting, and I delivered a prepared address at the Southern meeting. As you would presume, I am an active member of the New York Association, and very happy to have been elected an honorary member of the Southern Association some years ago.

Interim Committee Meetings.—Only one of the standing committees of the Conference held an interim meeting during the year. This was the Committee on Specifications and Tolerances. The meeting was held in Washington on January 29 and 30, 1962. As Chairman of the Conference, I was invited to meet with this committee for which I am very grateful. This has given me the opportunity to become much better informed on the matters which the committee will report to the Conference. I suggest that this practice be continued in the future. I wish to compliment the members of that committee on their serious devotion and untiring efforts, and to personally thank the members of industry and all others who have cooperated so generously with all of our standing committees during the year.

National Weights and Measures Week.—For the fifth consecutive year National Weights and Measures Week was successfully sponsored. This has been the principal project of the Conference Committee on Education. The "Week" received what was probably the widest coverage thus far given it. Much credit is due the Editor of the Scale Journal. The entire January issue of the Journal was devoted to material useful in the promotion of the "Week." Also, we cannot thank our friends in business and industry enough for their constructive assistance. I should like to urge that we make our public education program a continuous year-round project. We have learned what *can* be done during the "Week." Why not take advantage of these opportunities throughout the year?

Publicity and Legislation.—Weights and measures administration has continued to receive much helpful publicity throughout the year.

Congressional hearings, the President's consumer message, and State and local public educational programs have all contributed to a better informed public. Some States and cities have taken advantage of this favorable public sentiment to get improved legislation. Our Secretary will tell us more about these details in his report. I would like to stress just one important point at this time. Although several of our States have been successful in getting the Model Law enacted in recent years, a vast majority of our States remain with rather obsolete and inadequate laws and regulations, and the Council of State Governments has given recognition to this fact and has included mention of the Model Weights and Measures Law in its 1962 program of recommended legislation. I know that it is most difficult for conscientious weights and measures officials to work effectively under antiquated laws and regulations. I implore each of you to give your present laws and regulations your most careful study. Compare your laws and regulations with the Models recommended by this Conference. Determine where they fall short in meeting present day demands. Then set out to get something done about it in your jurisdiction.

Technical Education.—Before closing my talk I wish to mention what I think is one of the most important things taking place in weights and measures circles in this country today. This is the technical training program being sponsored by the National Bureau of Standards. During the past year the Office of Weights and Measures of the Bureau has helped conduct some 11 training schools at the State level and has conducted one school for supervisory officials at the Bureau. As professional weights and measures administrators, we cannot hope to keep up with the rapid technical developments and continue to be capable enforcement officers, unless we adopt effective training programs. Mr. M. W. Jensen and his staff are doing a wonderful job in this area. If you have not organized an effective training program in your State, I urge that you confer with Mr. Jensen at once.

Personal.—I think most of you know that Mr. Bussey and Mr. Jensen were on sick leave last fall. We are glad that they are both well again and here today, serving us as usual. We owe a vote of thanks to their able staffs who carried on so efficiently during that period.

Formal Program.—We are now ready to begin with the formal proceedings of this the 47th National Conference. The plans are all 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 this Conference is now in your hands. With your full participation it will be a success. Without it, our efforts will have been in vain. We plan to start all sessions on time. Please be on time for each session. I implore you, do not wait in the lobby to be urged into the meeting room. All session times are shown in the program. I especially urge all active members of the Conference to remain through the Friday morning session. To all of you, please participate fully throughout the Conference—this is your meeting.

SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 5, 1962

(PAUL DeVRIES, VICE CHAIRMAN, PRESIDING)

ODOMETERS—RENTAL AUTOMOBILES, OFFICIAL CONTROL

By NALLS BERRYMAN, *Director, Division of Standards, Department of Agriculture, State of Florida*

During the height of the tourist season this past winter, we received a vigorous complaint from a Canadian visitor in Miami that he was being charged for appreciably more miles than he actually traveled in a car he rented from a car rental agency.

We had never received a complaint of this nature before, and had made no inspection of odometers. We have not promulgated under our law the Mileage-Measuring Device Code recommended in Handbook 44. However, we realize that the odometer portion of the speedometer assembly on these rental cars was being used commercially, was covered in general by our law, and should be looked into.

This investigation was turned over to the Weights and Measures Section of our Division. A meeting was called in Miami. Present, besides our men, were representatives of three major car rental agencies and a representative of the City of Miami. The Survey Section of the Department of Engineering of the City of Miami established a course of 5 miles and certified to its accuracy. Thirty-six cars were selected at random from the stock of rental cars used by the three rental agencies participating. Each car was driven over the 5-mile course by our inspectors and one City of Miami inspector. Each car was driven up to the starting line, as determined by the left front wheel, the odometer reading was taken, estimating as well as possible to one-hundredth of a mile, and a normal takeoff was made. The car was driven straight along the center line at 30 to 45 miles per hour, according to the speedometer of the car. A normal stop was made at the finish line, as determined by front wheel. The odometer was read again to one-hundredth of a mile and recorded. The complete data for the 36 cars tested are given in the attached table.

The odometers of all cars, except one, overregistered. The results were from -1.0 percent error to +14.0 percent. The average error of the 36 odometers was +3.85 percent. Ten of the 36 tested showed an error of +6.0 percent or more.

After studying these results, we became concerned and did a little investigating. We found that it is the policy of automobile manufacturers to gear the odometers in installing them in cars so that they never underregister. They must always overregister. There may be some exceptions to this policy for special police cars, but evidently rental cars are no exception even though the buyers, and probably the sellers, know that the odometer will be used commercially. We believe this same condition exists over the entire country and not just Florida.

We have come to the conclusion that the odometer as built now could be installed in a car to measure miles more accurately simply by gearing it properly and not purposely gearing it to overregister. The present policy of gearing to overregister violates the Florida weights and measures law and is not in accordance with the Handbook 44 Mileage-Measuring Device Code.

We, in Florida, would like to have the help of this National Conference, other State officials, and the commercial interests involved.

Rental car odometers tested November 28-29, 1961

Car number	Tire size	Tire pressure	Tread depth	Odometer reading		Error	
		(hot temperature)		Start 5 miles	Finish 5 miles	Miles	Percent
		<i>lb</i>	<i>in.</i>				
1			$\frac{9}{32}$	15518.75	15524.15	+0.40	+8.0
2			$\frac{11}{32}$	10.70	15.85	+1.15	+3.0
3	8.00×14	27	$\frac{7}{32}$	1809.67	1814.80	+1.13	+2.6
4	8.00×14	35	$\frac{7}{32}$	1497.75	1502.87	+1.12	+2.4
5	7.50×14	27	$\frac{11}{32}$	214.10	219.25	+1.15	+3.0
6	5.90×15	30	$\frac{11}{32}$	19.70	24.65	-.05	-1.0
7	8.00×14	20	$\frac{10}{32}$	899.70	905.00	+1.30	+6.0
8	6.50×13	27	$\frac{10}{32}$	2559.79	2565.10	+1.31	+6.2
9	6.00×13	25	$\frac{10}{32}$	1023.15	1028.27	+1.12	+2.4
10	8.00×14	29	$\frac{7}{32}$	17130.25	17135.50	+1.25	+5.0
11	7.50×14	33	$\frac{7}{32}$	15055.57	15060.90	+1.33	+6.6
12	7.50×14	30 & 30	$\frac{11}{32}$	102.40	107.55	+1.15	+3.0
13	7.50×14	32 & 34	$\frac{11}{32}$	3091.07	3096.22	+1.15	+3.0
14	7.50×14	32 & 34	$\frac{11}{32}$	28.65	33.80	+1.15	+3.0
15	8.00×14	22 & 30	$\frac{4}{32}$	14749.05	14754.75	+1.70	+14.0
16	7.50×14	31	$\frac{4}{32}$	11112.00	11117.25	+1.25	+0.5
17	7.50×14	30	$\left. \begin{array}{l} (1(R))\frac{11}{32} \\ (1(R)) \text{ slick} \end{array} \right\}$	11030.70	11036.10	+1.40	+8.0
18	6.00×13	29		641.80	646.93	+1.13	+2.6
19	6.00×13	31	$\frac{11}{32}$	645.35	650.45	+1.10	+2.0
20	7.50×14	$\left\{ \begin{array}{l} 34 \text{ \& } 34 \\ 24 \text{ \& } 24 \end{array} \right\}$	$\frac{11}{32}$	24.30	29.50	+1.20	+4.0 (1st)
				29.70	34.90	+1.20	+4.0 (2d)
21	8.00×14	35	$\frac{11}{32}$	40.90	45.99	+1.09	+1.8
22	8.00×14	40	$\frac{11}{32}$	393.67	398.77	+1.10	+2.0
23	7.50×14	30	$\frac{6}{32}$	1138.40	1143.60	+1.20	+4.0
24	7.50×14	18 & 27	$\frac{3}{32}$	26893.10	26898.25	+1.15	+3.0
25	7.50×14	20	$\frac{11}{32}$	837.80	842.90	+1.10	+2.0
26	8.50×14	22	$\frac{11}{32}$	1891.05	1896.07	+1.02	+0.4
27	8.00×14	28	$\frac{11}{32}$	693.55	698.60	+1.05	+1.0
28	8.00×14	36 & 32	$\frac{11}{32}$	1300.38	1305.44	+1.06	+1.2
29	8.20×15	23 & 20	$\frac{11}{32}$	000.00	5.05	+1.05	+1.0
30	8.20×15	22 & 30	$\frac{11}{32}$	000.00	5.05	+1.05	+1.0
31	6.00×15	21 & 18	$\frac{5}{32}$	16376.50	16381.88	+1.38	+7.6
32	7.50×14	23	$\frac{10}{32}$	2420.70	2426.00	+1.30	+6.0
33	7.50×14	27	$\frac{7}{32}$	9911.20	9916.55	+1.35	+7.0
34	6.00×13	27 & 25	$\frac{11}{32}$	185.47	190.62	+1.15	+3.0
35	8.00×14	35	$\frac{11}{32}$	89.17	94.27	+1.10	+2.0
36	6.00×15	30	$\frac{9}{32}$	8573.27	8578.57	+1.30	+6.0

The average error of the 36 cars tested was +3.82 percent.

One car shows -1.0 percent error.

Twenty-two cars with odometer readings of less than 2,000 miles show +2.42 percent average error.

Thirteen cars with odometer readings of more than 2,000 miles show +6.56 percent average error.

ODOMETERS—RENTAL AUTOMOBILES, MECHANICAL CAPABILITIES

By T. J. McCook, *Chief Engineer, Instrument Division, Stewart Warner Corporation, Chicago, Illinois*

The purpose of this report is to explain the factors which affect the accuracy of mileage and speed on standard automobile speedometers.

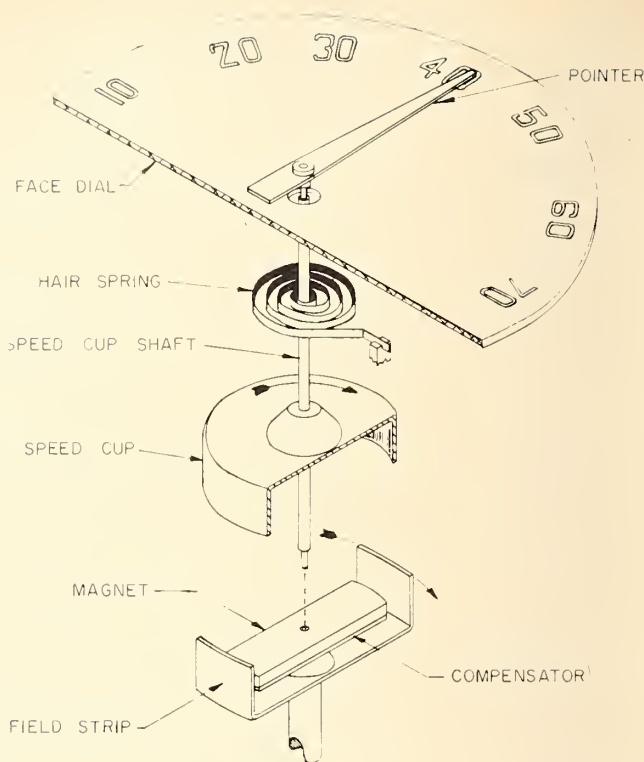


FIGURE 1.

It will explain the theory and practical aspects of this problem so that interested parties will be able to make an intelligent interpretation of speedometer and odometer readings.

The speedometer proper consists of two essential parts:

1. The speedometer, or speed-indicating device, including a face dial and a pointer.

2. The odometer, or mileage-traveled indicator.

While the subject of this discussion is the odometer, a brief review of the speedometer construction may be helpful for a more complete understanding.

The speedometer consists of the following primary operating parts (see fig. 1): (1) Magnet; (2) Field strip; (3) Speed cup; (4) Hair-spring; (5) Speed-cup shaft; (6) Pointer; (7) Facial dial.

The first item mentioned, the magnet, is the heart of the speedometer, because it is the driving element which transfers the mechanical revolutions per minute of the flexible shaft into a type of eddy current torque drive. This is a simple bar magnet with magnetic lines of force traveling from one magnetic pole to another. These flux lines are put to use by collecting and concentrating them through an iron form known as the field strip.

An aluminum speed cup is pivoted directly over the magnet and inside the field strip. As the magnet rotates, the lines of magnetic force cutting through the aluminum speed cup generate small eddy currents of electricity; aluminum is chosen because, in a pure state, it

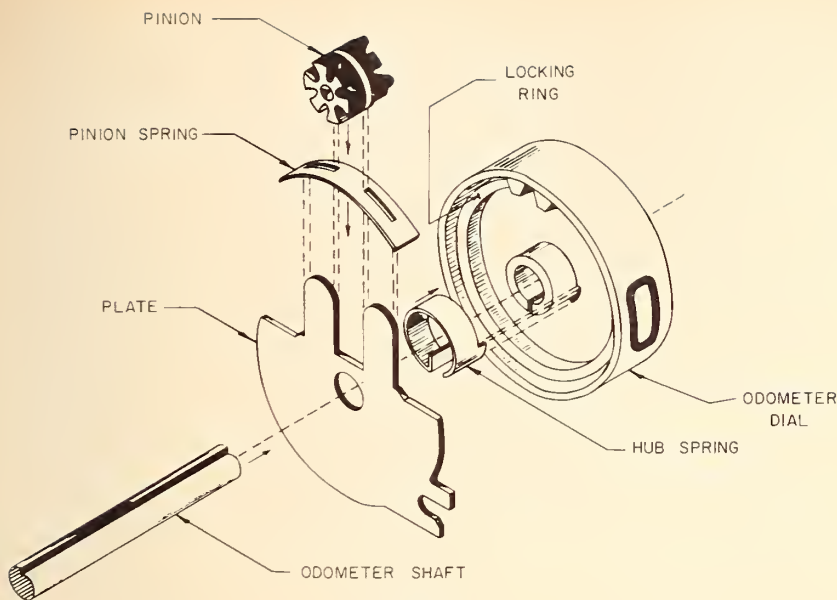


FIGURE 2.

is an excellent electrical conductor. Wherever we have an electrical current, a new magnetic field is formed. It is the reaction of the primary magnetic field and the eddy current magnetic field that creates the driving torque (a rotational twist) on the speed cup in the speedometer. These driving torques are directly proportional to speed. Doubling the speed will increase the torque, the twisting effect on the speed cup, by two. Attached to the speed cup is the speed-cup shaft, a fixed hairspring, and a pointer; the pointer silhouettes against the face dial.

The hairspring resists the force of the magnet on the speed cup and pointer. The force of resistance is also of a linear type; i.e., doubling the angle of twist will double its resistance to further change. We therefore have two opposing direct linear forces which, when balanced, may be read by the pointer against the face dial as an indication of driving speed.

The second part of the speedometer package is the odometer—measuring distance traveled on a numbered set of wheels and normally viewed through a slot in the dial of the speedometer.

The odometer itself consists of a number of gears with a full set of teeth on one side and a single tooth (see fig. 2) on the other. This is a Geneva Type Motion where ten turns of one gear are necessary to make one complete turn of the next gear.

The internal gearing of the speedometer from the magnet shaft to the 1-mile odometer wheel (see fig. 3) has been standardized throughout industry at a ratio of 1,000 to 1. One thousand turns of the magnet shaft will *always* read 1 mile on the odometer. This then sets up our problem; the accuracy of the odometer and the speedometer is predicated on turning the flexible shaft and magnet shaft exactly 1,000 revolutions for every mile the vehicle travels.

We will now work our way through the gear train to illustrate the theory and practical aspects of arriving as closely as possible to the

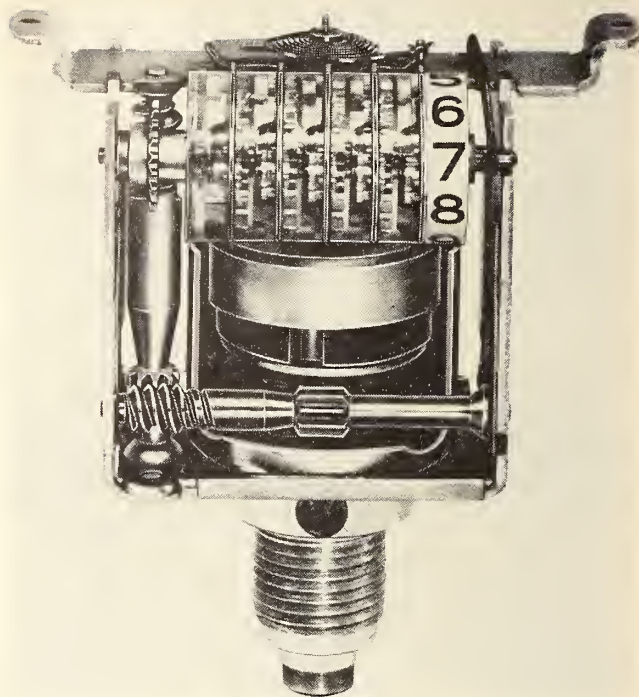


FIGURE 3.

magic number—1,000. The gear train in an automobile (see fig. 4) necessary to give us 1,000 to 1 starts with the tires, goes through the differential to the transmission, continues through the speedometer drive and pinion gears, and is transmitted to the speedometer head by a flexible drive shaft. The table illustrates the selected gearing and axle ratio of some typical automobiles in 1962 production.

Speedometer gears according to transmission type, axle ratio, gear tooth combination, and tires

Trans.	Axle ratio	Tooth comb.	Tires		Speedometer gears					
			Size	rpm	Customer part No.		Stewart Warner part No.		Tooth comb.	Percent error
					Gear	Pinion	Gear	Pinion		
E 25 trans.	4-speed	3.07 $\frac{43}{14}$	15×6.70	753	1552794	1552964	447505	431753	7—16	1.14 fast
		3.31 $\frac{43}{13}$	15×6.70	753	1552794	1552965	447505	431754	7—17	2.63 fast
		3.54 $\frac{46}{13}$	15×6.70	753	1552794	1552966	447505	431755	7—18	3.66 fast
		3.73 $\frac{41}{11}$	15×6.70	753	1552794	1555105	447505	-----	7—19	3.48 fast

The tire and rear axle combination is designed to give the best combination of acceleration, economy, and riding qualities for each particular car, transmission, and powerplant. A nominal figure of

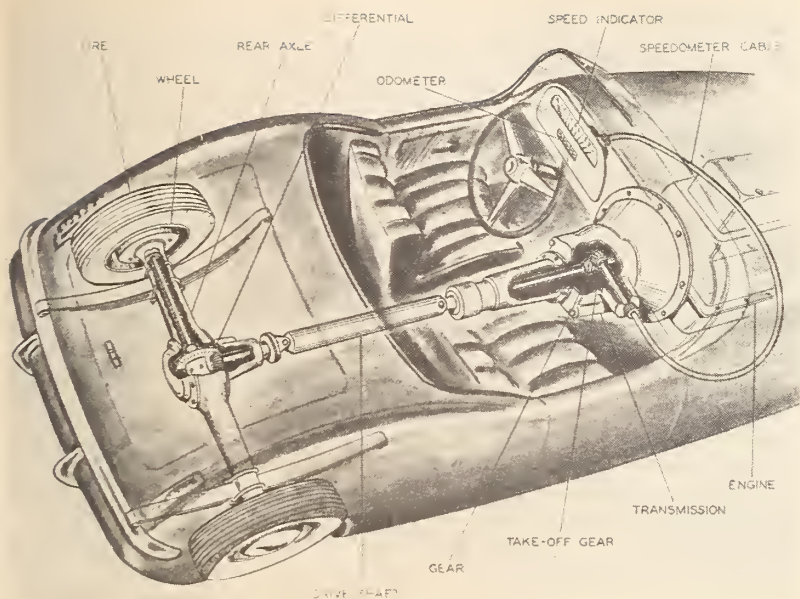


FIGURE 4.

tire revolutions per mile is determined from data supplied by the tire manufacturer. Then, knowing the differential axle ratio, it is possible to calculate accurately the necessary ratio of gearing of the speedometer drive and driven gears to achieve 1,000 revolutions of the flexible shaft per mile.

Here is the start of our problem: it is not always possible to select a gear combination to provide the absolute perfect ratio we previously calculated.

The center distance of the drive gears (see fig. 5) has been predetermined by the transmission housing dimensions, and the number of teeth on the pinion and drive gears (the pitch or number of teeth per inch of diameter) is limited to maintain a tooth size necessary to provide sufficient strength and life.

The absolute perfect gear ratio calculated within the limits of this fixed center distance of the gears and the number of teeth for strength always wind up with a whole number of teeth plus a fractional tooth left over on the pinion: since this is impossible, a selection is made to the nearest whole tooth number practically attainable.

At the present time, the gearing is selected to give a ratio from 1 percent slow to about 5 percent fast.

Next, let us look at the variable factors which enter into our problem and further limit the attainment of a perfect 1,000 to 1 drive train.

The initial driving element is the tire, an elastic member subject to a number of variables caused by manufacturing tolerances, age, wear, and speed. The following variations exist and make an exact solution under all conditions of vehicle use impossible. In the review of these factors, the average effect will be less than the maximum indicated, and some factors will compensate for the error of others.

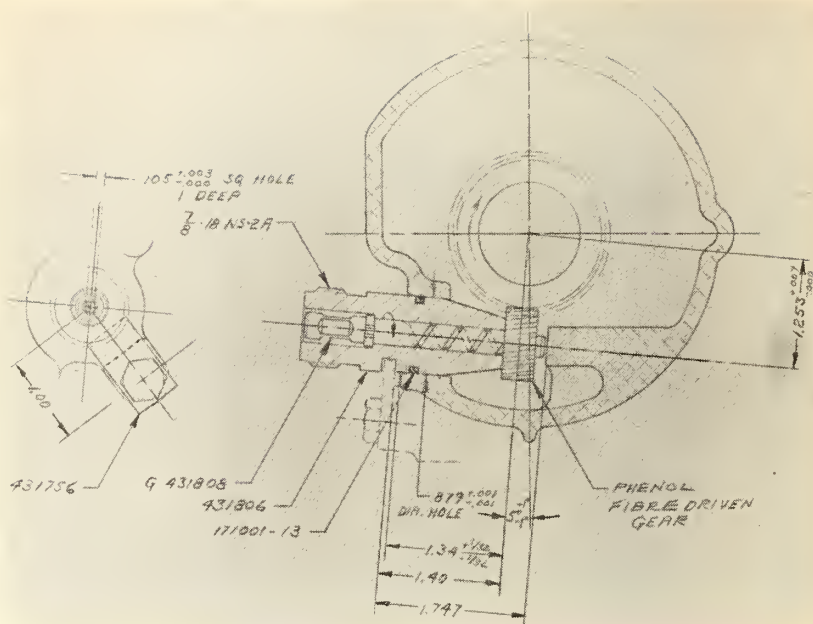


FIGURE 5.

1. The nominal tire revolutions per mile used in the table for the selected size of tire will vary due to manufacturing tolerances and to the differences in materials, tread form, and construction of the same or different manufacturer's tires.

For example: The revolutions per mile will change between a tube type and a tubeless tire; a variation of from 772 to 796 revolutions per mile of various types of the 7:50-14 tire, one of the most popular sizes, is catalog information of one manufacturer. Snow tires will have an even greater effect; their tread is heavier; the use of these larger tires will cause a reduction in mileage readings on the odometer.

2. Inflation pressure above or below the manufacturer's recommendation will similarly affect the mileage read by $\frac{1}{2}$ mile in a 100-mile trip.

3. Variation in ambient or operating temperatures will cause odometer variations due to contraction or expansion of the tire circumference with temperature. A theoretical trip of 100 miles on a hot day might, therefore, register 98 miles, whereas the same trip on a cold day might register 102 miles on the odometer.

4. Tire wear will reduce the rolling radius of the tire. A tire worn to a point where $\frac{1}{16}$ inch of tread remains will have to turn more times per mile than a new tire. This will result in a reading of as high as 103 miles during the theoretical 100-mile trip.

5. A little-known factor on tire behavior is the increase of the diameter of the tire due to age. Neglecting wear, which is a compensating factor, tire growth will cause the odometer to read as much as $1\frac{1}{2}$ miles low in 100 miles.

6. The problem of centrifugal force; an increase in diameter of the tire at progressively higher speed will decrease the reading on the odometer by 1 percent at 60 miles per hour and by 2 percent at 90 miles per hour. The faster we make the 100-mile trip, the lower the odometer reading. All other factors being perfect, we might read 100 miles at 30 mph, 99 miles at 60 mph, and 98 miles if the entire trip were made at 90 miles per hour.

7. An increase of 150 pounds in the car loading will increase the odometer reading by $\frac{1}{2}$ mile in 100 miles. A lightly loaded car will read less than 100 miles; a heavily loaded car will read over 100 miles.

You can see that, with the host of variables to be considered, an exact solution of our gear train problem is impossible. Many factors may be minimized: for example, tires should be maintained at a proper pressure and should be changed at intervals before the wear factor is predominant.

Consideration of these factors from the designer's point of view must always lean toward the high reading size. Remember the speed reading of a speedometer is dependent on the revolutions per minute of the same flexible shaft, and it is not advisable, particularly from a safety and law enforcement point of view, to permit any combination of these plus and minus tolerances to cause the driver to go faster than his speedometer reading.

The question of how close we should try to build in additional accuracy will take some pretty good thinking to answer. I hope this explanation will aid in an understanding of the combination of factors involved.

DISCUSSION ON THE TWO FOREGOING PAPERS

MR. DE VRIES: I wish to compliment both Mr. Berryman and Mr. McCook for their very informative presentations concerning odometers on rental automobiles. Are there any questions?

MR. J. T. KENNEDY: Mr. Berryman, do you believe that there should be a tolerance on overregistration for odometers on rental automobiles?

MR. BERRYMAN: I think these devices should be treated the same as other measuring devices. They must be allowed a tolerance. I think the code should provide an equal tolerance on underregistration and on overregistration.

MR. HOWARD: On taximeters, we do not allow a tolerance on overregistration and it is surprising how accurately they can adjust these devices on the side of underregistration. In our limited number of tests of odometers on rental automobiles, worn tires posed no problem. It has been my observation that rental automobiles are normally equipped with practically new tires.

MR. KALECHMAN: We know that official police speedometers are normally tested and certified by some recognized and competent authority. These speedometers must be accurate. Why can't this same thing be done with odometers on rental automobiles?

MR. MCCOOK: First of all, the certification of a police speedometer verifies only that the speedometer head itself is accurate within plus or minus one mile per hour, at any speed of operation. This certification does not mean that the mileage indication of the odometer is accurate. The odometer does not enter into this certification at all. When a police speedometer is tested for certification, the mileage indication of the odometer is not tested.

A second factor concerning police speedometers is, generally speaking, that they are adjusted to underregister slightly. Police departments do not want speedometers that overregister. When they are actually doing eighty miles per hour, they want their official speedometer to register about seventy-nine miles per hour. With private users, we like the speedometer to read about eighty-two, when you are actually doing eighty miles per hour. The citizen then has this small safety factor. The gearing on police speedometers is the same as that on other automobiles. It is not made special. The speedometer

heads themselves, those that are intended for police service, usually, are calibrated more carefully than other speedometer heads.

The matter of the accurate adjustment or calibration of the speed indication on a speedometer or the mileage indication on an odometer boils down to the general question of cost. The more precise the adjustment, the greater the cost of making the adjustment.

MR. KALECHMAN: We recognize that the courts feel that the public should get the break on speed law enforcement—that is, the speedometers on police cars should be set on the side of underregistration. Should not this same principle of equity prevail in the adjustment of odometers on rental automobiles? It all seems very simple to me and should be easily accomplished.

MR. MCCOOK: The speedometer and the odometer are both driven by the same flexible shaft. The speedometer can be adjusted without affecting the mileage indication of the odometer. The reverse is not true, however. The only adjustment that can be made to the odometer is by changing the gear ratio, which controls the number of revolutions of the flexible shaft, in relation to the distance traveled by the vehicle. When this gear ratio is changed it affects the indications of both the odometer and the speedometer. Since the gears are a fixed thing, we have chosen to go to the side of overregistration—+5 percent to -1 percent.

MR. BERRYMAN: Mr. McCook has made the statement that you cannot use "a fraction of a tooth" in odometer drive gears. One possibility of avoiding this situation would be to have more teeth on the gears. Also, I understood him to indicate that they do not desire to use teeth smaller than those now employed. He did not say that they go to the whole tooth that is nearest to "correct." He says that they always go to the next tooth on the side of overregistration. Regardless of how small the error might be, they always proceed to the next tooth on the high side. I think that this principle is wrong. I feel that this situation can and should be corrected either through the redesign of the regular gears or through the use of gear box adapters that are available.

MR. J. T. KENNEDY: Mr. McCook, in your opinion, what should the tolerance range be for odometers on rental automobiles?

MR. MCCOOK: I would not care to make a recommendation of my own in this area. The Society of Automotive Engineers and others are giving the matter their very careful attention. Personally, I do not feel that the problem is insolvable.

MR. BUSSEY: For the benefit of those who are not thoroughly familiar with the subject of odometers, I should like to point out that the National Conference on Weights and Measures adopted a code of specifications and tolerances covering these devices in 1930, or thirty-two years ago. The tolerance that was adopted at that time remains unchanged today. This tolerance provides for a spread of 5 percent. It is identical with the tolerances provided for taximeters. It allows a 4 percent tolerance on underregistration and a 1 percent tolerance on overregistration, where worn tires are involved.

The basic theory back of the tolerances for odometers and taximeters is that practically every situation that arises in the normal operation of these devices results in an error of overregistration. Only a very few extreme situations might result in an error of underregis-

tration. Furthermore, the rates that are usually collected over these devices are on a "prepaid" basis. This is, the customer is charged so much "per mile" or fraction thereof on odometers and so much "per money drop," or fraction thereof, on taximeters. It was the consensus of weights and measures officials in the very beginning that, since the customer gets none of these breaks, the tolerance should be on the side of underregistration only, except in the case of worn tires.

I do not know of any case of hardship or real serious objection to these tolerances as they apply to taximeters. In addition to weights and measures officials, both taximeter manufacturers and users have been given the opportunity to participate in the development and periodic review of these tolerances.

The specifications and tolerances in the Mileage Measuring Device Code have been enforced in a number of jurisdictions for quite a few years. According to all reports, the requirements have proven both practical and satisfactory. In so far as I am aware, no single jurisdiction in the United States has actually made any organized effort to enforce these requirements in so far as odometers on rental automobiles are concerned. Only recently have a few weights and measures officials begun to take serious interest in this matter. As has been reported to you today, a limited number of tests have been made and others are now in the process.

We have heard ratios, gear teeth, and fractions of gear teeth mentioned in this discussion. I have been reliably informed that there is such a thing as a correction gear box commercially available that will correct for these differences in ratio and that it is common practice to use these correction gears in the adjustment of taximeters. Undoubtedly, these correction gears could be used, if necessary, in the adjustment of odometers on rental automobiles.

MR. J. T. KENNEDY: Mr. Bussey has stated that we now have a 5 percent spread in the tolerances for odometers. This is true when you go from 4 percent underregistration to 1 percent overregistration, where worn tires are involved. I do not consider this a spread. I contend that the spread should provide equal amounts on underregistration and on overregistration. This is done in the case of gasoline pumps and scales, why not do the same thing on odometers?

MR. KEHM: I want to make two brief comments about odometer accuracy. My only feeling is this matter of spread is pretty well fixed for a commercial passenger car, the 5 percent spread we are talking about. This spread could be on the low side; it could be on the high side; it could be split right down the middle. (This is at the discretion of the automobile manufacturer.)

There is one thing I might offer as a suggestion. There is always a possibility of requiring an odometer "correction factor" that could be supplied for any particular make of car (used for rental). This would take into consideration at least the fixed part of the gear train that has to do with the axle ratio, transmission adapter, and the tire size used. For any given make of car this would reduce the total error (by applying the correction factor. *Example:* Odometer reading \times correction factor = true reading). It would not take into consideration tire wear, tire loading, tire inflation.

PROGRESS IN THE MEASUREMENT OF MILK

By D. R. MACKAY, *Engineer, Office of Weights and Measures,
National Bureau of Standards*

Background Information

Accurate measurement of the fluid product long has been of serious concern to technologists of the milk processing industry. For a number of years liquid meters have been used at various points of the liquid flow in the plant, but, since in-plant measurements do not relate to the buying or selling of the product, such meters have not been of concern to weights and measures officials.

A number of meter manufacturers in the United States have shown interest in milk meters and a few have even manufactured sanitary meters specifically for the milk industry, but apparently none has directed a major research and developmental effort toward solving the problems involved in obtaining accurate, repeatable performance under the varying conditions that exist in milk metering operations. A German firm, however, has produced for a number of years a sanitary meter specifically designed and marketed for measuring milk. Many of these meters are being used in the United States for measuring and controlling "in-plant" flow of milk.

With the tremendous increase in the number of farm milk tanks and the consequent increase in tank-truck delivery to the plant, milk marketers have attempted to check-measure the flow of milk into the plant. Thus, the milk plant managers, realizing that the legal source of their receipt information is on the farm, two operations removed from their plants, have turned to milk meters to measure milk intake. Records from such installations, when compared with the receipts obtained by the tank truck drivers for milk actually picked up from farm tanks, have indicated that differences do occur. These differences have, in turn, precipitated a very serious interest on the part of milk plant managers in obtaining legal acceptance of their milk-meter measurements.

Official Concern

It is at this point that the weights and measures officials have become concerned with the problems of milk meters. Since in most instances where a milk intake meter is being used, it is measuring an accumulation of product that already has been commercially measured on each of the several producing farms and then picked up by the tank truck; accordingly, the intake meter measurement could be accepted by the weights and measures officer as the basis for payment only after a clear agreement has been reached by the seller and the buyer as to such commercial use of the meter.

With only that very brief statement of the rather complicated legal ramifications, the purpose of this discussion will be to explore the examination of a specific milk-metering system designed for a fixed location in a dairy plant.

The design of a metering system for milk and the design of the official examination procedure for such a system both are unique. The equipment necessary for the test is special, and the test itself is a complicated one. There is involved a fairly sizable technical effort based upon knowledge of the measuring system and familiarity

with code requirements. This, of course, is true of many examinations of prototype equipment.

It was because of urgent requests from a producer's cooperative and a dairy processing plant and because of the highly technical nature of the investigation that the States of Maryland and Virginia in July of 1961 requested the National Bureau of Standards to undertake the examination of a specific milk meter—the German-made Siemens sanitary meter—in measuring milk being received at a plant.

The Bureau agreed to undertake the examination of this meter for three reasons: (1) the obvious need for a meter which could accurately measure the flow of milk, (2) the large number of meters being used in milk plants, and (3) the Bureau had been assured by the meter manufacturer's representative that the metering system was so designed and constructed as to provide the accuracy required for commercial measurement of milk flows.

The Examination

The examination of the meter was discussed with measurement experts of the Bureau's Metrology Division, and during the test, assistance was rendered by Blayne Keysar of the Volumetry and Densimetry Section of that Division.

The actual examination, planned to be objective and comprehensive as well as critical and accurate, was undertaken in two separate phases—inspection and testing—both phases being characteristic of an examination of any prototype equipment.

Inspection. The inspection was preceded by a thorough study of all information available from the manufacturer, including the principles of design, the engineering specifications, the performance characteristics, and installation and operational requirements. Thus there was developed background information permitting intelligent analysis of the device, its measurement capabilities, and its limitations. From this study there were determined such additional factors as possible applications of this device, critical functions and components, operational factors, and conditions that might affect the device in service.

The actual inspection procedure also was preceded by a thorough review of the General and Specific Code requirements of NBS Handbook 44 for such measuring equipment. There was determined from such a review all of the applicable specifications, regulations, and performance requirements.

Testing. The testing of the device also was preceded by a technical study and analysis of the appropriate chapters of National Bureau of Standards Handbook 45, *Testing of Measuring Equipment*, which provided information concerning the equipment requirements as well as the general plan of the tests.

Equipment. The physical standard that was selected for the evaluation of the performance of the meter was a gage-glass type prover with a Seraphin gage and a capacity of 100 gallons, since the meter had a maximum flow rate of 87 gallons per minute. It was also decided that a 50-gallon prover should be available for use for certain special tests, and that 1- and 5-gallon test measures should be available if required for the "topping-off" of any test runs.

Other items of equipment deemed necessary included a stopwatch for flow-rate determinations, a spirit level, a mercury-in-glass ther-

mometer for milk temperatures, and data sheets for recording all appropriate test information.

The accessory equipment that was incorporated in the metering system included an air eliminator, a sanitary pump, a back pressure valve with a pressure gage and built-in check valve, and a flow-control valve. This equipment was supplied by the local dairy or the meter distributor.

General Plan. Since the meter under test could be used with either of two types of pumps, a positive displacement pump and a centrifugal pump, and with two types of air eliminators, one for positive displacement pumps and one for centrifugal pumps, it was decided that the test plan would have to involve all four combinations of pumps and air eliminators.

Further, it was determined that the tests would have to be made with milk actually being unloaded from the tank trucks at the dairy receiving facility. Tests using water as the testing medium would also be necessary to compare test results using water with results from duplicate tests using milk. These tests would provide information regarding the feasibility of recommending to State and local officials the substitution of water for milk as a testing medium for milk meters.

Also, it was decided that various tank trucks with different drainage characteristics, various flow rates, as well as various back pressures would have to be involved in the tests to provide a thorough evaluation of the metering system.

Finally, it was recognized that since the terminal flow conditions would probably provide the greatest meter errors, special tests, such as air-eliminator tests, would have to be conducted in order to evaluate the accuracy of the metering system in measuring the milk during the final drainage of a tank truck.

The actual testing plan was designed to be completely flexible so that the preliminary findings could be used as a basis for pursuing certain aspects to greater depths.

Specific Details

Equipment. The meter used in these tests was a Siemens Sanitary flow meter, type MRP5, with a maximum flow rate of 87 gallons per minute. The meter had inlet and outlet connections sized for 2-inch sanitary piping. The two air eliminators used during the course of these tests were Chicago Stainless Models "C" for centrifugal pumps and "P" for positive displacement pumps. The centrifugal pump used during the tests had a capability of approximately 90 gallons per minute against a 35 psi back pressure; the positive displacement pump had a capability of approximately 60 gallons per minute against the 35 psi back pressure.

Installation. The equipment was installed so that the milk flowed from the tank truck through a 20-foot section of 3-inch diameter transparent plastic hose to the pump, which was located on the receiving room floor. The milk then flowed through 2-inch diameter stainless steel piping up to the air eliminator and then to the meter which was mounted on a steel stand approximately 3 feet above the pump. On the discharge side of the meter the milk flowed through the back pressure valve, the control valve, and finally through a section of 2-inch plastic hose into the 100-gallon prover. Special accessory equipment as well as modified test procedures were utilized to control milk flow.

Procedures. All equipment, lines, and hoses were washed, rinsed, and sanitized before each day's tests. Each of the provers was leveled in place before being used. All tests were started with a full supply of milk in the line to the pump. The control valve was slowly opened after the pump was started to prevent excessive foam during the initial surge. The flow rate determination was made during the 30 seconds following a meter indication of 10 gallons. At approximately 90 gallons, the control valve was slowly closed and, when the meter registered 100 gallons, the valve was completely closed.

Prover readings were delayed at least 60 seconds after milk flow into the prover was terminated, since it was found that the liquid level in the prover settled slightly during the first minute after closing the control valve due to foam rising to the surface of the milk. The prover was allowed to drain for 30 seconds after the main flow ceased during the emptying operation.

Tests. Tests were conducted at various flow rates using the two types of pumps and the two types of air eliminators in all four combinations, and were conducted using milk from various tank trucks unloading at the dairy plant. In each case two types of tests were conducted. They were categorized as "normal" tests and "special" tests. In the normal tests, the milk was metered into the prover under full-flow conditions. The special tests, which were designed specifically to reproduce the final emptying conditions of the vehicle tanks were started with approximately 90 gallons of milk left in the truck tank, and in each case the test was continued until the tank was emptied completely. Milk was then added to the prover from the 1-gallon and 5-gallon test measures to obtain a prover reading of approximately 100 gallons. By extrapolation, the meter error was calculated, based on an indicated 100-gallon run.

Another series of tests was conducted to study the repeatability of the meter in measuring milk under similar full-flow conditions. In these, cold milk from a 5000-gallon holding tank in the milk plant was used, the milk being metered from the 100-gallon prover into the 50-gallon prover. Water was substituted for milk under these same test conditions to study the feasibility of using water as a testing medium.

A second special test was devised to obtain repeated terminal flow conditions with a single tank truck. This test was conducted by placing the 50-gallon prover over the manhole on the top of the tank and using this smaller prover as the source for milk to complete a test run started from the single-compartment tank with approximately 90 gallons of milk in the tank at the start of the test. The 90 gallons was metered into the 100-gallon prover, emptying the tank completely; then, 50 gallons from the smaller prover was allowed to flow in the truck tank to provide sufficient milk to complete the test without further introduction of air into the tank discharge line.

Test Results

Normal Tests. The results of the normal tests, those in which the milk moved through the system under full-flow conditions with no introduction of air into the system, indicate that the meter was capable of providing fairly accurate and repeatable results in measuring milk flows. When the centrifugal pump was used errors ranged from underregistration of 0.12 gallons (27 cubic inches) to overregistration of

0.63 gallon (145 cubic inches). With the positive displacement pump, the errors varied from an overregistration of 0.18 gallon (42 cubic inches) to an overregistration of 0.63 gallon (145 cubic inches).

"Special" Tests The results of the special tests, which were devised specifically to evaluate the effectiveness of the air eliminator, indicated that the meter measured milk foam produced by either pump, using either of the air eliminators. When the meter was used with the centrifugal pump, the overregistration errors varied from 0.5 gallon to 4.6 gallons, based on tests involving 100 indicated gallons. When used with the positive displacement pump, overregistration errors of up to 12.8 gallons were encountered.

The results of the tests in which water was substituted for milk lead to the conclusion that water cannot be used as a substitute for milk, especially in the special tests, as the foaming characteristics of the two liquids are entirely different.

The test results also indicated that a number of tank trucks must be used in evaluating the accuracy of a milk meter because of the extreme variations in the drainage characteristics of various trucks.

Conclusions. The tests seemed to indicate that the meter was capable of measuring an airless supply of fluid milk, under certain circumstances, within the tolerances of the present code for liquid measuring devices. However, the special tests proved that the meter measured foam produced by both pumps in the tests involving the emptying of the truck tanks. Neither air eliminator demonstrated the ability to remove the air incorporated in the milk during these emptying conditions, and especially with the positive-displacement pump. Thus, the results of these tests indicate that the metering system tested might be completely satisfactory for in-plant use, but it could not be approved by weights and measures officials for commercial use.

Tank Truck Meters

The increased use of meters in measuring milk flows into receiving plants has also been accompanied by an increased interest in the use of a tank truck-mounted meter to measure both the milk picked up on the farms and the milk delivered at the plant. Such a truck-mounted meter would provide two distinct advantages. First, it would eliminate the critical and often troublesome requirements pertaining to the use of farm milk tanks as measuring devices: requirements concerning wall strength, horizontal cross-sectional area, installation, and level condition. Second, a single truck-mounted meter would be more easily controlled by the weights and measures official than the many farm milk tanks serviced by the single truck.

The development of a tank-truck metering system is currently being investigated by the Dairy Science Department of the Pennsylvania State University. Edward Glass, a graduate student in Dairy Manufacturing, is using a Siemens meter mounted in the rear compartment of a milk-tank truck which is used by the Penn State creamery to pick up milk from various dairy farms near the campus. Mr. Glass has made a number of modifications in the air-elimination system and has employed a new type sanitary pump in an effort to improve the accuracy of the meter. The results to date are encouraging, but not conclusive. The Pennsylvania Bureau of Weights and Measures is working closely with Mr. Glass in evaluating the accuracy of the sys-

tem. The Office of Weights and Measures of the National Bureau of Standards is also providing assistance and advice on the project upon request.

Future Plans

In an effort to assist State weights and measures officials in examining milk meters for compliance with the requirements of Handbook 44, the Office of Weights and Measures is preparing a fairly detailed test procedure outline which will include recommendations for conducting an adequate test of a meter.

The Office of Weights and Measures is also procuring a 100-gallon stainless steel prover specifically designed for milk meter testing. This prover will incorporate such features as 2-cubic inch graduations on a 300-cubic inch scale, two built-in spirit levels, three stainless steel ball feet with screw adjustment legs, four handles for convenience in moving, and an overall height of only 5 feet. This prover will facilitate the future testing of milk meters.

As in the case of all special commercial weighing and measuring equipment, the Office of Weights and Measures will attempt to provide all possible technical aid and assistance to those involved in the development or examination of such equipment.

DISCUSSION OF FOREGOING PAPER

MR. BERRYMAN: Will the prover proposed by the Bureau conform to sanitary requirements?

MR. MACKAY: Sanitary considerations provided for in the design of the prover include the type of stainless steel that is required for milk handling equipment, and the No. 4 finish.

MR. BERRYMAN: In applying either the Code for Liquid-Measuring Devices or the Code for Vehicle Tanks to milk meters, how can the inspector reconcile the "sealability" requirement with the milk-meter design and sanitary requirement, both of which provide for daily disassembly?

MR. MACKAY: We realize certain design requirements of the sanitary meters do conflict with the present code requirements. The Office of Weights and Measures will study this situation.

MR. BERRYMAN: Have you decided whether the tolerance for a liquid measuring device can be applied to any milk meter?

MR. MACKAY: Since this is presently the only tolerance for liquid-measuring devices of this type, a manufacturer must attempt to comply with this tolerance. Under full flow conditions, many of our test results were within Handbook 44 tolerances. In the special tests the ineffectiveness of the air eliminator caused overregistration in amounts greater than the tolerances prescribed.

SOME EXPERIENCES IN TYPE APPROVAL

By R. W. MacLEAN, *Director, Standards Branch, Department of Trade and Commerce, Canada*

When I was invited to speak on the question of approvals I queried the propriety of speaking about a subject on which I am aware there is some difference of opinion. However, I am a firm believer that a proper decision can only be made when all facets have been fully explored, and if anything I say can add to the sum of knowledge on

which such a decision can be made, then my remarks will have served their purpose. I would stress that a decision of this sort must rest with the country concerned, having regard to its own requirements and the objectives it seeks for maintenance of measurement standards at all levels of business activity. The fundamental aim in my view is that we should never for a moment point for anything but the best, and this regardless of the mechanics which are at our disposal. That this objective is widely endorsed is evidenced by the holding of your National Conferences, and the quite apparent strengthening of programmes in all countries of the world.

Those of you who were present on previous occasions when I had the pleasure of being a participant in your meetings will recall that Canada operates under a centralized system. This stems from our Constitution, which reserved the field of weights and measures to Federal jurisdiction. If it were now suggested that we adopt an alternative, all levels of interest would give it the considered study which you are now extending to this most important aspect of measurement. One does not heedlessly throw away something which works well for something which is untried. In addition to the constitutional responsibility in this field, Canadian application of "weights and measures" is broad. It extends to the increasingly complex fields of gas and electricity distribution. We thus operate in two additional areas which multiply our problems. However, it does give a broad perspective of measurement and this we find increasingly useful where products can be measured by more than one method. One example comes quickly to mind and this is the distribution of propane. In the main this is sold in cylinders by weight, or by volume as a liquid under pressure. However, in some circumstances it may be economically advantageous to deliver to storage from where it is subsequently metered as a gas through the conventional bellows-type meter. Therefore, in a new application we can draw on our experience in an established method to help produce a balanced result. Too, the increasing trend to electronic computation and totalization requires greater staff skills. In electricity distribution this method of recording has been in use for a considerable period, and our experience here is immediately available in its gradual extension into the general weights and measures field. Electricity telemetering is not too far removed from the new application of key-type metering of petroleum which is now engaging our attention. Further, our experience in orifice metering of natural gas gives a good base on which to build our experience in the introduction of "pipe-provers" for large volume petroleum deliveries.

Personally I have never been too happy with the expression "type approval." I say this for the words do not clearly express our objectives, and in themselves have come to be regarded as a system of rigidity. Therefore I think a lot of smoke could be blown away if we could adopt a better term. In Canada what we are endeavouring to achieve is two-fold: one, that a device is suitably designed and constructed for the service for which it is intended; and two, that in service it will perform adequately and repetitively within the limits of accuracy prescribed for it. For these specifications must exist, and an examination of a device to ensure compliance is, in effect, approval of that device. Therefore regardless of the origin of such specifications, be they mandatory or voluntary, if a device meets their requirements upon inspection, it is in essence approved. Therefore

I believe in all jurisdictions we do have "type approval." The sole question to be resolved therefore is who should "bell the cat." If the sole test was accuracy at the time of inspection, then perhaps a good case could be made for the judgment of staff at the field level. However, technology has taken us far beyond the once easy determination of accuracy. When volume was first determined by static standards, a field inspector could give assurance that measures met approved requirements and that because of the rigidity and stability of most such devices they would likely remain constant throughout an inspection period. Can he do so today even with such commonplace items as tank trucks with meters, complicated piping arrangements, air eliminators, and inter-compartment check valves? True—a one-test run might check out on accuracy, but does this ensure repeatability over an inspection period? More important, what if by unfamiliarity he rejects a device when he does test, when in fact the device is perfectly satisfactory? I cannot help but feel that without the guide lines of an approval and a standardized method of test, the time losses and duplication of effort entailed by individual inspection at the field level could be staggering.

Returning to the hypothesis of a change from our present system, there are certain fundamental questions which we would ask. Perhaps, for clarity, I might number some of these with a few examples of the problems inherent in such a change:

1. Regardless of how elementary specifications might be, and how carefully they were explained, is there a reasonable assurance that all inspections at the field level would produce acceptance or rejection on comparable inspection?

2. Canada imports a large quantity of its measuring equipment from the United States and other countries which has been manufactured to specifications different from our own. Would there be reasonable assurance of equal treatment across the country?

3. I think it fair to say that field inspection can only record the performance of a device under the ambient conditions prevailing at the time of test. As these conditions vary across the breadth of the country, and indeed over the course of a year, can a field inspector assess capability under all expected operating conditions?

4. I think we have all encountered new equipment which has some undetermined "bug" regardless of the efficiency of production. Could we rely on field staff to uncover these and ensure correction before unlimited sale and use?

5. What happens when installations involving considerable capital are made and when upon inspection the devices included in such installations do not perform? I have in mind the small liquid meter presently being considered in the distribution of fuel oil to residential consumers from bulk storage to replace tank truck delivery. As you know, these are designed for small intermittent flows. The meter is, of course, the integral part of the installation. In large subdivisions the contractor's investment could be substantial. In light of the consumer's right to accurate measurement, and to forestall later grief including possible complete replacement of the installation, it would appear that all are better served if the meter to be used is pre-tested under simulated operating conditions. To do otherwise would present a field inspector with an almost impossible situation—not only how to test adequately, but how to test at all. We therefore have set these meters up in actual operating series—low flows under pressure, lengthy and intermittent use, and in completed tests have judged the meter on an actual use flow of two years. At the same time we are developing the methods of inspection for the field staff.

6. Is it fair to field staff to place them in a position of having to inspect equipment which they have not previously seen, may not understand, and have little or no guidance as to how to inspect or how best to inspect?

7. There are certain devices which by their nature are designed for restricted uses. Is there value in having the governing factors carefully delineated and known before installation?

8. Is the manufacturing community better assisted by a system which provides a clearing house for equipment before sale and installation than by one which defers this inspection until equipment is in use? If I may cite an example, we were recently asked to approve a flowmeter which had been in use for internal control of measurement. Under test the meter as submitted would not meet the required field tolerances. Our staff were able to determine the cause of error, and with a modification the manufacturer quickly produced a satisfactory instrument. Now if the same instrument had been introduced directly into the field, it would, on the standard test procedures, have been uniformly rejected across the country. Too, it is quite unlikely from a field inspector's experience, or in the time available to him, that he could have indicated to the manufacturer the source of the trouble.

9. Finally, does technological advance preclude field staff from doing an adequate job on their own initiative and without specialized guidance? One here must give credit to industry for its ingenuity. By and large first-rate instruments are being produced in ever-increasing numbers and in novel applications. To keep abreast our engineering staff are forever "on the hop," and while I could be mistaken, without their assistance, our field staff would be placed in a most unhappy situation.

The criteria we in Canada have set and endeavoured to maintain have the following bases: A device must be capable of performing with reasonable accuracy over the range of conditions which it might be expected to meet in service, and it should do this over a span of load suitable to the intended service. A device should be capable of operating satisfactorily for at least one inspection period. It should be so marked that it is properly and uniquely identified as to its type and working range. It should be so designed that it cannot be readily mis-adjusted with intent or by accident. It should be amenable to field testing. Put in its simplest terms, the basic question is, can a field inspector assure these criteria?

Having posed these questions, and there perhaps might be others, I offer no particular conclusion. We in Canada are contemplating no change and will continue as in the past. I indicated earlier that the term "type approval" conveyed rigidity and stringent control. In actual operation this is not the situation. While the ground rules are enforced stringently, I like to think they are done fairly. The ground rules were established with the cooperation and agreement of the manufacturing community. Too, these rules are continually and co-operatively under review to ensure that so far as possible the practical and common-sense approach is taken. The specifications which form a part of the ground rules are not intended to restrict initiative or design. We endeavour, with a manufacturer's help, to test as few devices as we can reasonably do. Where it can be demonstrated that devices are of the same general type, but differing in capacity or in minor detail, we can limit testing. Similarly, modifications to existing devices can be OK'd without test if changes are minor. In certain circumstances we accept the manufacturer's test data or that of independent laboratories. We are prepared to witness-test in the manufacturer's plant or at the user's installation. Finally, an appeal to the head of the department may be launched on any decision taken by the Service.

For our part I believe the procedures have worked well, but as I indicated, special considerations led to the creation of the system as it

exists. Whether the same considerations apply or the system would be of value elsewhere is a matter of national judgment.

INTRODUCTION OF MR. MITSUO TAMANO BY H. S. PEISER, NATIONAL BUREAU OF STANDARDS

I regard it as a great honor to welcome to this Conference a most distinguished weights and measures official from abroad, who looks upon his attendance here as the culmination of a long-felt hope coupled with great admiration and expectancy for this meeting.

Mr. Mitsuo Tamano was born in the Gifu Prefecture of Japan. As a physics student of exceptional promise, he won one of the cherished places at the Tokyo Imperial University, where in 1926 he graduated and immediately won a research assistantship in the Aeronautical Research Institute of that University. In that period, Mr. Tamano gained fame for his careful measurement of high-speed air motion in wind tunnels.

In 1940, he transferred to the then Central Inspection Institute of Weights and Measures in Japan; and only ten years later was made Director of that Institute. I had the great pleasure and privilege of visiting Mr. Tamano last year just after his Institute had changed its name to "National Research Laboratory of Metrology."

I came to know him there as a most gracious host and, above all, as a leader of about 160 physicists and engineers with additional supporting staff. I have come to admire the atmosphere of honest devotion and modest integrity which prevails at his Institute. Mr. Tamano has had many honors bestowed on him and has fulfilled many responsibilities. I will mention just two, which are of special interest at this Conference. Firstly, he is a member of the International Committee of Legal Metrology; and, secondly, he is the chairman of the Executive Committee of the Metric System Promoting Committee of Japan.

Mr. Chairman, may I therefore call upon this assembled Conference sincerely to applaud in our welcome of Mr. Mitsuo Tamano, a very fine physicist, a friend of us all here, and a truly great public servant in his country.

JAPAN'S TRANSITION TO THE METRIC SYSTEM

By MITSUO TAMANO, *Director, National Research Laboratory of Metrology, Tokyo, Japan*

It is a great honor for me to have been invited to this Conference and to have an opportunity to speak to you. I would like to report today on the recent transition to the metric system in Japan. The main reason why I chose this subject is that Japan, as a nation which has converted its confused measuring systems to the metric one, has a great interest in the advancement of the metric system in the United States. I think my brief address might give you further information useful in your examination of the adoption of the metric system.

The weights and measures in all of Japan have been regulated by one law. This law, the "Measurement Law" we call it, controls various kinds of measuring instruments and devices when these are manufactured, repaired, and sold. At the same time, the "Measurement Law" establishes the legal measuring units and, in commercial transactions

and certifications, only these units are permitted. Since January 1, 1959, the metric system has been the unique measuring system authorized in Japan. Of course, there are some exceptions in the period of transition in which units of nonmetric systems can be used, as well as the metric ones. I will discuss these exceptions later.

First I will give you a brief history of the advancement of the metric system in Japan. It was in 1891 that the regulations of weights and measures were established for the first time in the form of law. Six years earlier, Japan had already decided to sign the Treaty of the Meter, and the Treaty had been enacted in 1886. In 1890, Japan received the prototype meter and kilogram from the International Bureau of Weights and Measures in accordance with the Treaty.

In the law of 1891, the traditional measuring units "shaku" and "kan" were taken as the fundamental units. At the same time, in this law the use of the metric system was approved, and the conversion factors between these two systems were also fixed. This law came into effect in 1893, the same year in which your country approved the use of the metric system and defined the yard and pound in terms of the meter and kilogram.

Since then, there have been several amendments in this old law, and in 1909 the units of the foot-pound system were adopted also as legal. So, since 1909, Japan had three measuring systems approved as legal. The actual measurements became more and more complicated and troublesome, and a desire to unify these measuring units arose.

In 1919, the Ministry of Agriculture and Commerce set up a Committee for Weights and Measures and Industrial Standards to investigate which measuring system was to be adopted in Japan and to study procedures for pushing the plan.

According to the advice of the committee, the Ministry decided to revise the old law and prepared a bill in which the metric system was taken as the unique measuring system. The bill passed the Diet in March 1921, and the revised law was promulgated in April of the same year. The date of enforcement of this law fixed by the Imperial Ordinance was July 1, 1924. But in the same Imperial Ordinance, the use of measuring units other than those of the metric system was also permitted as a transitional measure.

The compulsory changeover to the metric system was to take place in two steps. In the first step, government offices, public services, and other leading industries were required to change their system to the metric one in 10 years. In the second step, all actives and enterprises other than those mentioned were required to convert during the second decade.

With these legislative arrangements, various preparative actions for the changeover to the metric system started. In education or public services such as railroads, postal services, gas, and city water, in which the changeover was possible by administrative directive, the conversion to the metric system began gradually. The promotion in this area was carried out positively with the aid of the national and local governments and the Japanese Weights and Measures Association. The preparation for the changeover proceeded rather smoothly at the beginning. But as the date of legislative compulsory changeover drew near, the opposition gradually became large. The opponents of the metric system believed that the adoption of a foreign measuring system

would have a bad influence on the national sentiment, cause dislocations in the public life and needless expense of the nation, prove disadvantageous for foreign trade, and hurt the national language and classics. They claimed that the 1921 law had been made while the nation did not fully realize its consequences. At that period Japan had a very difficult time in foreign affairs, nationalism became powerful throughout Japan, and the opposition to the changeover became furious beyond all reason.

On the other side, the preparations in the official services and leading industries were not sufficient for the complete changeover, so in 1933, just one year before the compulsory changeover specified for the first group, the government postponed the date of conversion another 5 years for the first group and 10 years for the second group.

This resulted in the disappointment of those concerned with promoting the changeover to the metric system. A second postponement followed the first postponement. After the first postponement, the oppositions to the metric system became more and more strong. Pressed by these oppositions, the Investigating Committee for Weights and Measures System, newly organized in the government, advised in 1938 that the "Shaku-Kan" system should be adopted as well as the metric one.

Thus, the intention of the 1921 law of adopting the metric system as unique was largely changed. The Imperial Ordinance was revised in 1939. This revision did not exactly follow the committee advice, but it allowed customary units to be used in special cases indefinitely; that is, for special historical objects, houses, or treasures. Real estate and houses were allowed the customary units for the time being. The compulsory enforcement of the other items was postponed until December 31, 1958. But in spite of these obstacles, the state textbooks in primary school had been adopting the metric system since 1925. In Japan, primary school education is compulsory, so at the time of present changeover in 1959 the persons who were not over 40 years old had been educated under the metric system. The number of these—the "metric population," if I may so call them—amounted to 56 million; that means 63 percent of the whole nation. Thus, almost all of the people had come to know the metric system regardless of what they used in their daily life.

The defeat of our country in 1945 brought considerable confusion in many respects because of the shortage in living necessities. But as the recovery proceeded, the economic activities gradually grew larger, and measuring instruments lost during the war were needed. It was just in this period that we could unify our confused systems to the metric one, but unfortunately our leadership for the unification and promotion among the nation was not strong enough to push the idea. We really regret that we lost our most suitable chance at that time. After the war, foreign armies and their families came and stayed in our country, and many materials for economic rehabilitation were imported from America or England. Because of this, the use of the foot-pound system in our country gradually increased. Materials previously sold in the metric system changed their indications to the foot-pound system—for example, gasoline from liter to gallon, cloths from meter to yard. Again we came to use a mixture of the three systems, Shaku-Kan, foot-pound, and meter-kilogram.

Meanwhile, there arose the necessity to revise the old weights and measures law completely, because it had become partly out of date. In the deliberation of the revision of the old law, the committee members agreed unanimously to unify the confused system to the metric one. It was very fortunate that the leaders of the occupation armies also believed that it was reasonable to adopt the metric system that had already spread widely in Japan.

The new "Measurement Law" passed the Diet in 1951, was promulgated in June, and enforced on March 1, 1952.

The measuring units in this new law were based on the metric system, and the use of the Shaku-Kan and foot-pound systems were allowed transitionally with some exceptions until December 31, 1958, the same date set by the old law after the postponement as the compulsory conversion day.

There was no serious opposition to this bill in the Diet. However, promotion activities were not undertaken immediately, as there was thought to be ample time before the conversion. But from the earlier bitter experiences, we felt the need of a strong campaign for the promotion of the metric system lest we should repeat the same failure as before.

So we organized the Metric System Promotion Committee in August 1955 and began to take practical action in preparing for the conversion. This committee is not an official one, but is composed of national and local government officials, scholars, members of the Japan Weights and Measures Association, and other representatives from private organizations.

Starting in 1956, the Ministry of International Trade and Industry shared a part of its expenses, and the promotion became more active in many fields. Even so, the largest amount subsidized by the Ministry was not more than \$24,000 a year. In the first step, the committee tried to deepen the nation's understanding of the metric system in general, and issued many pamphlets and posters. The information media, such as newspapers, radio, and TV, were also cooperative in this campaign. Though the money available for the committee was limited, it could do many things effectively with the aid of these cooperating organizations.

The committee thought the best way to realize the compulsory changeover smoothly was to accomplish as much of the actual transition as possible before the specified day of transition. First, the committee attempted to convert to metric units the dealings of food-stuffs and cloths where the traditional system had been predominant, thus making the metric system familiar to the people through their daily shopping. The committee maintained close contact with various commercial bodies, especially department stores, which have great influence in cities upon the customers as well as the manufacturers and wholesale dealers, on account of their large-scale trading.

On the other hand, the committee issued monthly pamphlets, "Way to the Metric System," for the general campaigns of metric system promotion. These pamphlets were designed to help the local campaigner to promote the metric system and were delivered to each city, town, and village free of charge.

An early fruit of this campaign was in the changeover of selling confectionery by the gram instead of by the former Monme in the Shaku-Kan system in Tokyo department stores since the first of September 1956. The success of confectionery sales was followed by the

conversion of other foodstuff sales to the metric system. Gradually this conversion extended to the other goods. While the department stores began to sell goods in metric units, the fish or vegetable wholesale markets also began to use the metric system. Thus, the change-over to the metric system proceeded in many commercial transactions without waiting for the legal enforcement day.

The information industry, while cooperating with the Metric System Promotion Committee, organized their own planning committees and studied how to use the metric system in newspapers, radio, and TV.

For example, NHK, which has the largest radio and TV networks in Japan, published a brochure, "The Guide to the Metric System Adoption," and started to use the metric system in radio and TV before the legal changeover date. The other information media took the same stand.

This movement could not have been imagined during the preparatory period of the 1930's, and we cannot overestimate the role that the information media played for conversion in the past seven years.

On the government side, the bill "Metric Unit Law to Coordinate Metric Revisions in Other Laws" was drafted to change the non-metric units used in other laws and regulations to metric ones. This law passed the Diet in 1958 and was promulgated. The biggest difficulty encountered was the rewriting of the registration list of land and buildings. As to this changeover, in the ordinance based on the Registration Law of Real Estate, the conversion is expected to be completed by March 31, 1966, and the rewriting already started in 1960. The metric Industrial Standards of constructing materials for houses and furniture were also introduced, and a new module of Japanese houses based on the metric system was also decided.

In industry, at the time of resumption of the metric campaigns in 1955, the percentages of adoption of the metric system differed for each enterprise—for example, in electric, gas, and city water enterprises 95 percent, chemical industry 90 percent, metal working industry 80 percent, machine industry 70 percent, textile industry 60 percent. The average of other industries was 60 percent. Among those which were still nonmetric, there were, for example, screw and pipe size in the machine industry and raw cotton and raw wool in the textile industry.

In industrial fields, the legal regulations were relatively few, but (1) the indication of quantity of products, (2) measurement for transportation or sale, (3) measurement in buying raw material, and (4) indications of quantity in giving or accepting orders were regulated by law and required to use metric units. The industrial rationalization and simplification should lead to benefits through the adoption of the metric system.

So, in spite of the difficulties induced by the large import of goods from Anglo-American countries just after the war, the percentages of adoption of the metric system were rather reasonable as mentioned before.

The ultimate goal of unification of measuring units by the metric system should be that only the metric system is needed, regardless of whether the legal regulations are extended or not. But, in practice, it is difficult to make machines and apparatus metric at once, so here again a course of adopting over a period of time was taken. Industrial standards in Japan are regulated in the Japan Industrial Stand-

ards, and these regulations were also revised so as to be based on the metric system in accordance with the changeover. It was desirable in this revision to round off the conversion factors between the metric and nonmetric systems, but these procedures caused many difficulties in other areas, so we made only a few roundings in the present transition. In cases where the values converted to the metric system were too complicated—for example, for a quarter inch screw—we had to be satisfied with dropping the expression “inch,” yielding in this example only “ $\frac{1}{4}$ screw.” For some machine tools, the attached scales were changed to metric ones, or some gear mechanisms were inserted to make the machines fit the metric system. In manufacturers’ drawings the metric system came gradually to be used. Though in some areas the changeover in the industrial field is not yet completed, the movement is expected to proceed steadily. This changeover in industry depended entirely upon the individual cooperation on the part of business circles, and there has not been any demand for compensation by the government of large expense in making their equipment metric.

As mentioned before, the educational campaign of spreading the metric system throughout the nation played an important role in the present transition, but you should also realize that in Japan most measuring instruments, even though they were not for metric measuring purposes, were also equipped with metric graduations. So it was unnecessary to buy new instruments based on the metric system at the time of transition. This was also very effective in the changeover.

However, in the course of the transition campaign, it turned out that the average person did not intend to become accustomed to the metric system as long as older, more familiar systems were indicated in the same instruments. So the government decided to establish a regulation to abolish the verification and use of instruments with non-metric indications, and the date of the enforcement of this regulation was set at the end of 1961. This regulation was very drastic, and many measuring instruments and devices were forced to change their indications or weighing beams. These changes are expected to be accomplished in the near future, though they are not complete at the present.

At the beginning of the transition, the price cards at shops showed the quantities closest to customary expressions so as to make shopping convenient for housewives. For example, meat had been sold per 100 “Monme,” which equals 375 grams in the metric system, so they sold the meat per 400 grams. But these indications were found unsuitable, because they lost the benefit of the decimal system. Through the enforcement of the transition, most housewives acquired good understanding of the metric system and preferred to buy things with the indication of price per 100 grams or per kilogram.

The complaints during the early period of enforcement disappeared in these days, with the exception of occasional complaints made by old-fashioned persons. But we still often express our body weights by “Kan” according to the custom. And in sports, especially baseball, football, boxing, wrestling, and golf, that are popular in America or in England, the foot-pound system is largely used.

So the Metric System Promotion Committee published the Conversion Table for weights and measures for the convenience of the public. The complete conversion, therefore, was not achieved at the time of transition January 1, 1959. But a survey conducted in Feb-

ruary 1959 and in December of the same year in the field of commercial transactions showed the average percentage of compliance throughout Japan was 85 percent. This means that there remain some elements where nonmetric units are used in daily life, and shows that we must intensify the campaign to make the nation understand the system.

In the Measurement Law, any person who has violated the provisions concerning legal units shall be punished with a fine not more than about \$140, but we hope that the transition will proceed smoothly, not by enforcement with the penalty, but through the nation's voluntary using of the metric system.

Of course, in the import and export businesses, exceptions are permitted, though the imported goods are regulated by the measurement law when traded within Japan. Planes, flight navigation, weather observation for flight, and the munitions industry remain as exceptions. The reason for the former is that the flight has an international connection, and the reason for the latter is because of the special circumstances of our country after the war. Land and building measuring remains in transition.

This is the brief review of Japan's transition to the metric system. To make this system more complete in Japan, and also to unify the measuring units to one system throughout the world, depend largely on the adoption of the metric system in the United States and Great Britain. I hope the adoption of the metric system in the United States and Great Britain will be realized as soon as possible.

DISCUSSION OF FOREGOING PAPER

(Although Mr. Tamano presented his paper in English, he chose to answer the questions that followed through an interpreter. Dr. Okabe and Mr. Peiser, both of the National Bureau of Standards, assisted.)

MR. STENDER: Mr. Tamano, I would like to preface my question with a comment and an observation.

First, I would like to say I think that was a marvelous paper. It is one of the best I have ever heard presented at the National Conference, especially on the subject of the metric system.

Mr. Tamano, you have used the word "unique" in several instances. In one sentence you said "I would like to report since January 1959 the metric system has been the unique measuring system authorized in Japan." May I presume that you have used the word "unique" to mean universal?

MR. PEISER: Mr. Tamano says that it means the only permitted one, unique in the sense of "sole" or "singular." It is the only legal system. Universal, I think, might have implied it was universally adopted and used. The point Mr. Tamano wanted to bring out is that it was the only legally permissible system.

MR. STENDER: Mr. Tamano, from the experience gained in bringing the metric system to the point you now have it in Japan, do you believe that the education should start in the schools and, if so, at what level do you think it should begin?

DR. OKABE: He thinks that it has to begin with the elementary schools.

MR. MANLEY: Mr. Tamano, you said in your paper that about 85 percent transition has taken place. Would you care to estimate how long it will take to fully complete this transition?

DR. OKABE: He just thinks that it takes a long time.

MR. PEISER: It is my personal opinion that—if the cultural ties and reciprocal trade between Japan and the United States are to remain as close as we hope—the residual 15 percent conversion in Japan will depend greatly on this country's possible future change to the metric system.

MR. MANLEY: It has taken apparently some 40 years to achieve the present point of 85 percent conversion in Japan. I can conceive that "a long time" could mean almost forever. What do you believe, Mr. Tamano, might be the major problems involved in such transition in the United States?

DR. OKABE: He thinks that the United States must first decide whether or not it wishes to use the metric system and then educate the people afterwards.

MR. SANDERS: Mr. Tamano, have you found that your conversion to the metric system has improved your export trade due to that one fact?

DR. OKABE: He thinks that it certainly does not hurt the export trade.

MR. PEISER: You should observe Mr. Tamano's remark is based on his experience in Japan, which looks especially for exports to the United States, a nonmetric country.

MR. MANLEY: Mr. Tamano, I have one further question: Which have you found the harder to overcome, the resistance from the technical side or from the consumer (or public) side?

DR. OKABE: He thinks that there is no strong opposition from either side—from either the technical people or the consuming public.

MR. SLANE: Mr. Tamano, since your country has converted practically 85 percent to the metric system, do you insist that commodities that are shipped into Japan be delivered in the metric system?

DR. OKABE: When they import materials, they frequently use the foot-pound system, but for use in Japan, it must be converted to the metric system.

MR. DEVRIES: Mr. Tamano, in your paper, you mentioned the Japanese Weights and Measures Association. Is that organization comparable to our National Conference on Weights and Measures here in the United States?

MR. TAMANO: Yes.

DR. GORDON: Recently there was a suggestion in the sporting pages of the New York Times that one way to facilitate the transition to the metric system in the United States would be to adopt the metric units of measurement for sporting events, since the metric system is the one used for the Olympic games. With that in mind, I was surprised to read that the foot-pound unit has been retained for athletic events in Japan.

DR. OKABE: Mr. Tamano says that there is no law to enforce the adoption of the metric system in sporting events.

WEIGHTS AND MEASURES IN JAPAN

By BERNARD WASKO, *Chief Engineer, Voland Corporation, New Rochelle, New York*

Last summer, while I was planning a business trip to Japan, it occurred to me that members of this Conference might have some interest in the weights and measures program of the most advanced of the

eastern countries of the world. In discussing this idea with M. W. Jensen, Chief of the Office of Weights and Measures, and W. S. Bussey, Assistant to the Director of the National Bureau of Standards and Executive Secretary of the National Conference, they agreed that this topic might be of interest to the Conference. The material that I present here, therefore, represents the view of a reporter rather than of someone who has had actual experience in the weights and measures program of Japan. During past Conferences reports have been made by representatives of foreign countries which maintained programs analogous to those which are familiar to all of us here. I believe that the information that I was able to obtain will be of interest largely because it appeared to me to differ so much from our own experience here in the United States.

Although Japan is an oriental country with a cultural heritage going back thousands of years, it is very modern and has the most highly developed industry in the eastern world. The influence of the American Occupation after the war and the subsequent trade with the United States is evident everywhere. The style of dress, the rock and roll music, and the American fountain pen are all very much in evidence.

American movies are extremely popular, and Matt Dillon speaks a very good brand of Japanese as evidenced by the television program. The largest percentage of Japanese trade is with the United States, and this undoubtedly exerts a considerable influence. However, American cultural influences are very strong as well; and when an American concert artist or a jazz musician makes an appearance at a concert in Tokyo, the concert hall is sure to be overflowing with devotees of that particular art. A very striking influence is the considerable use of the English language. Every student, beginning in the seventh grade, is required to study English through high school, for a total of six years. Very few American high school students have an opportunity to study a single foreign language for this length of time. At a scientific conference which I attended in Kyoto, all papers were presented in English, since this was the most widely used language among those in attendance.

Japan has an area similar to that of California, but with a population of about 90 million. The four principal islands which make up this country are of volcanic origin and are so mountainous that only 15 percent of the land is arable. Natural resources are very limited, so Japan is very much dependent on the rest of the world for most of its raw materials. In order to have a balance of trade, much of the manufacturing effort must be applied to export products. However, my discussion here today will be limited to the problem of weights and measures in commerce within Japan.

As part of my preparation for the trip, I wrote to the National Research Laboratory of Metrology in Tokyo. This agency, which is an official office of the Japanese Government, can be compared in some ways to our National Bureau of Standards. Among other activities, it is custodian of Japanese Standards, including the Prototype Kilogram and Meter. This organization also does research in metrology, covering many fields of interest. However, in some functions it differs considerably from the National Bureau of Standards, and it is these differences which I believe would be of most interest to those who are concerned with weights and measures.

The Director of the Laboratory, Dr. Mitsuo Tamano, who is a guest of this Conference and who immediately preceded me on this program, very kindly agreed to permit me to visit the laboratory to discuss weights and measures in Japan. Upon my arrival I was greeted by Dr. Tamano and all of the division heads. Before proceeding with discussions, we were served the customary tea, a procedure which I found observed throughout Japan and which I enjoyed very much. Although all of the gentlemen in attendance spoke some English, it appeared desirable to make use of the services of another young man who was employed at the laboratory and whose command of our language was excellent. With the problem of communication dispensed with, we were able to proceed very nicely in our discussions. I was taken on a tour of the laboratory facility at Tokyo (there are other branches of the laboratory in Fukuoka, Osaka, and Nagoya). Aside from the usual scientific equipment associated with a measurements laboratory, there was in evidence a considerable amount of calibration being done on commercial products such as thermometers, pressure gages, laboratory balances, and other equipment of this type. I was to learn that this work was closely tied in with the weights and measures program.

After a most interesting tour, I was able to question Dr. Tamano and his associates at length about the Japanese weights and measures laws, their administration, and the problems that come about in the administration of any law of this type. Japan is now firmly committed to the metric system. That is to say, virtually all transactions now taking place within Japan are based on metric units of measure. Considerable credit must be given to many dedicated people who worked for many years to bring about the change from the old shaku and kan system, which was traditional in Japan until very recently. Although we here in the United States have adopted the metric system for our basic standards, no great strides have been taken to convert to the metric system in our daily measurements. It is true, of course, that in many scientific areas the metric system is used universally. Most chemists and physicists are better equipped to discuss measurements in the metric system than they are in the English system. There is continuous agitation among the engineering societies and other interested groups to bring about complete conversion to the metric system here. Recently some U.S. military branches here began the use of the meter in ordnance work. Dr. Tamano's paper covers the conversion to the metric system from the ancient systems in Japan. Suffice it to say, an orderly, step-by-step program was initiated covering a period of about 40 years. Today the metric system is the only system legally recognized in Japan. Complete conversion took place as recently as 1959.

In order to understand the administration of the weights and measures laws of Japan, a brief summary of the divisions of responsibility is in order.

Japan is divided into 43 prefectures, somewhat similar from a governmental standpoint to our States, but more comparable in size to our counties. In Japan, the prefectural governments do not have the autonomy which is given to our States, and the law for weights and measures as set forth by the National government is uniform throughout all the prefectures.

The principal Japanese agency responsible for measurements is the Ministry of International Trade and Industry. Under this Min-

istry is the Agency of Industrial Science, and the National Research Laboratory of Metrology reports to it.

The Heavy Industry Bureau, which is responsible for issuing licenses for the *manufacture and repair* of all measuring devices, also reports to this same Ministry.

This licensing is one of the most striking features of the weights and measures program. In order to obtain a license to manufacture a measuring device, there are three principal requirements which must be met by the applicant. First, it is necessary that the applicant have in his possession standards of sufficient quality to insure that government regulations will be met. Second, the applicant must establish that he has the knowledge and technique necessary to produce the particular device. Third, it is necessary that the applicant show that he has adequate facilities to produce the item.

Licenses are issued at the National Government level, but the administration of the weights and measures law comes under the prefectural government, which is responsible to a second independent Ministry, that of Internal Affairs. Therefore, it is necessary that there be considerable cooperation between these agencies in the execution of the weights and measures law. In a general way, the Ministry of International Trade and Industry provides the technical support to the Ministry of Internal Affairs, which is the functioning body as far as weights and measures enforcement is concerned.

A second way in which there is considerable difference is the fact that inspection of new equipment must be made before it is delivered to the customer. This means that every scale, pump, meter, gage, thermometer, or what have you, which comes under the weights and measures law, must be inspected by the NRLM or a local office either at the factory, as in the case of heavy equipment, or at inspection depots, in the case of portable equipment. On instruments which have been accepted, a national certificate marking is made. Equipment not thus marked cannot be used in trade.

Once a measuring device has been sold for use in transactions, it is subject to periodic inspection by local offices at some designated place. In metropolitan areas, measuring devices are inspected once a year. In rural areas, inspection is made once every three years. At this time a prefectural government certificate mark is applied to the instrument. In addition, a third field check made by local offices is made without prior notice. In the case of the unannounced inspection, the sealing is at the discretion of the prefectural governor, and therefore some prefectures will require a seal, while others will not.

In administering the weights and measures law, the inspectors can prohibit the use of a defective instrument. Although they cannot levy fines themselves, they can bring the offender to court. A conviction of an offense may carry a fine of up to 200,000 yen or the equivalent of about \$555, or up to three years imprisonment, or both.

There are certain items which are excluded from periodic inspection. The first of these are items which are not used in commerce. A second type which is excluded includes certain instruments which can only be operated for a specified length of time. For example, a taximeter may only be used for one year and must then be overhauled and re-inspected. Another example would be a household water meter, which may be used for eight years and must then be overhauled. A third general class of product which need not be inspected is that which is for

export. This is not to say that export items are not inspected, but they do not come under the weights and measures law and, therefore, are handled by different regulations.

In those cases where the equipment can be readily transported to a depot, inspection is made there on a calendar basis. In any event, all equipment is inspected regularly and all in accordance with a uniform weights and measures law.

Because of the wide range of inspections that are made, it has been found necessary in practice to divide the inspection between several agencies in accordance with the precision which is required. As a result, the inspection of devices of relatively high precision is performed by the National Research Laboratory of Metrology, while routine inspection of commercial apparatus is made by weights and measures officers under prefectural governments. Prefectural offices maintain working standards, and individual inspectors are supplied with any necessary local standards which are referred to the prefectural standards. The weights and measures law in Japan allows for a difference in maintenance standards and new standards, and all equipment is expected to operate within $1\frac{1}{2}$ times the new tolerances on periodic examination.

Obviously, in order to maintain such a program of inspection, a large number of inspectors are required. At present, there are approximately 1,000 inspectors operating under prefectural governments. In addition, there are a substantial number employed directly by the NRLM.

All weights and measures inspectors in Japan are either national or local officials. They are recruited from applicants who take a general examination similar to civil service examinations here. No special background is required for applicants other than their being high school graduates. In order to qualify as an authorized inspector, it is necessary to finish a training course called the Measurement Training Institute, which is given by the Ministry of International Trade and Industry. Any high school graduate may sit for an entrance examination, but, in practice, nearly half of the students are officials sent from local weights and measures offices and from industrial organizations.

The Measurement Training Institute covers a course of training of six months and consists of lectures of approximately 120 hours on weights and measures laws, 350 hours on the fundamentals of measuring instruments, and 80 hours on the use and maintenance of measuring instruments. At the completion of the course, a written examination must be taken in order to receive certification as an authorized inspector.

In industry in Japan there is a relationship between an employer and employee which is somewhat different from that found here in the United States. When an employee joins a company, his employer becomes in effect a kind of father and assumes many responsibilities for the employee. These include such things as health benefits, guaranteed employment, living quarters if necessary, and many other fringe benefits not usual in this country. In return, the employee is expected to remain with his employer for the rest of his working life. In the case of government employees, the same general relationship exists, and therefore civil employees find themselves in a stable employment situation. Progression to higher positions takes place largely through seniority. Although individual ability may

not justify it, the recognition of older and more experienced people as the natural recipients of advancement opportunities is closely tied to the culture of the country. It is very often frustrating to young men with good education to find themselves stymied in their progress to higher economic attainment by older but sometimes less qualified individuals. But the old older changeth; and as young men are coming into new jobs, they are demanding recognition, and, as a result, there is, among younger employees, some job changing today.

Salary scales for both national and local inspectors range from 10,000 yen to 50,000 yen per month. This corresponds, at the official exchange rate of 360 yen to \$1.00, from \$28 to \$140 per month. These figures may be somewhat misleading, since the purchasing power of the dollar is higher in Japan than it is here. As an example, the local officials may be able to rent an apartment for about \$12 a month. In fact, it has been increasingly difficult to find young people who are willing to work in the weights and measures field. The progress of industry in Japan has drawn many of the available young people, and the pay scales are higher than those of the government. In addition, the prospects for a young man in government service are not very high and advancement is very slow. As yet, no solution has been found to this problem.

As a manufacturer of weighing devices, I was particularly interested in weighing as it was done in Japan, and found again that there were some contrasts as compared to weighing as done in the United States. One striking example is the use of spring scales in commerce and trade. The Japanese law permits the use of spring scales, but does recognize some of the problems that can be associated with this type of equipment. As an example, a spring scale can be used with no temperature compensation, provided that the smallest division is no less than $1/200$ of the total capacity. The reason for this is that temperature effects which can be encountered in Japan would not affect the reading of the scale adversely to more than 1 part in 200. Spring scales reading to within 1 part in 800 of their capacity are also legal, but must be provided with temperature compensation.

This is the limit for spring scales, since the variation in the force of gravity throughout Japan corresponds to about 1 part in 1,000, and spring scales attempting to have a higher precision would show variations depending on which part of Japan they were located in. Market scales are generally of spring construction, and the most common are graduated to 1 part in 400 of their capacity.

In writing the weights and measures law, very specific detailed descriptions were made of the types of equipment which came under the law. As a result of this, it has been found that problems occur when a new piece of equipment is introduced into the market. Some States here have type-approved laws, so that a new piece of equipment must be examined and certified before it can be sold in those States. In contrast, the problem in Japan is that, if a new piece of equipment comes into the market and is not described by the existing law, it is necessary to change the law in order to have the piece of equipment conform. Since this is not done easily, it has been necessary from time to time to place a new piece of equipment in some category other than that under which it would normally fall. It is this situation

which points up the difficulty of writing a law which describes equipment in a specific manner. It becomes difficult to accept new products which might be useful unless the law is written flexibly enough so that it can meet new situations. For this reason, I suspect that legislation covering weights and measures in this country is never likely to be written so specifically.

Since the weights and measures law was written to cover so many products, there have been questions as to the need to examine some of these products at the point of manufacture. From time to time, manufacturers have requested that some items be removed from the list for the reason that the specific item is not one which would affect a customer or commodity by the lack of inspection.

Under the weights and measures legislation, the decision as to whether a specific product is to be subject to inspection is determined by whether it is used in a "transaction." The word "transaction" is defined in the law to mean "any act, with or without compensation, in business, the subject of which is either the delivery of goods or performance of services." As a result of this definition, very many products fall within the law which do not ordinarily come under the scrutiny of weights and measures officials in the United States. Some examples of items which do come under the Japanese law are: Units of length measures such as gage blocks, graduated rulers, tape measures, link measures, folding rules; all balances and scales, including those used in laboratories; stop watches, timers; graduated thermometers; recording thermometers; volumetric ware, speedometers of all types; pressure devices; brake horsepower meters; transmission power meters; calorimeters; flow meters; hydrometers; noise meters; hardness testers; and virtually all other devices of these types.

As you can see, a great variety of measurement techniques must be used and a large number of personnel involved in making these measurements.

You can see that the Central Japanese Government wields the authority in the weights and measures program certainly to a far greater extent than the Federal Government of the United States, which supports local enforcement agencies largely through the advisory services of the National Bureau of Standards.

I believe that the philosophy of the weights and measures law in Japan is basically the same as the laws of our individual States, and that is to provide the consumer with protection both from unscrupulous dealers and inadequate or improperly working measuring devices. The consumer in Japan, as the consumer everywhere, is generally not in a position to check the adequacy of the devices which measure the products that he buys, and it is therefore necessary that the government provide him with that protection.

I hope that in this report I have been able to introduce to you an approach to a weights and measures program which is somewhat different from our own—one which attempts to solve some problems which we have to face, one which introduces problems by the virtue of its almost unlimited scope. I hope that this information has been interesting to you, and thank you for the opportunity to present it.

We are indebted to Henry Birnbaum, Deputy Chief Scientist of the National Science Foundation in Tokyo, for permission to use excerpts from "Japanese Measurement Standardizing Organizations and Conversion to the Metric System."

MR. BOWEN: I would like to compliment Mr. Wasko on what I consider a very interesting and able report. I say "able" because it is evident he must have done a considerable amount of research.

I have one question: In comparing the Japanese operations with our own, you pretty well covered devices and the qualifications of official personnel. Mr. Wasko, do you know whether they attach the same importance that we do to actually going into the markets and doing trial weighings, making test purchases, and that sort of thing, projecting the end result of the operation of these devices?

MR. WASKO: Prepackaging is not done to the same extent as it is here. Prepackaging is not common. The markets generally are small local stores, not of the supermarket variety. And equipment is basically simple so there is a direct contact between the man who is disbursing the material and the consumer. So there, it is the equipment basically which must be inspected.

MR. MANLEY. Mr. Wasko, we in Seattle last year were very fortunate to have the Chief of the Weights and Measures Bureau of the City of Tokyo in our office for three days, and I would like to try to answer Mr. Bowen's question.

In Greater Tokyo, there are some 9 million people. The Chief of the Tokyo Weights and Measures Bureau said that there are some 200 inspectors in that jurisdiction. Mostly, these inspectors roamed. They had no fixed districts. They roamed each day in making inspections and surprise visits into the stores. They also made test purchases. Portable devices were brought to testing depots, or to the main office. But, surprise visits were made to keep everybody on their toes.

MR. WASKO: Thank you Mr. Manley.

I think you can appreciate the problem, the fact that there are 9 million people and 200 inspectors. Tokyo is the largest city in the world and most of the markets are small! And these inspectors would really have to keep hopping to cover the area very well.

MR. SANDERS: Mr. Wasko, I think you understood weights and measures pretty well before you went over there to be able to prepare a report like that. You are certainly to be commended for getting all of that information together.

I was very much surprised at what you said about the extent to which they go in testing all weighing and measuring devices. It would appear that almost everything is a commercial device over there, if it measures in any way at all. Of course, I would think that they are primarily interested in what we term commercial devices—those that are used for measuring quantities for purchase and sale.

Do they actually go into the testing of all of these various noncommercial devices, as we define them?

MR. WASKO: At the point of manufacture, they are inspected if they fall within this definition of a transaction, which does not necessarily mean commerce. It may be an exchange of service, but re-inspection or periodic inspection is only done on those items which are used in commerce. This inspection at the point of manufacture is made on all measuring devices which are or can be used in transactions. And the list is much longer than the one I gave you.

MR. SANDERS: One other question I would like to ask: They apparently have a very extensive law, and they check up. They have

type approval over a good many devices, and you pointed out that sometimes it is even difficult to comply with the specifications that they have. And I believe you hinted that sometimes they are so rigid that it might retard progress. And I wonder if that is not recognized there by government officials as well as industry people that such type approval and such a rigid weights and measures law might retard progress in the development of new devices.

MR. WASKO: This is recognized, and I discussed this particular problem with Mr. Tamano. But the laws there, as laws here, are difficult to get changed. And the law is very rigid, probably over-rigid in this respect. It does not seem that there is, in the immediate future, any prospect of this being changed, although there is considerable agitation among manufacturers to change this part of the law, and to restrict the inspection of devices only to those used in commerce rather than the very wide range of definition which is used now.

What they try to do is remove items from the list, basically, so that fewer items have to be inspected.

THIRD SESSION—MORNING OF WEDNESDAY, JUNE 6, 1962

(H. H. HOUSTON, VICE CHAIRMAN, PRESIDING)

ADDRESS

By HON. PHILIP A. HART, *U.S. Senator, Michigan*

Just a year ago I told this Conference that the Senate Antitrust and Monopoly Subcommittee planned to hold hearings, under my direction, on packaging and labeling of market basket items.

The plan materialized. It is now packaged and labeled! It measures more than half a million words of testimony; it numbers scores of exhibits.

The most important single conclusion reached on this record is that existing Federal law and regulation are not adequate to control the confusing and misleading packaging and labeling practices prevalent in the marketplace.

Many of you, of course, will say, "I told you so." And indeed many of you *have*—personally and by letters.

What are some of the contents of this hearing record? Meaningless and confusing label information; sizes and shapes and weights so odd as to make price comparisons almost impossible; misleading and deceptive promotions; weights and content cut while masking this drop from the consumer; inconspicuous and misleading content designations; package designs and shapes which give a distorted picture of the true amount of the product contained in the package.

Does the record show that time, in its inevitable passage, will cure the confusion? Just the opposite is suggested.

In the average supermarket after World War II there were approximately 1,500 items. Right now there are about 7,000 items. One witness estimated there will be 20,000 in the next decade!

Did the Committee simply collect examples of *illegal* practices, is that what we packaged? Most certainly no—

Most of the confusing and misleading practices seen by the Committee are *not* in violation of law. While the FDA has some authority in food items, it must proceed on a case by case basis and standards in the statute are ambiguous. On nonfood items, there is virtually no regulation.

As President Kennedy said in his recent extraordinary Consumer Message to Congress, March 15, "the housewife is called upon to be an amateur electrician, mechanic, chemist, toxicologist, dietitian and mathematician—but she is rarely furnished the information she needs to perform these tasks proficiently."

Our hearings confirm this statement by the President. Too often it was evident that the consumer could not get from the package and label the information essential to a rational buying decision. And even where this information is some place on the package, often it was

less than easily seen and understandable. On other occasions, it was presented in a way that confused and misled.

There is no doubt in my mind that consumers across the country are aware of their plight and want action. My mail is one basis for this feeling. The theory is that people write their Senators only *against* something. Over 90 percent of letters I have received supported the inquiry and a very large share have urged legislation.

Well, what do we do about it? One thing certainly is to determine what legislation will help.

How do we draft legislation that will not cripple the industry which has given the American consumer the widest choice of quality products in the history of the world?

Certainly, the case by case approach written into existing law is not adequate to meet the complex conditions in today's marketplace.

There is basic unfairness in singling out one company for legal action when a score of his competitors may be guilty of the same practices. There is an inherent clumsiness in enforcement procedures requiring a case by case approach based on ambiguous definitions when on the shelves in one market alone there may be 7,000 items.

It seems to me that what is required are definite standards against which packages and labels can be measured. Enforcement then requires only measurement against the standard; not a determination of whose definition of "conspicuousness" or "misleading" is correct.

Standards, whether in the law or in regulation, give to the manufacturer greater freedom to compete on the basis of price and quality. He can plan his merchandising campaign knowing that his competitor will be held to the same packaging and labeling standards as himself. And he can spend the large sums necessary for packaging and labeling equipment, materials and printing, secure in the knowledge that his packages and labels conform to the law and regulations because the law is certain and precise.

Such standards would insure the consumer that information necessary in making a rational purchase could be easily located on each package, expressed in terms that are meaningful, readily understood, and transferable without difficulty into dollars and cents comparisons.

Such standards would greatly simplify the process of enforcement. This would be true particularly if a pre-inspection procedure could be written into the law along the lines of the authority now exercised by the Department of Agriculture in regard to meat and poultry products and the Alcohol and Tobacco Division of the Internal Revenue Service in regard to distilled spirits.

It seems to me the bill would have to be written as follows:

First: A ban across the board of practices which by their nature are subject to a high degree of abuse because the manufacturer has no control over the final pricing of his product. Such practices, of course, include "cents off" promotions and "economy size" designations.

Second: Establishment of standards applicable to all products regardless of their particular problems and differences. This would include guides requiring the net weight or content designation to be in a specific type size and face in proportion to the main panel of the package, positioned in a location where it can easily be seen, unadorned by qualifying phrases.

Third: Promulgation of standards on a product line basis in those categories of practices which require separate and individual treat-

ment. The areas where this may be necessary as indicated by the testimony include serving designations; meaningful size designations; product efficiency measurement where net weight or content is not meaningful in this regard; undue proliferation of weights or sizes; (this would necessitate some modified kind of standardization, where necessary); distorted package proportions; relationship between package size and package contents.

Obviously no bill could be drafted which could spell out in detail standards in all of these areas. These are ground rules that need to be developed where necessary with industry assistance and with the assistance of other governmental and private groups with particular knowledge in the area involved.

It seems to me that the proper way to handle this is to give to an agency with experience in this kind of operation authority, where necessary to preserve competition and prevent consumer confusion or deception, to promulgate such regulations in the categories I have indicated on an industry by industry basis.

Two agencies have had extensive experience here—the FDA and the FTC. The FDA has worked long and hard in the food field and has both trained staff and expertise.

The FTC has also made significant contributions in this field and has much experience in the trade practice conference which establishes industry standards and in the administration of the wool, fur, and textile labeling acts.

It may well be that both agencies have a vital role to play in the packaging and labeling field based on the particular experience each has developed over the years.

In this second report to you I have attempted to outline lessons learned from the hearings and the broad suggestions of the type of legislation under consideration.

I have been delighted at the progress made at the State level both in support for stepped-up enforcement and for new and improved legislation in the weights and measures fields. My respect and admiration for the importance and quality of the work you are doing was great before the hearings commenced.

Now that I have an acquaintance with the magnitude of the problems you face, I am doubly impressed.

We are grateful for the assistance and support you have given our inquiry during the past year. With your further assistance and support, I am hopeful that legislation can be introduced, debated, and enacted that will benefit the consumer, the manufacturer, competition, and the economy alike.

**STATEMENT TO THE CONFERENCE BY R. W. COYNE, PRESIDENT,
DISTILLED SPIRITS INSTITUTE, INC., WASHINGTON, D.C.**

Mr. Chairman, Senator Hart, ladies and gentlemen: Senator Hart could bear eloquent testimony that very often a person with a problem or a group with a problem has no difficulty in finding their respective ways to the door of your good and faithful public servants. Businessmen with problems, citizens with problems find out your capacity, find out your responsibilities, and have no hesitancy in petitioning you for proper assistance. As public servants, you also know that very often after you have served the businessmen, the groups, the individuals,

sometimes you don't see them any more until another problem arises and until they need additional assistance.

I had the honor of addressing you last year and describing in some detail how I found this group two years ago when as president of the Distilled Spirits Institute we were confronted with a Grade A problem and we did not know which way to turn. A petition had been filed with the Internal Revenue Service asking for the authorization and legalization of a number of odd-size packages for liquor—a third of a gallon, a sixth of a gallon, a twelfth of a gallon and a twentieth of a gallon. This move was patently an effort to serve the false philosophy of "packaging to price," or to give less for more.

Being amateurs in the field of weights and measures, we were bereft of the ammunition with which to combat this which we thought would be a destructive move. A good angel led us to your door.

A series of hearings was held two years ago. You produced your then Chairman, Mr. Rollin E. Meek. You produced additional experts, former chairmen, and other officials of your group. You provided us with historic material and data with which we were able to build and project a tremendous argument. I am happy to come here today to acknowledge this great assistance to you. I am happy to announce that as of yesterday, the Internal Revenue Service after two years of study and consideration turned down this abortive petition which would have been a milestone in the wrong direction.

For this accomplishment, I will take bows with my clients. Numerous people who were well-meaning, but just as inexperienced as I, will and should take bows with their constituents. The credit belongs in this room! I am hopeful that this action will be a most valuable precedent in enabling you to get that handhold toward the establishment and the maintenance of ethical standards in industry that seem to be as logical as two plus two.

It is fortunate that during this two-year period there was good gospel emanating from the Hart Committee. It is fortunate that the President's message to Congress was so close to the right line of thinking. It, however, was extremely fortunate that not for one year, as the Hart Committee has been busy, or not for a year and a half since the present Administration has taken cognizance of this problem, but, according to your records which I have consulted, for the last fifty-seven years, this group has steadfastly and with great dedication maintained that standards should be a basis, not for deviation, but for compliance throughout the years, and that certain eternal verities do not change regardless of the economic complexion, regardless of the resourcefulness of entrepreneurs or regardless of the theories that we used to find only on the carnival lot.

So my chore today is a happy one to acknowledge the good work you have done, to assure you that our industry is one that is with you, and that it would be a great honor if in future years, we can encourage other industries to stand with you in your good work.

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 47th 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 4.

1. *Standardization of Package Sizes.*—There was only one major item carried over on the Committee's agenda from the 46th National Conference on Weights and Measures. This is the matter of standardization of package sizes, for which a subcommittee within the Laws and Regulations Committee was established in 1960. The present members of this subcommittee are as follows:

H. M. TURRELL, Pennsylvania, *Chairman*

A. E. DIAZ, Puerto Rico

J. G. GUSTAFSON, Minneapolis, Minnesota.

The Subcommittee on Standardization of Package Sizes has done a considerable amount of preliminary work since the close of the 46th Conference. The subcommittee has found that this subject commands a substantial amount of public interest at this time and believes that substantial accomplishments toward reasonable and proper standardization of package sizes would benefit the consumer, the manufacturer and packer, the wholesaler and retailer, and all other parties having an interest. A nationwide survey of package sizes, on a limited number of selected commodities, was made during the month of December 1961. The commodities surveyed were as follows: (1) coffee (regular and instant), (2) lard and shortening, (3) macaroni and spaghetti products (dry), and (4) potato chips. At the request of the subcommittee, thirty-nine (39) jurisdictions, including city, county, and State officials, participated in the survey. The results of this limited study indicate a need for further standardization of package sizes of each commodity. Regular coffee and lard and shortening are much better standardized, at present, than are the other commodities included in the study.

In discussing the matter of package standardization with several segments of the packaging industry, the Committee has reached the conclusion that, because of the magnitude of the problem and because of the obvious interest on the part of certain segments in the industry, attempts should be made to bring about voluntary standardization through the efforts of cognizant trade associations. Accordingly the Subcommittee on Standardization of Package Sizes will, between the close of this Conference and January of 1963, communicate with selected trade associations, with the plan that there be brought by such associations to the committee during a planned interim meeting proposals as to such voluntary standardization tactics.

It thus is the hope of the Committee that, by the time the Conference meets again, definite progress will be reportable, together with a firm plan as to step-by-step procedure.

(The above recommendation was adopted by voice vote.)

2. *Other Items.*

2.1. "*Cents off*" of the "*regular*" price on package labels.—During the open hearing, many expressions of contempt for the practice of certain packagers to indicate "cents off" on packaged items were heard.

Although the Committee is in complete agreement that this does not represent the best in marketing integrity, it finds itself drawn definitely to the conclusion that this practice is not truly a weights and measures problem. There appears to be no definite involvement with either the quantity contained or the quantity statement on the packages. Accordingly, the Committee recommends that this item be removed from its agenda with no action by the Conference.

DISCUSSION OF FOREGOING ITEM

MR. MAHONEY: Many of our States have adopted the Model Law, and I believe in the Model Law, there is a section relating to the misrepresentation of price. My question is: Would we consider that this "cents off" practice could be related to the section on misrepresentation of price?

MR. LEWIS: Yes, Mr. Mahoney, I believe that it is related. However, Section 31 of the Model Law pertains to the advertisement of price per unit of weight or measure. These particular "cents off" labels do not fall in this specific category. They do not actually qualify under that particular section of the Model Law. Neither do they qualify under Section 29.

MR. WRENN: How should this matter be dealt with by the weights and measures official in the field?

MR. LEWIS: This is something that has been discussed and at some length. This is a sales method or sales practice. It is something that packers themselves cannot control. Although they may have a suggested selling price, they cannot control the retail price in most instances. It is difficult to determine what the "regular price" normally would be for a specific item. Consequently, it is difficult for us to say just how the matter should be dealt with. In the opinion of the Committee, it is definitely a sales method or practice and should be treated accordingly.

(Item 2.1. was adopted by voice vote.)

2.2. *Qualifying terms such as "giant quart" in advertisements.*—The Committee and other members of the National Conference have observed the increase in the use of qualifying terms such as "giant," "jumbo," and the like in advertisements pertaining to packaged commodities. Being aware that such qualifying terms would not be permitted under the terms of the Model Law to appear on the labels of the packages themselves, it is the conviction of the Committee that the restriction in the use of such misleading terms be extended to include advertisement of packages. Accordingly, it is recommended that Section 29 of the Model Law be amended to read as follows:

Sec. 29. *METHOD OF SALE OF COMMODITIES: ADVERTISING PACKAGES FOR SALE.*—Whenever a commodity in package form is advertised in any manner and the retail price of the package is stated in the advertisement, there shall be closely and conspicuously associated with such statement of price a declaration of the basic quantity of contents of the package as is required by law or regulation to appear on the package: *Provided*, That in connection with the declaration required under this section there shall be declared neither the qualifying term "when packed" nor any other 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 the package.

It will be noted that the language the Committee now recommends being added to Section 29 is precisely the same language as now appears in Section 26 with respect to the qualifying of terms on package labels.

DISCUSSION OF FOREGOING ITEM

MR. BOWEN: I notice as the Committee has proposed it, Section 29 is limited to packaged items, and I raise the question as to whether this as written would include the "big gallon" of gasoline and, if not, whether there is a possibility that it should be included here.

MR. LEWIS: I am sure we all recognize there is a broad field in this area. This is a broad problem. The Committee feels that, in Section 29 of the Model Law, we are concerned basically with the advertisement of packages, not that we want to ignore the particular problem to which you refer. I repeat, this is a broad field and one which the Committee feels should be approached on firm ground. I do not believe that this type of coverage would be appropriate in Section 29 of the Model Law.

(Item 2.2. was adopted by voice vote.)

2.3. *Conspicuousness and placement of quantity statements on packages, deceptive packages; sluck 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 some discussion, upon motion from the floor, and by vote of the Conference, this item was held over for one year for further study.)

2.4. *Weights and measures supervision over prepackaging scales.*—The Committee received during the open hearing many helpful comments from weights and measures officials and from others on the matter of weights and measures supervision over prepackaging scales. There appeared to be no doubt with respect to the consensus of those

present during that meeting; and the Committee concurs in the opinion that prepackaging scales should continue to be considered commercial devices and to be examined accordingly.

(Item 2.4 was adopted by voice vote.)

J. H. LEWIS, *Chairman*
A. E. DIAZ
J. G. GUSTAFSON
H. M. TURRELL
ROBERT WILLIAMS
W. S. BUSSEY, *Secretary*

(On motion of the committee chairman, seconded from the floor, the report of the Conference Committee on Laws and Regulations as amended, was adopted by voice vote.)

**INTRODUCTION OF MR. THOMAS CAIRNS BY W. S. BUSSEY,
EXECUTIVE SECRETARY**

MR. BUSSEY: Mr. Chairman, ladies, and gentlemen: It gives me extreme pleasure to have the opportunity of presenting to you our next speaker. I am sure that many of you have met him personally during the past few days.

In 1960, I had the privilege of attending the annual meeting at the British Institute of Weights and Measures Administration. My second stop in Scotland was in the City of Glasgow. It was on Saturday morning when I walked into the office of a young man who was the Chief Inspector of Weights and Measures. He had assumed this position only a few days before my arrival. Arrangements for my visit to Glasgow were made by his predecessor. Therefore, as one of his first official duties as Chief Inspector, he was there to welcome me and act as my host upon that occasion.

We spent considerable time together. I had the privilege and the pleasure of meeting his lovely wife and two beautiful daughters. Mrs. Bussey and I were invited into their home and to travel with them over some of the beautiful scenic parts of Scotland. We traveled with our speaker from Glasgow to Rothesay, where the annual meeting of the Institute was held. We found him to be a perfect gentleman, a genial host, and a devoted weights and measures official.

This Conference is indeed fortunate that the Corporation of Glasgow has agreed to permit our speaker to travel to the United States to deliver one of the principal addresses at our meeting. Undoubtedly, this sets a precedent in weights and measures annals. I doubt that any city corporation has heretofore authorized its weights and measures officer to travel so far to participate in a meeting. This precedent may serve a particularly useful purpose in our own country, by encouraging more of our States, counties, and cities to authorize their officials to attend these important meetings.

Our next speaker is a native of Scotland. He pursued engineering studies in the Royal Technical College of Glasgow, from about 1933 to 1936. He took an intermediate degree in accountancy from 1936 to 1939. He was a prize winner in administrative law at the University of Glasgow in 1955. He has had a distinguished career in the military service of Great Britain, having served in the British

Territorial Army, retiring with the rank of major, and being awarded the Territorial Decoration.

During the war years, he served for six and one-half years in the regular Army and was mentioned in dispatches for distinguished service in the campaign of Northwestern Europe. He also has an impressive career outside the military service.

He started his civilian career as an engineer and draftsman. He joined the service of the City of Glasgow as an accountant in 1936, transferring to the Weights and Measures Department in 1939. He was appointed assistant chief inspector in 1953 and was promoted to the office of Chief Inspector in 1960.

He is a member of the British Institute of Weights and Measures Administration and a member of its Executive Council. He is chairman of the Reference Committee of the Institute and the immediate past chairman of the Scottish Branch of the Institute of Weights and Measures Administration.

I know that we are all happy to have him with us today, and it gives me extreme personal pleasure to present to you at this time, my friend, Thomas Cairns of Glasgow, Scotland.

MR. CAIRNS: Mr. Chairman, ladies and gentlemen, my first pleasant duty this morning is to present a parchment of greetings from the Scottish Branch of the Institute of Weights and Measures Administration to the 47th National Conference on Weights and Measures in the United States.

This parchment reads: "Whereas the Scottish Branch of the Institute of Weights and Measures Administration having learned with pleasure that the United States of America National Conference on Weights and Measures has invited one of our members, Thomas Cairns Chief Inspector of the City of Glasgow to address the Forty Seventh Conference, Now Therefore the Members of the said Branch take this opportunity of extending, through him sincere fraternal greetings to their American Colleagues, and send all Good Wishes for a successful and pleasant Conference." Signed R. S. Brown, *Chairman*, and Glen Robertson, *Secretary*.

And I would ask Mr. Bussey to accept the custody of this parchment on your behalf.

MR. BUSSEY: On behalf of the 47th National Conference on Weights and Measures, I accept this scroll with sincere thanks and appreciation.

WEIGHTS AND MEASURES IN SCOTLAND, ANCIENT AND MODERN

By THOMAS CAIRNS, *Chief Inspector, Weights and Measures Department, Glasgow, Scotland.*

Introduction

In recent years your Conference has been addressed by Mr. T. G. Poppy, Controller, Board of Trade Standard Weights and Measures Department, and by Mr. J. R. Roberts, Honorary Secretary, the Institute of Weights and Measures Administration. The papers presented by these gentlemen gave in great detail the history of the United Kingdom's weights and measures and the training and qualification of our inspectors.

However, until 1707 Scotland had its own Parliament—The Three Estates—and its own rather complicated system of weights and measures. The object of this paper is to trace the evolution of the weights

and measures service in Scotland until such time as it was integrated with the English or avoirdupois system and also to give some details of present-day operations.

Historical

The first statute dealing with the weights and measures of Scotland appeared during the reign of David I. Made at Newcastle-upon-Tyne (now an English town), sometime between 1124 and 1153, this assize decreed that "the length of the inch is the breadth of the thumb of a middle sized man measured at the root of the nail, taking the thumbs of three men for striking the medium; or is the length of three barley corns without tails," and that "the gallon ought to weigh 12 lbs. of divers waters, viz 4 lbs. of sea water, 4 lbs. of standing water and 4 lbs. of pure river water." The pound was 9,600 wheat grains.

The system of control exercised by the King basically changed very little over the centuries and most laws were the Laws of the Burghs. Originally the burgh was a Royal Burgh, a corporate body created by charter of the Sovereign and consisting of the inhabitants of the district designated in the charter. Later other types of burghs were created: (a) Burghs of Barony and Regality, also incorporated by Crown Charter but holding their lands by tenure from barons or lords of regality and not direct from the Crown; (b) Parliamentary Burghs, which are populous places, other than counties, and which have been created burghs by statute; and (c) Police Burghs, created under the provisions of the Burgh Police Acts or by private Act. A translation from Volume 1 of the Ancient Laws and Customs of the Burghs of Scotland, A. D. 1124-1153, reveals, "Any burgess whatsoever can have in his house for the purpose of measuring his corn an ell measure, a stone and a pound for weighing. All such measuring instruments and stones for weighing must be stamped with the burgh stamp. It must be realised that whosoever shall have been discovered employing false weights or measures will come under pain of fine."

Laws of the Burgh 68 Regarding Falsification of Weights and Measures

If any man knowingly shall have caused inaccuracy in weighing or measuring for example in wool or hides or in fat from pigs or any such commodities and who shall have been convicted on such a charge will pay a fine of eight shillings and he will suffer such act of justice as the town will think fit and thereupon he will be punished by the bailies of the town by a fine of the first, second and third degrees. Let the fourth be within the clemency of the sovereign king as regards his life and person because falsification of this sort affect the crown and the fine limit of the burgh does not exceed eight shillings. And in such a case the royal fine limit goes up to ten pounds and the case pertains to the crown.

Certain or some Fragments of the Ancient Laws and Customs of Scotland— The severe penalty for Weights and Measures

If any man or any woman shall have been convicted of using false weights or measures, by means of inquiry conducted by the bailies, the question of his life and limbs his lands and possessions will rest upon the King's will.

The heirs of such people will be entirely disinherited unless the King's grace shall intervene.

Acts of the Parliament of David II— A council held at Perth on 5th December, 1365

In a council held at Perth on 20th day following Christmas in the year 1365. . . . Amongst other enactments it was ordained that there should be a public

measuring place or tron for measuring wool in the royal burghs and in each port throughout the kingdom duly and fitly established by the Inspector of Weights and Measures (or King's Chamberlain) and that there should be a tron supervisor in each place to collect on the King's behalf one penny per sack so weighed.

And let there be also at each such tron or public measuring place, a clerk who can in the eyes of the lords of the council conveniently act as clerk on behalf of the King's treasury. For the customs officer as seems best to them must have their own clerk at their own expense. For the customs officers as to the tron clerks the same exchequer clerk must act as accountant.

During the period 1124 to 1707 there were a number of major Acts all endeavouring to establish a uniform system of weights and measures throughout the country. One typical example of a decree appearing for the year 1552 in the records of the Convention of Royal Burghs for Scotland:

Because of the difference in Mesouris within borrowis of this realme in tyme begane part being mair nor the rycht and part less. It is concludit be the provestis and commisaris of borrowis forsaidis that the hale borrowis of this realme ressaue their mesouris of the burghs following quhilkis has the just mesouris, viz the stane wecht of Lanark (17 lbs. 6 oz. 4 drs. 8.82 grains), the pynt stope of Striueling (3 imperial pints), the ferlatt of Linlytgu (21¼ pints), and the eluand of Edinburch (37.06 inches) and conform to thai wechts, mesouris, thai to use thame selfies within their borrowis.

Interpreted this means:

Because of the differences in measures, within the burghs of this realm since time began, some being more than the standard and some less. It is decreed by the provosts and magistrates of the said burghs that every burgh of this realm will reassize their measures with those of the following burghs which have correct measures, viz: the stone weight of Lanark, the pint jug or measure of Stirling, the firiot of Linlithow and the ell or yard of Edinburch and conform to these weights and measures and use them within their burghs.

The final Scottish standards were settled by Commissioners in 1618 appointed by James VI under the Act of the Scots Parliament of 28 June, 1617, which ordained "that there should be but one just measure and weight through all parts of this Kingdome, which shall universaillie serve all his Highnes Leiges by which they shall buy, sell, receive and give out in all tyme to come: Which measure His Majestie, with advise aforesaid, fand should be that measure of Linlithgo which is now commonlie used, and which has been used most customaible through the greatest part of this Kingdome these fiftie or thriescore years by past."

The Commissioners fixed that the Linlithgow measure contained 21¼ Scots pints, that the Scots pint was the Stirling jug which contained three pounds seven ounces of French troys weight of clear running water of the Water of Leith. The Commissioners also fixed the standard weight to be French Troys Stane Weight, containing 16 troy pounds in the stone and 16 troy ounces in the pound. They also found that the ell contained 37 inches (Scots 37 inches = 37.0598 imperial standard inches).

Avoirdupois, the English system established in 1327, came into use in Scotland by the 17th article of the Union of Parliaments, which stated "that the same weights and measures shall be used throughout the United Kingdom as are now established in England and that standards of weight and measure shall be kept by those Burghs in Scotland to whom the keeping of standards of weight and measure does of special right belong, all of which standards

shall be sent down to such Burghs from the standards kept in the Exchequer at Westminster."

Whilst the Act of Union provided that the English standards only should be used in Scotland and the Weights and Measures Acts of 1824 and 1835, the foundation stones of our present system decreed that the use of the old Scottish Standards (as well as of all local and customary weights and measures) was made an offence punishable by fine, nevertheless various Scottish weights and measures remained in use in many parts of the country until the late 19th and early 20th century.

In the city of Glasgow for two centuries prior to 1821 one of the merchants' courts in the city, the Dean of Guild Court, an organisation still extant today, was responsible for enforcement of weights and measures but the attention given thereto was somewhat intermittent. By the year 1821 the condition of the weights and measures of the city had become so hopelessly confused that an organised attempt had to be made to secure, within reasonable limits, uniformity of weight and measure. The Superintendent of Public Works was therefore instructed to adjust the different weights and measures in use, according to legal standards, and to prepare a minute and accurate exemplification of all these weights and measures. With the passing of the important act of 1824, by which most of the present standards were defined, the duty was laid upon the Magistrates of the city to procure standards and many of these standards are still in use.

In 1835 special officers were, under the amending statutes of that year, appointed by the Magistrates to be Inspectors of Weights and Measures, and were placed under the supervision of the Chief Constable, but following upon the amending and consolidating Act of 1878, which is still in operation, a Chief Inspector was appointed, and a separate department established.

Main Differences in Enforcement Between England and Scotland

The main Weights and Measures Acts are of universal application in England and Scotland but there are a few differences which on occasion cause administrative difficulties. For instance the Act and Regulations governing the conveyance of sand and ballast and the stamping of measures for that purpose do not apply in Scotland. With the development of industrial estates in Scotland firms have been established to build vehicle bodies suitable for sand and ballast but being unable to get their products stamped in Scotland have to proceed over the border. Certain minor discrepancies apply in Licensing Laws governing the sale of wines and spirits. The legal systems of the countries are different because with the Act of Union, 1707, Scotland was allowed to retain her own legal system.

The Scottish Legal System

The Lord Advocate and the Solicitor General for Scotland are the Law Officers of the Crown for Scotland and as such are responsible for advising the Government on all legal problems of magnitude affecting Scotland and representing the Crown in any important civil litigation in which it may be involved in the Scottish Courts.

The Lord Advocate is in charge of criminal administration in Scotland and is responsible for criminal prosecutions in all courts with

the exception of a very few private prosecutions and proceedings taken in the Police and Justice of Peace Corps. All indictments are taken at his instance and proceed in his name.

The centre of criminal administration is the Crown Office, Edinburgh. The powers of the Lord Advocate in relation to criminal proceedings are exercised through that Department, and in these functions he is assisted by the Solicitor General and four Advocates Depute. The Law Officers and Advocates Depute are known collectively as Crown Counsel. For the purpose of criminal administration, Scotland is divided into four circuits or districts, viz: Home, North, South, and West. An Advocate Depute is assigned to a Circuit and is responsible for the various cases reported to the Crown Office from that circuit.

The permanent head of the Crown Office is the Crown Agent, who acts in an administrative and executive capacity under the direction of the Lord Advocate. His duties are concerned mainly with criminal administration, including the Procurator Fiscal Service.

The local officers of the Lord Advocate and local prosecutors in Sheriff Courts in the various districts in Scotland are the Procurators Fiscal. In the busier and larger districts these officers are whole time officials, while in the smaller districts they are part-time officials. They investigate and institute proceedings for criminal offences within their districts and all summary prosecutions in the public interest in the Sheriff Court are taken at their instance. The more serious crimes are investigated and reported by them to the Crown Office for for the consideration and instructions of Crown Counsel. Where a case is prosecuted in the High Court of Justiciary, the trial is conducted by Crown Counsel.

There are a number of Scottish Courts of Law, which I shall deal with in order of importance. The High Court of Justiciary is the supreme court for criminal cases. It consists of the Lord Justice General (who is also the Lord President of the Court of Session), the Lord Justice Clerk, and at the present time thirteen Lords Commissioners of Justiciary (who are also Judges of the Court of Session). The seat of the Court is in Edinburgh, but the Judges travel on circuit for the purpose of presiding at trials in other towns. Cases involving serious crimes are taken in the High Court of Justiciary, which also functions as an Appeal Court for appeals taken by persons convicted on indictment, whether in the High Court itself or in the Sheriff Court, and for appeals from courts of summary jurisdiction. There is no appeal from the High Court of Justiciary to the House of Lords. The administrative business of the Court is the responsibility of the Clerk of Justiciary and his staff.

The supreme civil court in Scotland is the Court of Session, which was established in 1532. It sits in Edinburgh, and at present consists of 15 Judges including the Lord President of the Court and the Lord Justice Clerk. The Judges are sometimes referred to as Lords of Session and sometimes as Senators of the College of Justice. The Court is divided into two parts—The Inner House and the Outer House. At present there are six Outer House Judges who hear cases at first instance. The Inner House, which disposes of appeals from the Outer House and from Sheriff Courts, also deals with certain types of cases at first instance.

There is a Sheriff Court, in each of the twelve Sheriffdoms of Scotland, presided over by a Sheriff and a varying number of Sheriff Substitutes. The powers of a Sheriff-Substitute are for most purposes the same as those of a Sheriff, but the Sheriff is empowered to entertain appeals from a Sheriff-Substitute of his Sheriffdom in civil causes. The Sheriff has also a number of quasi-judicial and administrative duties.

The Sheriff Court has a very wide jurisdiction in civil matters and in criminal matters has power to try all crimes and offences, except a few of the most serious crimes. Its powers of punishment, however, are not as extensive as those of the High Court. Such criminal prosecutions may be tried either on indictment (in which case the trial is by jury) or summarily (in which case the trial is without jury).

Finally, there are the Police Courts in burghs presided over by Magistrates or Judges of Police, and Courts of Justices of the Peace in county districts. These are courts of summary jurisdiction, and have power to try minor offences included in the jurisdiction of such courts by statute.

In a burgh a qualified lawyer may be appointed to exercise the jurisdiction of the Magistrates. A person so appointed is called a Stipendiary Magistrate, but only in Glasgow, in one court, has an appointment of this kind been made.

Ordinary Justice of the Peace Courts have also a very small jurisdiction in civil matters, practically limited to actions not exceeding £5 in value.

Thus the procedure whereby a Chief Inspector of Weights and Measures in England may act as prosecutor does not apply in Scotland where the procurator-fiscal, a qualified lawyer, operating under the direction of the Lord Advocate in Edinburgh is the prosecutor on behalf of the Crown. On certain occasions the universal application of United Kingdom Weights and Measures Acts, particularly in prosecuting offences, has been impossible because of the difference in legal procedure and one eminent Scottish judge referred to certain sections of the Weights and Measures Acts as "this English law foisted upon Scotland."

When instituting proceedings with regard to Weights and Measures offences Scottish law requires, as with all offences, that there must be unequivocal corroboration of the circumstances.

Allocation of Inspectors to Areas in Scotland

Weights and Measures laws are enforced in Scotland by the local authorities viz: the four counties of cities Glasgow, Edinburgh, Aberdeen, and Dundee, various large burghs and for the largest areas of the country by county councils. Of the total inspectorate of 81, 37 are employed by the cities and large burghs and 44 by county authorities.

The county inspectors, particularly in the remote areas of the Counties of Caithness, Ross, and Cromarty, and Argyll, have occasionally to embark on "safari" type tours of inspection and verification, perhaps necessitating an absence of four or five weeks from the home office. The inspectors of Argyll in particular, faced with a network of small populated islands with large numbers of Gaelic speaking people, have to be particularly resourceful and energetic

persons, perhaps embarking and disembarking from small coastal steamers three or four times per day.

Joint ventures between authorities extend mostly to the operation of heavy weighbridge testing units, one of 13 tons capacity operating in the counties of North Eastern Scotland and the Glasgow unit of 20 tons capacity operating over the remainder of the country, with the exception of the islands.

Operations in the Glasgow Office

There are 13 of a qualified staff in Glasgow, representing one-sixth of the total weights and measures inspectorate in Scotland. The population is 1,100,000 and we visit 18,000 premises annually. Of necessity we specialise, the city being divided into five sectors, each the responsibility of a district inspector whose main concern is the surveillance of all trading premises in his area; two inspectors concentrate on deliveries of coal, inspection of coal depots, public health clinics, school meal kitchens, and street or itinerant type traders; three inspectors are responsible for supervision of petrol or gasoline stations. These latter officers are also concerned in certain building, safety, and licensing provisions, which is an ancillary responsibility of the Department.

The district inspectors accompanied by unqualified assistants mostly use public transport but coal inspectors and petroleum inspectors operate using patrol vans accompanied by driver assistants.

In addition to normal weights and measures legislation, for a number of years certain legislation of a public protection nature has been made the responsibility of the Department. The most important of these is the supervision, control, and safety of all petroleum installations in the city. Petroleum stored amounts to 3,500,000 gallons. The control of all shop opening hours and the hours of employment, hygiene, and welfare provisions for all shop assistants in the city is also a particularly onerous task. The Department maintains and administers 12 public weighing machines of 30 tons capacity in various parts of the city. The result of all such tasks is that the Glasgow office, with a total personnel of 49, is one of the largest weights and measures offices in the United Kingdom.

Present-Day Problems

Owing to lack of up-to-date legislation, certain problems in the United Kingdom are of uniform application, particularly with regard to pre-packaging—lack of markings, markings of indeterminate amounts, packing of gross weight, and packing of unspecified quantities. Many instruments have to be tested under regulations over 50 years old and some instruments have no regulations applicable to them.

Under commodity control, more trouble has been caused in coal deliveries than in any other commodity.

In Glasgow, fraudulent practices in regard to coal deliveries reveal ingenuities which would tax the mind of any inspector. We have had instances of a small boy being carried into a house as 1 cwt of coal, coal sacks containing empty sacks instead of coal, lumps of coal being taken from various sacks to accumulate a sack of coal for the lorryman and, another trick, where, instead of emptying all the coal into the cellar, large lumps are retained in the foot of the bag. As this paper

is being printed the number of coal offences in the city for the year totals 92 and, by means of the press, it has been necessary to warn Glasgow housewives to beware of fraudulent deliveries.

The control of food commodities is governed primarily by the Sale of Food (Weights and Measures) Act, 1926, and the Pre-Packed Food (Weights and Measures) Marking Regulations, 1957. It is estimated that in the United Kingdom 30/- or \$4.50 is spent per head of population on food in each week. For the city of Glasgow this represents a spending of approximately £1,500,000 or \$4,500,000. The field of prepackaging of food and sale of such commodities is mainly the responsibility of the district inspectors who, by daily visits to the various premises in the city, verify the exactitude of pre-packaging and of the various weighing instruments in use. A test purchase operation is undertaken on one day of each week when female members of the staff carry out trial purchases at various shops in the city; these purchases are immediately weighed by apparatus carried in a Departmental patrol van and if short weight is found, proceedings are initiated against the actual offenders.

Sales of wines and spirits have been inadequately covered by legislation and in most parts of the country sales are made by the glass or "nip" which may be $\frac{1}{5}$ th, $\frac{1}{6}$ th, $\frac{1}{4}$ th, or $\frac{1}{8}$ th gill according to the whim of the proprietor of the licensed premises. Scotland, the home of whisky, has a long history of using the "nip" of $\frac{1}{4}$ gill whereas the recognized measure in England has usually been $\frac{1}{5}$ th gill. It was hoped that the new Weights and Measures Bill would regularise such sales but the legislation proposes that measures of $\frac{1}{4}$, $\frac{1}{5}$, and $\frac{1}{6}$ gill be allowed.

All persons who sell wines and spirits are required to hold a licence from the local licensing court, which is composed mostly of city magistrates.

These courts may issue recommendations as to the building requirements, conduct of premises, hours of opening, etc. to which the licensee must conform and in Glasgow we have two recommendations:

1. That wines or spirits will be sold either by imperial measure of $\frac{1}{4}$ gill or by the nip of $\frac{1}{5}$ gill and suitable notices are required to be displayed.

2. That all wines and spirits should be dispensed by means of stamped optic or non-drip type measuring instruments.

Constant evening and Saturday afternoon patrols are organised to visit various public houses, hotels, and theatre bars, etc., to ensure that correct measure is dispensed.

The New Weights and Measures Bill

The main Weights and Measures Act operated in the United Kingdom is the Act of 1878, and for about two years the government has been endeavouring to pass a new Weights and Measures Bill. The Institute of Weights and Measures Administration has made many recommendations with regard to clauses in the bill which they consider to be inadequate or even offering less protection to the public than they presently enjoy. One of the most contentious items in the bill has been whether many goods should be packed by gross weight rather than net weight, the Institute holding firmly to the policy of net weight. It is a matter of interest that many goods on sale in the U.S.A., which have been packed in Britain or packed under the same

brand names in the U.S.A., are marked with the net contents to comply with American law yet, during discussions on the new Bill, some of the manufacturers have been most vehement in their protests that, selling the same goods in Britain, they are unable to mark the net contents or that to be required to do so would pose insurmountable obstacles.

The bill, at present, seems to have lost itself in a Parliamentary Wilderness. At the start of this Parliamentary session, the Government indicated their intention of investigating whether Britain should enter the Common Market and it may be that a New Weights and Measures Act will not materialize until a decision is made with regard to entry to the Common Market.

Decimal Coinage and the Metric System—Should Britain Change?

Should Britain Change is a booklet reporting an investigation jointly carried out by the British Association for the Advancement of Science and the Association of British Chambers of Commerce. Considerable detail is given as to the pros and cons of a complete changeover to the metric system, particularly of the financial burden which would be imposed on the country. It is a matter of interest that the British Pharmaceutical Industry, in wholesale dealings with chemists, changed from the imperial to the metric system on 1st July, 1953.

The forerunner of the proposed new bill was the deliberations of a committee of enquiry, the Hodgson Committee, who, in 1950, recommended that the Government should take steps in concert with the Commonwealth and the U.S.A. to abolish the imperial system of measurement in favour of the metric system over a period of about twenty years. At that time the Government indicated that it was not prepared to support the changeover to the metric system.

Meanwhile, the country is being educated to the Centigrade scale by our meteorological officers and a committee has been established to investigate the adoption of a decimal coinage.

Conclusion

Throughout the United Kingdom we have today a keen and responsible inspectorate poised on the brink of a new Weights and Measures era wherein up-to-date legislation, decimal coinage, and perhaps a complete metric system may soon appear. That such steps must be taken in consultation with the Commonwealth and the United States would seem beyond question. Thus it may be that within this century a universal system of weights and measures will operate, backed by a well qualified inspectorate.

The efforts of your Conference—"That Equity May Prevail"—and those of the Institute of Weights and Measures Administration—"Addere Legi Justitiam Decus" (It is a privilege to administer the law with justice)—may well provide the foundation stone of a world-wide organisation.

DISCUSSION ON FOREGOING PAPER

MR. HOUSTON: Thank you, Mr. Cairns. Your talk has been most informative, educational, and inspirational. We certainly appreciate your coming to see us.

Are there any questions?

MR. CHRISTIE: I was rather intrigued by the fact that you do have certain types of commodities that lack quantity markings when in package form. I am wondering whether you make any effort and what type of effort is possible for you to control them to prevent cheats or frauds of various nature?

MR. CAIRNS: Where the packages are unmarked and no declaration of weight is required under the weights and measures legislation, I am afraid there are no steps we can take to control the matter. However, we have this new weights and measures bill before Parliament and practically every commodity which is missing from weights and measures regulation at the present moment is included in the provisions of the new bill.

MR. BOWEN: I would like to say to Mr. Cairns that I think his presentation was most informative and worthwhile. From my point of view, I find it most interesting to listen to officials from other countries and, of course, relate their activities and the problems that they have to the problems that we meet in this country.

I would like to ask Mr. Cairns if he would care to comment on the current prevalence or nonprevalence of supermarkets in Scotland and whether or not they pose the same problems as in this country.

MR. CAIRNS: The problems posed by supermarkets have not reached us in Scotland to any great extent. We have many self-service stores. Having listened to your deliberations during the last two days, I would say our present legislation covers the situation better than it is covered in America. We have no problems with regard to staple foods which are packed in specified quantities and the labeling requirements leave no doubt as to the marking of weight or measure.

MR. BOWEN: What are your problems in Scotland relative to taximeters and odometers?

MR. CAIRNS: Taximeters we do not control, nor are we likely to control these for some considerable time. They are in the province of the Police Departments of the various cities. However, I was most interested in the papers on odometers and, you can take it from me, when I get back, I will be making steps to consult our chief constable, because we do have, in Scotland, quite a lot of car rental.

MRS. NELSON: Mr. Cairns, you tell us you have had no real problems resulting from odd size or nonstandard packages. I believe you refer to standard size packages as "specified quantities" and, I think your word is a much better one than ours; it is more descriptive.

I would like to know a little more about how long you have had these "specified quantities," and how you achieved them. I am sure you can see that we have not gone very far in that direction. We seem to encounter little cooperation from industry in going in that direction. How did you achieve it?

MR. CAIRNS: This achievement that Mrs. Nelson refers to occurred when I was just a boy. The Act was the Act of 1926. So, since 1926 in Great Britain, uniformly throughout all countries in Britain with regard to most staple foods, we have had this packing in specified quantities. There has been no trouble with it. All I can say is that the one thing you have in this country, which we would like in ours, is the specifying of "net weight."

Under our legislation of 1926, some items were allowed to be packed "gross weight" if the weight of the wrapper did not exceed a certain

tolerance. The Act came about, I assume, because of the same difficulties in Britain as you have here.

How did we manage to achieve it? Mostly, I would say, by the efforts of the inspectors of weights and measures professional society or institute. The one person in your country who is ignored almost completely, the one who handles most of your country's economy, is the housewife. Big business, little business, weights and measures inspectors, and trade organizations, they can look after themselves, but as we sit here today, your wife and my wife are downtown doing their shopping, completely confused by the lack of weight markings on commodities or markings in indeterminate weights. I would say, to assist your program here, do as we are doing back home—about two and three nights per week, either myself or my staff are out talking to women's organizations on weights and measures. If, when you go out and speak to these ladies' societies, you only get one or two disciples who, in the future, will know where to go if they receive short weight or measure or find bad packaging, your effort will have been justified. Ninety-nine percent of the population do not now know where to go. And particularly, they must know that you will do your best to help them.

MR. MEEK: I would like to ask Mr. Cairns what cooperation the weights and measures officials of Scotland received from the press with regard to prosecutions. Do you get favorable publicity? In this country, in many instances, when we prosecute, any mention of it is hidden away in the newspaper where it is seldom seen. I wonder if you receive more support from your press in Scotland than we seem to get in this country.

MR. CAIRNS: On occasions, we have the same difficulty, that after having conducted a very lengthy inquiry, no publicity is received. But, we have found through practice and from constant liaison with the press in the city, we are able to obtain quite a lot of publicity.

The one thing to realize with the press, is that they want to sell papers. If you can put over a prosecution which has some form of "gimmick" with it, and a bit of journalistic license added to it, we find that it does a world of good. In fact, about three weeks before I left, because of all these short weight coal cases we called a press conference on the subject. We put all of our cards on the table. The reporters really went to town. They went to the extreme. Many of the remarks attributed to me had actually been asides made by some of the reporters. The press reached the stage where I was alleged to have said that all coal deliverymen in Glasgow were recruited at the doors of the local prison.

Every paper in the land took this up, and I had to sit tight, before deciding what action to take. Should I issue a denial or await the effect of the publicity?

What was the effect? Our coal merchants in the city, who annually had held a meeting attended by about ten gentlemen, got such a fright they decided to hold a meeting before the regular time and asked me to attend and address their members. They had 120 men turn out for the meeting. The publicity was most effective.

On the day our Annual Report is published, copies are delivered by hand, immediately to all newspapers and T.V. stations in the city.

PACKAGE CONTROL IN PENNSYLVANIA

By E. A. VADELUND, *Assistant Director, Bureau of Standard Weights and Measures, Department of Internal Affairs, State of Pennsylvania*

The past several years have witnessed a major change in weights and measures enforcement in Pennsylvania. Basically, the change is nothing more than a recognition of change in the buying and selling habits of merchants and consumers; a change that is evident in the development of the modern self-service supermarket, and in the development of packaging. It is a change aided in no little way by developments in the scale industry. There are, of course, many other reasons for the change to the so-called "package economy," such as the increased income and leisure time of the general public and the subsequent demand for more convenience in the performance of household chores, including the preparation of food.

My point here is not to establish a cause and effect relationship, but simply to note that a marked change has occurred. This marked change forces weights and measures agencies and their officials to re-examine policies and programs in light of the changes in the market place. It forces weights and measures people to establish new priorities in order to best protect the public, and to spend the tax dollars entrusted to them in the wisest manner possible.

For many years, the Pennsylvania Bureau of Standard Weights and Measures concentrated its greatest efforts on device control—the inspection and testing of commercial weighing and measuring devices. Much effort is still expended in this field. The Bureau came to recognize, however, that major emphasis on device control did not, and cannot, offer the protection to the consumer that weights and measures laws are designed to offer. There was, of course, a time when major emphasis on device control did offer consumer protection, but, with the changes previously mentioned, this is no longer true.

Perhaps this was nowhere better illustrated than by a picture which appeared on the cover of the *Saturday Evening Post* some years ago. The cover pictured a benevolent looking little old storekeeper, complete with green eyeshade and long white apron, on one side of a hanging scale. On the other side stood a prim little old lady wearing an old-fashioned flowered hat and a faded print dress. Between them on the pan of the scale was a whole chicken being weighed. Both parties were gazing intently at the indicator. The storekeeper was gently pressing down on the pan with his finger concealed by the chicken; the little old lady was just as gently pressing up with her finger on the underside of the pan.

The method of sale illustrated on that magazine cover indicated that the consumer did receive some protection. The scale was probably tested by a weights and measures official, and the customer was able to provide protection for herself. However, few chickens are now being bought by little old ladies in the manner illustrated; rather, they are being bought already neatly wrapped, labeled, and priced. All the lady has to do is pick up the package of chicken and drop it in the shopping cart. The question is how to give the little old lady the same protection she got under one method of sale with the completely different method of sale that now generally prevails.

It is readily apparent that testing the scale on which the packaged chicken is weighed is not the final answer. Testing that scale offers no positive guarantee that the package of chicken was properly weighed and priced. Furthermore, the little old lady may never see the scale, since such scales are usually in a backroom well away from the point of sale. Similarly, every other packaged item our consumer may buy is also put up prior to sale and, in many cases, many miles from the point of sale. Checking the devices used in putting up these packages is difficult, if not impossible.

The only solution to the problem is to institute a systematic package control program concentrated at the retail level. Once this decision has been reached, as it was in Pennsylvania, the only question remaining is what system to use. Obviously, our earlier efforts at package control were not enough. The checkweighing or measuring of individual packages, under no special method, or an occasional survey of a problem item throughout the State offered no practical solution. What was needed was a procedure that would be both effective and acceptable—effective in that it would take a minimal amount of time and still produce required results; acceptable in that the results produced could be easily explained to producers and packers and accepted by the courts.

In addition, the technique had to be such that inspection personnel could easily master it; and the necessary equipment could be neither costly, cumbersome, nor complicated. Such a technique was available in the National Bureau of Standards Handbook 67, "Checking Pre-packaged Commodities."

This Handbook was published in March 1959, and Pennsylvania put the procedure into effect in May 1960. The intervening period was spent in acquiring equipment and training personnel. The personnel for the program were selected from what we call our general inspection staff. This general duty staff had, as its assignment, the whole range of weights and measures duties with the exception of those duties for which particular units were established. For example, the general duty staff does not handle large-capacity scale testing, farm milk tank testing, vehicle tank meter testing, etc.

Twelve inspectors from the staff were assigned to various areas of the State with instructions to spend 75 percent of their working time on package control. They were equipped with equal-arm scales graduated by sixteenth-ounce divisions. The inspectors carry the usual sealers' weight kits and just recently were also equipped with sets of graduated glass flasks designed especially for use in package control work involving liquid commodities.

The staff was instructed to conduct package control work primarily in self-service supermarket type stores. Here an inspector could check items packaged on the premises, as well as packaged items bought by the store for resale. Here also is where the greater portion of the consumer's food dollar is spent. The staff was also instructed to make as many of their checkweighings as possible out in the main area of the store in view of the public, and to checkweigh as many different types of packaged commodities as possible. Checkweighing packaged commodities in view of the public is beneficial in that it points up an important phase of weights and measures work to the casual observer, as well as to the interested consumer. All types of packaged commodi-

ties should be sampled, because it is just as important to get full measure whether the product is beans or bacon. As a consequence of the latter, we have checkweighed packaged items from A to Z—aerosols to zwieback.

The checkweighing program got off to a relatively slow start, as is the case with many new programs. The inspectors proceeded slowly until they gained confidence and experience. At the end of the first year it was evident that the program was both effective and necessary. During that first year, 8,165 different lots of packaged commodities were checkweighed, with an average of 40 packages to the lot. Of this number, 1,763 lots were found short-weight or measure. This means that, in our checkweighing of more than 325,000 packages, we found better than one out of every five short.

The economic significance of the program can probably best be expressed in terms of how much the shortages were costing Pennsylvania consumers of some widely used products. One of the first items we found to run rather consistently short-weight was packaged brown sugar. This commodity is generally put up in one-pound cartons and it retails for about 16 cents per pound. In 1960 the per capita consumption of sugar was about 98 pounds. On that basis, Pennsylvania consumers fed their sweet tooth in excess of one billion pounds of sugar. We were not able to determine how much of that total was represented by packaged brown or soft sugar, as it is called. However, our checkweighings in the first six months indicated that 50 percent of the brown sugar was short-weight, with an average shortage of $\frac{1}{2}$ ounce per one-pound package. At about 16 cents per pound, this was costing Pennsylvania consumers one-half cent per package every other time they bought brown sugar in a one-pound package. We have no way of determining how many millions of packages of this product were sold in Pennsylvania, or in the country for that matter, at $15\frac{1}{2}$ ounces to the pound, but I think we would all agree that it was a sizable amount.

Another widely used item in which we found wide-spread shortages was packaged butter. The shortages were found in widely distributed brands as well as in local brands. Our checkweighings revealed that 41 percent of the packaged butter checked was short-weight with an average shortage of $\frac{1}{4}$ ounce per package. Pennsylvanians consumed approximately 82 million pounds of butter in 1960. Applying the $\frac{1}{4}$ -ounce-per-pound shortage to 41 percent of that total indicates that the consumers were paying for more than one-half million pounds they were not getting. At the average retail price of 70 cents per pound, the overcharge would amount to more than \$365,000 per year. This, I submit, is a lot of money for nonexistent butter. Happily, our checkweighings in recent months have shown that over 97 percent of the packaged butter checked is proper weight.

Another widely used type of commodity which we regularly were finding short-weight was soap and related items such as detergents and cleansers. At one time we were finding as much as 25 percent of these items short-weight. The latest monthly figures indicated the percentage of short-weight packages in this line is slightly more than 4 percent. Because of the wide disparity in prices and package sizes in the soap, cleanser, and detergent field, no attempt has been made to determine what these shortages were costing Pennsylvania consumers.

We have all recently been hearing about the shortages in packaged tobacco products and what these are costing the consumer. When we first began systematically checkweighing this product, 45 percent of packaged tobacco products were found short-weight. As you all know, the situation is not peculiar to Pennsylvania and, unfortunately, it has not yet been resolved.

During one of the first three-month periods of our program we found that 39 percent of the dog and cat food we checkedweighed was short-weight. This would include both canned and dried products. The percentage of short-weight packages of this product for the most recent month had dropped to 3 percent.

The per capita consumption of breakfast cereals is about 9.5 pounds per year. At that rate, approximately 100 million pounds are sold each year in Pennsylvania. Again because of the wide disparity in package sizes and prices, it is difficult to estimate cost figures. For my purposes here, however, I have taken the price I pay for the breakfast cereal eaten in my home, and it is one of the lower priced dry cereals at 27 cents per pound. At that rate, Pennsylvanians are spending about \$27 million per year on breakfast cereals. Our first year's checkweighings indicated that 8 percent of the packaged cereals were short-weight, with the shortages averaging about one-half ounce per pound. Projected over the total amount used, this would result in a shortage of one-quarter million pounds per year at an annual cost of slightly less than \$70,000. That is a lot of cereal not being sugared every morning with the nonexistent sugar mentioned earlier.

Also, the Pennsylvania consumers who are pouring milk over their breakfast cereal are not making it as soggy as they might. Our checkweighings on milk put up in paper cartons indicate that approximately 50 percent of the milk packaged in this fashion is short measure.

In addition to all the standard or factory-packed items which we have checkweighed, the Bureau checkweighs many thousands of random-pack items such as meats and cheeses. In fact, all inspectors are instructed specifically to first checkweigh prepackaged fresh meats in every establishment they enter. Our inspectors have learned that if random-pack items are not checked first, they might all be removed from the case and reweighed before they can get to them. One instance comes to mind illustrating this very thing. An inspector walked into a supermarket one afternoon and introduced himself to the manager. The manager immediately took him in tow and escorted him around to the various departments to meet departmental managers. By the time the inspector reached the meat department, only two small lots of meat remained in the case. He check-weighed these, found them to be short, and immediately made an arrest.

The problem with prepackaged fresh meat is widespread. We have found that, whenever systematic package checkweighing is begun in a given area, short weight will be found in at least 50 percent of the packages offered for sale. The problem is not difficult to correct in any one store, since it usually only takes a warning and an off-sale order. A second violation brings an arrest and prosecution. However, this pattern must be followed in each store checked, at

least for a period of time. The news then spreads that a package checkweighing specialist is in the area, and the incidence of short weight begins to decrease.

We have also found that certain of the chain stores have taken steps to keep the number of violations to a minimum. One chain has adopted a policy of giving the meat manager a two-week vacation without pay when the first violation occurs. The second violation is supposed to bring dismissal, but we have seen no evidence of this. Other chain stores in Pennsylvania instituted their own internal package and scale checking systems. We have no way of measuring the effectiveness of these because we do not know how religiously they are being followed. We do know that rechecks in given localities have shown marked decreases in the incidence of short weight.

The scope of this short weight can best be demonstrated by using one supermarket as an example. I think it is safe to say that a medium-sized supermarket will package in excess of 5,000 packages per week. If those packages average about one pound each and the shortage is $\frac{1}{4}$ ounce per package, as our checkweighing indicates, the total shortage for one store will equal about 78 pounds per week. Multiplied by 52 weeks per year at about 80 cents per pound, the result would be almost \$3,250 per store per year. Since the shortages are found in only 50 percent of the cases, the yearly monetary average would be \$1,625 per store. There are about 28,000 retail stores in Pennsylvania, of which approximately 2,600 are the self-service supermarket type. Multiplying the \$1,625 figure by 2,600 stores produces the total sum of \$4,225,000. This sum would represent the cost to Pennsylvania consumers in short weight if what we have found in our checkweighing is projected to include all stores prepackaging their own fresh meats.

Another way of presenting the scope of this problem is to use the per capita consumption of meat as a starting point. In 1960 per capita consumption was about 160 pounds. This means that Pennsylvanians consumed approximately one and three-fourth billion pounds of meat. If we apply our average shortage of $\frac{1}{4}$ ounce per pound per package to 50 percent of that total, the result is in excess of 13 million pounds. This is not to say that Pennsylvanians were actually short-weighted out of 13 million pounds of meat; however, if our findings are projected in the manner outlined, this would be the result. In any event the cost to Pennsylvania consumers can be very large.

Another random-pack item in which we regularly find shortages is packaged fresh poultry. This brings us right back to the prim little old lady I mentioned earlier. Based on the results of our checkweighings the little old lady is being short-weighted on at least three out of every ten chickens she buys if she is buying prepackaged chickens in a self-service store.

Shortages in prepackaged fresh poultry average about $\frac{1}{2}$ ounce per pound in 30 percent of the packaged poultry we have checkweighed. The 1960 per capita consumption of ready-to-cook chicken was 28 pounds. If our findings were projected to include all such chicken consumed in Pennsylvania in one year, the shortage would amount to almost 3 million pounds. At the rock bottom price of 29 cents per pound, this amounts to more than \$800,000.

The following figures have been compiled from the Bureau's reports on package checkweighing for the latest 6-month period available.

Month	Number of lots checked	Number of lots short weight	Percentage of lots short weight
November.....	1, 062	161	15. 2
December.....	1, 090	244	22. 4
January.....	1, 417	277	19. 5
February.....	1, 050	234	22. 3
March.....	1, 010	172	17. 0
April.....	1, 019	185	22. 0
Total.....	6, 648	1, 273	19. 0

As can be seen from the table, the problem is widespread. For this reason, we see no lessening of emphasis on this program in the future. If anything, we see greater emphasis as the advent of prepackaging comes to new products and expands into other fields. We in Pennsylvania feel that we have hardly more than plumbed the surface in prepackage checkweighing. As time and money permit, we hope to include the checkweighing of all types of commodities, and we particularly look for an increase in the checking of packaged liquid commodities.

In conclusion, I want to mention a few more figures. The annual budget for the Pennsylvania Bureau of Standard Weights and Measures is less than \$250,000. The amount spent directly on package control is about \$90,000 per year. The population of Pennsylvania is about 11 million. This works out to less than nine-tenths of a cent per person per year. We submit that this expenditure on package control offers a lot of protection at less than one cent per person per year. If we have done nothing more than save that little old lady, and all other consumers like her, from being short-weighted when buying chicken, the money will have been well spent.

DISCUSSION ON FOREGOING PAPER

MR. BLACK: Mr. Vadelund, first I should like to compliment you and your staff for the work that made the paper you presented today possible.

I have two questions I would like to ask, and they have to do with procedure. The first question, in checking prepackaged fresh meat, when the packages are dry and packaging material has not absorbed moisture, are packages stripped and weighed net, or is similar packaging material used for tare purposes?

MR. VADELUND: Normally we take a sample of the tare material. We do not strip the packages unless we see an excessive amount of fluid in the packages. Then we do strip them.

MR. BLACK: Thank you, Mr. Vadelund. My second question is this: In checking prepackaged fresh meat and delicatessen items packaged in the retail market, is a special equal arm scale used, or is the regular prepackaging scale in the market tested for accuracy and then used for checking these items?

MR. VADELUND: We do not make a practice of using the store's scale. Each man is equipped with an equal-arm scale and sufficient weights and instructed to use these rather than the store scale.

MR. MANLEY: Mr. Vadelund, I have two questions also. First, do you not feel that deceptive packaging practices constitute a greater problem than short weight?

MR. VADELUND: Probably, but we can lick the short weight problem a lot easier. It is not as difficult to prove.

MR. MANLEY: My second question is, do you agree with the thinking that a great part of the task of consumer protection can be accomplished by educating the individual consumer?

MR. VADELUND: A portion of our task can be accomplished by educating the consumer. How great a portion is a difficult question. Should you ask if the percentage of shortages in prepackaged items could be reduced through proper education of consumers, my answer would be, yes.

MR. CHRISTIE: At the end of your inspection, what do you do—embargo, order off sale, prosecute in a summary manner, or by citation and further court action?

MR. VADELUND: We can do and have done all four. It depends on the circumstances. Normally, for a first offense, we will issue an off-sale order. For a second violation, depending again on the degree, seriousness, and intent, arrest and prosecution might follow.

DR. GORDON: How much publicity have you had on this program?

MR. VADELUND: That is difficult to measure, but not enough.

MR. WRENN: Do you permit any overpacking?

MR. VADELUND: Yes, within reason. We do not usually find any-body exceeding a reasonable overage, however.

MR. WRENN: What do you call reasonable overpacking on a two-pound package of steak?

MR. VADELUND: On two-pounds, I would say anything up to a half-ounce.

MR. FERNSTEN: Mr. Vadelund, I wonder if you could give us any idea of the time required to check the prepack meat operation in the supermarket you mentioned that packed some 6 or 7 thousand packages per week, that is, the time required by the inspector to go through this meat operation and determine whether short weight exists.

MR. VADELUND: I would say he would need to select three samples, samples from three different lots out of a supermarket meat case. He will be able to tell at the end of that test whether that store is short-weighting or not. It is as easy as that. In fact, our procedure usually is that if in the first three lots we cannot find one lot of proper weight, we will have the meat case cleaned out without any further sampling.

MR. HARRIS: I wonder if you are at liberty to tell the conference what happens to short-weight dog food?

MR. VADELUND: It comes back from Virginia in a sealed railway car. I break the seal, and the firm hires ten unemployed men to smash these cans one at a time.

MR. MARTIN: Your subject or title is "Package Control in Pennsylvania." In your efforts in the area of package weight control, do you also get into the area of what we would call misbranding or the areas of all inconspicuous labeling, these other areas that are of concern in package control?

MR. VADELUND: Yes. If our inspector, for example, is check-weighing an item which is improperly labeled, this will be noted on the report. Yes, we normally make this a practice.

AFTERNOON OF WEDNESDAY, JUNE 6, 1962

—No BUSINESS SESSION—

OFFICIAL LUNCHEON—WEDNESDAY, JUNE 6, 1962

(ROBERT WILLIAMS, CHAIRMAN, PRESIDING)

(HON. SIGURD ANDERSON, *Commissioner, Federal Trade Commission* gave a very informative address, explaining the various functions of the Federal Trade Commission.)

FOURTH SESSION—MORNING OF THURSDAY, JUNE 7, 1962

(ROBERT WILLIAMS, Chairman, Presiding)

REPORT OF THE COMMITTEE ON NOMINATIONS AND ELECTION OF OFFICERS

Presented By R. E. MEEK, *Acting Chairman, Director, State Division of Weights and Measures, Indianapolis, 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.

In selecting active members of the Conference to nominate for elective offices, 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 48th National Conference on Weights and Measures, and to serve during the ensuing year or until their successors may be elected:

Chairman: C. H. Stender (South Carolina).

Vice Chairman: C. L. Jackson (Wisconsin); Nathan Kalechman (Hartford, Connecticut); J. F. McCarthy (Boston, Massachusetts); and P. I. Morris, Jr. (Georgia).

Treasurer: C. C. Morgan (Gary, Indiana).

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

Executive Committee: All of the officers and, in addition, the following: G. W. Bay (Missouri); E. H. Black (Ventura County, California); C. R. Branch (Petersburg, Virginia); W. R. Copeland (Indianapolis, Indiana); R. J. Cord (Prince Georges County, Maryland); W. R. Cornelius (District of Columbia); W. E. Czaia (Minnesota); J. L. Littlefield (Michigan); A. T. Smith (New Jersey); and C. W. Van Schoik (Ohio).

R. E. Meek, *Acting Chairman*

H. E. Crawford

H. D. Robinson

R. K. Slough

H. M. Turrell

E. C. Westwood

(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.)

ADDRESS

By G. S. McINTYRE, *President, National Association of State Departments of Agriculture.*

I appreciate as a representative of the National Association of State Departments of Agriculture the privilege of appearing before this 47th National Conference on Weights and Measures.

It is trite for me to say anything about the importance of the work done by the sealers and inspectors of weights and measures. However, for the record, I believe it desirable to point out that few items are bought or sold that are not bought or sold on the basis of weight, volume, or numerical count. There probably is no other area where people can be cheated or defrauded as easily or to a greater extent than in the area of weights and measures.

It also is unnecessary for me to relate to you the interest the National Association of State Departments of Agriculture has in weights and measures programs. Again for the record, I would like to state that the Commissioner, Secretary, or Director of Agriculture is the State sealer of weights and measures in 37 States and Puerto Rico according to the directory compiled by the United States Department of Agriculture (1961). That fact alone should clearly indicate the interest the Association I represent has in the actions taken by this Conference.

In addition, the National Association of State Departments of Agriculture during the past five years has taken some very positive actions at its annual conferences. In 1955 the National Association of State Departments of Agriculture passed a resolution stating in part

... that the President of the Association of Commissioners, Secretaries and Directors of Agriculture appoint a permanent Weights and Measures committee of this Association to be the contact between this Association and the "National Conference on Weights and Measures Officials and the Bureau of Standards...

Such a permanent committee was appointed and has continued in existence ever since.

The 1959 convention passed Resolution No. VII which directed

... the National Association of State Departments of Agriculture ... encourage and promote the adoption of Handbook 44, as adopted by the National Conference on Weights and Measures and recommended by the National Bureau of Standards, in order to bring about uniform laws, and regulatory requirements in all states, and ... the Association urges its members to examine the individual weights and measures program for the purpose of modernizing and standardizing their testing equipment and enforcement practices, taking full advantage of the assistance that may be obtained from the National Bureau of Standards.

In 1960, Resolution No. XXI requested that

... Congress make available an adequate appropriation and authorize the National Bureau of Standards to refurnish adequate physical standards to each state.

In addition to the resolutions passed, a representative of this Association has taken part on the programs of this Conference for several years, and a representative of this Conference has been invited to attend the convention of the National Association of State Depart-

ments of Agriculture. This exchange is beneficial and highly desirable. It must continue.

The National Conference on Weights and Measures has been in operation for nearly a half century. During that time it has provided leadership and assistance to the States and local units of government in the field of weights and measures. This Conference and the relationship of the National Bureau of Standards exemplifies the finest kind of relationship existing between Federal Government and the State and local units of government. Here we have a National Bureau exercising leadership, doing research work, and providing assistance to the States without making any effort to enter the field itself and preempting the State's responsibilities. The worthwhile programs and the leadership provided by this Conference and the National Bureau of Standards has been due to a considerable degree to the work of Bill Bussey and his associates. I want to commend them for such leadership.

The trend today is for federal agencies to move activity into intrastate operations at the expense of State programs, whether the latter are good or bad. This has not happened in the field of weights and measures.

However, in spite of all that has been done in the past, there is still much to be done in the future. The Conference has developed and promoted the adoption of uniform laws and regulations relating to weights and measures inspection and work. Because so much of business today is of an interstate character such uniformity is necessary.

There is, however, another area of uniformity just as necessary but much harder to achieve—that of uniformity of inspection or the application of the laws or rules and regulations. It is easy for a State to adopt uniform laws and rules but because of financial resources, lack of equipment, or of manpower, or other factors, the laws and rules and regulations are not applied the same in one State as they are in another.

I believe the lack of uniformity in the application of laws, not alone in the field of weights and measures, but also in other areas, is one of our greatest problems. It is a matter which this Conference can rightfully give considerable attention to. And because of human nature, it is a job which will probably never be completed.

Probably one of the ways to get uniformity of inspection or application of weights and measures laws is through a free exchange of information between States and between the States and local units of government.

As already stated, much of business is of an interstate character, and most goods are now prepackaged. In most cases the prepackaging is done a considerable distance from where the article is sold. In any event, it is done out of sight of the consumer. The buyer has lost the opportunity to see goods weighed or measured as the case may be. This has given a hollow sound to the phrase "Let the buyer beware." In most cases the consumer, lacking any acceptable method or accurate equipment for determining the declared weight or measure of the article purchased, must accept what she buys and depend upon some official agency to make sure she is getting the quantity represented.

Since commerce is interstate, a free exchange of information and a follow-up by the States receiving the information will go a long way

toward obtaining uniformity in the application of laws and rules and regulations.

While such free exchange of other information regarding methods of operation and procedures will help obtain more uniformity of application of laws and rules, probably the most important method of obtaining such uniformity is through this Conference and the National Bureau of Standards. The development of new methods and techniques and the training of State and local personnel in their use will do much to get all inspectors and sealers of weights and measures to operate in a like manner. I cannot emphasize too greatly the importance of uniformity of operation. It is most difficult to achieve but will go far toward preventing a federal agency from preempting the field of weights and measures.

A field of mutual interest which the National Association of State Departments of Agriculture has been active in is that of moisture testing of grain. No dependable method has been devised to measure such moisture content. Yet it is extremely important to the grain industry. Even a small deviation in percentage of moisture in grain from the correct amount can mean millions of dollars loss or gain to producers, handlers and users of grain.

To find an accurate method to check moisture in grain apparently is no easy matter. The National Association of State Departments of Agriculture, under the leadership of Commissioner Parke Brinkley of Virginia, has worked with the National Bureau of Standards and the United States Department of Agriculture, each of which has been doing research work on this problem, to coordinate their efforts and speed an answer to this problem. A satisfactory method has not, as far as I know, been found, but the research must continue until an accurate method has been developed.

Weights and measures officials as a whole have done a good job. It is hard to conceive what the situation would be if it were not for the work they are doing. Consumers must depend upon some official agency to continually check on the accuracy of weights or measures declarations and quantities delivered.

One should, however, be careful not to leave an impression that all firms or businesses or individuals are dishonest and consciously making an effort to cheat or defraud the public. Exactly the opposite is true. A majority, in fact most businesses do everything possible to deliver the quantities represented, and it is as much to their advantage as to the consumer to know that a competitor cannot obtain an unfair advantage by delivery of less than the quantities represented.

In spite of the importance of weights and measures work, the public really knows little about it. I have often said that no responsibility of the Michigan Department of Agriculture is more important to the public than the work done on weights and measures. Until recently probably no responsibility was less publicized or less known about than our weights and measures programs. There is a need for a continuous public relations job—not necessarily on who has been found to be selling articles short weight or who has been prosecuted, but rather what is being done, how often, and how.

Another area in public relations I wish to mention is that of working closely with industry groups such as the food handlers, meat industry, petroleum industry, etc., so there may be a mutual understanding of the problems involved, both from the standpoint of industry and

of enforcement. Effective enforcement of any law is impossible without the close cooperation of industry. Our experience in Michigan, as has been your experience, shows us that responsible industry representatives welcome an opportunity to work with enforcement agencies. It is only through a mutual trust and understanding of the objectives and responsibilities of each that effective law enforcement programs can be conducted. I urge this Association and each member in his respective jurisdiction to work closely with industry and build a mutual respect and understanding for each other's problems.

These are some of the problems and needs as I see them. Weights and measures work becomes more important each year because of greater need for an official agency to protect the consumers and for an official agency to assure honest businessmen of fair competition. The problems are great and will continue to be great. Purchase and maintenance of proper equipment is expensive and most States are hard pressed for money. Yet there are many fields in which little or no work is being done and where there is a crying need for some enforcement.

In Michigan nothing is done to check LP gas, or liquid fertilizer. Other States will have other areas in which little is being done. I suspect no State is doing a complete job. All of us can do a better one.

The National Association of State Departments of Agriculture is vitally interested and concerned about weights and measures programs. The valuable and important work done by this Conference must continue. The interests and programs of this Conference and of the National Association of State Departments of Agriculture are one and the same. It is essential that we continue to work together.

DISCUSSION ON FOREGOING PAPER

MR. ROBERT WILLIAMS: Mr. McIntyre, in your organization of the heads of State Departments of Agriculture, what percentage of these officials, would you say, share with you this feeling about the importance of weights and measures administration and the necessity for it.

MR. MCINTYRE: I cannot tell what everybody else thinks, but I can speak of the official action of the Association. During the last five years, there have been definite resolutions passed which were intended to indicate the policies and programs of the Association. I think anyone who is in a position similar to mine and who has the same responsibilities must accept those responsibilities as they are given him.

There have been definite and positive actions taken by the Association, most of these were unanimous actions. I must conclude that these actions correctly expressed the sentiments of the various commissioners, secretaries, and directors of agriculture present.

MR. MEEK: I was impressed by the remarks made by Mr. McIntyre, with regard to moisture testers used in the testing of grain. My problem is that in the last two sessions of Indiana's general assembly, there have been bills introduced which would place the responsibility of testing these devices with the State Division of Weights and Measures. I consider this a compliment. Both times, the bill passed the House of Representatives. We think that the bill will be reintroduced in the next session. In fact, it is gaining support all of the time. We discouraged enactment of the bill, simply because we did not feel that we could do a satisfactory job in this area. Now, the ques-

tion I want to ask you, Mr. McIntyre, is this, in your opinion would it be advisable to accept this legislation and to take no further steps to discourage its enactment or should we continue to endeavor to postpone enactment until we get the information we need regarding the testing of these devices.

MR. MCINTYRE: Mr. Meek, we have had similar sentiments expressed in Michigan. I think there are certain things that can be done now, but we, like you, have not encouraged this legislation. We have tried to encourage the development of a method which will give an accurate reading in spite of all the factors that today throw it off. I understand that some progress is being made.

WEIGHTS AND MEASURES CONTROL AT THE FEDERAL LEVEL

By CHESTER T. HUBBLE, *Director, Division of Case Control, Bureau of Enforcement, Food and Drug Administration, U.S. Department of Health, Education, and Welfare*

I am complimented to be invited to appear on the program of another of your National Conferences on Weights and Measures. There is a great area of common interest in the work that you and your associates are doing on a daily basis and the kind of enforcement actions under the Federal Food, Drug, and Cosmetic Act that flow from our field offices through the Division of Case Control in the Bureau of Enforcement.

When Commissioner Larrick spoke at your meeting last year he referred to our inability to increase our efforts in investigating short-weight practices to the extent that would be desirable because of our enforcement obligations in the health field. As a suggested means of assisting in bridging this gap he invited your requests for commissions so that you could assist in enforcement of Federal requirements in your States and cities. This idea has been acted on by the officials of four States and the District of Columbia thus far.

Meanwhile we have been able to give regulatory attention to violations in the area of short weight and inconspicuously labeled foods to a significantly greater extent than originally contemplated. The number of violations has been running rather high in this relatively neglected area. During a 10-month period extending from the middle of June 1961 to the middle of April 1962 we removed from the market by seizure action 162 lots of short-weight foods and 63 lots of foods bearing inconspicuous declarations of net contents, ingredients or firm name and address. In approximately 30 other instances violations were encountered that warranted seizure but the goods were distributed and perhaps consumed before the lots could be attached by the U.S. marshals following preparation of the necessary legal documents. You recognize, of course, that we have no direct embargo or seizure authority, and it is not always possible to make a final decision as to the legal status of a lot in time to arrange a State or local embargo through cooperating enforcement officials, though such arrangements are used to great advantage on many occasions.

These short-weight and/or short-volume foods just about ran the gamut of the market basket. They included anchovies; beer; black pepper, and numerous other spices, including 16 in one seizure; blueberry pie filling; bread; breaded oysters; cake mix; candied watermelon slices; candy mints; candy bars; cane sirup; canned green

beans; canned mixed nuts; canned mushrooms; canned pork and beans; canned sweet potatoes; cashew nuts; caviar; cheese stick snacks; chocolate flavored sirup; concentrated fruit sirup; coffee; cookies; dates; dried beans; fried pork rinds; frosting mix; frozen flavored ice suckers; frozen pizza; fruit preserves; glace fruit; grenadine sirup; honey; ice cream topping; instant coffee; instant tea; macaroni; maraschino cherries; matzo crackers; nonfat dry milk; noodles; olemargarine; olive oil; olives; onion soup mix; orange juice; peanut butter; pecans; pickle chips; pickle relish; popcorn; potato chips; pretzels; puffed rice; puffed wheat; salad dressing; sauerkraut; sesame chips (crackers); shrimp cocktail; shoestring potatoes in cans; sorghum; spaghetti; sugar tablets; tea; tea bags; toasted pumpkin seeds; tortillas; vinegar; walnuts in sirup; wheat germ cereal and zweibach toast; and of all things, a short weight "weight control" liquid.

Since the legal charge against short-weight foods is one of misbranding it is usually limited to a single action for each product. As you perhaps know, our law provides for multiple seizures on the same alleged misbranding only after the adjudication of one such charge in favor of the Government unless the Secretary makes a finding of fact that the article is dangerous, or the labeling is fraudulent, or would be in a material respect misleading to the injury or damage of the purchaser or consumer. This is interpreted to include economic damage. We did make a finding in the case of some nationally distributed puffed wheat and puffed rice that ranged up to 15 percent short weight in the wheat and 6 percent in the rice product. The manufacturer had developed a process by which it could puff the grain to a substantially greater volume than had previously been the practice. Placing the product with increased volume in the same size cartons without change in weight declaration resulted in the shortages mentioned above. Although the company was aware of the short-weight problem as early as April 1961, it continued distribution of the short-weight packages until action was started by the Food and Drug Administration in July. Routine reports received by our Division of Federal-State Relations suggest that legal action was taken some months ago by the State of New Jersey resulting in a \$500 fine on 10 counts.

The amounts of the net contents shortages were not always large percentage wise. In fact, in the 162 libel actions filed only 8 percent showed shortages above 10 percent; 26 percent were from 5 to 10 percent, and 66 percent were less than 5 percent. Under the Federal law in order to establish criminal liability we must be able to conclude that the product was short weight when shipped. This poses no particular problem in the case of such containers as hermetically sealed cans, while in others such as paper or cloth bags considerable weight must be given to the age of the lot sampled, moisture content (as compared to normal moisture levels when this is known), storage conditions, temperature, and humidity.

Some of these problems can be overcome by check-weighing the same items in the same size packages as packaged at the factory prior to shipment; the weighing at the time a shipment is delivered to a common carrier for introduction into interstate commerce or by other similar techniques. There are apparently some tightly sealed containers that should not lose moisture such as heat-sealed pliofilm bags, but our scientists tell us that there is great variation in the porosity of various

films that appear tight and the moisture loss through them can be significant.

A further word of caution—it is not always easy to determine the tare weight accurately. We have experienced several examples of glass jars used as containers where the variation in weight of individual jars is greater than the average shortage in net weight of the contents, e.g., a 2 percent shortage in a 2-ounce jar is only 0.04 ounce and the glass jars may easily vary up to 0.08 ounce, so we must be sure we are measuring actual shortage and not container variation.

The number of seizure cases involving inconspicuous labeling has not been as great as for short weight cases but the percentage increase over previous years has been about the same. We understand that the impact on industry has been great. Some of the larger firms in the country have been involved. Many have hastened to bring about corrections that would meet our objections and thus far only two or three firms have decided to contest the issues in court. One such case was lost by the Government earlier this year because of the difficulty in proving to the satisfaction of the court as a fact that the accused statements were inconspicuous because of the inherent difficulties in such subjective measurements.

Those responsible for the makeup of food labels have shown us there are many resourceful ways to avoid easy detection of mandatory label information. Here are a few of the more common ways that have been used—through inadvertence or by deliberation. The ink color selected for such information on clear bags or wrappers is that of the product so that there is no contrast and thus the wording cannot be readily seen if at all. Black ink is used for licorice candy bags, brown ink for bags of chocolate candy or brown dried beans, white for marshmallows, and green for green colored gum-type candies. Similarly the ink does not contrast with the label background such as in the case of black printing on very dark green cardboard. The size type used, even when there is ample room on the label, is too small to be easily read, and often the fraction of a net weight declaration such as 1¼ oz. can not be read. Sometimes the printing is so blurred in the case of mandatory information (but never in the case of a brand name) that it can not be read.

Required information is encountered on package wrappers of a metallic type so highly reflective that the words, especially if small, can be read only with difficulty in good light and at one certain angle. Mandatory information has been found, camouflaged by a background of variegated colors or submerged in nonrequired information such as recipes and "trade puffery," of the same color, size, and style of type. Sales promoters of "free" portions of a product or a "free" prize such as a ball point pen or a cook book sometimes overlook legal requirements in attaching the gift to the original package in such a way that at the time of purchase it completely obscures the quantity of contents statement or other information. Many times unit items of a food bearing proper labels are packed six or more together in an open faced opaque carton which is sealed in a wrapper in such a way that the mandatory information on the individual units can not be seen and is not repeated on the outer wrapper.

Although we have sought through discussions, expressions of opinion, in correspondence, etc., to have required information appear plainly and conspicuously on the main panel of the label, in order to

be certain of compliance, we find considerable body of opinion among industry people that this is not necessary since the Act itself does not contain such a specific requirement. Also the interpretative regulations thus far issued have not specified an exact location or type size. Perhaps revised regulations in more specific terms may be needed to spell out packaging and labeling criteria more clearly. These matters, as you know, have been given much attention in the hearings conducted by Senator Hart's Subcommittee on the Antitrust and Monopoly of the Senate Committee on the Judiciary. And in case any of you did not have the opportunity to read this significant portion of President Kennedy's March 15, 1962, message on protecting the consumer, let me quote him as follows:

Just as consumers have the right to know what is in their credit contract, so also do they have the right to know what is in the package they buy. Senator Hart and his subcommittee are to be commended for the important investigation they are now conducting into packaging and labeling practices.

In our modern society good packaging meets many consumer needs, among them convenience, freshness, safety and attractive appearance. But often in recent years, as the hearings have demonstrated, these benefits have been accompanied by practices which frustrate the consumer's efforts to get the best value for his dollar. In many cases the label seems designed to conceal rather than to reveal the true contents of the package. Sometimes the consumer cannot readily ascertain the net amount of the product, or the ratio of solid contents to air. Frequently he cannot readily compute the comparative costs per unit of different brands packed in odd sizes, or of the same brand in large, giant, king size, or jumbo packages. And he may not realize that changes in the customary size or shape of the package may account for apparent bargains, or that "cents-off" promotions are often not real savings.

Misleading, fraudulent, or unhelpful practices such as these are clearly incompatible with the efficient and equitable functioning of our free competitive economy. Under our system, consumers have a right to expect that packages will carry reliable and readily usable information about their contents. And those manufacturers whose products are sold in such packages have a right to expect that their competitors will be required to adhere to the same standards. Upon completion of our own survey of these packaging and labeling abuses, in full cooperation with the Senate Subcommittee, I shall make recommendations as to the appropriate roles of private business and the Federal Government in improving packaging standards and achieving more specific disclosure of the quantity of ingredients of the product inside the package in a form convenient to and usable by the consumer.

Our enforcement actions in the field of deceptive packaging are still marked by lack of success in contested cases. We have appealed to the Circuit Court of Appeals twice in the well known Delson thin mint candy case previously discussed with you and only recently lost our last attempt to gain a decision favorable to the Government and we think to the consuming public. It now appears that in the absence of any further legislation in this area we might have more success by developing some standards of fill of container, as now provided for in the Act, even though this certainly would be marked with difficulty in view of the great number and variety of packages that would be involved even for a single food industry or product.

In a somewhat different area of economic cheating we recently seized, in possession of a large retail food chain in Chicago, stocks of 10-ounce size jars of instant coffee labeled by a nationally prominent food firm as "Giant Economy Size." This representation was charged to be false and misleading since the cost per ounce of product was 14.4¢ when buying the giant economy size but only 12½¢ when buying the smaller (6 oz.) size of the same product in the same stores.

In addition to participating in each of your National Conferences we have, primarily through our Division of Federal-State Relations, attempted to keep you up to date on our day-to-day activities so that our work would be coordinated to the greatest extent possible.

Following last year's Conference we sent you lists of seizures of foods that were found to be short weight, short volume, or inconspicuously labeled. Beginning February 1 of this year we started sending out consolidated lists of all seizures, prosecutions, and injunctions by us on all products covered in the enforcement of the Federal Food, Drug, and Cosmetic Act and the Federal Hazardous Substances Labeling Act. We hope this information, which is now being supplied every two weeks, is helpful and informative.

Many of you will recall that when we started sending this information to you we supplied a number of blank forms and suggested that you might wish to reciprocate by sending us information of a similar nature. A number of weights and measures officials responded and have been keeping us advised of their actions on a periodic basis. This has been extremely helpful in the development of our short weight and short volume programs.

We hope that each of you will join in a two-way exchange of this information and that such an exchange will lead to an accurate appraisal of the nationwide consumer protection afforded by our joint efforts in this area.

DISCUSSION ON FOREGOING PAPER

MR. KERLIN: Mr. Hubble, on the information that you send to the States through your Federal-State relations program, it gives the product, the name of the packer, and the place in which it was seized. Is it possible to include also the brand name? Many times, we find that a given packer will pack under several different brands. I think this information would be helpful to us.

MR. HUBBLE: I do not see any reason why not. I suspect that these lists are made up for several purposes, which have not required the brand names. But for you people, I see no reason why not. I will so recommend to our Division of Federal-State Relations.

MR. STENDER: Mr. Hubble, at a recent two-State bakers' meeting in my section of the country, the question was asked as to when a product lost its identity as interstate commerce. Normally, we always thought when it came to rest in the State. Recently it was told to us that if a product is manufactured locally and distributed intrastate, contains one item in it that had moved in interstate commerce, that the product was considered to be interstate commerce. Is that true?

MR. HUBBLE: That is an area that is being explored at the present time. We are going slow in this particular area. Our attorneys think we have jurisdiction under the conditions you describe. We realize that this may be subject to contest, and we want a good strong case, some very important matter, to try that out on. And we are letting cases go forward only where we think they are important.

MR. STENDER: The illustration used at this meeting was that a local baker manufacturing cake, as an example, could probably obtain practically all of the ingredients within his own State, but may not possibly be able to get some flavoring or some spices that may have to be

shipped in. His product, nevertheless, would be interstate commerce after it was distributed within the State.

MR. HUBBLE: Carrying the idea to the extreme, that would be true.

MR. LYLES: I would like to ask a question regarding the "cents off" that we see on the various types of labels now. Does the Food and Drug Administration consider this type of labeling to be misbranding or misleading and, if so, has any action been taken along this line?

MR. HUBBLE: It is a question of fact whether it is misleading. The law provides that a food is misbranded if the label is false or misleading in any particular. And if it is misleading or if it is false then it is misbranded and subject to the law. So we have to evaluate the facts, and I might say it is rather difficult in cases of that kind, because you can not always tell what the regular price is. The price is first one thing and then another, so you do not know if it is off the *regular* price or not. Reference to "regular price" when there is no "regular price" is in and of itself misleading.

In answer to that part of your question as to whether we have taken any action, yes, we have. We did take action against one of the shortening products. It was a new product being test marketed. So there was no previously established regular price. And when the very first label that came out said it was so many cents off the regular price, which had not been established, then we thought we had a good case and we did take action there.

MRS. NELSON: I have two questions. Mr. Hubble—how many cases of deceptive packaging have you taken to court?

MR. HUBBLE: I do not know exactly. I think it is in the neighborhood of four or five or six. Something like that.

You say, "Have been taken to court." Many of them have gone to court and were not contested, but I am answering in terms of those that went to court and there was a contest of the issues.

MRS. NELSON: I am wondering if you will continue to take cases to court. You lost the Delson thin mint case—O.K., why don't you take another one?

MR. HUBBLE: Well, I would not say that we have stopped. It is in the cards that we will in some other jurisdiction take some other cases if we think we have a strong enough case. We should point out, however, that we have not been successful in a single contested case. But we have not given up and thrown in the sponge, if that is the point of your question.

MRS. NELSON: We get this impression.

MR. HUBBLE: Well, you can understand why we would be a little cautious.

MRS. NELSON: No, I can't understand; I can't understand it. I think one case isn't definitive. Time has gone by. Other packages exist. I would urge you strongly to try other cases.

MR. HUBBLE: Our lawyers don't like us to take losing cases to court.

MRS. NELSON: Well, the second question I have is: can you tell me how much money the Food and Drug Administration spends a year on policing that area which you have described in your paper as "economic cheats"?

MR. HUBBLE: I would not have that answer in my head; our budget people would have the answer.

MRS. NELSON: Could it be obtained?

MR. HUBBLE: Yes, I think so. I think they would have a pretty good idea.

MRS. NELSON: I think consumers are going to have to learn that this kind of protection costs money, and it is important to make that sort of information available so that they can realize that by spending some money for protection, they avoid losing in the deceptions and cheats in the marketplace.

MR. HUBBLE: Very good.

MR. VAN SCHOIK: Do you find, generally speaking, that there is a tendency to cover up the proper labeling, or the alleged proper labeling on packages?

MR. HUBBLE: I think the answer to that is yes. There are all kinds of degrees, and it is our intention, of course, to proceed against those that are furthest out of line first.

WHAT ARE THE FUNDAMENTALS OF A GOOD WEIGHTS AND MEASURES PROGRAM?

By L. J. GORDON, *Director, Weights and Measures Research Center, Denison University, Granville, Ohio*

Fifty-one years ago this Conference drafted and approved a model weights and measures statute. Through the intervening years this Conference has sponsored its constantly revised Model Law. Today 10 States are operating under laws which conform closely to the Model Law, while 22 are administering laws which deviate from the Model Law in 10 to 15 provisions.

Seven years ago the Director of the Weights and Measures Research Center made a study of State legislation, administration, and enforcement. The published results of that study showed great disparity among the States. Some had good laws and some had none. Some State programs were well administered and some scarcely operative. Some laws were enforced effectively, and some not at all.

One of the reasons for wide disparity in administrative and enforcement programs may be the lack of a Model Program. With this thought in mind I addressed letters to 22 weights and measures officials asking them what they considered to be the fundamentals of a strong weights and measures program. It was suggested that we agree that a good law is basic. Furthermore, it was suggested that we agree that an adequate appropriation is basic. Beyond those two fundamentals each official was asked what he considered basic. Recipients of the letter were asked to draw on their experience and wisdom. It was suggested that they assume they were talking to a younger man who was about to assume the responsibility for the weights and measures program in that jurisdiction. What advice would be given? Putting it another way, each official was asked this question: "Knowing what you know now, if you were to start over again and could build an ideal program, what would that program be?"

The 19 responses to my letter have given me a unique insight into the thinking of my respondents. I am the only person who has seen these letters and the only one who will. I am the only one who knows to whom the letters went and I promised anonymity. Not that the respondents requested it, but because I want you to think with them and with me about the fundamentals of a good weights and measures program without thinking of any particular program.

As you listen to my oral report, and later as you read the longer paper, if you detect contradictions, it will be because of differences in thinking. Some of these differences may arise out of location, but some of them reflect the judgments of competent men who find themselves in philosophical disagreement.

In listening to a speech or in reading a paper one of the more difficult tasks is that of spotting the omissions. If you note omissions in the paper, I urge you to write to me. Your letter will be placed in a file with the hope that some day the material I have collected may become the raw material out of which a Model Program of Weights and Measures Administration and Enforcement may be drafted.

In the judgment of 10 respondents, the number one requirement for a strong program is a competent top official. A good official can do more with a poor law than an inept official can do with a good law. The top administrator must be active and enthusiastic. He must be receptive to constructive suggestions and criticisms from all people in his jurisdiction. He must be alert to recommend amendments to the law, to the rules, and to the regulations.

A good official must be a detective, a salesman, a mechanic, a lawyer, and a diplomat. He must have pride in his work and a sense of public service. He must be a practical psychologist, able to assign the right job to the right man. There must be no favoritism in enforcement; no whitewashes; no sweeping of unpleasant cases under the rug; and no suppression of findings. "Good personnel under good supervision, can be effective in any jurisdiction."

A second fundamental is good communication up, down, and out. A good administrator keeps his supervising Board well informed. This can be done not only by oral and written reports, but also by inviting members of the Board to accompany an administrator in the field to gain direct knowledge of the work done and the problems faced.

A good communications program will not only keep the staff and the trade informed, but will enable inspectors and those inspected to communicate upward to the administrator. Effective communication with consumer-buyers is a must for a strong program. This was emphasized by eight of the respondents. To illustrate the importance of informing the public one official related this incident. His office is on the ground floor and his door opens onto the street. This enables him to hear comments made by passersby. On one occasion he heard a woman say, after looking at the sign over the door, "Hugh! What in the world does that department do? Just another stupid way to spend the taxpayers' money."

Another official put it this way:

No matter how efficient we are in our inspections and in our investigations, and how industriously we go about our daily work, we cannot do the job without the help and cooperation of the very people we serve. We have, perhaps more than any other public service, an enormous job of education. We must educate the buyer and seller. We must constantly seek his aid in our efforts to maintain equity. Doing a good job quietly is admirable, but in weights and measures work there is a definite need for "blowing our own horn." We must not only do a good job, but we must let the public know we did it.

Still another official stresses unlimited information to the public by which he means publicizing the results of investigations, disclosing facts such as brand name, names of parties, and the nature of the violation.

Weights and measures departments perform a valuable service to sellers as well as to buyers. This must be emphasized repeatedly. The story can be carried to the schools, to civic organizations, to the press, and to the adult public through newspapers, radio, and television. National Weights and Measures Week should be used to create and maintain good public relations.

A strong weights and measures program must be well organized if it is to be well administered. Form 1 of the Model Law is easier to program. It is suggested that there be three line functions with a Program Supervisor for each function. One division will be responsible for devices, another for quantity control, and a third for special business regulation such as automotive products. The three staff functions would deal with fiscal matters, personnel, and public education.

Several responses stress the importance of an independent autonomous department, having responsibility only for weights and measures. This is an issue about which there is some difference in judgment. In drafting a Model Program, this will require considerable discussion.

An essential part of a good organizational plan is a salary schedule. It is not enough to have an adequate appropriation out of which to pay adequate salaries. It is necessary to have a salary schedule which holds incentive for personnel who strive for improvement in performance.

According to at least one official the fee plan of financing a department is bad.

... such a program of fee collection receives priority over a program of efficient weights and measures service. Also, a program conducted under a fee plan is usually restricted to the testing of weighing and measuring devices, for which fees are charged, and does not receive proper attention to trade practices, deceptive packaging, labeling, misleading advertising, etc., all of which should be included in a sound weights and measures program.

A competent staff of inspectors and office workers is an obvious fundamental in a good program.

The total personnel must be imbued with the purposes and objectives set forth in the weights and measures law, rules, and regulations, and must be able to impress those with whom they come in contact with their sincerity in the performance of their official duty. The personnel must also look the part, that is, be well groomed and never have cause to apologize for appearance nor for behavior.

Inspectors must know the law they are sworn to enforce. Just to say "It is the law" is not enough. New inspectors should serve a probation. They should be trained by working with experienced personnel for at least six months and then supervised closely for a much longer period. Inspectors must be interested and intelligent. They must learn to control their tempers, and be willing to prosecute when necessary. At the same time, it is important to help inspectors develop a sense of balance—they should be neither too tough nor too lenient.

The jurisdiction should conduct schools every six months to keep inspectors abreast of new trends in marketing and equipment.

One official would "impress inspectors with the importance of regarding their work as a profession rather than as a job." Indeed, one

official would avoid the term "inspector" because it conveys a limited picture of the duties performed by the weights and measures official.

Three respondents stressed on-the-job continuous self-education.

Each Department member should be a student of weights and measures laws and regulations and National Bureau of Standards handbooks on specifications and tolerances, and inspectional procedure. All employees should be sufficiently interested to be regular readers of weights and measures publications and other news media carrying articles on the subject.

This process of continuing self-education cannot be fully achieved in isolation. All senior officials would profit by attending the training school in Washington conducted by the Office of Weights and Measures of the National Bureau of Standards. One official who attended a training school in 1948, at the National Bureau of Standards, found it to be such an invaluable experience that he attended again in 1961.

Participation in the meetings and the work of regional associations is indicated. "Every jurisdiction must strive to create and promote adequate programs in other jurisdictions through regional conferences."

As often as possible everyone engaged in weights and measures work should attend the annual National Conference on Weights and Measures.

. . . Because of the opportunity afforded to mingle with others and to discuss their work and problems with men who are experts in the various phases of enforcement. . . . No official can approach his maximum effectiveness and efficiency without being able to "rub shoulders" with successful fellow officials and authorities from other jurisdictions.

How prone we are to fail to recognize the indispensability of a good secretary! No weights and measures program can function effectively without an efficient office force.

Good secretaries can handle about 75% of the office workload. They are important and necessary links between the supervisor and inspector, supervisor and higher officials, and the supervisor and the public.

The importance of a strong legal department is stressed by one respondent.

Most people who answer your letter will stress a good law, good personnel, plenty of money, etc., but you can only have perfunctory enforcement of the law unless you can make your threat good every now and then in court. A weights and measures official cannot do this without first-class legal advice and service.

Here again we have an issue on which officials differ. A contrary view was expressed in these words:

It has never been my thought that provisions in the law governing violations intended "an eye for an eye." I still think man's behavior is governed more by the Golden Rule than the desire to evade legalized systems of human actions.

The concluding sentences of the preceding section suggest the importance of administrative and enforcement procedures. One respondent dwelled on this aspect at some length. Let me paraphrase his views. Respect the businessman and you will be respected. Avoid arguments. If you are legally right, an argument is unnecessary, and if you are wrong, an argument makes you appear ridiculous.

Always be courteous. If you earn the reputation that you know what you are talking about, that you mean what you say, that you may be tough but that you are fair, you will be respected and successful in your work.

Another respondent put it this way. When you enter an establishment explain to the manager why you are there. Make it clear that your inspection can be as beneficial to him as it can be to his customer. If you find any violations, do not discuss them in the presence of customers.

The inspection of sales practices is one of the most important phases of weights and measures work. These include tests or sample purchases for the determination of accuracy, false or misleading advertising, actual checking of prepackaged commodities, because in this work we find the actual condition of the commodity that reaches the consuming public. Even if the scale were in excellent condition, meeting all tolerances and specifications, if the commodity weighed on that scale was not weighed correctly, then the scale has lost its value and becomes of secondary importance.

In the same vein another official expressed the opinion that a "statewide survey of food package weights did more to assure accuracy of packaged commodities than all the sealing of devices in the past ten years."

Simply to mention the obvious need for modern and adequate equipment is to emphasize that need. Without adequate equipment we have such practices as testing of a large capacity scale by the use of an automobile as a weight standard! A good program begins with the best obtainable standards. One official said

I would equip a laboratory which would assure my jurisdiction that our test equipment could not be questioned. Operating a weights and measures department without adequate equipment is like performing a tonsillectomy with a hedge clipper.

Obviously, good equipment should be kept in good condition.

Keep your testing equipment in first-class condition. Not only is the department, as a whole, careless and sloppy if the weights, weight boxes, or measures of every description that you carry are dented, nicked, dusty, scratched, etc., but you individually are judged by the type of equipment you are using, your appearance, and your manners.

What about testing new devices for acceptance?

Has the commercial field become the proving ground for commercial equipment? Isn't the rat race to be the first in the field with something new making commerce and the consuming public mediums for correcting the "bugs" in the equipment? Is it not true that there is no weights and measures jurisdiction in this country which is staffed or equipped to approve weights and measures equipment? Is it not becoming increasingly basic that centralized proving grounds are necessary to insure not only one accuracy test, but reasonable periods of repeatability?

These questions were posed by one respondent in such a way as to make it clear that in his judgment the National Bureau of Standards should be the one agency to test and approve new devices.

In a good weights and measures program the proper maintenance of commercial equipment is the responsibility of the owner.

In so many instances weights and measures jurisdictions have degraded to the level of a service agency of the Government who devote their time to advising owners of commercial devices whether or not the device is operating accurately. The proper approach is to evaluate the end result. The maintenance of the device in a condition to perform accurately is the responsibility of the owner.

These views were expressed by more than one official.

Several respondents emphasized the importance of complete records and periodic reports.

I would explain the importance of good records, by making notes of all discrepancies and seeing to it that they are recorded on the file card records for the particular store, service station, or business house concerned. By reviewing these records prior to annual inspection, the inspector is in a better position to pin-point discrepancies and take action if necessary. Do not rely on memory.

Another official, writing on the same subject, emphasized the importance of keeping accurate records of inspectors' activities such as daily reports, itineraries, and monthly reports. These should be tabulated for the information of the top official. They should show the total activities of the department, including expenses, weekly, monthly, quarterly, and annually.

To all of the above I would add the importance of standard uniform reporting forms. Not until such records are available can an objective agency, such as the Weights and Measures Research Center, conduct significant research, the results of which would be helpful to administrative officials.¹

A high degree of uniformity in administration and enforcement would strengthen the weights and measures program of each jurisdiction. In the words of one official

I wish there were some way to have more uniform programs of weights and measures between States. I realize that the sixteen ounces are the same in all States, but the inspection and enforcement procedures are quite varied.

Another official put it this way:

Another important phase of the weights and measures program is co-operation with other jurisdictions in an endeavor to develop a uniform system of enforcement.

A half century ago this Conference adopted a Model Law. Acceptance of that uniform basic statute has not been rapid or extensive. Yet at least five States have enacted the Model Law within the past 5 years. This is encouraging. It should encourage this Conference to begin work on a Model Program of administration and enforcement. Such a Program, sponsored by the National Conference on Weights and Measures would find quick acceptance in a substantial number of jurisdictions. Even though the number might not be large it would be a start. One might hope that in another 50 years the Model Law and the Model Program would be in effect and in operation in many jurisdictions. The fact of different problems arising out of regional differences suggests the possible wisdom of developing regional Model Programs rather than a single national Program.

Not one official mentioned the need for more formal education on the part of weights and measures personnel. As an educator it is a temptation for me to speak at length on what I consider to be an increasingly important fundamental. But I shall resist the temptation. Perhaps at another time there may be an opportunity to present to you some startling facts about the importance of education in the immediate future. In the meantime let me urge you to secure a copy of a publication of the United States Department of Labor entitled,

¹ See my longer statement on this subject in Report of the 45th National Conference on Weights and Measures, 1960, NBS Misc. Publ. 235, pp. 134-137.

Manpower-Challenge of the 1960's, available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., price 25¢. This 23-page brochure is filled with facts, charts, and graphs which makes it possible to read it in a few moments. I direct your attention particularly to the emphasis on education beginning on page 11.

We come now to the conclusion of a paper which one may hope may mark the beginning of a sustained effort to draft a Model Program of Administration and Enforcement. We are all indebted to the 19 officials who took the time to put on paper their best thinking, based on their experience and their wisdom. Remembering that a good law and adequate appropriation were taken as the first two fundamentals in a good weights and measures program, it is notable that there was no other one fundamental which was mentioned by every respondent. This is notable, but I doubt that it is significant. If these 19 men could have spent a day or two together around a conference table, I am sure they would have agreed on many of the fundamentals which I have pulled from their separate letters. Surely there would be substantial agreement that if we are to have a good weights and measures program, it must be headed by a competent official. There must be good channels of communication, and a sound organizational structure. The personnel must be competent and continually trained for improvement. Administrative and enforcement procedures are important. A department must have good equipment and keep it in good condition. Adequate reports are more important than is generally recognized. And finally, continuing efforts should be made to achieve more uniformity among jurisdictions.

DISCUSSION ON FOREGOING PAPER

MR. W. I. THOMPSON: Dr. Gordon, even though a majority of the respondents replied that the number one requirement of a strong program was a competent top official, no mention was made of what the qualifications would be to provide such competency. It would seem to me that some sort of formal educational background would be necessary for him to achieve this competency.

And along that same line, do you have any idea of a suitable curriculum or some courses of study which might be taken as an extension course of a higher educational institution? You have already mentioned the fact that you think this is a requisite for a man to hold such a high administrative post.

DR. GORDON: I have indicated in my paper that perhaps this might be the topic for another presentation. This is the stage of my thinking right now. If a man is going to dedicate himself to a career in weights and measures work, might we not develop some plan in which courses would be developed in weights and measures law, the fundamentals of administration, and enforcement? I would urge a course in psychology. I have not thought it through yet, but this is enough, I think, to indicate what I have in mind.

MR. GRASSI: The words "The Weights and Measures Institute" are what I wish to comment on. In Connecticut, we are planning a nonprofit corporation, whereby we can form the institute for the purpose of acting as a clearinghouse for all information, so that we can send it out to all of the sealers and enforcement officers throughout the United States. We have 3,000 or more enforcement officers who

should be kept informed on all of the subjects that we are speaking of here today at this very important meeting.

My question is: Do you think the time is right for us to set up a weights and measures institute to act as a clearinghouse so that we can further the education of our enforcement officers?

DR. GORDON: Yes, I think the time is overripe, but instead of doing it on a State level, I think it should be done probably through the National Conference. This subject has been on the agenda of the Weights and Measures Advisory Committee to the Director of the National Bureau of Standards practically all the time that I have served on this Committee. It is a live issue, but somehow, there are so many, many things to be done that this is on the periphery. And so far, we have not succeeded in focusing enough attention on it. But I think what you suggest is very much needed.

MR. FERNSTEN: Dr. Gordon, in your talk, you touched lightly on organization. To me, a proper organizational structure would be of prime importance before anyone could effect an efficient enforcement program. Do you have anything more to say on this?

DR. GORDON: No. In the printed version of my paper, you will find that it is treated at much greater length.

MR. GERSZ: I was very much interested in your talk about education. We in Connecticut make many talks to the various clubs and other organizations, telling them of the various services of the department. We find that it is educational to the consumer and that the consumer in turn helps us get better appropriations.

MR. VAN SCHOIK: It seems to me that in our administration, probably our weakest situation may be communications, which you have brought out very effectively. The communications that I am referring to are the communications which we have with the local jurisdictions in the State. I wonder if your study and survey indicated whether a field force between the State and the local jurisdictions was a very effective communications method. This is something we do not now have in Ohio, in the sense that I am thinking of.

DR. GORDON: I can answer your question only in a general way affirmatively. But there are men in the room, I think, who could answer it very specifically on the basis of their own organization.

MR. VAN SCHOIK: I am very much interested in this point because we have such a small State staff. Our communications, of course, are limited because of the inability to be several places at the same time, and to make frequent personal contacts with local officials.

MR. SLOUGH: I am sorry that Ohio is monopolizing the floor, but, Dr. Gordon, we do have some civil service in Ohio, mostly in the cities.

First, I wish to commend you on your paper. You have given us some very challenging goals. I hope many of them become accomplished.

I now want to make one observation: I regret the absence of answers stressing education. I think, based on experience, that the reason education is not stressed in these replies is limited appropriations. In other words, most of us do not have the money to hire the people with the educational backgrounds desired.

DR. GORDON: My response to that would be, then we will have to do it ourselves. We are caught in a sort of a cycle here, and we must break it somehow somewhere. You do not have money enough, obviously, to hire the men with advanced degrees, but what you can do, I think, and at a very low cost, would be to inaugurate the kind of a

program that would take little administrative expense and the expenses to the individuals participating would be small.

MR. SLOUGH: I did that very thing. I took a course in electronics at the University of Akron last year, to learn something about that subject.

MR. CORB: It seems that the consensus here is in favor of an educational program. You did state that you are on the Advisory Committee. Does the Committee concur in your thinking on this educational program? If so, is it not possible that this could be turned over to the Committee on Education so that it could be thoroughly explored and reported back at a future conference?

DR. GORDON: The answer to your first question is that this is my own idea, and it has not been discussed in the Committee. But I am sure that it would find support there.

And secondly, I would be sure that the Committee on Education would be the appropriate committee to pick up this idea if it has sufficient merit.

I would like to make what apparently may be the concluding comment. While there was no unanimity in these responses, I do not think this is surprising. I think if these 19 men had been convened in a central point and spent a day or two or more together, they could have hammered out the basic outline of a strong program of administration and enforcement on which they could have been in substantial, if not unanimous, agreement. So I would like to leave a word of caution that you not interpret the lack of unanimity as a barrier to progress.

I think the next step, if there is to be a next step, would be to convene such a group and let them then develop the basic fundamentals on which they can and do agree.

REPORT OF COMMITTEE ON EDUCATION

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

The 1961 Conference on Weights and Measures recommended to this Committee that information and suggestions be published for general distribution. The first material of this kind has been published and is entitled "Selection, Installation and Maintenance of Vehicle Scales." This is a six page pamphlet and fits into a ring binder which might be used to hold the looseleaf Handbook 44. The Committee would welcome comments or suggestions from weights and measures officials or others concerning the desirability of producing additional publications of this type.

National Weights and Measures Week

No special committee was appointed to promote National Weights and Measures Week in 1962, thus it became the responsibility of the Committee on Education to promote the Week and each of the five members of the Committee served as a regional coordinator. Each coordinator then secured a State chairman who was responsible for the promotional work within his State. A number of the larger counties and cities also had coordinators who worked through their State organization.

The scale industry proposed that the January 1962 issue of the Scale Journal be devoted entirely to material that would be used in pro-

moting Weights and Measures Week in State, county, and city jurisdictions. Through the efforts of Mack Rapp, Arthur Sanders and Sylvia Pickell, over 5,000 copies were distributed to weights and measures jurisdictions throughout the United States. Mr. Sanders had the responsibility of collecting the material. Mr. Rapp took the responsibility of raising the funds for the cost involved, and the Scale Journal published the material. As a result of this effort, every jurisdiction has at hand information that can be used during Weights and Measures Week and throughout the entire year. Industry representatives contributed 80 percent of the amount necessary for postage and other costs in distributing the material. The remainder was furnished from the funds allocated to the Committee on Education, by the National Conference, the Southern and the Kansas Weights and Measures Associations, and the Scale Journal.

It is impossible for this report to present the details of all the news items, proclamations, displays, and thousands of other promotional ideas that were used during National Weights and Measures Week. The scale and other industries were very cooperative in furnishing pamphlets, posters, and display materials. The Committee is thankful for this fine cooperation and for the interest shown in this very vital government activity.

NBS School

The Office of Weights and Measures, through the efforts of M. W. Jensen and other staff members, held the second technical training school for supervisory personnel during the month of April 1962. The Committee recommends that every State and many of the larger county and city jurisdictions have at least one person attend this school in order to hold similar schools in his own jurisdiction. The Committee feels that this is one of the best methods to bring about uniformity throughout the United States.

Training School for Food Store Managers

The Committee is investigating the possibility of getting some definite weights and measures instruction included in training schools for food store managers. It has been learned that there are a number of such schools in operation at various colleges and universities throughout the nation. The Committee feels that weights and measures instruction should be included as a part of this training.

Public Education

The Committee believes that a good weights and measures program can be more effective when it includes a good public educational program operating twelve months of the year with special emphasis at the time of the National Weights and Measures Week, March 1-7.

J. FRED TRUE, *Chairman*
J. ELLIS BOWEN
J. T. DANIELL
W. A. KERLIN
C. H. STENDER
W. S. BUSSEY, *Secretary*

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

REPORT OF THE EXECUTIVE SECRETARY OF THE NATIONAL CONFERENCE

W. S. BUSSEY, *National Bureau of Standards*

In further conformance with the policy reestablished last year, I have prepared a report to make at this meeting.

Reorganization at NBS

As most of the delegates present at this Conference are aware, and as was announced at the 46th Conference last June, a reorganization of weights and measures activities at the National Bureau of Standards was made effective July 1, 1961. I was named Assistant to the Director for Weights and Measures Administration and Mr. M. W. Jensen was promoted to Chief of the Office of Weights and Measures. My present assignments include all matters pertaining to weights and measures administration, such as National Bureau of Standards liaison with State and regional weights and measures associations, developing model laws and regulations, and assisting the States, cities, and counties in an effort to procure uniform laws and regulations in their respective jurisdictions. As the designated Executive Secretary of the Conference, I am responsible for all matters dealing with the Bureau's sponsorship of the National Conference. I serve as chairman of the Weights and Measures Advisory Committee to the Director and as secretary to the standing committees of the Conference. I am also responsible for the Bureau's participation in State and regional weights and measures meetings.

In September of 1961 Mr. R. N. Smith joined the staff at the National Bureau of Standards as a Weights and Measures Coordinator and to serve as my assistant. Mr. Smith was with the State of Maryland for about nine years, where he served as Assistant State Superintendent of Weights and Measures under Mr. John E. Mahoney. Mrs. Elaine Grayson joined my staff as secretary in August 1961, having transferred from the Bureau's Personnel Division. The new office of Assistant to the Director is located in rooms 217 and 218 of the East Building at the Bureau.

Mr. Jensen and the Office of Weights and Measures remain in the same quarters at 400 Power Plant Building. Mr. Jensen had served as Assistant Chief of the Office of Weights and Measures since 1951. The responsibilities of the Office of Weights and Measures include the technical aspects of weights and measures control. Mr. Jensen and his staff continue to handle the State technical training schools, the school at the National Bureau of Standards, the development of State Standards, and test procedures, and render other technical assistance to the several jurisdictions. The OWM staff has been increased since last year.

Mr. D. R. Mackay, a general engineer, joined the OWM staff in July 1961. He was formerly a project engineer with the U.S. Department of Agriculture at Beltsville, Maryland. Other recent additions to the OWM staff are Mr. John Griffith, a laboratory mechanic, in March 1962, and Mr. Lawrence Chisholm, a writer-editor, in May 1962. Mr. Jensen has also been endeavoring to employ an additional engineer to work with Mr. H. F. Wollin and Mr. Mackay. All of these new staff members are on duty here at this Conference. I

hope most of you have already met them. If not, I trust that you will before the Conference ends. Undoubtedly, with this increased staff, the Office of Weights and Measures will be able to render greater technical assistance to weights and measures officials and others.

Activities of the States, Counties, and Cities

In this part of my report I will cover matters arising during the year from the weights and measures operations of the States, counties, and cities, and give a brief summary of the weights and measures activities of the NBS.

The supervisory aspects of weights and measures control have continued to make steady progress. Several jurisdictions have increased their control over packaged commodities, and others have initiated package control programs. This control, in most cases, has been based on the procedures set forth in NBS Handbook 67.

The group of southern jurisdictions have continued their weekly reporting system designed to keep each other informed as to commodities in package form that have been found improperly labeled or containing less than the quantity represented. In other sections of the country, neighboring jurisdictions have continued to keep one another informed, but on a less formal basis. The Federal Food and Drug Administration has been furnishing to cooperating State and local weights and measures officials monthly reports on its enforcement activities. It is still felt by many that such additional exchange of information on a national basis would do much to bring about more rapid corrective measures with regard to interstate violations. Perhaps our Committee on Education will give this possibility its careful consideration in the year ahead.

During the past year, the States of Delaware and Virginia have enacted entirely new weights and measures laws, closely following, in practically every respect, the Model Law adopted by this Conference. Wisconsin has enacted a major revision of its weights and measures statutes in an effort to strengthen and modernize existing laws. Many jurisdictions have made minor changes in the form of new or improved regulations to implement their statutory provisions.

Efforts of most States toward uniformity of specifications and tolerances continue to be quite encouraging. The provisions of the Conference codes, as published in NBS Handbook 44, have now been promulgated officially, in whole or in part, by 41 States, the District of Columbia, and the Commonwealth of Puerto Rico. I would hope that the 9 remaining States will soon take similar official action in this important area.

The situation in the area of package regulation is commendable, but the degree of uniformity is still somewhat less than it is in the field of specifications and tolerances. Delaware and South Carolina have added their names to the list of States that have adopted the Model Package Regulation. Virginia is expected to join this group about July 1. North Carolina has promulgated a special regulation pertaining to the prominence, placement, and type size of package labels. This regulation is, I think, worthy of consideration by all weights and measures and food and drug officials and by this Conference.

I should like to urge all jurisdictions to carefully examine their current package regulations and to revise them promptly, as the need might indicate.

Uniformity and adequacy in testing equipment has continued to improve, with many jurisdictions adding to or replacing existing equipment. This new testing equipment has ranged from large and expensive vehicle-scale test trucks and meter provers to sets of small decimal fractions of pound weights and small glass graduates and flasks. A number of jurisdictions have built or are in the process of building new laboratory facilities. Several have obtained additional laboratory standards and equipment, including at least one new Russell Balance with a maximum capacity of 2,500 pounds. In fact, the progress in this area has been so extensive that I cannot begin to list all of these acquisitions in this brief report. I would describe this progress as most gratifying. It is my hope that this commendable program of improvement will continue and grow.

Activities of the National Bureau of Standards

Public interest in the packaging field has continued at a very high level. Mr. J. L. Littlefield of Michigan, Mrs. Helen E. Nelson of California, and I were invited to prepare and present statements to the Senate Anti-Trust and Monopoly Subcommittee, over which Senator Philip A. Hart of Michigan presides. Many noticeable improvements have resulted from these hearings and it is hoped that other beneficial and lasting results will be forthcoming.

Technical training remains to be a principal project of the Office of Weights and Measures. Since the last Conference, staff members of OWM have helped conduct State training schools in 11 States. This is the largest number of State schools ever held in a single year.

The national training school at the National Bureau of Standards for senior officials was repeated this year during the week of April 9. Twelve State and local jurisdictions were represented. Also, a representative of Nationalist China's Bureau of Standards participated. The staff members at the Bureau were pleased with the results of the school. It is hoped that sufficient interest will develop in the future to warrant at least two schools per year of this type.

In other States, field training involving special equipment or directed to the solution of special technical problems has been carried on.

Progress has continued in connection with the new State standards program. The newly developed single-pan balances have continued to perform up to every expectation. The new stainless steel for mass standards seems to be all that was hoped for. Also, a new and better finishing process for the stainless steel mass standards has been discovered. This process will result in a greatly improved finish and at a much lower cost. Further refinements have been accomplished in regard to other standards in the proposed new State series. Especially is this true regarding liquid capacity standards. This program is now ready to have authorizing and financing legislation enacted by Congress.

The Office of Weights and Measures has continued to lend technical assistance to the Conference Committee on Specifications and Tolerances and others. One project in this field was the testing of odometers on rental automobiles. Work has been continued in the areas of milk meters, slow-flow fuel-oil meters, scale tolerances, and others.

Mr. Jensen and Mr. Mackay have just returned from a two-week trip to Central and South America to make a study of laboratory facilities and standards and other phases of weights and measures.

It will continue to be the policy of the National Bureau of Standards to render every practicable assistance to this Conference, to weights and measures officials in general, to business and industry, and to all others who are concerned with weights and measures matters.

In closing, I wish to pledge my continued best efforts and full cooperation in the year ahead.

FIFTH SESSION—AFTERNOON OF THURSDAY, JUNE 7, 1962

(D. M. TURNBULL, Vice Chairman, Presiding)

REPORT OF THE COMMITTEE ON RESOLUTIONS

Presented by W. C. HUGHES, *Chairman, Head Administrative Assistant, Division of Standards and Necessaries of Life, Department of Labor and Industries, State of Massachusetts*

Resolutions of appreciation were adopted as follows:

1. To Dr. J. Herbert Hollomon, Assistant Secretary of Commerce for Science and Technology, for his constructive contribution to the program of the 47th National Conference on Weights and Measures.
2. To Mr. Thomas Cairns, Chief Inspector of Weights and Measures for the Corporation of Glasgow of Scotland, for a splendid address and for contributing to the success of committee hearings by participating in the deliberations.
3. To Mr. R. W. MacLean, Director, Standards Branch, Department of Trade and Commerce of Canada, for presenting an excellent paper, and to the Department of Trade and Commerce for making Mr. MacLean's participation in the Conference possible.
4. To Mr. Mitsua Tamano, Director of International Trade and Industry of Japan, for his timely and interesting contribution of a most excellent paper.
5. To business and industry for cooperating with the Conference, for attending and participating in the Conference, and for contributing to the success of the Conference through their participation and their gracious hospitality.
6. To all program speakers.
7. 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

RESOLUTION ON DISTILLED SPIRITS PACKAGE STANDARDIZATION

Whereas, the matter of package standardization is one that has for many years been of great interest to the National Conference on Weights and Measures; and

Whereas, standardization of package sizes is of significant economic benefit to packagers and to consumers; and

Whereas, the National Conference on Weights and Measures, as a body, and many of its members as individuals have made known their interest in this matter to the Internal Revenue Service, U.S. Treasury Department, with particular regard to the petition that was placed before that agency to break down the established package standardization in distilled spirits; and

Whereas, the Internal Revenue Service announced during the meeting of the 47th National Conference on Weights and Measures that the said petition to break down package standardization in the distilled spirits industry had been officially denied: Therefore, be it

Resolved, That the National Conference on Weights and Measures does highly commend and congratulate the Internal Revenue Service, U.S. Treasury Department, for this very desirable action that obviously was predicated on careful judgment and an intelligent evaluation of the interests of both consumers and packagers: And be it further

Resolved, That the Conference Chairman be instructed to send

copies of this resolution to the Secretary of the Treasury and to the Commissioner, Internal Revenue Service.

RESOLUTION ON PACKAGED TOBACCO

Whereas, the packaging of tobacco products so as to provide consumers with full weight seemingly is an impossibility under rules laid down by the Alcohol and Tobacco Tax Division, Internal Revenue Service, U.S. Treasury Department, because of the requirements of that agency that no package can contain more than the labeled quantity, and accordingly consumers of this product presently are sustaining large monetary losses; and

Whereas, the tobacco industry has demonstrated its desire to correct this situation if the aforesaid rules of the Alcohol and Tobacco Tax Division can be amended to permit reasonable overpack to allow for moisture loss; and

Whereas, it is the firm opinion of weights and measures officials nationally that the Congress of the United States did not intend to enact legislation that would require packagers of tobacco to deliver less than the quantity represented: Therefore, be it

Resolved, That the 47th National Conference on Weights and Measures does formally urge the Internal Revenue Service to restudy this entire problem and then to take prompt action to correct this unfortunate situation: and be it further

Resolved, That the Conference Chairman be instructed to send copies of this resolution to the Secretary of the Treasury, to the Commissioner, Internal Revenue Service, to the Secretary of Commerce, and to the chairmen of appropriate committees of the Congress.

RESOLUTION ON CONSUMER PROTECTION

Whereas, the President of the United States, in his recent message to Congress, announced his personal interest in consumer protection and his intention to have the Council of Economic Advisors create a Consumers' Advisory Council; and

Whereas, efficient, effective, and uniform weights and measures administration is basic to the interests of consumers and business: Therefore, be it

Resolved, That the 47th National Conference on Weights and Measures, assembled in Washington, D.C., on June 7, 1962, does formally commend the President of the United States and does respectfully suggest that there be given consideration to inclusion of competent weights and measures representation on the Consumers' Advisory Council; and be it further

Resolved, That the Chairman of the Conference be instructed to send a copy of this resolution to the President of the United States.

W. C. HUGHES, *Chairman*

C. D. BAUCOM

R. C. PARKS

W. H. SCHNEIDEWIND

J. L. LITTLEFIELD

J. J. PERSAK

C. W. VAN SCHOIK

(On motion of the Chairman, seconded from the floor, the report of the Committee on Resolutions was adopted by voice vote.)

DECEPTION OF CONSUMERS THROUGH TECHNIQUES IN PACKAGING AND LABELING

By F. J. SCHLINK, *President and Technical Director, Consumers' Research, Washington, New Jersey*

In reviewing many volumes of past reports of the National Conference on Weights and Measures as part of the preparation for my presentation, I was greatly impressed by the importance of the work of the Conference and by the permanent value of the material that has been published for it under the auspices of the National Bureau of Standards. The contents of the many annual volumes are of striking interest, not only to persons who work directly in the weights and measures field, but to everyone who has an interest in the problems of the consumer.

We thought we had heard of everything possible in the way of short weights and measures until a few weeks ago when a reader of Consumer Bulletin sent in an advertisement for homesite land in Arizona offered on the basis of short-measure acres, of 36,000 square feet. The sites were described as "a big one-acre (36,000-square-foot) homesite." Competitors of the land company will no doubt soon be offering Jumbo, Giant, and Colossal acres to compete with what one is tempted to term a "Big Economy size" 36,000-square-foot acre. The big economy size New York Sunday newspaper that carried the advertisement should have had someone in its advertising department who would know that the best "big" one-acre plots comprise a full 43,560 square feet.

There is a remark commonly heard, that people talk about the weather, but no one does anything about it. Such a statement is no longer valid, for cloud seeding is now an active project in meteorological research. On the other hand, as to deceptive packaging, there is enough in print to fill several sizable volumes, but what has actually been done about it is of strictly minuscule proportions in terms of the legislative and regulatory effort needed.

Until the coming of the very ably conducted Senate subcommittee hearings under the chairmanship of Senator Philip A. Hart, there were few signs of activity either in governmental circles or in business that would bring about a correction of a situation that has worked to the great disadvantage of consumers for at least the past 40 years. Senator Hart's Subcommittee of the Committee on the Judiciary brought together the views of a great number of witnesses and was successful in achieving wide publicity through the newspaper press. Its work was specially recognized in President Kennedy's March 15 Message to the Congress on the need for strengthening of programs for protection of consumer interests. It is rare that a topic related to the problems of the consumer has achieved such extensive publication in the newspaper and trade press in the short space of a few months.

Recently we gave special attention to the matter of label designs by which manufacturers use a variety of techniques for making the list of ingredients or the net weight or volume statement difficult to find, and difficult to read if it is found. We cited the use of shiny aluminum lettering against a shiny strongly reflecting metallic foil background, so that, unless the lighting fell just right, the wording could not be read. Added pasters and extra "special sale" labels were also used so as to make the ingredients unreadable. Rubber stamping over

an ingredients label was a very common practice, with the same effect.

We found one instance in which the type was from $2\frac{1}{2}$ to 3 points in size ($\frac{1}{3}$ to $\frac{1}{2}$ the size of newspaper type), which hardly anyone could read without a magnifying glass, and this small type was combined with letters in shiny aluminum so as to take advantage of light reflections to make reading even more difficult. Twin or cluster packages of several small boxes inside an outer wrap which obscured box labeling was another common device which we criticized. Poor color contrasts or printing on shiny cellophane were other abuses of proper labeling procedures. At least two manufacturers used an interesting pattern of crosshatching to reduce the prominence and readability of their ingredients list almost to the vanishing point. The crosshatching, of course, was not carried into the area which they wanted the customers to read.

The June 1961 Consumer Bulletin carried an article in which we discussed the labels of frozen chicken and other food packages, particularly candy and bakery goods. At least one large-chain grocer in our region is using labels printed by a process which causes consistent illegibility through imperfect type contact and smudging. This, we note, has been going on for a year or more without any apparent interest on the part of the State or local officials having jurisdiction. We note another modern device of putting a part of the list of ingredients on one side of the package and the remainder on another panel, "around the corner."

We emphasize the fact that, while packages have ample room for advertising, recipes, pictures to amuse the children, and other extraneous matter; they very commonly devote little space to the list of ingredients and net quantity declarations. (In one instance, the space used for the list of ingredients and additives was half of one percent of the total space available on the package.) We find that sometimes a skillful and ingenious package designer has found two or three methods to make the list of ingredients almost impossible to read, and we have called attention to the fact that, while almost all State and Federal laws and regulations call for proper legibility with respect to ingredients and net quantity, a very large proportion of the labels in the groceries and supermarkets are, nevertheless, hard to read, and not uncommonly they defy the efforts of anyone but the person of exceptional curiosity and patience to read essential wording.

The rapid growth of chain food stores and supermarkets and the correspondingly wide extension of prepackaging of foods and many other commodities have brought a host of abuses. Merely to list them, without details or comments, would take more space than is permissible for this paper. A properly detailed exploration of means of correction would fill a volume as large as one of the annual reports of this Conference.

In discussing deception of consumers through techniques in packaging and labeling, one must define terms with care, since what is deceptive to the consumer does not seem deceptive at all to Federal courts, judging by the successive holdings in cases brought by the Food and Drug Administration against certain candy manufacturers. It may be said, however, that aside from the food and detergent industries, which tend to hold that there is no such thing, practically, as a deceptive package—or at least that there are too few of them to be of interest and importance—there is little doubt about what consumers

and a few of the more enlightened representatives of the industry consider to be deceptive.

We may start with the assumption that a package which falls far short of being as full as the customer expects to find it, upon opening, is deceptive. A package is also deceptive to many consumers when its dimensions are so chosen as to maximize its appearance of size. A package is deceptive in effect also when either the net weight or the statement of ingredients is difficult to find, or to read when it is found.

Slack Filling and Hard-to-Read Labels Have Been With Us a Long Time

The work of Consumers' Research in this field goes back to 1934, when we published a study on slack filling and noted that it was a widely practiced expedient in the grocery and household specialty trades.

A considerable number of cereals, cleaners, and spice packages examined by Consumers' Research showed slack filling as high as 40 and 50 percent for noodles, up to 25 percent for scouring cleaners, and up to 28 percent for ginger. At that time we noted that there were many tricks used, including abnormal proportions of height and diameter of packages to give the appearance of maximum volume; that even the color scheme and arrangement of labels were often so contrived as to favor or accentuate the appearance of large size. False bottoms on packages were common then as now, and we noted the use of outer packages to make the unit appear much larger than the container within. Twenty years ago we reported that flavored gelatin packages were only *one-third to one-half* full; these practices are still very much in evidence.

Not long ago we conducted a special study of breakfast cereals, of which some important brands have recently come under criticism from the Federal Food and Drug Administration because of large shortages below the declared weights. These were products which sold to the amount of \$200,000 worth a month and the short-weight practices continued over several months. Since that time the Federal Food and Drug Administration has begun to pay added attention to short-weight packages and has proceeded against a number of manufacturers who were packaging spices, seasonings, and other food materials, in quantities far below the declared weights.

Slack Filling Now a Live Topic

Slack filling, however, except in the various candy cases lost in the Federal Courts, has received little attention from Federal and State agencies. In articles on breakfast cereals, we looked closely at slack filling and reported on 35 brands of cereals, of 9 manufacturers, purchased in two eastern States, which showed an average filling shortage of about 25 percent (with a range from about 12 to 48 percent). We find no justification for manufacturers' claims that wide latitude must be allowed in the height to which packages are to be filled because of the particular physical properties of the cereals or other material being packaged, for the extent of slack filling for a single type of cereal varied over the wide range of 13 to 30 percent.

Most striking, indeed, is the fact that a certain cereal packed in transparent glass is chock full to the very neck of the bottle. Spices

and herbs packaged in clear glass containers are also so full, as a rule, that the consumer can be sure that no one is trying to mislead him as to the bulk of the product. Such well-filled packages provide evidence that the consumer cares how full packages are, and expects them to be filled right up to the top.

In studying cardboard cereal packages, we found a considerable number slack filled in the 30 to 40 percent range and two flake cereals measured 46 and 48 percent underfilled, respectively. It would appear that food and drug and weights and measures officials consider that even 40 percent is too small a shortage below complete filling to warrant taking action against a food manufacturer, in spite of the fact that we find that at least one brand of cereal is delivered to consumers in a cardboard box that is within 3 percent of being full to the very top.

The Food and Packaging Industries Are Reluctant To Remedy Deficiencies in Package Filling and Labeling

Following these presentations there were no evident signs of corrective activity in industry or government until the first revelations of Senator Hart's committee began to make the headlines in newspapers all over the country. Especially in the beginning, the general attitude of the trade press was highly unfavorable to these disclosures, and more than one industry leader suggested that newspapers had acted unwisely in bringing the subject so strongly to public notice.

One trade publication editor made the rash statement that no one ever slack-fills a package on purpose. The Food and Drug Administration has expressed the view that deceptive packaging practices are uncommon and relatively unimportant. These comments, in the experience of Consumers' Research, are very far from valid statements of what an observing consumer will find in studying package designs and labels in any supermarket or grocery store.

A packaging expert, arguing for the commercial value of clever packaging, reported that one major seller of coffee cake in special packaging found he was able to sell in large volume at 79 cents a product formerly marketed in a conventional package at 29 to 49 cents. A large part of the special appeal of this product to homemakers would be lost if she were to be made fully aware of its being twice as high in price per pound as its competitors. This great price discrepancy between some brands and their lower-unit-price competitors explains the reluctance of some manufacturers to feature *weights* and *volumes* in standard units of $\frac{1}{2}$ pound, 1 pound, and so on, and to show the *weight* prominently, as the law requires. If the quantity statement can be seen at a glance and the calculation can be made quickly, the decision not to pay the 100 percent or other higher price can be made quickly too. The consumer, with present labeling practices and with odd ounces and an irrational mixture of common and decimal fractions, very often cannot make the comparison at all, and thus does not know how one product compares with another in price per unit quantity.

Nearly all the statements of representatives of the packaging industry and package consultants before the Hart Committee showed a notable lack of concern for the consumer's rights. The food industry representatives seemed unaware that, if they are to have the advantages of great distribution economies in self-service and ready-to-carry-out packaging of their commodities, they ought not, in good

conscience, expect the consumer to be penalized for permitting these practices. Why should the buyer of a canned chicken have to pay for the weight and bulk of a container that is *half full* of chicken and *half full* of water and gelatin space-filler, while the buyer of a chicken weighed out at the butcher's counter gets, as a rule, nothing but the meat and bones he expects to find in his hand-wrapped parcel? The judge in the now famous candy mint case held that the manufacturer was to be exonerated of the charge against him. One reason was that he found it expedient to use a machine that could produce a hundred thousand packages a day. By that reasoning, manufacturers will need only to step up their packaging speeds to be allowed even greater degrees of slack fill. Nothing in the food and drug law would appear to warrant any such determination of the overriding rights of the manufacturer, serving his own convenience and economy, as against the right of the ultimate consumer to judge, in a rough, approximate way, the relative contents of a package by its size.

The packager who sells as much air, water, and carton as he does food takes a most unfair advantage of his customers. The packaging consultant who insists that such expedients are unimportant to the allegedly uniformly affluent consumers of today is exaggerating the prosperity of consumers and justifying sharp practices that have no place in modern business. The food industry executive who insists that the homemaker cares only about the number of servings she gets, and then holds that no one but the industries' home economists are qualified to decide how big is a typical serving, is putting his head in the sand. He is most foolishly letting his company in for serious doubt, in the public's mind, as to the ethics and fairness of corporations and their interest in the welfare of their customers.

There are some intelligent and forward looking executives in the food trades, but, with a few honorable exceptions, they have not been conspicuous in their public reactions to the slack-fill studies by Consumers' Research or to the voluminous and absorbing record of the Hart Committee's work.

The voices most heard have been those of industrialists and trade association and trade paper executives who wish only to be left alone in their present ways of packaging and labeling. Some suggest that they will consider a modest amount of cleaning up of questioned practices in their trades, but they do not concede that anything is very much open to criticism. They have not been observed to offer to set up standards of sizes and of fill that will give their industries something to aim at, at least, or even concede that someone, somewhere, must and will establish such standards.

One trade publication editor was quite hardboiled about the matter of odd fractions in package weights. The housewife, he said, should be expected to take the time to divide fractionalized weights into fractionalized prices in order to determine the "best buy." Anyway, she should buy by "product performance," he thought, not on the basis of relative cost. He did not say how many years that point of view has been out of date in the food industries' own purchasing offices in the buying of raw materials for manufacture. Progressive purchasing agents have not for a generation bought their raw materials on a basis which precluded their knowing unit costs and raw material quality as determined by objective tests, not by guess or hunch. Yet leaders of the food industry, almost to a

man, oppose the housewife's even being given a reasonable basis for calculating costs per ounce of the biscuit mix or instant coffee which she buys at the supermarket. We note that one big industry devotee of this opposition very recently got into serious trouble and was publicly pilloried for selling a "Giant Economy Size" of instant coffee that was not an economy size. This package would have been more accurately labeled "our large buy-this-and-lose-money size."

When a large detergent manufacturer was asked to say what was the price per ounce of one of his packages marked in *pounds and odd ounces*, he had difficulty, as anyone would, with the arithmetic involved. Then he excused himself by saying that the *unit price was of no particular importance*. Any housewife would wonder if an executive with such a casual point of view toward relative costs would do well in managing the purchase of raw materials for his own firm. Some would hold that such a cavalier attitude toward costs might imply a notable lack of consideration for his firm's less prosperous customers, and that such an executive would be no help to his company's aims to maintain good public relations.

A trade publication editor was even more hardboiled. He held that the grocery trades had to defend themselves against pilferage by retail stores' customers. That seemed, in his mind, to give a degree of justification to an attitude that the customer was the vendor's enemy, to be outsmarted, rather than the customer whose patronage made the manufacturer's business possible and profitable. This is a curious outlook, indeed, for a spokesman representing an \$80 billion a year industry.

One manufacturer of packaged grocery store products, deviating from the usual view in the food trades of the Hart Committee's findings, spoke out clearly and sharply, and he minced no words in his recent condemnation of sharp practices in packaging. He said: (1) "If the package isn't full, it's cheating." (2) "If the package doesn't show the ingredients, it's cheating [many do not]." (3) "If the consumer can't find out how much she's buying, it's cheating." He added that firms which pack and label products honestly are injured by firms that cheat in their packaging and labeling. Yet another company, after its attention had been drawn to the consumer's interest in more readable labels, took steps to correct unsuitable labels on its private brands of candy by changing to colors of ink on cellophane which were not lost against the brown, black, or white color of chocolate, licorice, or mint candies. Hereafter the colors used will stand out against the colors of the candy, and label information will be in larger, clearer type. A real innovation, but a reform that would have come much sooner had food and drug and weights and measures laws, State and National, been effectively enforced. May this firm's example be widely emulated by other big food store operators!

Everyone in the food industries should read an article by L. H. Zahn of Ciba Pharmaceutical Company in *Drug and Cosmetic Industry* for March 1962. Mr. Zahn, a packaging expert, not only presented a fine summary of the points brought out during the Hart Committee's hearings, but criticized the evident willingness of industry men to condone sharp practice and psychological tricks designed to cozen the ultimate consumer-buyer. Continuation of such practices, Mr. Zahn asserted, will "convert the market place into a jungle." Shady packaging practices reflect reprehensible corporate attitudes

and policies. Mr. Zahn recommends that packagers quit defending their position and start *doing something* about the Hart Committee's findings. Finally, he notes that big distributors should contribute to a solution by refusing to stock and to display poorly packaged or poorly labeled merchandise.

The economic cost of deceptive packaging and uninformative labeling is so great that prompt steps should be taken to protect the consumer's interests. A congressional committee should hold hearings upon the special matters of standard sizes and slack filling. Legislation should be prepared where new legislation is found to be needed. Such legislation would direct the Food and Drug Administration and other appropriate Federal agencies promptly to establish proper standards for sizes and short-fill limits on all of the common liquid, paste, powdered, and granular food, drug, and cosmetic products, and other packaged products. Satisfactory standards could be set up in a few months for most of the big-volume cereals and detergents, and there is little doubt that quick improvement in commercial practices would follow. This would provide a situation in which the manufacturers could not successfully argue, as one did in the unfortunate candy mint case, that a very high degree of incomplete filling of packages is essential for the proper preservation of contents.

One notes* that, when a cellophane window is put into the side of the package, it is often so placed that it just falls short of exposing the degree of slack filling; or if the whole package is transparent, a colored design is often printed upon it to conceal the large empty head space. One could hardly doubt the intent to conceal or deceive in many such cases. Some of the macaroni and spaghetti packages are so grossly underfilled that the consumer can tell, by tilting the package and looking through the cellophane window, that little more than half of the package space is occupied by the purchased commodity.

Two packages of "instant tea" came to our notice recently. Both are of the same physical size, yet one contains 1½ ounces of a half-and-half mixture of tea and carbohydrate. The other contains only ¾ of an ounce, with no added carbohydrate. One may certainly question the propriety of Government agencies' allowing a product which is only half tea to carry a label that strongly features the words "instant tea" and thus compete unfairly with another which, though apparently fluffed in volume, contains tea with no added carbohydrate.

Correction of Present Practices

Some changes are going to be made, and soon, but it were much better that they should be made by the consent and earnest cooperation of the packers of canned chicken and ham, of candy, breakfast cereals, detergents, and other packaged products. If State and Federal agencies must do this work against industry opposition, they will do so. They could do it better and more expeditiously with help from those who are clearly in line for some degree of public control.

A number of States are on the point of carrying on investigations similar to those of the Hart Committee. Others are sure to join in, in a type of legislative hearing that has clearly acquired marked support by the consuming public. A State government commission in Pennsylvania promises hearings on the subject, from short weight to fine

*Twenty-one slides were shown to illustrate the speaker's discussion.

print on labels. Common sense would suggest that the time for the food trades and others to get busy on the coming reforms is *now*. Supermarket operators, particularly, can play a big part in this development. Their enormous buying power could be employed most effectively in bringing about changes in packaging practices that would redound to the advantage of their own operations and of the more effective utilization of consumers' dollars.

A number of positive recommendations for improvement of current deceptive packaging practices in consumer goods industries are presented here. Some of these proposals are new; others are not, but represent the results of wide reading and observation of what is deemed to be wrong in present packaging practices. They are offered for consideration of this Conference and its committees.

1. Statements of quantity and of ingredients should be prominently displayed. No small print on any package, for any reason, for manufacturer's name and address, weight or volume of contents, or lists of ingredients. (No one should have to look *through* the contents of any bottle or package to read quantity or ingredients declarations.)

The type size for these statements should be *not less* than a stated fraction of the largest type used on the package, e.g., for the brand name, for example, but never smaller than 12 points, in a highly legible font, on any package having any panel larger than 20 square inches in area. The type size ratio might be $\frac{1}{2}$ for the weight or volume statement, $\frac{1}{4}$ for the statement of ingredients (except where the statement of ingredients exceeds a specified number of letters in length). Canada and North Carolina have already established regulations to control type size of quantity or ingredients statements, to some degree.

2. It should in no case be necessary for any purchaser to hunt for weight, volume, or ingredients declarations, or the name and address of the manufacturer (an address full enough that the post office will deliver a letter and not send it back for "incomplete address"). To the consumer, these are as important as the manufacturer's brand name and should be equally easy to find and to read.

3. Suitable contrast of lettering and background should be prescribed by regulation, and there should be no more use of glare and glisten as ways to keep wording from being read by all but the most determined customers. No required lettering is to be of lower color contrast than the manufacturer uses for his brand name.

4. No overwraps or stickers of any kind should be permitted to conceal or obscure any part of the required labeling of a package, as to ingredients or quantity of contents. Neither manufacturer nor retailer should be permitted to rubber-stamp merchandise numbers or price marks, or to affix or imprint any other information in the space reserved for printing of quantity and ingredients statements.

5. With each statement of net contents of the package, a space should be provided for insertion by the dealer of the price per pound, per ounce, per pint, per fluid ounce, etc. Where the package is prepriced at the factory, the price per unit shall be a clear, legible part of the printed package label.

6. Weight, volume, and ingredients marking on flat or square or oblong packages should be required to be on two opposite panels (the two largest ones) and each on a stated part of that panel. For example, both might be shown together on a wide band across the bottom, so that lettering can be large—black on white, or white on black, or something equally contrasting.

7. The industry should proceed to gradual standardization of weight and volume sizes (already dealt with in recommendations by committees of the Conference), and there should be no more marking of packages with odd ounces or odd fractions of an ounce. Decimal numbers are not understood by some consumers and should not be permitted for weight and volume declarations (but decimal numbers should be used instead of common fractions in giving the price per unit provided for in recommendation 5).

8. There should be a logical sequence of package sizes, in an approximate geometric progression or preferred number series now widely adopted in the sizing of engineering components of many kinds, and best known, perhaps, in the wattage series of incandescent lamps 10, 15, 25, 40, 60, 100. No one needs the odd weights and quantities but the seller, who can and does use them to com-

pete unfairly with other vendors and to keep consumers from knowing what they pay per unit of weight or measure for a given product. Without such limitation of number of sizes and weights, the desirable comparison of cost per pint, per pound, or per ounce cannot be made by the consumer at the time and place of purchase. His problem is difficult enough, without his being required to master the use of a slide rule (and on mixed ounces and pounds, the ordinary slide rule alone is of no help anyway).

9. Small volume of product in a large container should, by law and regulation, be permanently ruled out. It is already out by law, but not by enforcement practice, for, with many kinds of food sold in very large volumes, oversized partly filled packages are the rule rather than the exception.

10. There should be a limit on the proportions of packages. A package five times as high as it is thick tends to be an imposition on the market operator as well as on the ultimate consumer.

11. Recessed ends and bottoms, and extra thick partitions of packages should be controlled by regulation. The several cases that went against the Government need not have been lost. The absence of carefully worked out and legally adopted regulations, in the many years during which the problem has been a serious one, put the Government at a great disadvantage in the conduct of its cases against firms using packages much larger in volume than their useful contents.

12. There should be elimination of such mislabeling terms as Jumbo, Giant, Super, Economy, Full, etc., as adjectives modifying size, or modifying units of measure such as pound, quart, pint, etc. (termed "a Madison Avenue gimmick" by packaging expert L. H. Zahn). The weight or volume alone defines the contents of a package. Complications and possibilities for deception arise quickly when a packager is allowed to use even simple comparative terms such as small, regular, and large.

DISCUSSION ON FOREGOING PAPER

MR. BALLENTINE: Mr. Schlink, has Consumers' Research developed a practical solution to the determination of the net weight of commodities in packages also containing premiums, such as towels, dish cloths, dishes, etc., intended as sales inducements?

MR. SCHLINK: I suppose you cannot stop that type of packaging, but I should think every effort ought to be made to discourage its use. The dish or other premium should be attached to the *outside of the package*, so that the bulk of the product itself can be judged. One must bear in mind that most package buying is done by the consumer's judgment of the bulk and not by judgment of weight. The housewife does not heft the package, ordinarily; she looks at it and, therefore, if the packager put anything inside which occupies space, she is going to credit the extra bulk to the product instead of to the product plus a dish, etc.

MR. BOWEN: If I understood you correctly, Mr. Schlink, I think you made some remark with regard to decimal fractions of pounds and ounces. Apparently, you are opposed to these decimal fractions. We find that decimal fractions are being used extensively in the pre-packaging of meats in supermarkets. As far as I am aware, this has been working satisfactorily. Would you care to comment further on that point?

MR. SCHLINK: Yes, you have made a good point. If the decimal marking of weight is done in relation to a price per unit, I see no objection to it, since it facilitates computation. The harm done is when you have a package of baking powder, for instance, that says, net weight 14.3 ounces. Indeed, I have a package of tea of a well-known supermarket brand that carries a declared weight of 1.28 oz. To the housewife, the decimal in this usage carries little meaning.

As a matter of fact, $7\frac{1}{16}$ ounces would not carry much more meaning to her, either. And when you get to fractions much below $\frac{1}{4}$ or $\frac{1}{2}$, the number often has little significance to the average housewife. The use

of the decimal fractions bothers her because she may often think it has something to do with 143 instead of 14.3. She decides that the whole thing is beyond her and lets it go at that.

In the case where the price per unit weight and the final price are both given (cents, or dollars and cents, both decimal numbers), as in meat packaging, I see nothing wrong at all in the use of decimal fractions. It is a good thing, indeed.

REPORT OF COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Presented by C. L. JACKSON, *Chairman, Chief, Division of Economic Practices, Department of Agriculture, State of Wisconsin*

The Committee on Specifications and Tolerances of the 47th National Conference on Weights and Measures submits its report—a tentative report as amended by this final report. The Committee is grateful for the many constructive suggestions received by mail and during its open meeting on Monday, June 4.

GENERAL CODE

1. *Recorded Value Representations and Digital Indications.*—At the 45th National Conference on Weights and Measures in 1960, the Committee recommended and the Conference adopted specification paragraph S.10.2. of the Scale Code. This paragraph was designed to clarify the intended meaning of the code to require accurate mathematical agreement between associated money-value and weight representations or indications on computing scales to the nearest one cent of money value. It has now come to the attention of the Committee that computing type devices other than scales, and in which are incorporated recorded money-value representations or digital money-value indications, are reaching the market. This makes it necessary that this same principle of accurate mathematical agreement between associated money values and quantity values be extended to other weighing and measuring devices used in retail trade. Therefore, the Committee recommends that a new specification paragraph to be numbered “G-S.5.6 RECORDED VALUE REPRESENTATIONS AND DIGITAL VALUE INDICATIONS” be added to the General Code, to read as follows:

G-S.5.6. RECORDED VALUE REPRESENTATIONS AND DIGITAL VALUE INDICATIONS.—Any recorded money-value representation or digital money-value indication on a computing type weighing or measuring device used in retail trade shall be in combination with a quantity representation or indication, and the associated money-value and quantity representation or indication, as the case may be, shall be in accurate mathematical agreement to the nearest one cent of money value.

(Item 1 of the General Code was adopted by voice vote)

2. *G-R.3. Suitability of equipment.*—The diversity of models and complexity in design of modern weighing and measuring devices are constantly increasing. These factors, together with certain aspects of commercial weighing and measuring operations, continue to point up the vital importance of regulation paragraph G-R.3. SUITABILITY OF EQUIPMENT, in a weights and measures program.

It should not be assumed that conformance with the requirements of regulation paragraph G-R.3. is necessarily assured merely because

a device is found to conform to the technical requirements of the General Code and of the appropriate specific code. It is necessary that the weights and measures official go beyond the technical requirements and consider the overall suitability of the particular device under examination in the service and in the environment in which that device is or will be commercially used.

During the official examination, a device should be (1) inspected for compliance with the General Code and specific code requirements and (2) tested with suitable standards for compliance with all applicable performance requirements. The test should be so conducted as to develop, as nearly as practicable, the performance characteristics of the particular device under examination as it may be anticipated that the device will be used commercially.

Based upon a thorough examination and test and after full consideration of all important factors surrounding its commercial use, the official decision should be made as to whether or not the device is "suitable for the service in which it is used."

(Item 2 of the General Code was adopted by voice vote.)

3. *Position of Equipment.*—It has been called to the attention of the Committee that a discrepancy exists between a Model Law provision and a paragraph in the General Code of Handbook 44. SEC. 44(8) of the Model State Law establishes that a weight or measure used for the compounding of medical prescriptions is exempted from this penalty paragraph. However, in Handbook 44, General Code paragraph G-R. 1. POSITION OF EQUIPMENT, does not make this exception for prescription scales. When the Model Law language was written to exempt prescription scales from being in full customer view, this same exemption was inadvertently overlooked as being necessary in paragraph G-R. 1. of the General Code.

In order to eliminate the discrepancy between a Model Law provision and the Handbook 44 codes the Committee recommends that General Code paragraph G-R. 1. be amended to read as follows:

G-R. 1. POSITION OF EQUIPMENT.—All equipment used in retail trade except when used exclusively for putting up packages in advance of sale and in compounding medical prescriptions, shall be so positioned that its indications may be accurately read, and the weighing or measuring operation observed, from some reasonable "customer" position. The permissible distance between the equipment and a reasonable customer position shall be determined in each case upon the basis of the individual circumstances, particularly the size and character of the indicating elements.

(The General Code amendment was adopted by voice vote.)

SCALE CODE

Further discussion by the Committee, in preparation of this final report, clearly disclosed a sincere consensus of the need that a tentative proposal be made available to weights and measures officials and industry at the earliest practical moment. The Committee has been assured that technical and legal aspects of such a proposal will begin immediately by National Bureau of Standards staff members and the Committee. It is the hope of the Committee that a tentative proposal will be available well in advance of the 48th Conference. All suggestions from officials and industry to assist in making this study are solicited by the Committee.

1. *T.1.1.3. and T.2.1.3. To decreasing-load tests on automatic-indicating scales.*—The matter of the special tolerances applicable to decreasing-load tests on automatic-indicating scales has, for many years, been a troublesome factor to weights and measures officers. Prior to the publication of Handbook 44 (first edition) in 1949, the pertinent specification paragraph in this area was as follows:

B-2x. INCREASING-AND-DECREASING-LOAD TEST OF AUTOMATIC-INDICATING SCALES. When tests are being made with both increasing and decreasing loads on an automatic-indicating scale, the indications on all increasing loads shall be within the regular tolerances specified, and also at any given load the range between corresponding observations for increasing and decreasing loads shall not be greater than the sum of the tolerances in excess and in deficiency for the load in question.

In an attempt toward simplification and to help eliminate contingencies that were most difficult to explain when Handbook 44 was first published in 1949, Scale Code tolerance paragraphs T.1.1.3. (for small-capacity scales) and T.2.1.3. (for large-capacity scales) were inserted to replace specification paragraph B-2x. These two tolerance paragraphs are identical and now read as follows:

T.1.1.3. (and T.2.1.3.) TO DECREASING-LOAD TESTS ON AUTOMATIC-INDICATING SCALES.—Twice the basic tolerance shall be applied.

The Committee is of the opinion that the current tolerance paragraphs T.1.1.3. and T.2.1.3. provide for unnecessarily large errors for automatic-indicating scales, and which are not permitted for non-automatic-indicating scales. Furthermore, it is the consensus of the Committee that these extremely liberal special tolerances are not needed for the modern high quality scales now being manufactured in this country.

Owing to the fact that some scale manufacturers have voiced objection to this recommendation and since neither the Committee nor the manufacturers have made recent comprehensive studies relating to this particular problem, the Committee feels that, although its opinion remains unchanged, no real damage would result from a delay of one year in taking action on this item. This will allow ample time for sufficient study. The Committee now recommends that this item be continued on the Committee's agenda and that consideration be given to the future amendment of Scale Code tolerance paragraphs T.1.1.3. and T.2.1.3. to read as follows:

T.1.1.3. TO DECREASING-LOAD TESTS ON AUTOMATIC-INDICATING SCALES.—Basic tolerances shall be applied.

T.2.1.3. TO DECREASING-LOAD TESTS ON AUTOMATIC-INDICATING SCALES.—Basic tolerances shall be applied.

DISCUSSION ON FOREGOING ITEM

MR. ALBANESE: I understand that these scales can be made to comply with closer tolerances. I would like to ask if anyone representing industry cares to give us a little further information on this item before we take a vote on it. If we can come within a closer tolerance, I think now is the time to do it instead of putting it off another year.

MR. KENDALL: Speaking for the Toledo Scale Corporation only, and as an individual manufacturer of scales, I can say that we do not object to the tightening of these particular tolerances.

Mr. ALLEN: Hobart Manufacturing Company would have no problem in complying with the tolerances as suggested by the Committee. I spoke before the Committee Monday and tried to explain that the Scale Manufacturers Association felt that the proposal of the Committee was a step backward, that you were returning to the situation that existed, I believe, prior to 1923 and that the proposal that the basic tolerances be applied to decreasing-load tests was such that it would encourage an inaccurate adjustment of a scale on the increasing-load test, in order to favor a scale that had an excessive decreasing-load weighing error.

Speaking for the Scale Manufacturers Association, we feel that our proposal takes you back to the step that you took in 1923, rather than going back to the requirements that existed before 1923. To those who feel that this is an effort on the part of our association to get a more liberal tolerance, let me assure you that is not the case. I do not think anybody is trying to talk the Committee into allowing greater tolerances on decreasing-load tests than those adopted in 1923, which, however, were later made more liberal. In fact, the SMA proposal would tighten the now-existing double tolerance.

I hope I have made it clear to Mr. Albanese that the manufacturers are not trying to get more liberal allowances on decreasing-load tests. I do think it should be made clear to everyone, however, that these hysteresis errors do exist. As I said Monday, they exist in every weighing instrument that has ever been built. You must recognize that a scale is going to have a slightly different indication on a decreasing-load test from that shown on an increasing-load test. If you say that we are going to have the same tolerance on increasing-load tests and on decreasing-load tests, then the tolerance must allow for some hysteresis and thus be needlessly broad for the increasing-load test.

I can assure you that all scale manufacturers can comply with the original but tentative proposal just as they did prior to 1923, when you had exactly the same thing.

Mr. KARP: I also spoke on Monday, and I would like only to reiterate basically what I said then. We would agree there is a hysteresis error, and, as stated, you cannot legislate or design it out of being. We do think, however, apparently along with others, that the present basic tolerance is satisfactory, in most, if not all cases, to adequately cover the normal hysteresis error.

To further explain our thinking and our position, I should like to repeat a part of what I attempted to say to the Committee on Monday.

It seems apparent that the present double tolerance for decreasing-load test in Handbook 44 was established on the assumption that (a) most commercial weighings were increasing-load weighings and decreasing-load weighings would occur only infrequently, and (b) in the event of appreciable hysteresis error, it would be desirable to encourage a shift of the hysteresis loop, in calibration, such that weighings with increasing-load would tend to remain relatively accurate even though the errors on decreasing-load weighings would then tend to be double and appreciably on the side of overregistration.

With the advent of prepacking devices and techniques, half or more of prepackage weighings are now, in effect, found to be on a decreasing-load basis. With appreciable hysteresis error, resultant net average commodity weights are significantly *short*! If the present

double tolerance for decreasing-load is eliminated, appreciable hysteresis error might force a shift of the hysteresis loop, in calibration. However, such shift would now, in effect, be desirable, resulting in relatively true, net average commodity weights.

As a company, we certainly do not feel that a double tolerance on decreasing-load tests, on all automatic indicating scales, is necessary and we would endorse the original proposal of the Committee.

MR. JACKSON: We have tried to explain the position of the Committee in the language of the report. Probably I should re-emphasize, however, that the Committee is endeavoring only to be fair and reasonable and to take everything into consideration. As stated in the report, there is not any doubt that the Committee feels quite definitely that this double tolerance is a factor which should be corrected. It is a matter of whether it should be done at this time, or whether it should be included in the major study, for which preparations are being made, to review the entire scale tolerance structure. It was the conclusion of the Committee that no damage would be done by carrying this over another year. This is a matter for the Conference to decide, however.

MR. ALBANESE: I gather from the comments of the different people from the scale industry that they can comply with the tolerances proposed for decreasing-load tests. I still cannot understand the reason for holding this over for another year. If they agree that the proposed tolerance is reasonable, then I think that we should adopt it now.

MR. BOIVIN: I do not see much point in having a Committee on Specifications and Tolerances unless we can take their recommendations. It would seem to me that the Committee has given a lot of time and study to this matter and that we certainly should follow the recommendation. Therefore, I call for the question.

MR. KENNEDY: Mr. Chairman, I was quiet until that point. The Committee on Specifications and Tolerances does not run this Conference. That is all I have to say about that.

However, you have said that some companies oppose this. Where are the opposing companies? We have heard from Hobart and Sanitary and Toledo. All of them say they are in favor of it. If they are not here to oppose it, I think the committee should stick to its original recommendation and not bypass it for another year.

MR. JACKSON: It should be kept in mind that we do have a definite, official, and complete recommendation from the Scale Manufacturers' Association on this point and they do oppose the adoption of the amendment this year. The Committee also has letters of opposition from two other scale companies and I do not understand that Mr. Allen of Hobart favors adoption this year.

(Item 1 of the Scale Code was adopted by voice vote.)

2. *R.4.1. Value of minimum graduated interval on retail food scales.*—This item was retained on the agenda of the Committee from last year. The following statement was included in the final report of the Committee to the 46th National Conference on Weights and Measures:

It has been pointed out to the committee that certain complications arise from the stipulation that "The value of the minimum graduated interval on a scale used for the retail sale of foodstuffs shall be not greater than 1 ounce," because the word "retail" is not defined. A specific example is the sale of

meats in locker plants, where there frequently are individual retail sales of 50 to 100 pounds, and even more. Dial scales with at least 125-pound capacities have been used in this service, and to require such scales to have 1-ounce graduated intervals and thus $\frac{1}{8}$ -ounce minimum acceptance tolerances seems impractical. One suggestion being considered is that regulation paragraph R.4.1. be rewritten along the following lines:

R.4.1. ON RETAIL FOOD SCALES.—The value of the minimum graduated interval on a scale used for the retail sale of foodstuffs weighing 30 pounds or less shall be not greater than 1 ounce. (For retail sale of foodstuffs weighing more than 30 pounds, see G-R.3.)

The reasoning behind this suggestion is that computing scales with 1-ounce graduations are generally available up to 30 pounds capacity, and are not available at capacities of greater than 30 pounds.

The Committee feels that this matter requires further study; therefore, it is proposed that this item be retained on the agenda of the Committee.

The Committee has continued to give this matter its attention and study, as has the Technical Committee of the Scale Manufacturers Association. As a result of this study, the Committee recommends that regulation paragraph R.4.1. of the Scale Code be amended to read as follows:

R.4.1. ON RETAIL FOOD SCALES.—The value of the minimum graduated interval on a scale used for the retail sale of foodstuffs, with a nominal capacity of 50 pounds or less, shall be not greater than 1 ounce.

(Item 2 of the Scale Code was adopted by voice vote.)

3. Tolerances for large capacity scales.—Item 7 in the Committee's report to the 46th National Conference read as follows:

7. Tolerances for large-capacity scales.—The Southern Weights and Measures Association has recommended that the National Conference "review the tolerances for large-capacity scales." During the interim meeting of this Committee, the structure of tolerances for large-capacity scales was discussed at some length with representatives of the manufacturers of such scales. The scale manufacturers and the Scale Manufacturers Association have volunteered to study this matter thoroughly and to be in further communication with the Committee. The Committee, in the meantime, plans to conduct its own study. The Committee desires to express its sincere appreciation to the Southern Weights and Measures Association for bringing this matter officially before the National Conference.

This item has had the continued attention of the Committee since the adjournment of the 46th National Conference. Also, it has received a tremendous amount of study by the Technical Committee of the Scale Manufacturers Association, of which Mr. K. C. Allen of Hobart Manufacturing Company is Chairman. The Scale Manufacturers Association has filed a rather complete and enlightening report and recommendation with the Committee. The matter was discussed in detail and at considerable length during the interim meeting of the committee in Washington, D.C., January 30, 1962. The proposal of the Scale Manufacturers Association provides for the discontinuance of the two separate tolerance classifications for "small-capacity" and "large-capacity" scales. The proposal would consolidate the two tables of tolerances and have only one table for "all" scales. The principal objective of the recommendation is to achieve greater simplification. It is anticipated that this would improve understanding and result in more uniform interpretation. The possibilities of the idea look quite promising to the Committee.

The pursuit of this plan will involve a major revision of the Scale Code. It will involve a great amount of additional work. Therefore, it is the opinion of the Committee that a very thorough and complete job should be done. It will not be possible for the Committee to complete this type of job prior to the 47th National Conference. Furthermore, the Committee feels that a major proposed revision of this magnitude should be in the hands of the Conference delegates well in advance of the meeting at which it is to be considered and acted upon. Accordingly, it is the plan of the Committee to diligently pursue the project and to distribute the tentative draft to delegates as soon as is practicable.

The Committee wishes to thank the Scale Manufacturers Association for its suggestion and for its splendid cooperation and helpful assistance, both in the past and in the future.

(Item 3 of the Scale Code was adopted by voice vote.)

4. *Tolerance paragraph T.2.3.4. For railway track scales.*—In item 6 of the Committee's report to the 46th National Conference, acknowledgment was made of the communication received from Mr. A. S. Kreffing, Chairman, American Railway Engineering Association Committee No. 14, requesting that the basic maintenance tolerance on railway track scales in grain weighing service be increased from 0.1 percent to 0.2 percent. The Committee has now received the formal recommendation of the AREA that this change be made. Also, the Committee has received a formal recommendation from the Executive Committee of the Terminal Grain Weighmasters' National Association and informal recommendations from a few other sources, that this change not be made.

Since this matter is closely related to the project described in item 3 of this report, the Committee proposes to study it along with the review and revision of all other scale tolerances. Therefore, the matter will be covered in the Committee's report to the 48th Conference in 1963 and no action is recommended at this time.

(Item 4 of the Scale Code was adopted by voice vote.)

5. *Definition paragraph D.22. LIVESTOCK SCALE.*—It has been called to the attention of the Committee by Mr. R. D. Thompson of the United States Department of Agriculture that numerous livestock scales now in use are equipped with dials having no tare bar or unit weights and having a nominal capacity of 5000 pounds. Since the value of the minimum graduated interval on a livestock scale is not permitted to exceed 5 pounds, the maximum capacity that can be attained on a conventional dial scale is 5000 pounds, without the use of a tare bar or unit weight. Also, the United States Department of Agriculture has found that better weighing results might be expected from scales that have no tare bar. For these reasons, Mr. Thompson has suggested and the Committee recommends that the figure "6000" in Scale Code definition paragraph D. 22. be changed to "5000" and that the paragraph read hereafter as follows:

D.22. LIVESTOCK SCALE.—One having a nominal capacity of 5,000 pounds or more and used primarily for weighing livestock standing on the scale platform.

(Item 5 of the Scale Code was adopted by voice vote.)

1. *Anti-drain valve.*—The current requirement for an “anti-drain valve” in the discharge line of a wet-hose pressure-type device has proven to be difficult to locate: included as it is in specification paragraph S.2.5. DISCHARGE-LINE VALVES. In order to further facilitate the use of Handbook 44, and without changing the present meaning of the paragraph, the Committee recommends that specification paragraph S.2.5. be amended to read as follows:

S.2.5. DISCHARGE-LINE VALVES. (See also S.10.2.)

S.2.5.1. DISCHARGE VALVE.—A discharge valve may be provided at the discharge end of the hose or elsewhere in the hose line only if the device is of the wet-hose type. If the discharge valve is so positioned, any other shut-off valve in any portion of the discharge line leading to this outlet shall be of the automatic or semiautomatic set-stop, or predetermining type, or shall be operable only (a) by means such as a wrench or screw driver (but not a pin) entirely separate from the device, or (b) by mutilation of a lead-and-wire seal by which the valve is sealed open.

S.2.5.2. ANTI-DRAIN VALVE.—In a wet-hose, pressure-type device, an effective anti-drain valve shall be incorporated in the discharge valve assembly. If the anti-drain valve is located on the inlet side of the discharge valve, it shall be installed immediately adjacent thereto.

(Item 1 of the Liquid-Measuring Device Code was adopted by voice vote.)

2. *S.3.6. Unit-price and product-identity display.*—The advent of new designs of retail motor fuel devices, including blending and multiple-product types of devices, necessitated a change in specification paragraph S.3.6. by the 41st National Conference in 1956. Continued design changes and the arrival of new models has rendered the present wording of paragraph S.3.6. difficult to interpret and somewhat inconsistent in its intended requirements between conventional single-product devices and multiple-product, or blending type devices.

Paragraph S.3.6. has been interpreted as requiring, on conventional single-product devices, that price-per-gallon display be geared to and synchronized with the computing mechanism, thus causing the displayed price-per-gallon to be changed automatically when the price-per-gallon at which the computing mechanism is set is changed. It has not been interpreted as requiring this same type of construction on blending type devices and these devices have not been so designed and constructed.

It is the Committee's understanding that all conventional single-product retail motor fuel devices that are now being manufactured, do conform to the requirements as heretofore described. It is the hope and expectation of the Committee that this will continue to be the policy and practice of all manufacturers of these devices. On the other hand, it is the feeling of the Committee that the code requirements should be fully consistent. To accomplish this purpose and to eliminate the need for special interpretation, the Committee recommends that specification paragraph S.3.6. of the Liquid-Measuring Device Code be amended to read as follows:

S.3.6. UNIT-PRICE AND PRODUCT-IDENTITY DISPLAY.—In a device of the computing type, or of the coin-operated type, means shall be provided for displaying on each face of the device the unit price at which the device is set to compute, or to deliver, as the case may be. If a device is so designed as to dis-

pense more than one grade, brand, blend, or mixture of product, means also shall be provided for displaying on each face of the device the identity of the grade, brand, blend, or mixture being dispensed. (See G-R.5. and R.5. for method of operation and operator responsibility.)

DISCUSSION ON FOREGOING ITEM

MR. KERLIN: Mr. Chairman, I would like to restate our position with regard to this item. Due to the number of complaints that we had from consumers that they had been overcharged on pumps where the price could be manually set—that is, the indicated price could be manually set and the computed price also manually set—we caused a survey to be conducted in a particular area in California. The results of that survey were given to the Committee on Monday. The total overall result was that in 17.55 percent of the cases, the indicated price was set at a different price than that at which the pump was set to compute.

We can see no real harm being done in this item being held over for a year and studied further by the Committee. This would give the various weights and measures jurisdictions a chance to look into this situation more thoroughly. I, therefore, would like to move to amend the motion to the effect that this item be held over for one year for further study.

MR. JACKSON: This motion is to lay this item over for a year. I think we should try to re-emphasize the position of the Committee. We did emphasize this position in the Committee report. We must be concerned about our position of being consistent in what we require in the code. This item is simply an effort to spell out, in precise and understandable language, just what the code is now intended to mean. I emphasize again that you do have a responsibility to see that the price setting is correct. Under the new language, you can proceed under the regulation paragraph if you find the setting incorrect. I think it would be a little premature to set up a requirement that automatic mechanical synchronization be provided until we reach a point when the industry can furnish it. As far as I have been able to determine, the industry is not yet ready to do this.

I do not think there is any doubt in the minds of those who have done work in the weights and measures field, that we would like to have automatic mechanical policemen wherever we can get them. We must be reasonable, however, and we do have plenty of authority to prevent deception in pricing under the code as proposed by the Committee. If we find that the prices are not being set correctly, we may be obliged to take legal action to see that the operator does set them correctly. I think it is the feeling of the Committee that when industry is prepared to furnish equipment that will do this job automatically and mechanically, at the time, the Committee would be willing to entertain such a requirement.

MR. BUSSEY: I am afraid that there is rather gross misunderstanding as to what this Committee proposal really does. This proposal actually strengthens what is in the code at this time. The code does not now require the automatic mechanical and synchronized operation of the posted price on any gasoline pump, but it has been interpreted that way. Some people have interpreted it to mean that you must have this feature on conventional pumps. All modern conventional pumps do have it and we have had reasonable assurance from

the gasoline pump manufacturing industry they will continue to provide it.

The code, since the blending pump came out, has not actually required this feature on the conventional pump. The manufacturers have known this, but they have not stopped providing it on their conventional pumps. We have talked with all of the major gasoline pump manufacturers. Of course, only a few of them are making blending pumps at this time. Several manufacturers are making multiple product pumps, however. No manufacturer has a completely automatic mechanical and synchronized device for posting the prices on a blending pump, at this time. They may have it later. If you should decide to lay this item on the table, you will have a much less satisfactory situation than you would have with its adoption. Under the Committee proposals, you will have an additional specific regulation, directed to the operator of the device, that tells him that he must set and operate these pumps properly. If he fails to do this he will be guilty of misusing the device and will be subject to prosecution.

I emphasize, this is actually a tightening of the present code requirements. It is an attempt of the Committee to provide language that can be understood and that will not be misinterpreted. In addition, it gives you a better tool with which to work in the year to come. I can assure you that the Committee keeps these matters under constant study at all times. Should industry be in position to furnish a pump that is fully automatic in this respect by next year, it would be my guess that the Committee would be bringing in a proposed regulation that would require this feature.

The Committee proposal is a definite improvement to the code and I think it would be a serious mistake if you failed to adopt it. It actually does not change the present intended meaning of the code. It does give you a specific regulation directed to the operator of a device, and spells out all of this so you can understand it.

MR. KERLIN. Mr. Bussey, I understand most of what you say is absolutely correct. However, on the regulation that we have in the handbook at the present time—the wording that is there now—the Committee and the Bureau have stated that it is their interpretation that the single-product pumps must be geared automatically to the computer. Therefore, by the adoption of this regulation, you let down this barrier to the point where both types of pumps can be manually set. I believe one of our main objectives is to protect our consumers and our motoring public.

The adoption of G-R.5. as recommended is all right. You are spelling out the obligation of the users. We have had no trouble in getting prosecutions where we have found these to be misset. On the other hand, we do not have the force to constantly police this condition, and I think we should have some regulation governing it.

MR. BUSSEY: The paragraph that is in the handbook now reads as follows:

S.3.6. Unit-Price and Product-Identity Display.—In a device of the computing type or the coin-operated type, automatic means shall be provided for displaying on each face of the device the unit price at which the device is set to compute or to deliver at any time the device is in operation.

This paragraph applies not just to blending pumps, but to all pumps. No distinction is made. You can set the price manually

so long as it is displayed automatically while the device is in operation. I do not recall an occasion when an official interpretation was requested on this point. All conventional pumps have included this feature and no blending pump has included it. Because of these facts, I do not know of any case that has required an official interpretation.

MR. KERLIN: In rebuttal to what Mr. Bussey has just said, I offer the following statement of the Committee:

Paragraph S.3.6. has been interpreted as requiring, on the conventional single-product devices, that price-per-gallon-display be geared to and synchronized with the computing mechanism.

MR. BUSSEY: That portion of the report does not say that the Committee made such interpretation, Mr. Kerlin. The Committee said that paragraph S.3.6. has been interpreted that way. It is being pointed out that this is not a proper interpretation of the present language.

MR. TURNBULL: We are now voting on the motion to amend the Committee report by laying this item on the table. If you reject this motion you will then go back to the original motion of the Committee chairman to adopt item 2, Liquid-Measuring Device Code, of the committee report.

(The motion to amend the committee report was defeated and item 2 of the Liquid-Measuring Device Code was adopted by voice vote.)

3. *Return to zero.*—Item 1 of the Committee's report to the 46th Conference, relative to the "return to zero" of the primary indicating (recording) elements of a retail motor-fuel device (gasoline pump), was retained on the agenda of the Committee for further study. This item involved a recommendation made by the Southern Weights and Measures Association prior to the 46th Conference, which was endorsed by the Gasoline Pump Manufacturers Association. The recommendation was to amend the Liquid-Measuring Device Code to permit retail motor-fuel devices (gasoline pumps) to be equipped with cumulative type primary recording elements, that is, primary recording elements that are not returnable to a definite zero position before each delivery is begun.

It has been traditional with the National Conference to recommend specifications and regulations that require retail liquid measuring devices to be equipped with primary indicating and recording elements (See S.11.1. and S.11.2., page 86, H-44) that are returnable to zero and that these elements be returned to zero before each delivery is begun (see R.3., page 91, H-44). Furthermore, since 1957 and after waiting some twenty years for patents to expire, the Conference code has required that each retail motor-fuel device of the meter type (gasoline pump) be equipped with a "zero-set-back interlock" (see S.10.2., page 86, H-44). These requirements are applicable to both "indicating" and "recording" elements (see G-S.5.5., page 37, H-44).

The Committee continues to feel that the present code requirements relative to the return of primary indicating and recording elements to zero, on liquid-measuring devices used in making retail deliveries to individual consumers before each delivery is begun, are reasonable, proper, and necessary for adequate protection of the purchaser. Especially is this true in the case of retail motor-fuel devices (gasoline pumps).

After these additional months of study of this problem, the Committee is still convinced that it would be a mistake for the Conference to adopt this recommended amendment. Furthermore, it would be a step of retrogression and the Committee again recommends no action.

(Item 3 of the Liquid-Measuring Device Code was adopted by voice vote.)

4. *Specification paragraph S.11.3. Visibility.*—This subject was carried as item 2 in the Committee's report to the 46th National Conference. The Committee made no final recommendation on the request of the Gasoline Pump Manufacturers Association to have specification paragraph S.11.3. VISIBILITY revised to eliminate the 36-inch minimum height requirement. This was principally because industry representatives had not presented specific evidence or examples of restriction or hardship that would require that this paragraph be modified or deleted, and to allow the Committee additional time to study the request and to confer with city, county, and State weights and measures officials.

Under date of December 8, 1961, the Committee sent a letter of inquiry to approximately 170 city, county, and State weights and measures offices, located throughout the nation, seeking comments and opinions as to the advisability of deleting specification paragraph S.11.3. The opinions of those responding were almost equally divided between "retention" and "deletion" of the paragraph. Numerous good reasons were given on both sides of the question. Accordingly, after careful consideration of all related factors and a thorough study of other code requirements in this area, together with current marketing conditions in retail gasoline stations, the Committee is of the opinion that the following General Code paragraphs are sufficient to control this situation and that neither specification paragraph S.3.1. nor S.11.3. are any longer necessary :

G-S.4. DESIGN.—All weighing and measuring devices shall be provided with indicating or recording elements, appropriate in design and adequate in amount. Primary indications and recorded representations shall be clear, definite, accurate, and easily read under any conditions of normal operation of the device. Graduations and a suitable indicator shall be provided in connection with indications and recorded representations designed to advance continuously. Graduations shall not be required in connection with indications or recorded representations designed to advance intermittently or with indications or recorded representations of the selector type.

G-R.1. POSITION OF EQUIPMENT.—All equipment used in retail trade, except when used exclusively for putting up packages in advance of sale, shall be so positioned that its indications may be accurately read, and the weighing or measuring operation observed, from some reasonable "customer" position. The permissible distance between the equipment and a reasonable customer position shall be determined in each case upon the basis of the individual circumstances, particularly the size and character of the indicating elements.

G-R.3. SUITABILITY OF EQUIPMENT.—Commercial equipment shall be suitable for the service in which it is used with respect to all elements of its design, including but not limited to its weighing capacity (for weighing devices), its rate of flow (for liquid-measuring devices), the character, number, size, and location of its indicating or recording elements, and the value of its minimum graduated interval.

The Committee recommends that specification paragraphs S.3.1. READABILITY, and S.11.3. VISIBILITY, of the Code for Liquid-Measuring Devices be deleted.

5. *Unit price and product identity.*—In order to properly implement the change in specification paragraph S.3.6., as recommended in item 2, by requiring clearly that the proper display of unit price and product identity is the specific responsibility of the owner or operator of the device, the Committee recommends that a new regulation paragraph R.5. be added to the Liquid-Measuring Device Code, to read as follows:

R.5. UNIT PRICE AND PRODUCT IDENTITY.—On a retail device of the computing type, or of the coin-operated type, there shall be displayed on each face of the device the unit price at which the device is set to compute, or to deliver, as the case may be. If a device is so designed as to dispense more than one grade, brand, blend, or mixture of product, there shall also be displayed on each face of the device, at any time the device is in service, the identity of the grade, brand, blend, or mixture which the device is set to dispense.

(Item 4 of the Liquid-Measuring Device Code was adopted by voice vote.)

VEHICLE TANK CODE

1. *Anti-drain valve.*—During the open Committee meeting, it was pointed out by a representative of a meter manufacturer that there are in existence and in commercial service a number of pump discharge units delivering through dry hoses and that, accordingly, the second sentence of proposed specification paragraph S.20.3. should be reevaluated. The wet-hose requirement for pump-discharge units has been in the code for many years, and this is the first time information as to dry hoses from such pump-discharge units has been brought to the attention of the Committee; accordingly, the Committee has placed this item on its agenda for study during the coming year and in the meantime recommends that the amendments as presented be adopted.

For the same reason given in item 1 under the Liquid-Measuring Device Code, in regard to the anti-drain valve requirement, amend specification paragraph S.20.3. DELIVERY HOSE, and add a new paragraph S.20.4. ANTI-DRAIN VALVE, as follows:

S.20.3. DELIVERY HOSE.—On a gravity-discharge unit, the delivery hose shall be as short as practicable, and there shall not be a shutoff valve at its outlet end. On a pump-discharge unit, the delivery hose shall be of the wet-hose type with a shutoff valve at its outlet end.

S.20.4. ANTI-DRAIN VALVE.—In a wet-hose, pump-discharge type device, an effective anti-drain valve shall be incorporated in the discharge valve assembly. If the anti-drain valve is located on the inlet side of the discharge valve, it shall be installed immediately adjacent thereto.

(Item 1 of the Vehicle Tank Code was adopted by voice vote.)

FARM MILK TANK CODE

1. *Tolerance paragraph T.2. and Table 1 heading "Indicated Gallonage."*—It has been reported to the Committee that there has been some misunderstanding and misinterpretation as to the proper method of applying the prescribed tolerances to farm milk tanks. Some officials seem to have been construing the words "Indicated gallonage" in the Table 1 heading to mean "Nominal capacity." This is improper and was never intended. Although the Committee has felt that the present wording should be adequate, it does have a strong desire to eliminate all possible confusion, and the following amendments to the Farm Milk Tank Code are recommended:

Amend tolerance paragraph T.2. BASIC TOLERANCE VALUES, by adding to the parenthetical statement, following the word "test", the following: "—

the tolerance being applied according to the volume of the test liquid in the tank at each test draft, regardless of the nominal capacity of the tank", making the paragraph read hereafter as follows :

T.2. BASIC TOLERANCE VALUES.—Basic maintenance and acceptance tolerances on underregistration and on overregistration shall be as shown in table 1. (The error at any liquid level, of a tank—to which the tolerance is applied—is the difference between the gallonage shown for that level on the gallonage chart and the corresponding gallonage determined by the test—the tolerance being applied according to the volume of the test liquid in the tank at each test draft, regardless of the nominal capacity of the tank.)

Table 1.—Amend Table 1 by changing the words "Indicated gallonage" to "Test draft."

(This item was adopted by voice vote.)

MILEAGE-MEASURING DEVICE CODE

1. *Odometers on rental automobiles.*—The automobile rental business has grown tremendously in the United States during the past several years. In practically all instances, at least a portion of the rental charge is made on a mileage basis. This practice results in the odometer portion of the regular automobile speedometer being used as a commercial measuring device. In most jurisdictions, this brings the odometer under the purview of the weights and measures law, whether or not these devices are being tested officially.

The odometers that are used on rental automobiles are generally of the same type and design as are those used in privately owned passenger cars.

The Committee has been advised that some complaints have been received by the weights and measures officials in a few jurisdictions. A preliminary survey has indicated that it has been an industry practice of long standing to set all passenger car odometers to "overregister" from one to five percent. This poses a problem when these odometers are used commercially.

The current code for mileage-measuring devices provides for no tolerance on overregistration, except to allow for normal tire wear. The basic acceptance and maintenance tolerance provided for underregistration is four percent (see T.1.1.2., page 145, H-44). The reason that no tolerance on "overregistration" is provided for mileage-measuring devices, except for tire wear, is that all factors that normally occur in the operation of an automobile or taxicab result in errors of overregistration. None of these normal factors result in similar or equal errors on underregistration.

Additional tests and studies have been undertaken subsequent to the preparation of the Committee's tentative report. The studies are incomplete at this time. The subject was discussed at the open meeting of the Committee on Monday and was presented as a formal program item on Tuesday afternoon by Mr. Nalls Berryman, Director, Division of Standards, State of Florida, and Mr. T. J. McCook, Chief Engineer, Instrument Division, Stewart-Warner Corporation. The data that has thus far reached the Committee is not sufficiently conclusive to permit the Committee to make any firm recommendation as to present or proposed tolerances.

It does appear that the automobile manufacturers of the United States are specifying odometers so designed as to provide an average overregistration error of significant proportion. When these instru-

ments become commercial measuring instruments, as they do in the case of rental automobiles, there is created a situation by which the average user of a rental car will pay for more miles than he actually drives. The Committee urges that the Society of Automotive Engineers and the automobile manufacturers reevaluate their specifications for odometers and reconstitute these specifications with the aim to provide, on automobiles that are sold to rental car agencies, odometers that conform to current code requirements.

The Committee also urges that rental car agencies urge upon automobile manufacturers far greater accuracy in the odometer supplied in automobiles sold for rent purposes.

The Committee will retain this item on its agenda and, with the cooperation of the Office of Weights and Measures of the National Bureau of Standards, conduct a detailed technical study during the coming year. In the meantime, it is suggested that weights and measures officials give this matter their very careful attention. All comments from officials, rental car agencies, automobile manufacturers, and others will be most welcome.

The Committee does appreciate the assistance thus far given and hopes that this cooperative atmosphere will prevail until this critical problem is solved.

DISCUSSION ON FOREGOING ITEM

MR. KALECHMAN: This subject has already gotten publicity in the newspapers. When we get back to our homes, we will find that it has been in the papers there. We may start getting telephone calls: What are we going to do about it? Here is what I intend to do. I am going to use our present code. We have an odometer code in Handbook 44. Unless, and until the Committee makes a recommendation for tolerance changes for odometers, I plan to apply the specifications and tolerances now in Handbook 44. I have talked with an expert on odometers, and he told me it is quite practical, and at nominal cost, to meet our present tolerance requirements.

MR. BUSSEY: It is true that we do and have had a code covering odometers for many years. The thing is, this is a field of weights and measures control that has been dormant all of this time. Weights and measures officials have not been testing these devices, and I do not know how many jurisdictions are going to test them now. It would be a rather gigantic undertaking to test all of them—there are thousands now in use. The idea, as I see it, is to do some testing and to carefully study the entire matter. In fact, this has already been started. Mr. Berryman, as you know, has done some testing in Miami and so has Mr. Turnbull in Seattle. The Office of Weights and Measures is currently engaged in a series of tests. From the information gained from these tests and studies, the Committee will know, from actual experience, whether or not the present code is reasonable and adequate. If the code needs amending, this will be recommended. In the meantime, we hope other weights and measures officials will start making odometer tests under our present code requirements and report your findings to the Committee.

MR. KALECHMAN: Then, you do suggest that we do some of this testing?

MR. BUSSEY: Yes. And there is one other thing I should like to say for the record. I saw the article in the paper this morning. This

Conference, as has been indicated several times today, tries to be perfectly fair and objective in its every undertaking. We do not wish to damage any segment of business or any individual.

Insofar as I know, during none of the investigations thus far made in this area, has there been any indication or evidence suggesting that the rental car agencies have been guilty of any negligent or purposeful wrongdoing. They have been buying the same types of automobiles that you and I have been buying. They have not requested the automobile manufacturers to furnish them with odometers that overregister. The setting of odometers to overregister seems to have been an industry policy for many years, and the establishment of this policy did not involve rental automobiles. The automobile rental agencies in Florida, in Washington, D.C. and in Seattle, Washington have been most cooperative. This we appreciate greatly. I feel that they are entitled to have this statement made publicly, that all may know that weights and measures officials are not accusing them of promoting this situation that now confronts us.

MR. JACKSON: In conclusion, again, the Committee would like to express its appreciation to the representatives of industry and to weights and measures officials for the splendid cooperation and attention. I personally thank you for the good job that you have done.

MR. TURNBULL: Thank you, Mr. Jackson, you have done another excellent job just before retiring from the Committee.

I want to personally thank the members of the Committee for their fine work. I happen to be the most recent ex-member up to this point, and I know the work that has been contributed by these members. Also, I appreciate the attention that you, the delegates out here in the audience, have given.

(This item was adopted by voice vote.)

The Committee desires to record formally its appreciation to all who have participated in its deliberations, either in writing or in person during the interim meeting. The Committee can fulfill its responsibility only with full cooperation from weights and measures officials and business and commercial interests.

C. L. JACKSON, *Chairman*

A. H. DITTRICH

T. C. HARRIS, Jr.

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.)

REPORT OF THE EXECUTIVE COMMITTEE

Presented by ROBERT WILLIAMS, *Chairman, County Sealer, Department of Weights and Measures, Nassau County, Mineola, New York*

The Executive Committee of the 47th National Conference on Weights and Measures held its final session on Tuesday, June 5, 1962 at 8:30 a.m. Conference activities for the year were reviewed and discussed.

Organization and Procedure of the National Conference

1. As prescribed for amendments to the Conference Organization and Procedure, the outgoing Executive Committee read into the record during the 46th National Conference three proposed amendments, as follows:

(a) Section 3. Constituent Membership.—In order that due recognition may be afforded those weights and measures authorities who have served the Conference in high elected positions or for many years and who later have retired from their positions in Federal, State, county, or city government, it is recommended that the advisory membership be extended by amending the third paragraph of Section 3, Constituent Membership, to read as follows:

Advisory membership comprises (1) representatives of agencies of the Federal Government who are concerned in any way with regulatory weights and measures officers or their official activities or who are interested in the objectives and activities of the Conference, and (2) each person who has retired from his Federal, State, county, or city weights and measures position and who, in addition, prior to his retirement, either has served the Conference as its President, Chairman, or Executive Secretary, or has attended as an active or advisory member 15 or more meetings of the Conference.

(b) In order that the duties and field of operation of the Executive Committee be more specifically set forth, and to avoid any questions as to its authority to act in certain areas, it is recommended that the fourth paragraph under Section 7, Duties and Fields of Operation of Committees, be amended to read as follows:

The Executive Committee subject to the overriding authority of the Conference itself, selects the place, dates, and headquarters, and fixes the registration fee, for each meeting of the Conference, may at its option fill any vacancy in an elective office of the Conference caused by death, resignation, or retirement from active official regulatory service, advises with the Executive Secretary with respect to the programs for the meetings of the Conference, reviews the general activities of the Conference and its committees and makes such recommendations to the Conference, the Conference officers, and the committee chairmen as it deems appropriate, and, in the interval between successive meetings of the Conference, authorizes interim meetings of Conference committees as the need therefor may develop, authorizes committee and other contingent expenditures (including travel and subsistence expenses of committee members and the Conference Chairman), and acts for the Conference in all routine or emergency situations that may arise. Each new Executive Committee joins with the new chairmen of standing Conference committees in a breakfast meeting (as guests of the Conference) on the last day of the Conference, for general discussion and for transaction of business by the Executive Committee. Questions before the Executive Committee are decided, whether by voice vote or ballot, on the basis of the majority of votes cast.

(c) As has been explained in the Report of the Conference Committee on Laws and Regulations (1961), it now considers its duties and responsibilities inadequately defined in the Organization and Procedure. To clarify this situation, the Executive Committee recommends that the sixth paragraph of Section 7, Duties and Fields of Operation of Committees, be amended to read as follows:

The Committee on Laws and Regulations annually presents a report for Conference action. Its field of operation embraces all matters within the area of weights and measures supervision that deal with the development and interpretation of model laws and model regulations, the study and analysis of bills introduced for legislative enactment, and the recommendations of general and administrative procedures, but exclusive of such matters as are within the jurisdiction of the Committee on Specifications and Tolerances.

2. Also, as prescribed for amendments to the Conference Organization and Procedure, the current Executive Committee read into the record during the 46th National Conference the proposed amendment, as follows:

Amend the first paragraph of Section 5, Committees, which now reads, "The annual committees are a Nominating Committee of seven members, a Resolutions Committee of seven members, and an Auditing Committee of three members, appointed by the Conference Chairman from the active membership, and an Executive Committee consisting of all the officers, *ex officio*, and ten members elected from the active membership. The committees appointed by the Chairman serve during his term of office. The term of the Executive Committee runs from the adjournment of the meeting at which its members are elected through the succeeding meeting." to read as follows:

The annual committees are a Nominating Committee of seven members, a Resolutions Committee of seven members, and an Auditing Committee of three members, appointed by the Conference Chairman from the active membership, and an Executive Committee consisting of all officers, *ex officio*, past Chairmen of the Conference still active as regulatory weights and measures officials, and ten members elected from the active membership; *Provided*, That the Executive Secretary and the past Chairmen shall not have votes on matters before the Executive Committee. The committees appointed by the Chairman serve during his term of office. The term of the Executive Committee runs from the adjournment of the meeting at which its members are elected through the succeeding meeting.

These items were restudied during the pre-Conference meeting of the Executive Committee and their adoption is recommended.

International Bureau of Legal Metrology

The National Conference has, upon several occasions in the past, heard reports describing the formation and activities of the International Bureau of Legal Metrology, which has its headquarters in Paris, France. This organization is completely separate from the International Bureau of Weights and Measures in Sevres, France, and the operations of the two organizations do not overlap or conflict in any way. The International Bureau of Legal Metrology is an organization quite similar to our own National Conference on Weights and Measures, except that it is "international" in scope, as the name implies.

The United States has been requested to participate in this organization since its very inception. In fact, the late Dr. E. C. Crittenden of the National Bureau of Standards served on the committee that helped to organize the International Bureau. For several reasons which this Committee will not go into at this time, the United States has not seen fit to affiliate with this organization. In the light of our extensive current interest in the European Common Market and the possibility of the adoption of the metric system in this country, the Committee is of the opinion that this matter should be restudied and that consideration should be given to the possible desirability of United States participation in this organization. The Committee recommends, therefore, that the U.S. Department of Commerce and the National Bureau of Standards reexamine and reevaluate this matter and that the Conference Chairman and Executive Secretary be authorized to cooperate fully in the study as the official representatives of the National Conference on Weights and Measures.

Foreign Colleagues

Another subject discussed by the Committee was the policy followed by our secretary in recent years in inviting our colleagues from other countries to appear as program speakers and participate in our meetings. The Committee fully endorses this practice and recommends its continuance.

R. WILLIAMS, *Chairman*
P. DeVRIES
H. H. HOUSTON
D. M. TURNBULL
C. C. MORGAN
R. W. SEARLES
W. S. BUSSEY, *Secretary*

H. E. CRAWFORD
R. I. CUMMINGS
A. H. DITTRICH
G. L. JOHNSON
R. E. MEEK
D. R. PRATT
C. H. WRENN
R. ZIERTEN

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

REPORT OF THE WEIGHTS AND MEASURES ADVISORY COMMITTEE

Presented by R. E. MEEK, *Director, Division of Weights and Measures, State of Indiana*

The Weights and Measures Advisory Committee met at the National Bureau of Standards on April 3 and 4. The Committee currently includes the following members: Miss Genevieve Blatt, Secretary of Internal Affairs, State of Pennsylvania; Mr. C. G. Gehringer, Vice President, The Howe-Richardson Corporation, Chicago, Illinois; Dr. L. J. Gordon, Director, Weights and Measures Research Center, Denison University, Granville, Ohio; Mr. R. E. Meek, Director, Division of Weights and Measures, State of Indiana; Mr. J. E. Moss, American Petroleum Institute, Washington, D.C.; and Mr. E. C. Westwood, City Sealer of Weights and Measures, Salt Lake City, Utah. Mr. W. S. Bussey and Mr. G. E. Auman, Assistants to the Director, National Bureau of Standards, serve as chairman and secretary. All members were present for this meeting except Mr. J. E. Moss, who was on a business trip in Europe. Mr. Moss did file written comments with the committee chairman.

The Committee's report to the Director of the National Bureau of Standards will include the following comments and recommendations on matters discussed during this meeting.

General Comments

NBS Handbook 26 and other publications.—The Committee has been much concerned over the republication of NBS Handbook 26 for the past several years. It is delighted with the announcement that the manuscript for this publication is now in the hands of the United States Government Printing Office. The Committee will commend the National Bureau of Standards upon the preparation of the manuscript for an up-to-date Index to the Reports of all National Conferences through the 45th Conference in 1960. It also heartily endorses the actions of the National Bureau of Standards in revising Miscellaneous Publication 64 on the history of weights and measures standards in the United States.

Prepackaged commodities.—The Committee discussed at some length the important and timely subject of package control. Inconspicuous labeling, deceptive and misleading packages, and odd-size packages are in great need of improvement. The committee has no specific recommendations at this time, but feels that this might be a good topic for a panel discussion at the National Conference in 1963.

The Committee does wish to call attention to the work being done at this time by the Committee on Laws and Regulations of the National Conference, and to urge close cooperation with this committee. It is to be hoped that more effective enforcement and, possibly, improved legislation will be forthcoming soon.

Quality requirements.—The Director of the National Bureau of Standards asked the Committee to comment on whether weights and measures officials should be concerned with qualitative considerations as well as measurements of quantity. Examples might be to determine the moisture content of certain products, the octane rating of gasoline, and the like. After lengthy discussion and consideration, the Committee agreed that the policy of long standing that has been followed by the National Conference on Weights and Measures should not be changed. This is a policy of adhering basically to commercial quantity determinations and closely related matters. Committee members feel that most weights and measures officers have plenty to do in this particular field. It is also felt that many "quality" matters are already covered by State laws, the enforcement of which comes under the jurisdiction of officials other than weights and measures, and that it might be inappropriate to invade these fields. It is the suggestion of the Committee that weights and measures laws be *not* expanded in this manner.

Consumer Services.—The Committee was quite pleased with the President's message to Congress on consumer protection problems and was encouraged by the renewed interest of the Director in this area.

Regular Meeting Date for the Weights and Measures Advisory Committee.—In order to minimize the recurring difficulty of determining meeting dates suitable for all committee members, the Committee agreed that future meetings would be scheduled for the first Tuesday in April of each year.

Proposed Recommendations

Metric System.—The Committee is of the opinion 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. The Committee recommends an immediate study by the National Bureau of Standards of possible means, costs, and other ramifications effecting a more rapid, orderly transition from our present system to the metric system.

New State Standards.—The Committee is pleased with the progress made by the National Bureau of Standards in the design and development of new prototypes for State Standards of mass, length, and capacity. It specially commends the Bureau for the development of the very excellent new prototypes for State laboratory balances. All of those having a part in this program deserve to be complimented most highly.

Now that these prototypes are nearing completion, the Committee will recommend that the Bureau proceed promptly with the preparation and submission of the necessary enabling legislation, together with supporting appropriations, to the Congress of the United States for the purchase of these standards for the States. The Committee feels that this project is highly meritorious and should be pursued with all possible diligence.

Moisture in Grain.—The Committee commends the Bureau for its study of the important subject of moisture determination in grain. It will urge that this project be vigorously pursued, since many weights and measures officials are already feeling the need for assistance in this area.

NBS Handbooks 37 and 45.—Owing to the fact that both of these important handbooks describing proper test procedures for commercial weighing and measuring devices are out of print, supported by the fact that they are very widely used by weights and measures officials as their inspection manuals, the Committee recommends that the Office of Weights and Measures give top priority to the complete revision and publication of these two handbooks.

Motion Picture Film.—The use of the NBS film "Assignment—Weights and Measures" has been quite widespread. It is serving a very valuable purpose in the education of the public regarding weights and measures administration—especially junior and senior high school pupils. The Committee strongly urges the earliest practical production of a second educational film intended for the general public. This is in line with the President's expressed desire for Federal Government Departments to render greater service to consumers.

The members of this committee reviewed and endorsed a manuscript for a new NBS film of this type some months ago. The Committee will urge that this script be immediately revised to meet the desires of the Director's Office and current objectives, and that it be produced as soon as possible.

Current NBS Services.—Present projects of the Office of Weights and Measures were reviewed for the Committee. All of the current projects of OWM are considered to be appropriate and necessary. Their continuation will be recommended. The Committee especially endorses its program of technical education for weights and measures officials, both at the Bureau and in the field.

Several additional worthwhile and greatly needed projects were discussed. The Committee will recommend that the services of OWM be expanded, in both the technical and educational fields.

SIXTH SESSION—MORNING OF FRIDAY, JUNE 8, 1962

(ROBERT WILLIAMS, Chairman, Presiding)

REPORT OF THE AUDITING COMMITTEE

Presented by D. R. PRATT, *Chairman, County Sealer of Weights and Measures, Santa Clara County, California.*

The Conference Auditing Committee is proud to report to the Assembly that your books and accounts have been maintained in an impressively perfect order. We can well be confident that our treasurer, C. C. Morgan, has been diligent and competent.

D. R. PRATT, *Chairman*

J. T. BENNICK

PETER GRASSI

REPORT OF THE TREASURER

Presented by C. C. MORGAN, *Treasurer, City Sealer of Weights and Measures, Gary, Indiana*

Balance on hand: June 1, 1961----- \$2, 115. 13

RECEIPTS:

335 Registrations @ \$10.00-----	\$3, 350. 00
Refund from Manufactures-----	34. 50
Luncheon Tickets-----	28. 00
Bank Interest Accrued-----	55. 08

Subtotal-----	3, 467. 58	3, 467. 58
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Total-----		5, 582. 71
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DISBURSEMENTS:

R. W. Searles, (Chaplain expense)-----	\$3. 00
A-B & W Transit Co., (2 Buses' Service)-----	154. 50
Blackstone Inc., (Flowers)-----	9. 86
Rauschs Flowers-----	10. 35
Geo. W. Allen Co. Inc., Luncheon tickets-----	17. 34
The Chesapeake & Potomac Telephone-----	12. 95
Traveling expense for Specifications & Tolerance Comm-----	\$60. 62
The American Electrotpe (1000 Mats)-----	30. 60
The American Electrotpe (2000 Mats)-----	61. 20
J. Fred True, Expense of Education Comm-----	75. 00
Miscellaneous expenses (duplicating, printing, telephone, telegraph messenger, porter, maid, reporting, recording, photographs, taxi, drayage, hotel meeting and committee rooms, services, badges, registration desk, postage, cards, flowers, press desk and conference luncheon)-----	2, 434. 32
Bank charges-----	5. 50

Subtotal -----	3, 675. 24	3, 675. 24
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Total Balance on June 1, 1962-----		1, 907. 47
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DEPOSITORY:

Gary Trust and Savings Bank, Gary, Indiana.

First Federal Savings and Loan Association, Gary, Indiana.

(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

On Friday morning, June 8, the newly elected Executive Committee and the chairmen of the standing committees were invited to meet to study and reach decisions regarding the 48th Conference. The meeting was presided over by the newly elected Conference Chairman, Carl Stender of South Carolina. The following decisions were reached regarding the 48th National Conference on Weights and Measures, 1963:

1. *Place*: Sheraton-Park Hotel, Washington, D.C.
2. *Date*: June 10-14, 1963.
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 1963.
5. *Ladies' Entertainment*: Left to the discretion of the Executive Secretary and the Ladies' Committee.

SYMPOSIUM

ADMINISTRATIVE ACTIONS UNDER MODEL LAW PROVISIONS:

INTRODUCTION

By R. N. SMITH, *Weights and Measures Coordinator, National Bureau of Standards—Moderator*

Several States have enacted weights and measures laws in recent years which have included major portions of the Model Law language. Rapid changes are taking place in the field of commercial weighing and measuring. The need for modern, adequate, and uniform language in the laws and regulations of the several States has become apparent. Officials from four of the States most recently enacting laws patterned after the Model Law and containing most of its major provisions, have been selected to participate in this symposium. Each of these four officials has had unique experiences in enforcing one or more particular Model Law provisions. John Clough of Delaware has a complete new law authorizing a new State Department of Weights and Measures. He will tell us about their experiences in recruiting, equipping, and training a new staff. Tom Harris of Virginia has been very active in the testing field, including both devices and commodities. Under their newly enacted legislation Virginia will be enforcing still more of the Model Law provisions. Matt Jennings of Tennessee has had some very interesting experiences in the enforcement of the advertising section relating to price signs. George Bay of Missouri has been very active in the field of standardization, particularly in enforcing the standard weight bread section.

Many jurisdictions are cognizant of a need for revision and strengthening of their existing laws and regulations. Some seem to be reluctant to attempt such revision, however. This appears to be an excellent time to expect success in such undertaking. I am sure the four panel members and many other delegates in this room would agree with me that in every case that a really diligent effort toward revision of existing statutes has been made, and Model Law language used, the result has spelled success. It is the hope today that the statements made by our panel members will answer some of the questions the dele-

gates may have that are contemplating adoption of the Model Law language and provoke many additional questions from the delegates. This is designed to be a discussion program.

As the four panel members give their statements, please jot down any questions that may arise. After we have heard from all four members we will accept questions directed to any one of the individual members. It is our plan to allow ample time for your questions after the last panel member has given his statement.

I now present to you Mr. John L. Clough, Acting Director, Department of Weights and Measures, State of Delaware.

ADMINISTRATIVE ACTIONS UNDER MODEL LAW PROVISIONS: ORGANIZATION—PERSONNEL

By J. L. CLOUGH, *Acting Director, Department of Weights and Measures, State of Delaware*

In preparation for the personnel and organization of a department, we must first consider the law and rules and regulations under the law. Much progress has been made and many States have adopted the Model Law with minor modifications. Viewpoints of legislators differ, perhaps even more than those of weights and measures officials. It is, therefore, unlikely that any of us will see complete uniformity during our lifetime.

Delaware does not have a civil service law. Therefore, the section of the Model Law pertaining to the appointment of the director and inspectors and their dismissal and compensation was included in our Act and adopted. This particular section is one of the reasons that prevented Delaware for many years from having an up-to-date weights and measures law. Attempts were made to remove this section in the present legislature, but cooler heads prevailed. It was retained, and the law as adopted did not receive a *dissenting* vote.

Having the proper provisions for selecting personnel, the next step was to decide on qualifications and to make preparations for examinations.

The minimum qualifications for the director were (1) successful completion of high school (twelfth grade), (2) at least four years of experience as the administrator of a State or large county or city weights and measures program, (3) excellent ability in both spoken and written English, (4) ability to manage people, (5) ability to demonstrate and speak effectively either formally or informally, (6) ability to compose clear and concise business letters, (7) ability to develop an idea into a sound working plan, to look ahead to visualize the requirements of the future, (8) thorough working knowledge of the State weights and measures statutes and rules and regulations, (9) natural ability to inspire subordinate personnel. The special personal characteristics were age limit 35-50 years old, good health, strength and agility, neat personal appearance, and the ability to impart ideas to others and to organize, plan, and direct a technical and administrative program.

The successful candidate for the position was to be selected on the basis of a two-phase examination, written and oral. The examination dealt in generalities pertaining to weights and measures, knowledge of the law, and administrative ability.

In preparing the requirements for inspectors, the minimum education qualifications were (1) equivalent to successful completion of

high school (twelfth grade), (2) experience in the field of weights and measures not required, but desirable to have experience in mechanics, investigation, law enforcement, or business administration. On knowledge and abilities the requirements were (1) ability in spoken and written English, (2) basic knowledge of mathematics, algebra, and leverage, (3) ability to work successfully with people of various economic levels. The special personal characteristics were age limit preferably 21-35 years old, but not limited to this, good health, strength and agility, willingness to work irregular hours and to travel throughout the State, excellent moral character.

The successful candidates for the positions were also to be selected on the basis of a two-phase examination, written and oral. The written examination was strictly an aptitude-type test.

The Delaware Board of Agriculture inserted notices in the State papers that these examinations were to be held and that applications to take the examinations were to be obtained from the department. On the day of the examinations, eight applicants were present for the director's position (but no out-of-State applicants), and forty applicants for the three inspectors' positions. The examinations were barely underway before one applicant for the director's position and three applicants for the inspectors' positions left the room and did not return. It is assumed that the examinations were too difficult for these applicants.

Following the examinations and grading of papers, the Board selected for interviews one applicant for the director's position and six applicants for the inspectors' positions. The applicant for the director's position did not meet the qualifications considered essential by the Board. No other applicants were interviewed for this position. However, three inspectors did meet the qualifications of the Board and were appointed and, complying with the Code, were placed on a six-month probationary period, with a starting salary of \$5,000 annually. We then had the nucleus of a department, but no director. Two weeks before the office opened on January 2, 1962, I was called before the Board and appointed as Acting Director to organize the department and start the program. I am sure there is a question as to my appointment. Briefly, my background is this: I have been an employee of the State Board of Agriculture for twenty-three years and have been Director of the State Laboratory for fourteen years, and have also served as Acting Secretary of the Board for eight years. For the past fourteen years I have been actively engaged in obtaining constructive legislation in weights and measures with the assistance of Bill Bussey and Mac Jensen of the National Bureau of Standards. Also, under our old law and in my capacity as State Chemist, I was designated as the "custodian" of the State standards of weight and measure.

The personnel having been appointed, our next step was to organize the office, obtain office supplies, forms, inspectors' equipment, train the inspectors, and begin the actual inspection work.

We were assigned adequate office space, but, with our small budget, were limited in our purchases of office furniture and equipment. To offset this, we furnished the office with discarded desks and chairs from the other departments.

Our friends from the National Bureau of Standards supplied us with lists of manufacturers for inspection equipment and made recommendations for the essential equipment and necessary inspection forms

to begin our program. We were fortunate in that delivery and certification of the new equipment was not delayed. Our printing firms were also cooperative, and inspection forms were delivered almost immediately.

In the interim between the opening of the office and the start of the inspection program on January 22, conferences were held with the inspectors to discuss the law, public relations, and our future plans. The inspectors were also in the field locating vehicle scales, small platform scales, and public weighmasters. This also provided the inspectors with experience in meeting the public. On January 22 we "launched our ship" with officials from the National Bureau of Standards conducting a training program with on-the-spot instruction for our inspectors. To me this was most important and is certainly recommended procedure for any new program.

After a three-day instruction period, our three inspectors traveled together for one week doing routine inspection work. The purpose of this was to establish confidence in their work and to help each other on any problems that were encountered. We also began weekly conferences to discuss interpretations of the law, rules, regulations, reports, and progress. These weekly conferences have proven fruitful in that the inspectors can present their problems and the entire staff discuss them for an equitable decision. To assist us in legal questions, we have the services of an attorney available to advise us on legal entanglements.

Our work so far has been entirely on small scales, gasoline pumps, and prepackaged commodities. We recently purchased a volumetric prover for checking fuel-oil meters. In preparation for performing this work, we have held meetings with the Oil Heat Institute of Delaware, Inc., to attempt to determine the best procedure to benefit the State as well as the dealer.

We have presented to our Legislature an entirely new budget which provides funds for an additional inspector and equipment for checking vehicle scales. If they are kind to us, we expect to give Delaware a fairly complete inspection program on weights and measures.

Our three inspectors and secretary are apparently dedicated employees. The inspectors have met all requirements of weights and measures officials. They have initiative and ability and have performed excellent public relations work. It has been a pleasure for me to work with them.

We want to express our gratitude to the National Bureau of Standards, Bill Bussey, Mac Jensen, and their staffs for the excellent cooperation and assistance that they have given us. Without this help it would have been practically impossible to start an entirely new program.

ADMINISTRATIVE ACTIONS UNDER MODEL LAW PROVISIONS: ADVERTISING—PRICE SIGNS—LABELS

By MATT JENNINGS, *Director, Division of Marketing, Department of Agriculture, State of Tennessee*

Advertising, price signs, and labels are three very effective tools in merchandising and sales. The manner in which these tools are used may sometimes classify them as deceptive.

The dictionary says that to deceive is to make a person believe as true something that is false. It further says that to mislead is to lead

a person to think what is not so. It appears that some manufacturers, distributors, and retailers have wanted more money for their merchandise, but they want the consumers to think they are getting more for their money. Therefore, they are both misleading and deceiving.

Each of these tools is related to weights and measures and should be of major concern to every weights and measures official in every jurisdiction. In evaluating the situation, we should consider three questions:

1. How big is the problem with which we are faced in these three fields?

2. Is our law, which we now have in effect and under which we are governed, sufficiently adequate to control the irregularities and illegal practices being used in advertising, price signs, and labels?

3. Are our administrative actions, under the provisions of our law, adequate?

Our problem in dealing with these irregularities and practices is already a big one. It will become even greater when any phase is allowed to get out of hand. It will continue to require alertness on the part of every official. Advertising agencies, in meeting competitive rivalry, continue to try to outgimmick one another. Package designers are creating new package designs for sales appeal. Then, as manufacturers, distributors, and retailers, through the use of both, try to outsell their competitors, we will continue to have many new problems.

The Tennessee Weights and Measures Law, enacted in January 1961, is patterned after the Model Law and contains all of its provisions with only a few exceptions. Our activity under our new law may be considered small when compared to the activity in many States. Our progress seems creditable, considering the fact that we had so far to come and have so far to go.

Our administrative actions have not been unusual, but seemingly effective. It is true that we implemented a statewide control program on food advertisements in a very brief period of time. We returned a violator using illegal price signs to the penitentiary. We recently obtained commitment from a major food concern, distributor of a famous brand, to obtain new plates immediately for a new label which will set forth the weight declaration without any qualifying adjective and specifically to exclude the word "giant" with their weight declaration. Some of the following administrative actions are presented, not necessarily as examples, but for your information.

Our experiences under our new law, in respect to advertising, indicates that an effective enforcement program on advertising not only controls advertising violations, but the proper adoption of such program contributes a great deal to the control of other violations as specified in the law.

Our law provides that, whenever a commodity in package form is advertised in any manner and the retail price of such commodity is mentioned, there shall be declared conspicuously in such advertisement the actual weight, measure, or count of the contents of the package as is declared on the package.

Before we started our control program on advertising, it was a common practice to include in food advertisements such items as: giant Fab, 69 cents; peaches, No. 2½, 29 cents; condensed milk, 3 tall cans, 39 cents; Ajax, 2 regular size, 33 cents; ranch-style beans, 300 can, 10 cents; corn, two 303 cans, 25 cents; bread, 2 loaves big 1 lb., 29 cents;

frozen vegetables, 5 packages \$1.00; and many other similar violations.

Our first procedure was to contact major food distributors and to explain to the food advertising editors the details of the law and requirements pertaining to advertising. We then contacted the advertising managers of leading newspapers and explained to them the requirements as to what was legal and what was illegal, and the kind of advertisement that would receive approval. Many personal contacts were made, and repeated when necessary. We did not limit our work to newspaper advertising. We also directed attention to circulars, advertisements on store windows, and signs at point of sale. Each State inspector received special training, and his attention to the details of advertising requirements was required to be included in his inspection procedure at the retail store.

We recognized that advertisements are not always prepared in a day, and in many cases are in the process of preparation for ten days or two weeks. By the third week there was considerable contrast and improvement. Considerable followup was required to eliminate "oversights" and to reject new advertising techniques that were not acceptable. Some stores were persistent in continuing to include in their advertisement: fryers, $1\frac{3}{4}$ -2 lb. average or more at 49 cents each; or barbecued chickens, 99 cents each. This also was a violation, as meat and meat products, including poultry, sold as food, must be sold by weight. There persistency diminished when inspectors began stamping such packages, when found, "illegal sale," requiring them to be rewrapped and remarked. The advertisements of the larger food chains in daily newspapers in the major cities are greatly improved. It is not unusual to see double-page spreads advertising approximately 100 different items with only one or two minor errors and many times correct on every item. We are now reaching the smaller towns, smaller chains, independent retailers and weekly newspapers.

Our procedure in administering this program of advertising control and the results being obtained are developing an extensive reporting system. Violators who were required to make the necessary corrections in their advertisements later reported a competitor, also a violator, whom we may not have previously known or contacted. When that competitor was brought into compliance, he in turn reported another competitor, thus joining the campaign on his own volition as another reporter. All such complaints are promptly investigated and, with proper action taken, continue to increase our number of reporters.

The section of our law which specifies "that whenever any commodity or service is sold, offered, exposed or advertised for sale by weight, measure, or count, the price shall not be misrepresented in any manner calculated or tending to mislead or deceive an actual or prospective purchaser" is different from the provision contained in the Model Law, our law having been based on an earlier version of the Model Law. The section in the Model Law pertaining to misrepresentation of price contains the requirement that, when an advertised, posted, or labeled price per unit of weight, measure, or count includes a fraction of a cent, all elements of the fraction shall be prominently displayed and the numeral or numerals expressing the fraction shall be immediately adjacent to, of the same general design and type as,

and at least one-half the height and width of the numerals representing the whole cents.

The publicity of our criminal court case concerning misrepresentation of price on posted signs had a stimulating effect on better compliance with the law by most all filling-station operators.

A price sign started it all. A big sign with big letters read "regular gas 29.9 cents." Less visible, but still there, were small letters reading, "price does not include 11.6 cents tax." The operator's regular pump meter was set at 37.5 cents per gallon, but a paper covering the meter listed the price at 25.9 cents. On the premium pump the meter was set at 43.5 cents, but a paper covering that indicator read 31.9 cents.

Failure to remove the paper stickers obstructing the view of the price indicators, following rejection of the devices, resulted in confiscation and removal of the two pumps from the premises.

It has been interesting to note how the size of fractions on price signs at gas stations in Tennessee has generally increased since the court conviction.

Our observations in this case indicated the main consideration of the judge and jury was whether or not a sign is misleading or deceiving, and not necessarily whether it conforms to a specified size ratio of fractions and numerals. For instance, a sign with a fraction the size of which is 40 percent the size of the numeral may not be considered misleading.

It has not been difficult to get the words "when packed" deleted from the labels. We are continuing our work on descriptive terms and declarations of quantity using fractions that are not binary sub-multiple common fractions.

Our law, patterned after the Model Law, has been in effect only 17 months. Our administrative actions have not been spectacular, but they have gotten results.

ADMINISTRATIVE ACTIONS UNDER MODEL LAW PROVISIONS: TESTING, DEVICES AND COMMODITIES

By T. C. HARRIS, Jr., *Supervisor, Weights and Measures Section,
Department of Agriculture and Immigration, State of Virginia*

The most important administrative action in weights and measures in Virginia during recent years was recognizing the need to enact new legislation. Although Virginia's law and regulations were not as good as some States, but better than most, we felt an urgent need to bring our laws and regulations in line with modern enforcement and merchandising techniques.

A careful study of our weights and measures program in Virginia revealed that in many areas our enforcement program exceeded our law and regulations. In talking with other State weights and measures officials, and when studying their laws and regulations, I found that Virginia was not alone in this area.

I am happy to report to you that the 1962 General Assembly passed a Weights and Measures bill which includes all of the most important provisions of the Model Law. This new law, which becomes effective July 1, 1962, contains many new provisions for administrative action to improve our program in Virginia.

Specifically, Handbook 44 has been adopted by law except as may be modified or amended by the Board of Agriculture. This permits

us to keep up with all the changes in Handbook 44 without having to hold hearings for the purpose of adopting these changes by the Board.

For the first time in Virginia a clearer, more positive division is drawn between State responsibility and equipment-owner responsibility of having and maintaining accurate and suitable equipment. Emphasis in the future will place more responsibility on equipment owners and less responsibility on the State. Adequate penalty provision is provided for violators whether they be equipment salesmen, repairmen, owners, or users. Also included in the Weights and Measures law is adequate provision for adopting a type approval program, if such a program is deemed administratively advisable.

The most important changes in our new law are in the areas of (1) method of sale of commodities, (2) standards of fill for commodities in package form, (3) package checking and (4) package labeling.

The authority of our Board of Agriculture has been broadened to permit the Board to adopt regulations governing the sale of commodities and standards of fill of commodities in package form. The Board of Agriculture is expected to adopt rules and regulations in this area when appropriate and desirable.

Under our model law and regulations, Handbook 67 will be the official manual for weights and measures officials when checking prepackaged commodities. Official recognition of Handbook 67 will do much to improve our checkweighing program and will give legal status to the procedure which we will use. This, of course, makes official the method of selecting samples, recording values, and ordering commodities off sale.

On July 1, 1962 we will enter into a program of enforcing more plain and conspicuous labeling of commodities in package form. We expect to pursue this matter vigorously and will add our support to those States already taking steps to correct labeling violations. Qualifying statements such as "Giant" and "Jumbo" sizes that tend to exaggerate the contents of the packages will be prohibited.

Beginning July 1, 1962 all meat, fish, and poultry sold in Virginia will be sold on a weight basis. More attention will be given to pricing and advertising of commodities. Future advertisements of commodities must state the quantity of contents in the package if the price of the package is mentioned in the advertisements.

As soon as printed copies of the Virginia law and regulations are available, they will be mailed to industry representatives. We encourage industries doing business in Virginia to study these laws and regulations carefully. We shall expect full compliance.

To you who have obsolete laws, I encourage you to start now making plans to submit changes, using the Model Law as a guide. You can do no better in writing a Weights and Measures bill than to follow the Model Law.

ADMINISTRATIVE ACTIONS UNDER MODEL LAW PROVISIONS: PACKAGE STANDARDIZATION—RANDOM PACKAGES

By G. W. BAY, *Chief Inspector, Weights and Measures Division,
Department of Agriculture, State of Missouri*

To say that the method used in Missouri to promote the passage of the Model State Law on Weights and Measures would be the right

method or approach in all States would be a misstatement, I am sure. Each State has political problems, a conglomeration of laws, a different outlook, varied industries, and a world of things that could make any possible kind of approach difficult at this time.

Weights and measures during the past two years has taken its place among the top protective institutions of the States, due to the publicity given by Senate investigations and the hard work of the people dedicated to weights and measures. The publicity and the ever-increasing advertising schemes and packaging methods that mean millions of dollars to industry will, in turn, be an incentive for certain groups to fight any and all laws that might curtail their methods of operation. So each State, in order to get the new Model Law passed, will have to work out its own solution.

States that have the Model Law, I think, are fortunate. They did not have the pressure from so many groups that the States endeavoring to get the Model Law passed have today.

This brings us to the methods used in Missouri. Perhaps I should say, "Missouri was ripe for the plucking." In other words, every phase involved in the successful passage of the Model Law worked out smoothly. The old law was obsolete. The need for a new law was unquestioned. Finances were no problem. The importance of the necessary protection that the new law would give was proven. There were no pressure groups or individuals active against a new weights and measures law. Pressure came later, after the law was passed, from only one source—the bread industry. Probably no other State in the Union would or could have similar circumstances, circumstances that set the stage for the passage of the Model State Law on Weights and Measures in Missouri.

Missouri had weights and measures laws back in the territorial days that were considered adequate for that day and time. Very little action was taken over the years to improve the law until 1943. The Department of Agriculture was the enforcing agency, and its agents were to test all weights and measures. Weights and measures testing was confined principally to large-capacity scales until 1948 and 1949. Two inspectors and one truck with 9,000 pounds of weights were used for the entire State.

Certain legislators and commissioners of agriculture showed an increased degree of interest in weights and measures from 1949 to 1957. Two more trucks for testing large scales were purchased. Four inspectors for the inspection of small scales were added to the staff. Balances for weight calibration up to 50 pounds were purchased.

Credit for this first interest should be given to an assistant commissioner of agriculture who attended a National Conference on Weights and Measures. After numerous talks with W. S. Bussey and M. W. Jensen of the National Bureau of Standards, this assistant commissioner realized the need for a better weights and measures law in Missouri.

Under the guidance of Mr. Bussey and Mr. Jensen, weights and measures in Missouri began to take shape. Schools and conferences were held, and with knowledge came interest. To Mr. Bussey and Mr. Jensen the credit for the final outcome of the weights and measures law must be given. Without the guidance and advice of these two gentlemen, weights and measures laws and enforcement in Missouri would still be as inadequate as they were in 1943.

In 1958 a new commissioner of agriculture was appointed. He was receptive to and interested in modernizing and bringing up to date any and all laws concerning the Department of Agriculture. He made a thorough study of weights and measures and found that weights and measures was of vital interest to agriculture and to all the people of the State of Missouri. The commissioner used the power at his command to get the Model Law passed. Here again, circumstances played an important role in the resulting passage of the Model Law in Missouri. That is, the appointment at this time of the right man to the office of commissioner of agriculture.

By order of the commissioner, surveys were made to get the necessary information and facts as to the actual condition of weights and measures in Missouri. The surveys continued for several months to assemble the facts as to the cost of operation and the need for consumer protection to be presented to the legislature.

When the information was ready, the next step was to find the right man in legislature to present the bill and to see that he had the necessary support for its passage. Without the aid of a lobby or of any outside interest, the Department of Agriculture made an all-out effort to gain the interest of legislators. The success of the venture is proof that a good job was done.

A prominent senator became very much interested and agreed to introduce the bill. It was considered a good bill, and after two committee hearings it was passed by both houses and became a law on August 29, 1959.

As I have stated before, the law had no opposition before passage, but immediately afterward the bread industry filed an injunction against enforcement of the Bread Section, stating that it was being discriminated against and that the new law would cause great loss of business and money.

The "20-ounce" loaf was the item of particular interest. The plea was that, due to public demand, the 20-ounce loaf outsold by a large percent all other weight loaves, and for that reason the bakeries were baking very few of other weights. Also that the changeover in operation and the purchase of wrapping supplies and new pans would cost millions. A hearing in circuit court was held, but no injunction was granted.

At the hearing, weights and measures presented evidence to the court in the form of a 1-pound, a 1 $\frac{1}{4}$ -pound, and a 1 $\frac{1}{2}$ -pound bakery-baked loaf of bread baked within an eight-hour period of time. All three were baked in pans of the same length, the same width, and the same depth and were made from the same mixture of dough.

The court was shown, by weight and size, that there was no necessity for the expense of new pans and that there was a necessity for the 8-ounce spread between loaf weight, as written in the Bread Section of the Model Law, to protect the consumer against fraud. Also, bakery officials, witnesses before the court, under oath, testified that a 1-pound, a 1 $\frac{1}{4}$ -pound, and a 1 $\frac{1}{2}$ -pound loaf could be baked in a pan that was ordinarily used for baking a 1 $\frac{1}{4}$ -pound loaf, using the same dough mix in each loaf.

Enforcement of the Model Law was started after the court hearing and continued in its entirety until 1961.

In 1961 a new governor was elected and a new commissioner of agriculture was appointed.

The legislature convened in January, and I am sorry to say that, at this 1961 session of the General Assembly, this same senator, our friend who introduced the first bill, introduced a bill to amend the Bread Section of the Model Law, giving the bakers back the 20-ounce loaf. The reason for his action is unknown. The amendment passed and the bill was signed by the governor.

I have given a more or less rambling history of weights and measures in Missouri and of the methods that were used in getting the Model Law passed by legislature. The amendment of the Bread Section hurt, but we feel that all our hard work and effort paid off. The right of package inspection alone was well worth our effort. The legislature had passed the new Model Law in its entirety in 1959, and we still have all of that left with the exception of that section of the bread law which gave the 20-ounce loaf back to the bakers in 1961.

In one short period of time, two or three years, Missouri has moved further ahead than it had moved in twenty years. We are not resting on our laurels. We hope, with circumstances permitting, to continue to move forward in the field of weights and measures.

It has been a pleasure to appear before you and to give this sketch of weights and measures history and Operation Model Law in Missouri. It is my hope that in some way this may be of help to those of you who are looking forward to a change in your present law.

DISCUSSION OF FOREGOING GROUP OF PAPERS

MR. J. T. KENNEDY: Mr. Harris, I was somewhat startled, though, as a Virginian, not as a weights and measures man, to hear that you in Virginia are kind of disregarding the testing of scales. Are you forgetting that there are over-the-counter sales made and that these sales are not in package form? If you are going to disregard these scales, what are you going to do to control this type of business?

MR. HARRIS: I do not believe that I said we were disregarding the testing of scales. What I intended to say was, that under our law, the State is not necessarily assuming the complete responsibility for the accuracy of scales. We are de-emphasizing State responsibility in this area, at least from the position which we have been taking in the past. We are emphasizing the responsibility of the equipment owner to maintain his own scales. We are continuing to test scales.

MR. KENNEDY: I agree with you, Mr. Harris; however, in decreasing it, is it fair to the consuming public?

MR. HARRIS: We have more requests for service coming to our weights and measures office than ever before. What we are trying to do in Virginia is to spend the available money in the very best way possible to offer maximum service and protection. I think many of our companies are doing a good job of maintaining their own equipment. Certainly our records will confirm this.

Many companies in Virginia are equipped to do their own scale testing. If they can do this testing properly, we can adapt ourselves to a procedure of sample testing and free our men for other pressing duties.

MR. KENNEDY: How about fuel oil meters? If you condemn a meter, is it permissible for that company to inspect and reseal it?

MR. HARRIS: Yes, it is.

MR. KENNEDY: What kind of a seal would be put on it?

MR. HARRIS: Not an official State seal, of course. If the owner or a service company is doing the repairing and adjusting and we have confidence in them, we ask them to put their own company seal on that piece of equipment and notify our office. We will recheck the device at the first opportunity, when our equipment is in that area. If this confidence is violated, we do not allow them to seal and release the equipment or to break the official seal that is on the device. We would rather have the seal of a reputable company on a meter until we get back to check it, than no seal at all. We think seals on equipment are important. We do not think that seals offer the only assurance of full weight or measure. Too many jurisdictions put too much value on sealing equipment and not enough on other phases of their responsibility.

MR. KENNEDY: Mr. Harris, you were very reluctant to accept the official seal of the District of Columbia in Virginia. You finally agreed, and I told you that I would accept the official seal of Virginia. I will not accept, in the District of Columbia, the seal of a dealer.

MR. HARRIS: Mr. Kennedy, we are very happy to accept your official seal since I understand that you are now running a proper air-eliminator test.

MR. CRAWFORD: I am not in accord with your program of checking packages almost to the exclusion of testing scales, or I may be putting that a little too strongly, Mr. Harris. In our jurisdiction, we are required to test scales twice a year, and we also include prepackaging scales. We find that the merchants are highly appreciative of this service. But we check the packages, and I believe we do about as much package checking as most any jurisdiction in the country, yet, we continue to find the need for testing the prepackaging scales.

Do you have any comment on this, Mr. Harris?

MR. HARRIS: I would ask you to look at our annual reports for the past years and compare them with the one that will be compiled on June 30, 1962, for this year. You will find that we are not testing less equipment. We are maintaining, at least, the same level of inspection of equipment that we have always maintained. This means that we test devices once a year in most instances, and in some cases, twice a year. I make no apologies for the mechanical phase of our work.

As we obtain additional personnel, they will not be assigned solely to the testing of equipment. They will be assigned principally to testing packages and other supervisory phases of our work. The potential protection to consumers is a lot more in these areas than in some of the areas of equipment testing. I repeat, we are not decreasing our device testing, however. I do not want anybody to think we are minimizing the importance of accurate equipment, but from now on, we hope, as new people are added to our staff, they will be used mainly in the fields of packaging, labeling, advertising, etc., rather than in the field of equipment testing.

MR. CRAWFORD: Do you find that the supermarket operators know whether or not their scales are reasonably within tolerance before your inspectors arrive and tell them?

MR. HARRIS: In many cases, they do, and in many cases, they do not. It is their legal responsibility to know and this we are now emphasizing. We find that the supermarkets are doing a very good job on their prepackaging of meats. Most of the short weight meats we find are not the result of inaccurate scales, but other things. On the

other hand our records will show that in many instances the prepackaging scale will be inaccurate and the packages correct weight.

This may be peculiar to Virginia. Most, if not all, our self-service markets allow for overpack to assure the customer correct weight.

MR. BIRD: Mr. Harris, you made no mention in your paper of a program for testing hopper and tank scales. I have three questions; I will ask them simultaneously. I am referring particularly to those scales used in concrete batching plants. Do you have a program for testing these scales?

I was wondering, also, if you have a program for the testing of vehicle tank compartments.

And third, how do you accomplish the testing of scales at higher capacities such as 73,000 to 75,000 pounds, when there are discrepancies in those ranges?

MR. HARRIS: We are making an effort to test commercial hopper scales that are used to weigh bulk feed and other bulk commodities. We are not testing aggregate scales used on construction jobs, except upon request. We found that concrete is being sold by the yard and the scales are used only for the determination of the amount of the particular ingredients that go into the concrete. We test those scales as noncommercial and upon request, only.

We do test vehicle tank compartments, used as measures.

We have four large-capacity scale test units. One unit carries a known test load of 12,000 pounds. The three other units carry test loads of 20,000 pounds each. The gross weights of the larger units run about 37,000 to 38,000 pounds. We apply the very best test that we can with these loads, plus the strain load of the truck. If a scale is off at 75,000 to 100,000 pounds, I suppose it just continues to be off. We have not heard of any cases of appreciable discrepancies in weights at those higher ranges when the scale is accurate at the twenty to thirty-eight thousand pound test range.

MR. WRENN: I am a local sealer from Danville, Virginia and it seems to me that according to the present trend, the local sealer is on the way out and I wish to address my question to Mr. Jennings: Do you have many local sealers in your State?

MR. MATT JENNINGS: Our law is form 2 of the Model Law. It provides for State-wide coverage but it also provides permissive weights and measures enforcement in certain cities and counties. The State has concurrent authority in those jurisdictions.

MR. WRENN: How do you use or how do you anticipate using your concurrent powers?

MR. MATT JENNINGS: We hold regular meetings with State, city, and county personnel participating. We even conduct investigations together, which indicates concurrent authority.

MR. WRENN: If you have a local sealer that is not doing a job that is satisfactory to you, do you take any specific stand or action?

MR. MATT JENNINGS: We are working on this phase of our program at the moment. We are endeavoring to have uniformity of enforcement throughout the State. We are working toward that end by working with the local sealers, particularly in an educational and cooperative manner.

MR. WRENN: That answers my question and now I would like to make a comment on Mr. Harris' statement.

I believe that I am as close to Mr. Harris as any local sealer in the State of Virginia, and I believe that I understand his thinking and

methods of operation as well as anyone except possibly his own inspectors. I think Mr. Harris has been misunderstood a little in his attitude toward testing devices. What Mr. Harris does, according to the way I understand his position, is to not let up on his device testing. Instead, he merely de-emphasizes such testing when it interferes disproportionately with package check weighing and other important functions.

I believe Mr. Harris considers package checkweighing to be the most important phase of weights and measures control, at this time. He is doing the package checkweighing to the greatest extent possible and still he is holding up the testing of devices as much as he deems appropriate. I am inclined to go along with him in this thinking to a very appreciable degree.

As to the matter of honoring a seal from another jurisdiction, especially from outside the State, I do not think any of us should adopt a policy of this type. I doubt that it can be done legally, under most State laws.

MR. J. T. KENNEDY: Mr. Harris, how many vehicle scales does one of your trucks test in a day?

MR. HARRIS: If all are four-section scales, in a typically populated area, we can test four.

Let me make one thing real clear: We do not think that any activity that we have is more important than any other activity. We just like to put them in the proper perspective. We think the testing of equipment is necessary. We think checking packages is necessary. So we try not to put too much emphasis on the importance of one over the other. We take everything into consideration when deciding how our program will be directed and how our money will be spent. We think that there must be more emphasis placed on the package work in the future.

MR. CRAWFORD: Mr. Clough, I was very much interested in your paper covering your experiences in selecting personnel. I want to compliment you upon your apparent success in doing it. Were you able, at the salaries you could pay, to hire men with college educations?

MR. CLOUGH: We have one inspector with a college education. The other two are high school graduates.

MR. CRAWFORD: Do I understand that your salary bracket starts at \$5,000?

MR. CLOUGH: Yes, that is right.

MR. CRAWFORD: Do you believe that we can look forward to having money available to hire weights and measures inspectors who have a college education?

MR. CLOUGH: I think some of the men that have high school educations would make just as good inspectors as a man with a college education.

MR. DIAZ: My question is for Mr. Bay. In the enforcement of your bread law, have you established guidelines as to what items are considered as "bread?"

MR. BAY: That was one of the questions brought up in court. The people opposing our law were some of the people baking so-called "fancy bread." They opposed the standard sizes set forth in the bread law. However, in getting the law amended, it did not identify any particular kinds of bread.

MR. W. I. THOMPSON: Mr. Bay, was there a large demand by the consumers of your State for having the $1\frac{1}{4}$ pound loaf over the 1 pound, or the $1\frac{1}{2}$ pound loaf?

MR. BAY: There was no noticeable consumer demand. In our survey, we found that the statements made that the majority of the bread sales were in 20-ounce loaves, were untrue.

Since they have succeeded in getting the amendment passed, we are keeping a close watch on the industry, and we find that possibly 40 to 50 percent of the sales are now in 20-ounce loaves.

MR. W. I. THOMPSON: Is this just because the 20-ounce loaf is the most predominantly produced loaf, or is it because it is the loaf that the people actually want?

MR. BAY: I think it is the loaf that the industry has chosen to push.

MR. R. N. SMITH: I now wish to recognize Mr. Thomas Cairns of Glasgow, Scotland. He has an important appointment and must be leaving the session soon.

MR. CAIRNS: Mr. Chairman and gentlemen; I just want to take this opportunity of saying farewell and thank you for having had me at your 47th Conference. I had hoped to say farewells quietly just as you were all departing, because I am in the hotel until tomorrow. However, I have just had a message from the Capitol, from Senator Hart, asking me to have lunch with him or his representative to discuss our packing in specified quantities. I feel, not only would it be a good thing for the Weights and Measures Institute in Britain that such a meeting should take place, but I think it might be good for the prestige of the 47th National Conference. I thank you very much for your many kindnesses.

MR. STABLER: I have a question that I would like to address to Mr. Jennings. The question concerns a national product that, I am sure, is sold in every State in the Union. There is a statement on the package that says the package contained one pound when packed and that this product may lose moisture from its crystallization. Mr. Jennings, would you review your procedure—the steps that you would take—in having this statement removed from the package, particularly in light of our experience of not receiving a reply from two letters written concerning this subject. How would you handle this situation?

MR. MATT JENNINGS: In that particular situation, we would either make a personal contact or a contact by registered mail and give the company a certain period of time to delete the statement from the label. At the expiration of that time, we would start stamping and returning shipments to the company, which corrects the situation immediately.

MR. VAN SCHOIK: Mr. Jennings, you have indicated that you have State inspection in Tennessee: How many inspectors do you have to work with the local people?

MR. MATT JENNINGS: We have 7 State and 14 local inspectors.

MR. VAN SCHOIK: You have also stated that your law, with respect to the sale, offering for sale, exposure, or advertising for sale, of any commodity or service by weight, measure, or count, provides that the price should not be so represented as to mislead or deceive a purchaser. The Model Law says, "Any individual item or lot of any commodity not in the package form as defined in this section, but on which there is marked a selling price based on the established price per unit of weight or of measure, shall be construed to be a commodity in pack-

age form." Do you think that the manner in which your law is written is more effective than the latest Model Law?

MR. MATT JENNINGS: No, I do not. I am afraid that you have two sections of the law confused. Your final quotation is from Section 1 of the Model Law and is the definition of the term, "commodity in package form." This definition in the Tennessee law is identical with the Model Law.

Your first reference was to Section 26 of the Tennessee law and Section 31 of the Model Law. Our Section 26 is identical with Model Law Section 31, as far as our section goes. Section 31 of the Model Law now contains some additional requirements controlling the relative size of fractions in price signs, etc. This additional language is very desirable, in my opinion, and is an improvement over our law. I wish we had it in our law. As I said in my opening statement, this additional language was developed and added to the Model Law after our bill was drafted.

MR. VAN SCHOIK: Have you had any problems with the sale and pricing of the same grade of gasoline through two meters in the same pump housing—one meter priced at 29.9 cents per gallon and the other meter set at 30.9 cents per gallon with stamps or dishes given and when there is no such indication on the pump? Would this be considered deceptive advertising under your law?

MR. MATT JENNINGS: In that case, we would consider it misleading because the customer is attracted by the 29.9 cent sign and he is sold on the basis of 30.9 cents per gallon. The one way he might get around it would be to put up a sign reading, "Gas with one teacup 30.9 cents per gallon."

MR. VAN SCHOIK: That would be more truthful, I would agree.

Have you found any instances where a chain store advertises and sells $11\frac{1}{2}$ pounds of tomatoes at 29 cents in one store and, at another store, in some other area of town, sell $11\frac{1}{2}$ pounds for 39 cents? Have you had any problems like that, and were you able to consider that as deception in advertising?

MR. MATT JENNINGS: We had a similar problem on another product, which we did consider to be misleading. It was in regard to a package of "steakettes." They were advertising ten steakettes, $1\frac{1}{4}$ pounds for one dollar. One particular store was posting that advertisement, yet he was selling a pound and three ounces for one dollar. We made him change this practice to cause his product and the advertising of his product to agree.

MR. VAN SCHOIK: Thank you, Mr. Jennings.

I now have a question for Mr. Harris. I want to say first to Mr. Harris, I think your replies have been very commendable thus far and I hope you can help me.

Do you test meters on gasoline trucks and fuel oil trucks?

MR. HARRIS: Yes, we do.

MR. VAN SCHOIK: Do your men adjust those meters at the time of the test, if they find them off?

MR. HARRIS: Not routinely. In some cases, in the extreme southwest part of Virginia, for instance, late on Friday afternoon, when the inspector does not expect to return to that section the following week, he certainly would, I hope, make minor adjustments. We do not routinely make adjustments where service is available.

MR. VAN SCHOIK: In connection with Handbook 67, you indicated that you had adopted it as a regulation. Since Handbook

67 is a procedure, did your legal department indicate there was any problem about adopting that as a regulation?

MR. HARRIS: We adopted Handbook 67 administratively, when it first came out. In our new law, there is a section whereby we can adopt it officially and legally. The Commissioner or the Board of Agriculture can adopt books, manuals of inspections, and so forth, for weights and measures administration. It is not spelled out in our law like Handbook 44 is. Handbook 44 is adopted by law. Handbook 67 is not, but we do have authority to adopt manuals of inspection that come from the National Bureau of Standards and which we will expect to adopt by reference.

MR. VAN SCHOIK: Does your legal department indicate that adoption by reference is acceptable?

MR. HARRIS: Yes.

MR. VAN SCHOIK: I have one more question for Mr. Bay.

I was not quite clear about your 20-ounce loaf of bread. We have a bread weight law in the State of Ohio, too. It has a minimum weight loaf of 16 ounces, of course, with tolerances which I think are more excessive for bread than most any other product. Therefore, my question to you is: Was the 20-ounce loaf supposed to be a minimum loaf, or was it just outlawed per se?

MR. BAY: Originally, we adopted the Model Law. Section 33 of the Model Law provides for $\frac{1}{2}$ pound, 1 pound, $1\frac{1}{2}$ pounds, and multiple of 1 pound loaves. It does not permit the 20 ounce, or $1\frac{1}{4}$ pound loaf.

MR. VAN SCHOIK: What was your purpose in excluding the 20-ounce loaf, so long as it was labeled properly?

MR. BAY: The purpose is quite obvious. We established to the satisfaction of the court that the 20-ounce, 24-ounce, and 16-ounce loaves could all be baked in the same pan size, which represented a misleading package. The purpose of the standard weight bread law is to prevent this type of deception. Proper labeling alone, is not the answer.

MR. BALLENTINE: Mr. Harris, do you test gravity flow meters on gasoline trucks? If so, what size prover do you use and what is your method?

MR. HARRIS: We check gravity meters at our calibrating station in Richmond, only. We use a 100 gallon prover. We do not test gravity meters at other points in the State.

While I have the floor, may I ask a couple questions? I would like to ask Mr. Jennings what he is doing on barbecued chickens. And another question that comes up very often with us is, a chain store will advertise choice steaks, 79 cents a pound, and this will come out in the Wednesday afternoon edition of the paper. You then go to the store on Thursday afternoon, and you cannot find choice steaks at 79 cents, but choice steaks at 89 cents per pound. The answer usually given is, "We had them; we had some this morning at 79 cents, but we are sold out now." Is that deceptive advertising?

MR. MATT JENNINGS: That certainly is deceptive advertising, and in my opinion, it is just another gimmick for stores to sell more products at higher prices. It is a case that is rather difficult to handle. We have many similar cases. For instance, an advertisement for lettuce at 10 cents a head will come out on Thursday, on Saturday morning lettuce is 19 cents. They say that the particular grade of

lettuce at 10 cents has all been sold and that the 19 cent lettuce is a better grade. It is a problem that is hard to handle.

On our barbecued chicken, that is easy. All you need to do is put an illegal sale stamp on the package, where the customer can see it, and there is no problem. It has not been any problem for us.

MR. HOWARD: We have had advertising ordinances in Miami for many years. I am glad to see that this subject is coming before the Conference and is being given recognition. We have no problem with the newspaper advertising of foods. If they advertise something and do not have it in stock, they must deliver the next higher priced grade at the advertised price. Our ordinance provides for this and we get pretty good cooperation.

Neither do we have a problem with barbecued chickens. We sell these by the pound.

I would like to say this while I have the floor: During the last two days, I have noticed that we keep saying "should." We must get out of the "should" habit and use the term "shall." Codes of ethics and things like that, where they say "should," are all very fine in their places, but we are enforcement officers and "should" will not fulfill our responsibilities.

DR. GORDON: This is not a question, but I would like to report an incident to show the influence of the housewife. When I made my first survey, many of you State directors stressed the importance of housewives serving as unofficial inspectors. By so doing, they could multiply the effectiveness of your field force. This idea appealed to me very much and I have publicized it at every opportunity in groups to whom I have spoken.

Recently, Mrs. Gordon went to a nearby store which had advertised lamb at a sale price. When she got there, they were "all out." She went home and wrote a letter to the head office of the company. And, the day before we left for Washington, a man called at our home to apologize and left with her an order for two porterhouse steaks!

MR. MEEK: I would like to direct a question to Mr. Jennings, regarding the posted price signs used in connection with the sale of gasoline at service stations. I think, throughout the country, the principal price is in larger figures than the fraction. For instance, if gasoline sells at $29\frac{9}{10}$ cents per gallon, the 29 will be in large figures—often several feet high—and the $\frac{9}{10}$ will be so tiny that you can hardly see it. Do you interpret your law as giving you authority to regulate that?

MR. MATT JENNINGS: The way our law reads, the price shall not be represented in any manner calculated or tending to mislead or deceive an actual or prospective purchaser. If the fraction is in small figures, we interpret it as being misleading and deceptive, and we let the jury decide, and they have decided in our favor so far.

MR. MEEK: What proportion do you permit?

MR. MATT JENNINGS: Unfortunately our law does not specify sizes for the figures. This is where the present Model Law language is superior to ours. The particular arrangement must determine whether or not the sign is misleading. We like to see the fraction at least 50 percent as large as the whole number, like the Model Law says, but in certain cases, we would not take action against a fraction of 35 to 40 percent as large as the whole number.

Mr. HOWARD: In Miami, we have a simple ordinance on price signs and advertising that requires any fraction to be equal in height and one-half the body of the main characters or figures.

Mr. R. N. SMITH: Are there more questions, gentlemen?

If not, I wish to thank each and every one of you for your attendance at this session and for your participation in this panel discussion. Your presence and participation has been most gratifying to me personally and I am sure the four panel members appreciate it as much as I do. Thank you very much.

Mr. ROBERT WILLIAMS: Thank you, Mr. Moderator and panel members. It has been very enlightening, and I think we have all had a profitable and enjoyable morning.

Would any of the delegates who are attending the Conference for the first time like to express their satisfaction or dissatisfaction with the conference before we adjourn? If so, we would like to hear from you.

Mr. MANLEY: I would like to commend all of those—the officers, committees and all those in the background—who have made this a very successful conference, at least for me, and, I am sure, for all the others. Thanks very much.

Mr. STABLER: I simply wish to concur in the statements you have just heard made by Mr. Manley. This, to me, has been a tremendous experience. Thank you.

Mr. FITZGERALD: I thought it was outstanding, and I enjoyed it very much. Thank you.

(The benediction was delivered by Mr. L. A. Gredy of the State of Indiana. Thereupon at 11:55 a.m. the 47th National Conference on Weights and Measures adjourned *sine die*.)

PERSONS ATTENDING THE CONFERENCE

Delegates—State, City, and County Officials

ALABAMA

City:
Birmingham----- L. T. WILLS, Supervisor, Division of Weights and Measures, 406 City Hall.

ARIZONA

State----- J. J. O'DONNELL, Deputy Inspector, State Department of Weights and Measures, Room 139 Capitol Building, Phoenix.

CALIFORNIA

State----- W. A. KERLIN, Chief, Bureau of Weights and Measures, Department of Agriculture, 1220 "N" Street, Sacramento.
Mrs. H. E. NELSON, Consumer Counsel, Governor's Office, State Capitol, Sacramento.

County:

Alameda----- R. H. FERNSTEN, County Sealer of Weights and Measures, 333 Fifth Street, Oakland.
Kern----- A. D. ROSE, County Sealer of Weights and Measures, 1116 E. California Avenue, Bakersfield.
Los Angeles----- F. M. RAYMUND, County Sealer of Weights and Measures, 3200 N. Main Street, Los Angeles.
San Bernardino----- H. E. SANDEL, County Sealer of Weights and Measures, 566 Lugo Avenue, 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 N. Market Street, San Jose.
Ventura----- E. H. BLACK, County Sealer of Weights and Measures, Post Office Box 1610, Ventura.

COLORADO

State----- H. N. DUFF, State Supervisor, Weights and Measures Section, Department of Agriculture, State Services Building, 1525 Sherman Street, Denver.
H. H. HOUSTON, Director, Oil Inspection Department, 1024 Speer Boulevard, Denver.

CONNECTICUT

State----- F. M. GERSZ, Deputy Commissioner of Weights and Measures, Department of Consumer Protection, State Office Building, Room 520, Hartford.
City:
Hartford----- NATHAN KALECHMAN, City Sealer of Weights and Measures, 550 Main Street.
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----- J. L. CLOUGH, Acting Director, Department of Weights and Measures, Board of Agriculture, Dover.
 F. C. COLAMAIIO, State Inspector of Weights and Measures, 2405 Jessup Street, Wilmington.
 LEWIS HARRINGTON, State Inspector of Weights and Measures, Haven Lake Avenue, Milford.
 R. R. SMITH, State Inspector of Weights and Measures, N.E. 10th Street, Milford.

DISTRICT OF COLUMBIA

Weights, Measures, and Markets Branch, Department of Licenses and Inspection,
 Room 227 Esso Building, 261 Constitution Avenue, N.W., Washington, D.C.

District----- 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 Stand-
 ards, 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----- LUKE PRENDERGAST, Chief Taximeter Inspector, Public
 Vehicle License Commission, 1104 S. Wabash Ave-
 nue.

INDIANA

State----- R. E. MEEK, Director, Division of Weights and Meas-
 ures, State Board of Health, 1330 W. Michigan St.,
 Indianapolis.
 L. A. GREBY, State Inspector.
 County:
 Gibson----- W. R. SEVIER, County Inspector of Weights and Meas-
 ures, Somerville.
 Grant----- R. C. PARKS, County Inspector of Weights and Meas-
 ures, Court House, Marion.
 Knox----- W. D. LIDDIL, County Inspector of Weights and Meas-
 ures, 840 State St., Vincennes.
 Madison----- WILBUR MOORE, County Inspector of Weights and
 Measures, Court House, Anderson.

St. Joseph-----	C. S. ZMUDZINSKI, County Inspector of Weights and Measures, Court House, South Bend.
Vigo-----	R. J. SILCOCK, County Inspector of Weights and Measures, Room 5 Court House, Terre Haute.
City:	
Anderson-----	HOBART McDANIEL, City Inspector of Weights and Measures, Court House.
Gary-----	C. C. MORGAN, City Sealer of Weights and Measures, City Hall.
Hammond -----	DEAN BRAHOS, City Sealer of Weights and Measures, 5925 Calumet Avenue.
Indianapolis -----	W. R. COPELAND, Supervising Inspector, Department of Weights and Measures, 202 N. Alabama St.
South Bend -----	B. S. CICHOWICZ, City Inspector of Weights and Measures, City Hall.

IOWA

State -----	L. J. DAMRON, State Field Supervisor, 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.
	W. L. CURRY, Assistant Director.

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.
	LACY DEGRANGE, State Inspector.
	J. R. FRYE, State Inspector.
	R. W. GLENDENNING, State Inspector, Post Office Box 356, Chestertown.
	H. F. FOWLER, State Inspector, Regency Drive, Salisbury.
	J. C. LEWIS, State Inspector, Post Office Box 661, Salisbury.

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.
Prince Georges-----	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 Build-
 ing.

MASSACHUSETTS

State ----- W. C. HUGHES, Head Administrative Assistant, Divi-
 sion of Standards and Necessaries of Life, Depart-
 ment of Labor and Industries, State House, Boston.

City :
 Boston ----- J. F. MCCARTHY, City Sealer of Weights and Meas-
 ures, Room 105, City Hall Annex.
 Cambridge----- A. T. ANDERSON, City Sealer of Weights and Meas-
 ures, 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.
 Holyoke----- E. L. HUGHES, City Sealer of Weights and Measures,
 City Hall.
 Newton----- J. E. BOWEN, City Sealer of Weights and Measures,
 City Hall, Newton Centre.
 Quincy----- H. H. HUGHES, City Sealer of Weights and Measures,
 City Hall Annex, 63 Saville Row.
 Somerville----- J. F. CASEY, City Sealer of Weights and Measures,
 Public Works Building.
 Westfield----- D. J. FITZGERALD, City Sealer of Weights and Meas-
 ures, City Hall.

MICHIGAN

State----- G. S. MCINTYRE, Director, State Department of Agri-
 culture, and President, National Association of
 State Departments of Agriculture, 621 Lewis Cass
 Building, Lansing.
 J. L. LITTLEFIELD, Chief, Division of Foods and Stand-
 ards, Department of Agriculture, 607 Lewis Cass
 Building, Lansing.
 GORDON GILLAUME, Supervisor of Weights and Meas-
 ures, 523 Woodland, Petoskey.

County :
 Washtenaw----- G. P. SMITH, County Sealer of Weights and Measures,
 County Building, Ann Arbor.

City :
 Dearborn----- J. A. HUGHES, Superintendent, Department of Li-
 censes, Weights, and Measures, 13030 Hemlock
 Avenue.
 Detroit----- J. T. DANIELL, Deputy Sealer, Bureau of Weights and
 Measures, 2693 Eighteenth St.
 GEORGE LAHIFF, Supervising Weights and Measures
 Inspector.
 Livonia----- R. C. BAUMGARTNER, City Sealer of Weights and
 Measures, Police Department, 33145 W. 5 Mile
 Road.
 Royal----- G. E. RUTLEDGE, City Sealer of Weights and Measures
 (Michigan Association of Weights and Measures
 Officials), 211 William Street.

MINNESOTA

State----- W. E. CZAIA, Supervisor, Department of Weights and
 Measures, Railroad and Warehouse Commission,
 One Flour Exchange, Minneapolis.
 H. F. KIEKOW, State Inspector of Weights and Meas-
 ures, Mora.

City :
 Minneapolis----- J. G. GUSTAFSON, Chief Inspector, Department of Li-
 censes, Weights, and Measures, Room 101-A City
 Hall.

MISSISSIPPI

State----- W. G. SELLERS, State Inspector, Department of Agriculture and Commerce, State Office Building, Jackson.

MISSOURI

State----- G. W. BAY, Chief Inspector, Weights and Measures Division, Department of Agriculture, Jefferson City.

County :
St. Louis----- A. G. LOEFFEL, Commissioner, Weights and Measures, 1040 So. Brentwood, Richmond Heights.

NEW HAMPSHIRE

State----- A. H. DITTRICH, Chief Inspector, Bureau of Weights and Measures, Division of Markets and Standards, Department of Agriculture, State Office Building, Concord.
A. E. BOVIN, State Inspector, State House, Concord.

NEW JERSEY

State----- T. F. TANSEY, Deputy Attorney General, Attorney General's Office, State House Annex, Trenton.
S. H. CHRISTIE, JR., Deputy State Superintendent, Division of Weights and Measures, Department of Law and Public Safety, 187 West Hanover Street, Trenton.
R. K. BODENWEISER, Supervisor of Enforcement.
A. T. SMITH, Supervisor of Technical Services.
J. R. BIRD, Senior Technician.
M. N. EDMONSTON, Chief, Bureau of Fruit and Vegetable Service, Department of Agriculture, Division of Markets, 1 W. State Street, Trenton.

County :
Atlantic----- J. E. MYERS, County Superintendent of Weights and Measures, 350 S. Egg Harbor Road, Hammonton.
Bergen----- M. J. SANTIMAURO, County Superintendent of Weights and Measures, 66 Zabriskie Street, Hackensack.
Burlington----- E. E. DAWSON, Assistant County Superintendent.
D. F. HUMMEL, Superintendent of Weights and Measures, County Office Building, 49 Water Street, Mt. 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, County Court House, Bridgeton.
Essex----- W. H. SCHNEIDEWIND, County Superintendent of Weights and Measures, 278 New Street, Newark.
Mercer----- R. M. BODENWEISER, County Superintendent of Weights and Measures, Court House, Trenton.
Middlesex----- JOSEPH CORSE, Acting County Superintendent of Weights and Measures, County Record Building, New Brunswick.
Monmouth----- W. I. THOMPSON, County Superintendent of Weights and Measures, Post Office Box 74, Allenhurst.
J. A. J. 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.
Warren----- G. E. CONNOLLY, County Superintendent of Weights and Measures, Court House, Belvidere.

City:

Fair Lawn-----	OSCAR HAUG, Municipal Superintendent of Weights and Measures, Plaza 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.
Linden-----	L. T. REAGAN, Municipal Superintendent of Weights and Measures, Room 206 City Hall.
Nutley-----	W. L. CALLANAN, Municipal Superintendent of Weights and Measures, Town Hall.
Passaic-----	PAUL DeVRIES, Municipal Superintendent of Weights and Measures, City Hall.
Paterson-----	JOSEPH SHAW, Assistant Municipal Superintendent.
	J. P. LEONARD, Municipal Superintendent of Weights and Measures, 115 Van Houten St.
Trenton-----	R. J. BONEY, Municipal Superintendent of Weights and Measures, 324 E. State St., City Hall Annex.
Union City-----	A. O. OSLUND, Municipal Superintendent of Weights and Measures, City Hall, 3715 Palisade Avenue.

NEW MEXICO

State-----	C. B. WHIGHAM, Chief, Division of Markets, Weights and Measures, Department of Agriculture, Box 457, University Park.
------------	---

NEW YORK

State-----	J. F. MADDEN, Director, Bureau of Weights and Measures, Department of Agriculture and Markets, State Office Building, Albany.
	H. L. DILLON, State Inspector of Weights and Measures, 108 Greenhedge Drive, Camillus.

County:

Dutchess-----	J. E. DEAN, County Sealer of Weights and Measures, 47 Fuller Lane, Hyde Park.
Genesee-----	G. A. PULLMAN, County Sealer of Weights and Measures, 19 Buffalo Street, Bergen.
Monroe-----	E. D. HUBBLE, County Sealer of Weights and Measures, 1400 South Avenue, Rochester.
	R. J. VENESS, Deputy County Sealer.
Nassau-----	ROBERT WILLIAMS, County Sealer of Weights and Measures, 58 Third Avenue, Mineola.
	A. W. WEIDNER, JR., Assistant County Sealer.
Wayne-----	H. H. WRIGHT, County Sealer of Weights and Measures, 30 Catherine Street, Lyons.

City:

Binghamton-----	E. N. VOLKAY, Sealer of Weights and Measures, 54 Hawley Street.
Ithaca-----	E. P. NEDROW, City Sealer of Weights and Measures, City Hall.
Lackawanna-----	J. J. SERIES, City Sealer of Weights and Measures, 84 Rosary Avenue.
New York City-----	R. E. HURLEY, Director, Bureau of Weights and Measures, Department of Public Markets, 137 Centre Street.
	RUEHLIARD HOFFMAN.
	JEROME GOUDING.
Syracuse-----	J. M. BYRNE, City Sealer of Weights and Measures, 209 State Street.
White Plains-----	T. E. LATMORE, City Sealer of Weights and Measures, Department of Public Safety, 279 Hamilton Avenue.
Yonkers-----	S. J. DIMASE, City Sealer of Weights and Measures, City Hall.

NORTH CAROLINA

State----- C. D. BAUCOM, Superintendent, Weights and Measures Division, Department of Agriculture, Agriculture Building, Raleigh.
J. I. MOORE, Supervisor.
G. S. YOUNG, Inspector.

OHIO

State----- C. W. VAN SCHOIK, Chief, Division of Weights and Measures, Department of Agriculture, Reynoldsburg.

County:

Medina----- R. W. SEARLES, Deputy County Sealer of Weights and Measures, County Board of Education Building, Medina.

Ottawa----- RUDOLPH STARKLOFF, Deputy County Sealer of Weights and Measures, 241 Church Street, Post Office Box 47, Oak Harbor.

Summit----- E. T. LINDEMAN, Deputy County Sealer of Weights and Measures, c/o County Auditor, Court House, Akron.

City:

Akron----- R. K. SLOUGH, City Sealer of Weights and Measures, 69 N. Union.

Cincinnati----- W. E. G. RHEIN, Superintendent of Markets, Weights and Measures, 316 George St.

Youngstown----- F. B. JONES, City Sealer of Weights and Measures, City Hall.

OKLAHOMA

City:

Tulsa----- J. L. SMITH, Weights and Measures Inspector, City Hall, 4th & Cincinnati.

PENNSYLVANIA

State----- H. M. TURRELL, Director, Bureau of Standard Weights and Measures, Department of Internal Affairs, Capitol Building, Harrisburg.
E. A. VADELUND, Assistant Director.
J. W. HOUSER, Field Supervisor.
ORVILLE DANIEL, State Inspector, Gratz.
F. E. DYSINGER, State Inspector, 4th St., Muffintown.
J. P. HASSON, State Inspector, 10½ N. Grand St., Lewistown.
M. J. KOVAL, State Inspector, Scranton.

City:

Altoona----- R. I. CUMMINGS, City Inspector of Weights and Measures, City Hall.

Chester----- J. J. FERRIGAN, SR., City Inspector of Weights and Measures, Department of Public Affairs.

PUERTO RICO

Commonwealth----- A. E. DIAZ, Head, Weights and Measures Division, Economic Stabilization Administration, Post Office Box 4183, San Juan.

RHODE ISLAND

State----- E. R. FISHER, State Sealer of Weights and Measures, Department of Labor, Veterans Memorial Building, 83 Park St., Providence.

City:

Cranston----- J. J. ADAMS, City Sealer of Weights and Measures, City Hall.

Providence----- WILLIAM D'ABATE, Superintendent of Weights and Measures, 173 Sisson St.

SOUTH CAROLINA

State----- C. H. STENDER, Assistant to Commissioner, Department of Agriculture, Post Office Box 1080, Columbia.
E. W. BALLENTINE, Director, Bureau of Inspection.

SOUTH DAKOTA

State----- GEORGE CLARK, Inspector of Weights and Measures, Box 296, Alexandria.

TENNESSEE

State----- MATT JENNINGS, Director, Division of Marketing, Department of Agriculture, Melrose Station, Box 9039, Nashville.

TEXAS

State----- R. H. KOONTZ, Assistant Commissioner of Agriculture, Capitol Station, Austin.

City:
Fort Worth----- R. L. SHARP, City Sealer of Weights and Measures, Health Center, 1800 University Drive.

UTAH

City:
Salt Lake City----- E. C. WESTWOOD, City Sealer of Weights and Measures, 140 S. 3rd West.

VIRGINIA

State----- T. C. HARRIS, JR., Supervisor, Weights and Measures Section, Division of Markets, Department of Agriculture and Immigration, 1200 E. Main Street, Richmond.

J. F. LYLES, Field Supervisor.

J. C. STEWART, Inspector.

R. S. WINFREE, Inspector.

C. E. WHITMAN, Supervisor, Scale Maintenance, Department of Highways, Richmond.

City:
Alexandria----- L. W. VEZINA, Sealer of Weights and Measures, City Hall—Room 223.

Danville----- NEIL NIELSEN, Assistant City Manager, Municipal Building.

C. H. WRENN, City Sealer of Weights and Measures, Curb Market Building.

Norfolk----- W. F. BRADLEY, City Sealer of Weights and Measures, City Hall.

Petersburg----- C. R. BRANCH, City Sealer of Weights and Measures, City Hall.

Richmond----- J. G. WILLIAMS, JR., Chief, Bureau of Weights and Measures, Room 112 The Mosque, Laurel and Main Sts.

Roanoke----- J. M. HUDGINS, Chief, Department of Weights and Measures, City Market Building.

WASHINGTON

State----- J. H. LEWIS, Chief, Weights and Measures Section, Department of Agriculture, Post Office Box 120, Olympia.

City:
Seattle----- D. M. TURNBULL, Director, Division of Licenses and Standards, Office of the Comptroller, Room 100, County-City Building.

L. L. MANLEY, Supervisor, Weights and Measures Section.

WEST VIRGINIA

State----- LAWRENCE BARKER, Commissioner, Department of Labor, 643 State Office Building, 1800 Washington Street E., Charleston.
W. H. HOLT, Administrative Assistant to Commissioner.

WISCONSIN

State----- C. L. JACKSON, Chief, Division of Economic Practices, Department of Agriculture, State Capitol, Madison.
L. J. MARTIN, Package Weighing Specialist.

City:

Green Bay----- N. P. TILLEMANN, City Sealer of Weights and Measures, City Hall.

Kenosha----- J. P. KUCHERA, City Sealer of Weights and Measures, Room 15 City Hall.

Marshfield----- A. A. FRANK, City Sealer of Weights and Measures, 112 E. Second St., City Hall.

Milwaukee----- P. J. DWYER, Deputy Sealer of Weights and Measures, 1331 N. 5th Street.

Racine----- ROBERT ZIERTEN, City Sealer of Weights and Measures, City Hall.

West Allis----- J. J. PERSAK, Deputy Sealer of Weights and Measures, City Hall.

Advisory Members

U.S. Department of Commerce:

J. HERBERT HOLLOMON, Assistant Secretary for Science and Technology.

National Bureau of Standards:

Director's Office:

A. V. ASTIN, Director

A. T. MCPHERSON, Associate Director.

G. E. AUMAN, Assistant to the Director.

W. S. BUSSEY, Assistant to the Director.

R. N. SMITH, Weights and Measures Coordinator.

MRS. E. S. GRAYSON, Secretary.

Office of Weights and Measures:

M. W. JENSEN, Chief.

R. W. SMITH, Consultant.

L. V. JUDSON, Physicist.

D. R. MACKAY, Engineer.

H. F. WOLLIN, Engineer.

L. J. CHISHOLM, Writer-Editor.

MRS. F. C. BELL, Administrative Assistant.

MRS. M. M. BRODMERKEL, Secretary.

MRS. E. L. BRUECKNER, Secretary.

J. H. GRIFFITH, JR., Lab. General Mechanic.

Office of Technical Information:

W. R. TILLEY, Chief.

J. F. REILLY, Publications Editor.

MISS MARGARET STACK, Publications Editor.

Metrology Division:

I. H. FULLMER, Chief, Engineering Metrology Section.

H. E. ALMER, Physical Science Technician, Mass Unit, Mass and Scale Section.

P. S. SHOENFELD, Physicist, Mass Unit, Mass and Scale Section.

MRS. M. W. JONES, Technician, Mass Unit, Mass and Scale Section.

MISS ROSALIND COHEN, Physicist, Mass Unit, Mass and Scale Section.

MRS. E. A. WECK, Physicist, Mass Unit, Mass and Scale Section.

H. H. RUSSELL, Chief, Scale Unit, Mass and Scale Section.

H. L. BADGER, Physicist, Scale Unit, Mass and Scale Section.

J. C. HUGHES, Acting Chief, Volumetry and Densimetry Section.

B. C. KEYSAR, Physical Science Technician, Volumetry and Densimetry Section.

Analytical and Inorganic Chemistry Division:

H. S. PEISER, Chief, Crystal Chemistry Section.

U.S. Department of Commerce—Continued

J. HERBERT HOLLOMON, Assistant Secretary for Science and Technology.

National Bureau of Standards—Continued

Applied Mathematics Division:

E. W. CANNON, Chief.

Physical Chemistry Division:

ILIDEO OKABE, Physical Chemist, Molecular Kinetics Section.

U.S. Department of Agriculture:

R. D. THOMPSON, Chief, Scales and Weighing Branch, Packers and Stockyards Division, Agricultural Marketing Service, Washington, D.C.

M. W. STEPHENS, Livestock Scale and Weighing Specialist.

C. J. PETERS, Scale Specialist, Packers and Stockyard Division, 621 College Street, Room 202, Jackson, Mississippi.

FRED STEIN, Milk Marketing Specialist, Washington, D.C.

MILTON JOHNSON, Specialist in Package Standardization, Fruit and Vegetable Division.

Federal Trade Commission:

SIGURD ANDERSON, Commissioner, Washington, D.C.

U.S. Department of Health, Education, and Welfare—Food and Drug Administration—Washington, D.C.

J. C. PEARSON, Director, Division of Federal-State Relations.

B. V. McFARLAND, Deputy Director.

C. H. POGUE, Food and Drug Officer.

R. A. TUCKER, Food and Drug Officer.

C. T. HUBBLE, Director, Division of Case Control, Bureau of Enforcement.

L. M. BEACHAM, Deputy Director, Division of Food.

Mrs. CARLA WILLIAMS, Administrative Officer, Consumer Programming, Office of the Commissioner.

V. H. BLUMQUIST, Chemist.

U.S. Senate:

PHILIP A. HART, United States Senator (Michigan).

Senate Antitrust and Monopoly Subcommittee—412 Senate Office Bldg.—Washington, D.C.:

J. S. COHEN, Assistant Counsel.

T. C. WILLIAMS, Assistant Counsel.

U.S. Department of the Treasury:

E. W. TEAGARDEN, Engineer, Division of Technical Services, Bureau of Customs, Washington, D.C.

Associate Members—Manufacturers of Weighing and Measuring Devices

American Meter Co.: D. C. WILEY, Vice President, 13500 Philmont Ave., Philadelphia, Pa.

Badger Meter Manufacturing Co.: M. E. HARTZ, Director, Research and Engineering, 4545 W. Brown Deer Rd., Milwaukee, Wis.

Bennett Pump:

M. S. GODSMAN, Service Manager, Broadway and Wood Sts., Muskegon, Mich.

L. G. CLOSE, District Manager, 2127 N. Charles St., Baltimore, Md.

Bowser, Inc.: E. J. REINHART, Manager, Customer Service, Greenville, Tenn.

Brodie, Ralph N., Co.:

C. J. McCaffrey, Vice President, 550 S. Columbus Ave., Mount Vernon, N. Y.

H. E. STEBOLD, Sales Engineer, 3314 Chrysler Building, New York, N.Y.

Buffalo Meter Co. (Granco): T. J. SMITH, Manager, Sales and Engineering, 2917 Main St., Buffalo, N.Y.

Byron Miller & Associates: B. D. MILLER, Owner, 7712 Georgia Ave., N.W., Washington, D.C.

Capitol Scale Co.: R. G. MACURA, Owner, 128 High St., Milford, Conn.

Cardinal Scale Manufacturing Co.: W. H. PERRY, President, 203 E. Daugherty, Webb City, Mo.

Chatillon, John, & Sons: G. C. REILEY, Vice President, 89 Cliff St., New York City, N.Y.

Continental Can Co., Inc.: SEYMOUR KURTZ, P.O. Box 1159, 349 Oraton St., Newark, N.J.

Crow Scales, Inc.: C. H. CROW, President, P.O. Box 3092, Waco, Tex.

Detecto Scales, Inc.: MACK RAPP, Vice President, 540 Park Ave., Brooklyn, N.Y.

Dixie Cup Division of American Can Co.: C. G. McBRIDE, Assistant to Vice President and General Manager, Easton, Pa.

Eastern Scale Works, Ltd.: TED JOHNSON, Vice President, 143 Parliament St., Toronto, Can.

Exact Weight Scale Co. :

W. A. SCHEURER, President, 538 E. Town St., Columbus, Ohio.

W. J. SCHIESER, Vice President.

O. H. WATSON, Midwest Division Manager, 608 S. Dearborn St., Chicago, Ill.

Ex-Cell-O Corp. :

ARNOLD DORBECK, Supervisor, Pure-Pak Service Department, 1200 Oakman Blvd., Detroit, Mich.

H. J. LADUE, Project Engineer, 850 Ladd Rd., Walled Lake, Mich.

Factory Equipment Co. : M. E. SKIBIAK, 190 State St., Bloomfield, N.J.

Fairbanks, Morse & Co. :

G. E. LONGBOON, Area Sales Manager, 4301 Main St., Pittsburgh, Pa.

F. J. MURPHY, Field Engineer, 1050 Cromwell Bridge Rd., Baltimore, Md.

Fuller, H. J., Co. : W. S. FULLER, Sales Manager, 1212 Chesapeake Ave., Columbus, Ohio.

General Motors—AC Spark Plug Division : P. H. KEHM, Staff Engineer, 1300 N. Dort, Flint, Mich.

Gilbert & Barker Manufacturing Co. :

WILLIAM KEAY, Manager, Sales Service, West Springfield, Mass.

R. E. NIX, Manager, Sales Engineering.

Gurley, W. & L. E. : F. G. WILLIAMS, Washington Representative, 5514 Nevada Ave., N.W., Washington, D.C.

Hobart Manufacturing Co. :

K. C. ALLEN, Vice President, Scale Operations, 448 Huffman Ave., Dayton, Ohio.

E. A. REUSSENZEHN, Chief Scale Engineer, Dayton Scale Division.

M. E. BONE, Weights and Measures Representative.

H. W. HEADY, 914 W. Girard, Philadelphia, Pa.

Howe-Richardson Corp. : C. G. GEHRINGER, Vice President, 1741-43 W. Fullerton Ave., Chicago, Ill.

Howe Scale Co. : R. F. STRAW, Vice President, 685 Stewart Ave., S.W., Atlanta, Ga.

Huffman Manufacturing Co. : R. E. DORMAN, Vice President, P.O. Box 310, Delphos, Ohio.

Lily-Tulip Cup Corp. : M. W. WILDER, Assistant to Vice President, 122 E. 42d St., New York, N.Y.

LIRIO, ALFRED, P.O. Box 369, Vineland, N.J.

Lockheed Electronics Co. : D. P. SAMMARCO, Sales Engineer, Rt. 1, Metuchen, N.J.

McIntyre, John J., Sons, Inc. : F. L. MCINTYRE, President, 514-16, Knorr St., Philadelphia, Pa.

Measuregraph Co. : F. L. WALL, Reg. Manager, 1634 Hickory Hill Rd., Falls Church, Va.

Murphy, L. R., Scale Co. : L. R. MURPHY, President, 1610-12 N. "C" St., Sacramento, Calif.

Neptune Meter Co. :

E. P. WEHMAN, Assistant Chief Engineer, 47-25 34th Street, Long Island City, N.Y.

FRED KUTCH, Sales Manager, Petroleum and Industrial Meters.

W. A. MEDFORD, Engineer.

Ohaus Scale Corp. : E. D. MYERS, Design Engineer, 1050 Commerce Ave., Union, N.J.

Owens-Illinois Glass Co. :

W. F. ALDERSON, Manager, Design Development Division, P.O. Box 1035, Toledo, Ohio.

F. B. BUSCH, Specifications Engineer.

Potter Areonautical Corp. :

J. J. MURPHY, Administrative Assistant, U.S. Route #22, Union, N.J.

H. R. LAUTERBACH, Project Engineer.

Power-Plus Corp. : D. M. NELSON, President, 4462 E. Washington, Los Angeles, Calif.

Ren Equipment Co. : L. D. HARBOUR, Manager East Coast Division, 2223 Tucker Lane, Baltimore, Md.

Revere Corp. of America :

C. W. SILVER, Sales Manager, Wallingford, Conn.

H. L. ZUPP, Sales Engineer.

Rockwell Manufacturing Co. : A. J. KOMICH, Production Manager, Liquid Meters, Box 450, Statesboro, Ga.

Sanitary Scale Co.: E. C. KARP, Vice President, Manufacturing and Engineering, 910 E. Lincoln Ave., Belvidere, Ill.

Sealright Co., Inc.: C. E. FOSTER, Chief Chemist, Fulton, N.Y.

Seraphin Test Measure Co.: T. A. SERAPHIN, General Manager, 1314 N. 7th St., Philadelphia, Pa.

Smith, A. O., Corp.:
W. T. SCHULTZE, Eastern Area Sales Manager, 250 Park Ave., New York, N.Y.
W. M. MILLIGAN, Meter Division.

Spinks Scale Co.: D. F. LAIRD, Vice President, 836 Stewart Ave., Atlanta, Ga.

Stewart Warner Corp.:
W. E. FAITHORN, JR., Assistant Secretary, 1317 F. St., N.W., Washington, D.C.
T. J. MCCOOK, Chief Engineer, Instrument Division, 1826 Diversey, Chicago, Ill.

Streeter-Amet Co.: G. F. GRAHAM, Vice President, Grayslake, Ill.

Swab Wagon Co., Inc.: W. P. LEHMAN, Secretary, Elizabethtown, Pa.

Symington Wayne Corp.:
P. A. MANKIN, General Manager, Salisbury, Md.
W. J. DUBSKY, Manager of Engineering.
F. W. LOVE, Administrative Assistant.

Tokheim Corp.:
WILLIAM LOUTHAN, Service Manager, Fort Wayne, Ind.
W. F. GERDOM, Assistant Service Manager, 1602 E. Wabash, Fort Wayne, Ind.

Toledo Scale Co.:
F. D. INSTONE, Vice President, Toledo, Ohio.
D. B. KENDALL, Manager, Product Engineering.
J. G. LEWIS, Marketing Manager, Industrial Products.
R. V. MILLER, National Manager of Weights and Measures and Sanitary Standards.

Torsion Balance Co.: J. P. SLANE, Manager, Eastern Division, Clifton, N.J.

Veeder-Root, Inc.:
A. E. MCKEEVER, Sales Manager, Master Meter Duplicator Division, 70 Sargeant St., Hartford, Conn.
H. W. BARNES, Field Sales Manager, Computer Division.
J. P. LORD, Sales.
R. P. HUCKMAN.

Voland Corp.: BERNARD WASKO, Chief of Engineering, 27 Centre Ave., New Rochelle, N.Y.

Washington Scale and Equipment Co., Inc.: AARON YOCHELSON, President, 1107 New Jersey Ave., N.W., Washington, D.C.

Winslow Govt. Standard Scale Works, Inc.: C. E. EHRENHARDT, Vice President, 25th & Haythorne, Terre Haute, Ind.

Associate Members—Associations, Business and Industry, and Railroads

American Seed Trade Association: WILLIAM HECKENDORN, Executive Secretary, Southern Bldg.—Suite 803, 1425 H St., N.W., Washington, D.C.

Arnold Corp.: W. C. LEITCH, President, 300 S. Salisbury Blvd., Salisbury, Md.

Association of American Soap and Glycerine Producers, Inc.: C. R. MATHIS, Counsel, Davies, Richberg, Tydings, Landa, and Duff, 1000 Vermont Ave., N.W., Washington, D.C.

Automobile Manufacturer's Association: A. C. DOTY, JR., Staff Engineer, 380 New Center Bldg., Detroit, Mich.

Chemical Specialties Manufacturing Association: R. L. ACKERLY, 1625 K St., N.W., Washington, D.C.

Cocoa Cola Co. (Tenco): EDWARD ABORN, President, Edgarr Road, Linden, N.J.

Consumers' Research: F. J. SCHLINK, President and Technical Director, Washington, N.J.

Cook Chemical Co.: R. D. GHOLSON, Research and Product Development Manager, P.O. Box 78, Kansas City, Mo.

Cooperative League of USA: J. T. JENNINGS, Associate Director Washington Office, 1012 14th St., Washington, D.C.

Corn Products Co.: E. L. SEXTON, Assistant to Director of Research, 99 Ave. A., Bayonne, N.J.

Dairy Industries Supply Association: D. H. WILLIAMS, Technical Director, 1145 19th St., N.W., Washington, D.C.

Distilled Spirits Institute :

R. W. COYNE, President, 1132 Pennsylvania Bldg., Washington, D.C.

B. J. O'CALLAGHAN, Public Relations Director.

Food Chemical News: RAYMOND GALANT, Assistant to the Editor, 602 Warner Bldg., Washington, D.C.

General Foods Corp.: J. J. HALSEY, Consultant, Quality Services, 555 S. Broadway, Tarrytown, N.Y.

General Mills, Inc.: O. A. OUDAL, Assistant Director Quality Control, 9200 Wayzata Blvd., Minneapolis, Minn.

Glass Container Manufacturers Institute, Inc.: C. E. WAGNER, Development Engineer, 99 Park Ave., New York, N.Y.

Grand Union Co.: MURRAY SOCOLOF, Vice President, 7000 Sheriff Rd., Landover, Md.

Greenbelt Consumer Services, Inc.:

MARY A. NEWMAN, Director, 10703 Clermont Ave., Garrett Park, Md.

ROBERT DRESSLE, 10501 Rhode Island Ave., Beltsville, Md.

Hopper Paper Co., Inc.: R. L. BULLINGTON, President, Richmond, Va.

Humble Oil and Refining Co.: L. L. KENNEDY, Manager, Construction and Maintenance, Eastern Esso Region, 500 N. Broad St., Elizabeth, N.J.

International Packers Ltd.: A. F. GOLLNICK, Director of Operations, 135 So. LaSalle St., Chicago, Ill.

Institute of Shortening and Edible Oils, Inc.: E. W. BROCKENBROUGH, President, 2000 K St., N.W., Washington, D.C.

Liquefied Petroleum Gas Association: M. E. BROWN, District Secretary, 711 14th St., N.W., Washington, D.C.

L & N Railroad Co.: J. L. DAHLROT, General Scale Inspector, Louisville, Ky.

Metric Association: R. P. FISCHER, President, 502 Albee Bldg., 1426 G St., N.W., Washington, D.C.

Milk Industry Foundation: E. B. KELLOGG, Director of Technical Services, 1145 19th St., N.W., Washington, D.C.

Millers' National Federation: F. H. MEWHINNEY, Washington Representative, 752 National Press Bldg., Washington, D.C.

Mullen, Robert R., & Co.: E. S. COLCLOUGH, 1737 H St., N.W., Washington, D.C.

National Association of Dairy Equipment Manufacturers: JOHN MARSHALL, Executive Vice President, 1012 14th St., N.W., Washington, D.C.

National Canners Association: J. W. BELL, Sanitarian, 1133 20th St., N.W., Washington, D.C.

National Coffee Association:

J. F. McKIERNAN, President, 120 Wall St., New York, N.Y.

G. E. BOECKLIN, Secretary.

National Fisheries Institute: HARRIS MAGNUSSON, Director of Technology, 1614 20th St., N.W., Washington, D.C.

National Macaroni Manufacturers Association:

J. J. WINSTON, Technical Director, 156 Chambers St., New York City, N.Y.

R. M. GREEN, Executive Secretary, P.O. Box 336, Palatine, Ill.

National Scale Mens Association: W. F. NICOL, President, 1315 S. Akard St., Dallas, Tex.

National Oil Fuel Institute, Inc.: F. S. BURROUGHS, Vice President, 60 E. 42nd St., New York, N.Y.

Oil Heat Institute of Greater Washington:

T. J. FANNON, President, 1343 H St., N.W., Washington, D.C.

H. I. CLARKSON, Executive Secretary.

Package Engineering: D. L. OLSSON, Field Editor, Editorial and Executive Office, 185 N. Wabash Ave., Chicago, Ill.

Paper Cup and Container Institute, Inc.: R. W. FOSTER, Assistant to Executive Director, 250 Park Ave., New York, N.Y.

Paper Stationery and Tablet Manufacturers Association, Inc.: E. P. EATON, Executive Secretary, 444 Madison Ave., Suite 2102, New York, N.Y.

Phillips Petroleum Co.: J. W. HALE, Technical Consultant, Bartlesville, Okla.

Pillsbury Co.: C. E. JOYCE, General Claim Manager, 608 Second Ave., S., Minneapolis, Minn.

Procter & Gamble Co.:

J. H. CHALOUH, Associate Director, Product Development Division, M.V.L., Cincinnati, Ohio.

D. R. BYEELY, Assistant Director, Research and Development.

J. C. ERVIN, Product Development Division.

R. L. ALVERSON, Zone Industrial Engineer, Haubert & Nicholson Sts., Baltimore, Md.

Quaker Oats Co.: F. A. DOBBLINS, Quality Control Manager, Merchandise Mart Plaza, Chicago, Ill.

Republic Steel Corp.: D. R. SMITH, Corporation Weighing Supervisor, 410 Oberlin Rd., S.W., Massillon, Ohio.

RICHARD, C. L., Consultant, 200 Olive Ave., Vista, Calif.

Scale Journal Publishing Co.: S. T. PICKELL, Secretary, 176 W. Adams St., Chicago, Ill.

Scale Manufacturers Association, ARTHUR SANDERS, Executive Secretary, One Thomas Circle, Washington, D.C.

Soap and Detergent Association: R. W. PEET, Manager, 295 Madison Ave., New York, N.Y.

Staley, A. E., Manufacturing Co.: D. P. LANGLOIS, Decatur, Ill.

Sun Oil Co.:
 WILLIAM GORDEN, Manager, Plant Operations, 1608 Walnut St., Philadelphia, Pa.
 E. W. HESS, Manager, General Marketing Operations.
 W. A. PIERSON, Special Assistant, Marketing Operations.

Swift & Co.: E. G. SPIKER, 711 14th St., N.W., Washington, D.C.

Texaco Inc.: R. H. TOLSON, Assistant Superintendent, Construction and Equipment Division, 135 E. 42nd St., New York, N.Y.

Thread Institute, Inc.: W. F. OPERER, Executive Director, 15 E. 40th St., New York, N.Y.

Tissue Association, Inc.: C. J. CAREY, Executive Secretary, 122 E. 42nd St., New York, N.Y.

Visking Co., Division of Union Carbide Corp.: W. M. SAWERS, Manager, Special Services, 800 Wyatt Bldg., Washington, D.C.

Western Weighing and Inspection Bureau: C. G. JOHNSON, Supervisor, Weight Agreements and Weighing, Room 460 Union Station, 517 W. Adams St., Chicago, Ill.

Guests

AUSTIN, GEORGE, 980 Whitmore Rd., Detroit, Mich.

BLICKLEY, J. F., 4538 N. Carlisle St., Philadelphia, Pa.

BUND, HENRY, 30 E. 42nd St., New York, N.Y.

CAIRNS, THOMAS, Chief Inspector, Weights and Measures Department, The Corporation of Glasgow, 85 Parnie St., Glasgow, Scotland.

DRIGGS, A. P., 390 Park Ave., New York City, N.Y.

ENGELS, P. W., 1274 Avenue of the Americas, New York, N.Y.

GOODMAN, DOROTHY, 2946 Macomb St., N.W., Washington, D.C.

GORDON, L. J., Director, Weights and Measures Research Center, Denison University, Granville, Ohio.

HERRINGTON, B. L., Cornell University, Stocking Hall, Ithaca, N.Y.

KEYWORTH, P. W., Bareville, Pa.

LINK, H. O., Commonwealth Ave., N. Chicago, Ill.

MACLEAN, R. W., Director, Standards Branch, Department of Trade and Commerce, Ottawa, Can.

MIZUNO, R., Kobe University of Commerce, Kobe, Japan.

TAMANO, MITSUO, Director, National Research Laboratory of Metrology, 3569, 6-Chome, Itsabashi-Machi, Itabashi-Ku, Tokyo, Japan.

TSAI, NIEN-TSU, Senior Specialist, Chinese National Bureau of Standards, 60 1st St., Cheng-Kung Rd., Tainan, Taiwan, Republic of China.

THE NATIONAL BUREAU OF STANDARDS

The scope of activities of the National Bureau of Standards at its major laboratories in Washington, D.C., and Boulder, Colorado, is suggested in the following listing of the divisions and sections engaged in technical work. In general, each section carries out specialized research, development, and engineering in the field indicated by its title. A brief description of the activities, and of the resultant publications, appears on the inside of the back cover.

WASHINGTON, D.C.

Electricity. Resistance and Reactance. Electrochemistry. Electrical Instruments. Magnetic Measurements. Dielectrics. High Voltage.

Metrology. Photometry and Colorimetry. Refractometry. Photographic Research. Length. Engineering Metrology. Mass and Scale. Volumetry and Densimetry.

Heat. Temperature Physics. Heat Measurements. Cryogenic Physics. Equation of State. Statistical Physics.

Radiation Physics. X-ray. Radioactivity. Radiation Theory. High Energy Radiation. Radiological Equipment. Nucleonic Instrumentation. Neutron Physics.

Analytical and Inorganic Chemistry. Pure Substances. Spectrochemistry. Solution Chemistry. Standard Reference Materials. Applied Analytical Research. Crystal Chemistry.

Mechanics. Sound. Pressure and Vacuum. Fluid Mechanics. Engineering Mechanics. Rheology. Combustion Controls.

Polymers. Macromolecules: Synthesis and Structure. Polymer Chemistry. Polymer Physics. Polymer Characterization. Polymer Evaluation and Testing. Applied Polymer Standards and Research. Dental Research.

Metallurgy. Engineering Metallurgy. Microscopy and Diffraction. Metal Reactions. Metal Physics. Electrolysis and Metal Deposition.

Inorganic Solids. Engineering Ceramics. Glass. Solid State Chemistry. Crystal Growth. Physical Properties. Crystallography.

Building Research. Structural Engineering. Fire Research. Mechanical Systems. Organic Building Materials. Codes and Safety Standards. Heat Transfer. Inorganic Building Materials. Metallic Building Materials.

Applied Mathematics. Numerical Analysis. Computation. Statistical Engineering. Mathematical Physics. Operations Research.

Data Processing Systems. Components and Techniques. Computer Technology. Measurements Automation. Engineering Applications. Systems Analysis.

Atomic Physics. Spectroscopy. Infrared Spectroscopy. Far Ultraviolet Physics. Solid State Physics. Electron Physics. Atomic Physics. Plasma Spectroscopy.

Instrumentation. Engineering Electronics. Electron Devices. Electronic Instrumentation. Mechanical Instruments. Basic Instrumentation.

Physical Chemistry. Thermochemistry. Surface Chemistry. Organic Chemistry. Molecular Spectroscopy. Elementary Processes. Mass Spectrometry. Photochemistry and Radiation Chemistry.

Office of Weights and Measures.

BOULDER, COLO.

Cryogenic Engineering Laboratory. Cryogenic Equipment. Cryogenic Processes. Properties of Materials. Cryogenic Technical Services.

CENTRAL RADIO PROPAGATION LABORATORY

Ionosphere Research and Propagation. Low Frequency and Very Low Frequency Research. Ionosphere Research. Prediction Services. Sun-Earth Relationships. Field Engineering. Radio Warning Services. Vertical Soundings Research.

Radio Propagation Engineering. Data Reduction Instrumentation. Radio Noise. Tropospheric Measurements. Tropospheric Analysis. Propagation-Terrain Effects. Radio-Meteorology. Lower Atmosphere Physics.

Radio Systems. Applied Electromagnetic Theory. High Frequency and Very High Frequency Research. Frequency Utilization. Modulation Research. Antenna Research. Radiodetermination.

Upper Atmosphere and Space Physics. Upper Atmosphere and Plasma Physics. High Latitude Ionosphere Physics. Ionosphere and Exosphere Scatter. Airglow and Aurora. Ionospheric Radio Astronomy.

RADIO STANDARDS LABORATORY

Radio Physics. Radio Broadcast Service. Radio and Microwave Materials. Atomic Frequency and Time-Interval Standards. Radio Plasma. Millimeter-Wave Research.

Circuit Standards. High Frequency Electrical Standards. High Frequency Calibration Services. High Frequency Impedance Standards. Microwave Calibration Services. Microwave Circuit Standards. Low Frequency Calibration Services.



THE NATIONAL BUREAU OF STANDARDS

Functions and Activities

The functions of the National Bureau of Standards are set forth in the Act of Congress, March 3, 1901, as amended by Congress in Public Law 619, 1950. These 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 development of devices to serve special needs of the Government; and the development of standard practices, codes, and specifications. 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 166 and 167.

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 Basic Radio Propagation Predictions provides data for determining the best frequencies to use for radio communications throughout the world. There are also five series of nonperiodical publications: Monographs, Applied Mathematics Series, Handbooks, Miscellaneous Publications, and Technical Notes.

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 Documents, Government Printing Office, Washington 25, D.C.



