

Report of the  
Thirty-Seventh National Conference on  
Weights and Measures  
1952



U. S. Department of Commerce

National Bureau of Standards

Miscellaneous Publication 206

## SELECTED WEIGHTS AND MEASURES PUBLICATIONS OF THE NATIONAL BUREAU OF STANDARDS

### NBS HANDBOOK 26      WEIGHTS AND MEASURES ADMINISTRATION

Discussing the broad subject of weights and measures supervision, this handbook gives particular attention to the general aspects of weights and measures administration, mechanical activities of officials, and systems of records. [Appendix include recommendations for standards and equipment for State and local regulatory agencies.] 292 pages. Price \$1.50.

### NBS HANDBOOK 37      TESTING OF WEIGHING EQUIPMENT

As a manual for State and local weights and measures officials, this handbook describes various types of commercial weighing equipment, principles of their operation, and methods for their inspection and testing. 184 pages. Price \$1.25.

### NBS HANDBOOK 44      SPECIFICATIONS, TOLERANCES, AND REGULATIONS FOR COMMERCIAL WEIGHING AND MEASURING DEVICES

This Handbook deals with specifications, tolerances, and regulations for commercial weighing and measuring devices, as adopted by the National Conference on Weights and Measures and recommended by the National Bureau of Standards for State promulgation. [To keep the material up to date, the NBS regularly issues correction sheets, which are available without cost upon application to the NBS.] 144 pages. Price \$1.25.

### NBS HANDBOOK 45      TESTING OF MEASURING EQUIPMENT

A companion volume to Handbook 37, this handbook presents information concerning commercial measures and measuring devices and their inspection and testing. Specific outlines supplement the discussions on testing procedure. 205 pages. Price \$1.25.

### NBS CIRCULAR 501      FEDERAL AND STATE WEIGHTS AND MEASUREMENT LAWS

This publication is a completely indexed compilation of all Federal and State weights and measures laws, through 1949 enactments. [Supplements will be issued periodically, as indicated by subsequent enactments. A pocket is provided inside the back cover for such supplements.] 1,182 pages. Price \$5.75.

### NBS Misc. Pub. 203      INDEX TO THE REPORTS OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES FROM THE FIRST TO THE THIRTY-SIXTH, 1901 TO 1951

The large amount of information on a wide variety of weights and measures subjects, which is embraced within the published reports of the National Conference, is made more valuable by reason of the means provided for locating all material on a specific subject and all material presented by any particular speaker. 41 pages. Price 20¢.

---

Order all publications, with remittance, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.







# Report of the Thirty-Seventh National Conference on Weights and Measures

Attended by Representatives from Various States

Sponsored by the National Bureau of Standards  
Washington, D. C., May 20, 21, 22, and 23, 1952



National Bureau of Standards Miscellaneous Publication 206

Issued March 19, 1953





*Official photograph of delegates and guests attending the Thirty-seventh National Conference on Weights and Measures, assembled at the National Bureau of Standards.*





# CONTENTS

	Page v
ers and Committees.....	
<b>FIRST SESSION—MORNING OF TUESDAY, MAY 20, 1952</b>	
education, by R. W. Searles, Deputy County Sealer, Medina, Ohio.....	1
come to Washington, by Hon. F. Joseph Donohue, President, Board of Commissioners, District of Columbia.....	1
Memorial Service for Departed Members, by R. W. Searles, Deputy County Sealer, Medina, Ohio.....	1
Report of the Secretary of the Conference, by W. S. Bussey.....	1
Address by Dr. A. V. Astin, Director, National Bureau of Standards.....	2
Men Who Make the Conference, by W. E. Sheehy, County Sealer of Weights and Measures, Bridgeport, Conn.....	4
Call of States.....	4
<b>SECOND SESSION—AFTERNOON OF TUESDAY, MAY 20, 1952</b>	
Call of State and Regional Associations.....	4
Labels in Retail Cartons, by C. A. Lyon, Director, Division of Markets and Standards, State of New Hampshire.....	5
Weights, by G. F. Austin, Jr., Deputy Sealer of Weights and Measures, Detroit, Michigan.....	7
Word "Net" be Mandatory in Quantity Statements, by J. F. Blickley, Director, Bureau of Standard Weights and Measures, Commonwealth of Pennsylvania.....	12
Standardization of Food Packages, by I. M. Levy, Sealer of Weights and Measures, Chicago, Illinois.....	14
<b>THIRD SESSION—MORNING OF WEDNESDAY, MAY 21, 1952</b>	
Report of the Committee on Trading by Weight, Presented by J. Fred True, Chairman.....	18
Address by Dr. E. C. Crittenden, Consultant to the Office of the Director, National Bureau of Standards.....	19
in Holding Tanks, by H. J. McDade, Sealer of Weights and Measures, San Diego, California.....	20
Measurement of Petroleum, by E. L. Hoffman, Socony-Vacuum Oil Co., New York, N. Y.....	23
in Weighing, by David Lundeen, State Weighmaster, Track and Hopper Scale Department, State of Minnesota, President National Scale Men's Association.....	30
Lowway Track Scale Testing Program, by J. N. Todd, Superintendent, Scales and Work Equipment, Southern Railway System, Washington, D. C.....	34
<b>FOURTH SESSION—MORNING OF THURSDAY, MAY 22, 1952</b>	
Report of Committee on Education, Presented by Charles Morris Fuller, Chairman.....	39
Report of the Committee on Legislation, Presented by R. E. Meek, Chairman.....	43
Work in the Field, by Alfred Di Piero, Superintendent of Weights and Measures, Camden, N. J.....	45
at Lake City and Ice Cream, by E. C. Westwood, Sealer, Department of Weights and Measures, Salt Lake City, Utah.....	48
Weight Markings of Packages and Cans of Tobacco, by G. H. Leithauser, Senior Assistant Superintendent of Weights and Measures, Baltimore, Maryland.....	51
Use of Peat Moss, by T. A. Carter, Supervisor, Division of Standards, State of Washington.....	54
Washing Cloths, by J. E. Brenton, Chief, Bureau of Weights and Measures, State of California.....	55

FIFTH SESSION—AFTERNOON OF THURSDAY, MAY 22, 1952

Report of the Committee on Methods of Sale of Commodities, Presented  
J. G. Rogers, Chairman  
Training Schools for Weights and Measures Officials and Servicemen.  
W. M. Hoxie, Service Manager, Bennett Pump Division, John W. Co.  
Company, Muskegon, Mich.  
Report of Conference Committee on Nominations, and Election of Officers  
Presented by J. E. Brenton, Chairman  
Belt Conveyor Scales, by R. O. Bradley, Toledo Scale Company, Toledo  
Ohio  
Testing of Vehicle Tank Meters, by W. A. Kerlin, County Sealer of Weights  
and Measures, Oakland, Calif.

SIXTH SESSION—MORNING OF FRIDAY, MAY 23, 1952

Dr. A. V. Astin Presented  
Appointment of Standing Committees  
Report of Committee on Methods of Sale of Commodities (continued), Presented  
by J. G. Rogers, Chairman  
Report of the Committee on Specifications and Tolerances, Presented by  
P. McBride, Chairman  
Remarks of Arthur Sanders  
Report of the Conference Committee on Resolutions, Presented by M.  
Nelson, Chairman  
Report of the National Conference Treasurer, George F. Austin, Jr.  
Ralph W. Smith Made Honorary Life Member  
Meeting of the Executive Committee  
Persons attending Conference

## OFFICERS AND COMMITTEES

### OFFICERS

(Present and serving during the Thirty-seventh National Conference)

#### Presidents :

E. R. FISHER, State Sealer of Weights and Measures, Department of Labor, Providence, R. I.

ERLING HANSEN, Supervisor, State Department of Weights and Measures, Minneapolis, Minn.

R. D. THOMPSON, State Supervisor of Weights and Measures, Division of Markets, Department of Agriculture and Immigration, Richmond, Va.

J. F. TRUE, State Sealer of Weights and Measures, Board of Agriculture, Topeka, Kans.

G. H. LEITHAUSER, Senior Assistant Superintendent of Weights and Measures City of Baltimore, Md.

etary : W. S. BUSSEY, Chief, Office of Weights and Measures, National Bureau of Standards, Washington, D. C.

surer : G. F. AUSTIN, Jr., Deputy Sealer of Weights and Measures, Detroit, Mich.

### EXECUTIVE COMMITTEE

(As elected by the Thirty-seventh National Conference)

G. F. AUSTIN

ERLING HANSEN

R. D. THOMPSON

J. F. TRUE

E. R. GREENE

G. H. LEVY

R. D. NELSON

W. S. BUSSEY

G. F. AUSTIN, JR.

*Ex Officio*

L. MEEK, Director, State Division of Weights and Measures, Indianapolis, Ind.

L. PEIKERT, City Sealer of Weights and Measures, Sheboygan, Wis.

L. O'NEIL, City Sealer of Weights and Measures, Cambridge, Mass.

L. STENDER, Assistant Commissioner, State Department of Agriculture, Columbia, S. C.

G. RICE, State Inspector, Bureau of Weights and Measures, White Plains, N. Y.

E. CRAWFORD, City Inspector of Weights and Measures, Jacksonville, Fla.

C. WESTWOOD, City Sealer of Weights and Measures, Salt Lake City, Utah.

A. BOYLE, Deputy State Sealer, Bureau of Weights and Measures, Augusta, Maine.

E. MAHONEY, State Superintendent of Weights and Measures, College Park, Md.

W. SEARLES, Deputy County Sealer of Weight and Measures, Medina, Ohio.

M. FULLER, County Sealer of Weights and Measures, Los Angeles, Calif.

C. SAMENFINK, City Sealer of Weights and Measures, Rochester, N. Y.

H. ISING, Superintendent of Weights and Measures, City of Louisville, Ky.

M. BOUCHER, Supervisor, Department of Weights, Measures, and Markets, Washington, D. C.

B. DAGGETT, County Inspector of Weights and Measures, North Girard, Pa.

### STANDING COMMITTEES

As constituted at the conclusion of the Thirty-seventh National Conference, the personnel and organization of each of the standing committees of the Conference are as reported below. As reported, the membership of each committee reflects the appointments made by the President of the Conference, changes which have occurred from expiration of term or other cause, and the elections by the general committees of chairmen, and in one case secretary, for the ensuing year. The term of office for each committee member, in years, is shown by the figure in parentheses following each entry.)

#### COMMITTEE ON SPECIFICATIONS AND TOLERANCES

- J. P. McBRIDE, State Director of Standards and Necessaries of Life, Boston, Chairman. (1)  
W. S. BUSSEY, Chief, Office of Weights and Measures, National Bureau of Standards, Washington, D. C., Secretary. (3)  
R. E. MEEK, Director, State Division of Weights and Measures, Indian Ind. (5)  
ROBERT WILLIAMS, County Sealer of Weights and Measures, Mineola, N. Y.  
L. E. WITT, City Sealer of Weights and Measures, Milwaukee, Wis. (2)

#### COMMITTEE ON METHODS OF SALE OF COMMODITIES

- J. G. ROGERS, State Superintendent of Weights and Measures, Trenton, Chairman. (3)  
C. D. BAUCOM, State Superintendent, Weights and Measures Division, R. N. C. (2)  
J. E. BRENTON, Chief, State Bureau of Weights and Measures, Sacramento, (4)  
G. H. LEITHAUSER, Senior Assistant Superintendent of Weights and Measures, City of Baltimore, Md. (5)  
I. M. LEVY, City Sealer of Weights and Measures, Chicago, Ill. (1)

#### COMMITTEE ON LEGISLATION

- M. A. NELSON, Chief, State Bureau of Marketing and Enforcement, La. Mich., Chairman. (5)  
C. A. BAKER, Director, State Bureau of Weights and Measures, Albany, (1)  
R. M. BODENWEISER, County Superintendent of Weights and Measures, Tre N. J. (4)  
V. D. CAMPBELL, Deputy State Sealer, Columbus, Ohio. (2)  
D. M. TURNBULL, Supervisor, Division of Licenses and Standards, Cing Seattle, Wash. (3)

#### COMMITTEE ON WEIGHTS AND MEASURES EDUCATION

- C. M. FULLER, County Sealer of Weights and Measures, Los Angeles, Calif., C man. (3)  
J. F. BLICKLEY, Director, State Bureau of Standard Weights and Measures, risburg, Pa. (5)  
G. E. CARPENTER, Supervisor, State Division of Weights and Measures, Mo lier, Vt. (2)  
H. E. CRAWFORD, City Inspector of Weights and Measures, Jacksonville, Fla.  
J. T. KENNEDY, Director, Department of Weights, Measures, and Markets, V ington, D. C. (1)

#### COMMITTEE ON TRADING BY WEIGHT

- J. F. TRUE, State Sealer, Weights and Measures Division, Topeka, Kans., C man. (2)  
J. J. LEVITT, State Superintendent of Standards, Springfield, Ill. (3)  
A. J. MAYER, State Division of Weights and Measures, Baton Rouge, La. (1)  
J. H. MEEK, Director, State Division of Markets, Richmond, Va. (1)  
J. W. REESE, Supervisor, State Division of Weights and Measures, Des Mo Iowa. (4)

#### COMMITTEES ACTING ONLY DURING THE THIRTY-SEVENTH NATIONAL CONFERENCE

- Committee on Nominations:* J. E. BRENTON of California, Chairman; C. A. B of New York, J. F. BLICKLEY of Pennsylvania, J. ROY JONES of South Caro J. J. LEVITT of Illinois, C. C. MORGAN of Gary, Indiana, R. J. ZIERTON, of Rac Wisconsin.  
*Committee on Resolutions:* M. A. NELSON of Michigan, Chairman, A. C. BEC of Camden, New Jersey, W. L. DANIELS of Seattle, Washington, J. E. MAH of Maryland, M. G. RICE of New York, LOUIS SNOW of Bridgeport, Connect  
*Ladies' Committee:* Mrs. C. M. FULLER, Chairman, Mrs. J. M. DIETZ, Mrs. R MEEK, Mrs. J. T. KENNEDY, Mrs. W. S. BUSSEY, Mrs. M. W. JENSEN.  
*In Charge of Registrations:* Mrs. F. C. BELL, Mrs. K. M. SCHWARZ.  
*In Charge of Badges:* H. L. BADGER.



# REPORT OF THE THIRTY-SEVENTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

SPONSORED BY THE NATIONAL BUREAU OF STANDARDS, AND HELD  
AT THE WARDMAN PARK HOTEL, WASHINGTON, D. C., MAY 20, 21, 22,  
23, 1952

---

## THIRTY-SEVENTH SESSION—MORNING OF TUESDAY, MAY 20, 1952

(R. D. Thompson, Vice President, presiding)

The invocation was delivered by the Conference Chaplain, R. W. [illegible], Deputy County Sealer of Weights and Measures, Medina County, Ohio. Following the invocation, the Honorable F. Joseph [illegible], President, Board of Commissioners, District of Columbia, addressed the delegates a welcome to the City of Washington. Mr. [illegible] conducted an appropriate memorial service for departed members.

### REPORT OF THE SECRETARY OF THE CONFERENCE, W. S. BUSSEY

Secretary of the Conference, I present officially the resignation of Edward U. Condon from the office of President of the National Conference on Weights and Measures, effective as of the date of his resignation as Director of the National Bureau of Standards, September 30, 1951. Dr. Condon's letter of resignation follows:

National Conference on Weights and Measures

W. S. Bussey, Secretary

National Bureau of Standards

Washington 25, D. C.

In accordance with my resignation as Director of the National Bureau of Standards, effective on the thirtieth day of September, I consider it proper for me to resign as President of the National Conference on Weights and Measures, and to tender my resignation to you for transmittal at the proper time to the Conference.

The work of the Conference is of great importance to the successful operations of commerce and industry throughout the Nation. I know that the Conference will continue its successful endeavors in this field in the years to come and that its endeavors will be marked by the same spirit of cooperation which has been present in the years of my association with the Conference.

With considerable regret, therefore, that I now sever my official connection with the State and local weight and measures officials in the United States, I continue to be interested in the advances which such officials are making throughout the Nation in the field of weights and measures.

Sincerely,

(Signed) E. U. CONDON, *Director*.

The National Conference on Weights and Measures has continued its function effectively throughout the year, especially through the various standing committees.

The nature of the National Conference is such that its interim activities must be carried on by the committees and officers. The full participation of each committee member and the cooperation of all mem-

bers of the Conference with the committees are essential to progress. Since practically all Conference business must be conducted by you, you can help immeasurably if you will reply to all correspondence promptly.

The Conference is the "hub of the wheel" of uniform and progressive weights and measures administration in the United States. It is our duty to keep it well oiled with our enthusiastic cooperation and support in order that this wheel may keep rolling at the highest possible rate of speed and efficiency.

This is your Conference. It was established for the benefit of the people of the United States. The true value of the Conference will be determined by the contributions that each of us, as individuals, make to its various activities.

(Mr. Bussey continued his report by describing the procedures that would be followed in the conduct of the Conference. The method of distribution of papers and reports during the Conference was explained. The report ended with a description of the social functions that had been arranged.)

#### **ADDRESS BY DR. A. V. ASTIN, DIRECTOR, NATIONAL BUREAU OF STANDARDS**

(Dr. A. V. Astin addressed the Conference concerning the part the National Bureau of Standards is playing in the national defense program and told of the responsibilities that had increased tremendously during the past few years. He concluded his remarks with the following summary of the development of weights and measures throughout the Nation during the past year.)

I would like to report on the part of the Bureau with which we are most closely connected—its Office of Weights and Measures. Under the able leadership of W. S. Bussey, we have attempted to fulfill numerous requests for assistance and advice from the members of this Conference. Our primary purpose in this area is in fulfillment of the basic activity authorized by the Congress to cooperate with the States to secure uniformity in weights and measures and in methods of inspection.

Since the 36th National Conference, the staff of the Office of Weights and Measures has been increased by two members. The employment of M. W. Jensen as Assistant Chief of the Office was announced by the Director last year, and Mr. Jensen started work at the Bureau on July 2, 1951.

We have also succeeded in procuring the services of C. H. Oakley, formerly Superintendent, Division of Weights and Measures, State of Wyoming. Mr. Oakley, who started his Federal employment on January 7 of this year, underwent training at the National Bureau of Standards Master Scale Depot at Clearing, Illinois, at the Bureau in Washington, and in the field.

The employment of Mr. Oakley makes possible the culmination of our plan to have in operation two railway track scale testing units. He has been assigned to one of our two units, and the other is being operated by D. V. Smith, who has been with the Bureau for more than 27 years. Between scheduled tests, both of these men are making their time available to State and local weights and measures officials. It is felt that efficient utilization of their time results in greater uniformity and better application of recommended test procedures.

Improvement in the efficiency and coverage of weights and measures enforcement throughout the Nation has continued during the past year. Many jurisdictions have purchased equipment for test-

sale meters. Additional large-capacity scale testing units have been placed in service. Many States, counties, and cities have employed additional personnel.

In some States, legislative improvements have been made, but no action has been culminated. We still have five States with no comprehensive weights and measures control at the State level. There is only one State, however, which has no weights and measures control at any level.

The Office of Weights and Measures of the National Bureau of Standards has had a representative present and participating in every national conference of weights and measures officials during the year—State and regional. We feel that through these meetings we are able to keep in touch with activities, progress, and requirements of State and local jurisdictions.

Staff members of the Office of Weights and Measures have made a number of official visitations to State and local offices, and have endeavored to furnish counsel, information, and advice whenever it has been requested.

Three publications of importance to all weights and measures officials and to allied industries have been issued by the Bureau since the 36th National Conference. NBS Handbook 45, Testing of Measuring Equipment, the fourth and final of the series of handbooks for guidance, became available about August 1, 1951. This book should be, and we sincerely hope soon will be, read and used by all the weights and measures officials and related experts in business and industry.

The Report of the 36th National Conference became available about the middle of January 1952 as NBS Miscellaneous Publication 202. If you who registered at the 36th Conference have been sent copies, this is your report.

National Bureau of Standards Circular 501, Federal and State Weights and Measures Laws, was issued during March of this year. It has been appraised as a most valuable edition for all weights and measures offices, manufacturers of weighing and measuring equipment, producers and processors of commodities. This compilation includes enactments through 1949. Our plan is to issue supplements at approximately 5-year intervals in order to include additional up-to-date legislative actions.

An index to the Reports of all National Conferences, from the first through thirty-sixth, has been issued and is now available from the U. S. Government Printing Office. Its designation is NBS Miscellaneous Publication 203.

Mrs. K. M. Schwarz, our Attorney-Editor, has been working throughout the past year on the Weights and Measures Case Reference Book. We hope to place this material in the hands of the Government Printing Office before the end of this summer.

Our plans for future publications include circulars on specific subjects, as the need is indicated. NBS Circular 503, Statutory Net Weight Marking Requirements for Packages (Undefined) and Packages of Foods, Drugs, and Cosmetics, is an example of this type of publication.

The activities of the States toward the adoption of the specifications, tolerances, and regulations for commercial weighing and measuring devices, as contained in NBS Handbook 44, amended, has been



gratifying. There are now 21 States that have officially promulgated these provisions, and many others which plan to proceed with adoption. In a few States legislative action is required. Most of the States are applying the code in their official inspections.

The States which have officially accepted the H44 codes with substantial change are Alabama, Florida, Georgia, Indiana, Kansas, Louisiana, Maine, Massachusetts, Michigan, Montana, Nevada, New Jersey, North Dakota, Oklahoma, Oregon, Pennsylvania, Texas, Vermont, Virginia, West Virginia, and Wyoming.

In addition, the following States have taken initial steps and are now in the process of officially adopting the codes: Illinois, Maryland, New Hampshire, Tennessee, and Wisconsin.

In closing, I would like to extend to each of you an invitation to call freely on the National Bureau of Standards for assistance in the solution of your technical problems. We believe that the work you are doing is of fundamental importance to the stability and strength of the Nation's commerce. Therefore, within the limits of our finite resources, we are at your service. Finally, please accept my wishes for both a profitable and an enjoyable series of discussions during this 37th National Conference on Weights and Measures.

(The chairman appointed the following committees to serve during the National Conference: *Nominating Committee*, J. E. Brenton of California as Chairman; C. A. Baker of New York; J. F. Blickley of Pennsylvania; J. Jones of South Carolina; J. J. Levitt of Illinois; C. C. Morgan of Gary, Indiana; and R. J. Zierten of Racine, Wis. *Resolutions Committee*, M. A. Nelson of Michigan as Chairman; T. C. Beck of Oklahoma; A. C. Becker of Camden, New Jersey; Walter L. Daniels of Seattle, Wash.; J. E. Mahoney of Maryland; M. G. Rice of New York; and Louis Snow of Bridgeport, Conn.)

## THE MEN WHO MAKE THE CONFERENCE

(By W. E. SHEEHY, *County Sealer of Weights and Measures, Bridgeport, Conn.*)

(Mr. Sheehy spoke extemporaneously and in a humorous vein. His remarks covered many of the more important aspects of weights and measures administration and enforcement, and was both interesting and inspirational.)

## ROLL CALL OF STATES

The Chairman called the roll of States. Delegates from 35 States and the District of Columbia responded. All delegates and ladies were introduced individually.

(The Conference was recessed until 2 p. m.)

## SECOND SESSION—AFTERNOON OF TUESDAY, MAY 20, 1925

(G. H. Leithauser, Vice President, presiding)

## ROLL CALL OF STATE AND REGIONAL WEIGHTS AND MEASURES ASSOCIATIONS

The Chairman called the roll of State and Regional Associations of Weights and Measures Officials. Representatives of all 19 Associations on record responded.

(Written reports from several States and Associations were mimeographed and distributed at the Conference.)

## TOMATOES IN RETAIL CARTONS

A. LYON, *Director, Division of Markets and Standards, State of New Hampshire*

The prevailing practice whereby tomatoes are packaged in a container faced with cellophane, constitutes packaging in a closed package. New Hampshire closed package law states: "It shall be unlawful for any person to sell or offer for sale any commodity in package form if the contents thereof is expressed in terms of net weight, measure, or numerical count in a conspicuous place on the outside of the package, in plain printed statement in large type."

When this type of package and method of marketing tomatoes were developed, quantity marking was in terms of weight. This weight was usually 15 to 16 ounces to the carton. It has been a growing practice in recent years to mark by numerical count, fours, fives, or sixes. Inspection experience in New Hampshire, indicates that this method of marking has deteriorated to the extent that the actual count per package varies from the expressed count appearing on the package. In addition, the size of the tomatoes in the pack varies, causing variance of weight.

Consumer protection and individual State enforcement can best be maintained by uniform package marking requirements in all States. Achievement of such uniform legislation should be encouraged and fostered by this National Conference with the cooperation of the Federal Food and Drug Administration.

We have found packages containing five tomatoes marked four, packages of four tomatoes marked five, and packages of six tomatoes marked four or five. The net weights ranged from 11 to 15 ounces. Retailer and consumer are confused by these methods of package markings.

This confusion in merchandising and marking packages of tomatoes has been the concern of weights and measures officials in Massachusetts and New Hampshire for many months. The legitimate packers in the area are likewise aroused and are lending support to the requirement of a weight statement. A few States, including Texas, have required for several years that packaged tomatoes be marked with statement of weight.

On March 10, 1952, the following regulation was issued by the New Hampshire Bureau of Weights and Measures: "... that consumer protection will best be accomplished by expressing quantity of tomatoes in package form in terms of weight." The effective date of this regulation shall be September 1, 1952.

No attempt is being made to standardize on any package. Reports received from repackers indicate standardization on 12- and 14-ounce packages. Possibly a 16-ounce package will be used.

The Massachusetts Department of Weights and Measures has issued a similar ruling to become effective on September 1, 1952.

The problem of more adequate and uniform control over the sale of tomatoes in retail cartons should be the concern of the National Conference on Weights and Measures. The trade volume of this type of package is steadily increasing and is Nation-wide in scope.

R. KENNEDY: The proposed Model Regulation on Package Marking Requirements provides for the marking of packages by count in certain instances. In the case of tomatoes, the consumer can see the

merchandise she is buying. Do you not think a statement of number count is sufficient?

MR. THOMPSON: Mr. Lyon, I would like to ask if you had no trouble in getting the cooperation of your Attorney General in promulgation of this regulation.

MR. LYON: We encountered no difficulty. The attitude is that count, as it refers to tomatoes in the package, does not give the necessary information to the consumer. The consumer cannot make a comparison of value without knowing the weight of the product.

MR. MAHONEY: I carried on a limited informal survey on this. I found not one housewife who was interested in the weight of the package of tomatoes. They were interested in quality, condition, uniformity of size.

MR. McBRIDE: We accept too readily, I think, the expression of quantity in terms of count. If we require that the expression of quantity be in terms of weight, we can offer to the consumer the utmost in informative declarations.

We have made surveys, and, as a result of them and the experience which we have had, it seems to us that the best way to protect the consumer is to require the declaration of quantity in terms of weight.

MR. MUNDY: What is the attitude of the Federal Food and Drug Administration as to the method of marketing tomatoes in cartons?

MR. ROWE: I have been listening with interest to this discussion. I am sure you will appreciate that it is a matter for debate. There are two sides to the question. The Federal Food and Drug Administration has not insisted upon a net-weight declaration. We have, however, that there should be a survey to find out what the consumer really thinks about the matter. The Federal law stipulates that the statement of contents, which may be in terms of weight, measure or numerical count, shall be in the term that is used most generally by the consumer and that gives an accurate declaration of the quantity of content. We have been unable to determine just what is an accurate determination in this case.

At the present time, while we have not insisted upon the net-weight declaration, we have given consideration to it and we are open-minded about it. We have hoped to conduct a survey, but this has not been done to date.

MR. McBRIDE: Has the Federal department indicated any trend as to what their thinking might be? This is a problem of long standing.

MR. ROWE: The Food and Drug Administration has not as yet taken an official position. I do not think that should deter the State from going ahead with this matter.

MR. MEEK: In Indiana we require cartons of tomatoes to be labeled in terms of net weight. We enforce that requirement under the Food, Drug, and Cosmetic Act, which, in Indiana, is exactly the same as the Federal Act. Both the Food and Drug Division and the Weights and Measures Division are in the Indiana State Board of Health. We have, in company with others of the State Board, talked to Mr. Quinn and others of the Federal Food and Drug Administration. We have always had the impression that they look with favor upon the labeling of cartons of tomatoes in terms of net weight. We have interpreted the Food and Drug Law of Indiana as requiring the labeling in terms of net weight, and we are receiving from 85 to 90 percent compliance.



think it is a reasonable requirement, and I think it helps to protect the public. I would like to see this Conference go on record as favoring the sale of this commodity by weight.

MR. GREENE: We directed a letter to W. A. Queen, Food and Drug Administration, April 15, and we received an answer on April 23, which referred to a letter dated January 14, 1948. I will read part of it as I think it is of interest to this Conference.

This Agency is anxious to proceed promptly against all practices which it regards as a violation of the law. Unfortunately its ability to do so is restricted, for it has limited facilities.

First, attention must, of course, be given to such abuses as the distribution of impure matter, etc.

Before this Agency brings any action against interstate shipments of packaged tomatoes, we would want to be fortified with additional information as to what constitutes accurate information as to quantity. This would necessitate a consumer survey.

In view of our inability to divert action to the packaged tomato industry at this time and since consumers do not have the opportunity to see the size and quality of such tomatoes, it is not our intention to institute regulatory action at this time against such packaged tomatoes shipped by this firm solely for failure to bear a net-weight statement on the package. It is our purpose to make such a consumer survey just as soon as opportunity permits and appropriate announcement of our view on the labeling will be made.

Additional comment on the subject was added by Messrs. Fisher, Crawford, Mullen, Goode, Ising, Rafael, and Carey.)

The matter of tomatoes in paper cartons is included in the Report of the Conference Committee on Methods of Sale of Commodities. Additional discussion will take place after the presentation of this item by the Committee Chairman, beginning on page 61 of this Report.)

## FLOUR WEIGHTS

By G. F. AUSTIN, JR.,

*Deputy Sealer of Weights and Measures, Detroit, Michigan*

We have before us, at this time, the discussion of flour weights. As you know, this has been a very controversial subject for a long time, and, more especially of late, it has come to be a matter which has taken on a more serious aspect. The present rise of interest in this subject, therefore, is not one based on a sudden impulse, but rather the climax of a long siege of restless dissatisfaction with a seemingly unwarranted situation.

With the passing of time, the public has become more and more enlightened and measure conscious, departments of weights and measures have become more numerous, and, with all of the facilities available today to better acquaint weights and measures officials with their responsibilities, together with the excellent on-the-job training programs which abound, a more competent and thorough administration of weights and measures affairs has come into being throughout the country. Finally, and as a result, matters which have gone more or less unattended heretofore are now coming into the spotlight, so to speak.

In dealing with the subject of flour weights, it is imperative that we give due credence to the problems of all parties concerned, the consumer, the retail store, the jobber, the flour manufacturer, and the weights and measures official. We should enter this discussion with an open mind, free from prejudice, knowing well that it is a problem in which there is little hope of attaining a panacea; therefore, any

conclusion arrived at here will of necessity be the result of a compromise based on logical and sound reasoning.

Flour is an hygroscopic substance, and, as a result, it contains varying amounts of moisture, depending upon relative humidity, temperature, and length of time it is exposed. As a result of this character of flour, a particular sack of flour will vary in weight from time to time, depending upon the relative humidities and temperature which it has been exposed, such changes occurring as a result of sorption of moisture by the flour or evaporation of moisture in flour. The hygroscopic character of flour is a well-recognized fact; however, for the purpose of this discussion, it is well to keep in mind that the climatic condition to which flour is normally exposed during its period of transportation and delivery to the ultimate consumer, is such as to cause a sharp loss in weight due to the evaporation of moisture.

This being the case, it would seem only logical that some transporting and merchandising controls should be set up by properly constituted authority to assure the presence of "good distribution practice" in the handling of this commodity. This has been done by the Federal Food Security Agency (Federal Food, Drug, and Cosmetic Act of June 1938, as amended, 21 U. S. C. A.—301 et seq.) for the purpose of interstate commerce, which act reads in part as follows:

(k) Where the statement does not express the minimum quantity:

(1) Variations from the stated weight or measure shall be permitted, caused by ordinary and customary exposure, after the food is introduced into interstate commerce, to conditions which normally occur in good distribution practice and which unavoidably result in change of weight or measure.

Some State and local regulations, together with the Conference Committee on Legislation regulation as proposed in their tentative report, carry similar provisions to control "good distribution practice" within their respective jurisdiction. The existence of these State and local regulations where they do exist, and if enforced, would control the subject problem fairly well insofar as the jobber and the retailer are concerned. However, there exists a basic problem involving the flour manufacturer against which these regulations are ineffective and which is really the prime concern of the moment. This basic problem is that of finding some ways or means to encourage the flour manufacturer to overpack a reasonable amount to take care of shrinkage which occurs quite immediately after the weighing operation. Knowing well the common tendency for flour to lose moisture rather than to absorb the same, in the normal course of distribution it would seem that the milling industry has a very definite responsibility in this matter and should take such steps as are necessary to assure correct weights being maintained until, at least, the sale and delivery have been completed at the initial destination.

In the City of Detroit, we have made several flour surveys over the past few years, and, as an apparent result of this sustained vigilance together with a little court action, we have improved the flour-weight situation considerably. However, our last major survey, which was completed about 6 months ago, revealed some interesting information which I will discuss briefly at this time.

*At Warehouse Level.* The flour reweighed, had been in transit and storage for a period of from three to four days. We examined various brands, we reweighed 895 twenty-five-pound sacks, and



an average minus error of 2.3 ounces (approximately one-half percent).

*Retail Level.* The flour reweighed had been in stock for a period from 3 to 4 weeks. We examined 11 various brands, we reweighed twenty-five-pound sacks, and we found an average minus error of 2.3 ounces (approximately 1 percent).

One of the important bits of information which highlighted this was that two of the leading national brands which constituted one-third of the volume checked, had contributed most to the average minus error. Had it not been for the lesser known brands bringing an overweight average, the average minus error would have been considerably greater. In light of the foregoing information, it is quite reasonable to presume that we, in Detroit, have our sights set on the next flour weight targets.

Before concluding my introduction of the subject "FLOUR SHORTS," I shall quote from the report of the Committee on Methods of Sale of Commodities, 31st National Conference on Weights and Measures. This report can be found in NBS Miscellaneous Publication M170 (1941). It reads as follows:

... Tolerances should be reasonable and should allow for possible variations in weight or measure due to atmospheric or other conditions. The most serious question for our consideration was the establishment of uniformity in the proper allowance for shrinkages. It is the consensus of opinion of this committee that, for the purpose of determining the actual weight or measure of commodities, tolerance shall mean a permitted variation from the marked or indicated net content of a commodity. Such variations shall be as often above as below. Commodities which show a normal shrinkage should be so overpacked as to assure the housewife of receipt of the exact amount specified on the label at the time of sale to the consumer.

A uniform shortage of all packages of one commodity sold by the same manufacturer, though within the tolerance, should not be permitted . . . .

Mr. RHEIN: Last year we reweighed over 5,000 bags of flour, of which 40 percent were short weight. We met with 14 representatives of the milling industry to discuss the problem. Their claim that the moisture content had dropped from 14½ percent down to 8 or 9 percent was refuted by the records of laboratory analysis by one of the chain-store operators who had run samples. These records indicated that in no case did the moisture content drop more than 1 percent.

We instituted, for a short time, a tolerance based upon the claims of the millers, and reweighed an additional 3,000 packages. Allowing for the tolerance they requested, we still found 7 percent of the samples short of declared weight.

Hereafter we allowed no tolerance. From that time on, we have had no short-weight flour in Cincinnati. Flour weights are being controlled by the millers, who weigh a carload when it leaves the mill. We weigh it again on a track scale in Cincinnati. They then open the car and weigh individual packages.

During the past year we have found not one bag of flour short in weight.

Mr. KENNEDY: I have been informed that, when flour is packed for export, it is packed 99½ pounds in a 100-pound sack. I presume it is to allow for a moisture increase during transit across the ocean. I would like to know if this is also the practice when flour is being shipped in the United States.

MR. AUSTIN: I have found nothing that would bear out that contention. We have only one mill in Detroit over which we can make observations.

I would like to suggest that the weights and measures officials in jurisdictions where flour mills are in operation maintain a close supervision over the flour weights at the mills.

MR. KENNEDY: Mr. Austin, do you feel that some allowance should be made for shrinkage?

MR. AUSTIN: I do not think there should be any average allowance. I feel that the average net weight should be there. For an isolated bag or two, I think that there should be a 1 percent tolerance. That is the limit of shortage or overage allowed on any individual package. The average net weight must be correct.

MR. FAKLER: I am Vice President of the Millers National Federation, which is the national trade association of the flour milling industry.

We regard the problem of flour weights as a very serious one. We regret shortages as much as you do. Our prime obligation is to produce a product of quality, acceptable to the consumer, and to reach the consumer in the proper quantity. We also feel that we have an obligation to comply with the laws and regulations. We feel that those laws and the regulations must, of necessity, be reasonable, and we believe that the courts so hold.

In answer to Mr. Kennedy's question, I believe there is a practicality in export of labeling gross weight. Therefore, the actual content of flour will be less than the amount stated on the package. That is permissible and has long been the practice in export.

We are anxious to consider with you a proper solution of this problem, and, if it is agreeable to this organization, it would be more than agreeable to us to appoint a mutual committee representing your organization and the milling industry to work together to find a solution.

MR. O. W. GALLAWAY: There are several factors which must be taken into consideration regarding the variations in weights. Temperature and relative humidity is the big factor, since flour will absorb and lose moisture. In a survey in the stores in 14 States, we found that the relative humidity throughout the year will average about 48 percent.

If a store has a relative humidity of 36 percent and a temperature of 71° F, a 5-pound sack of flour, which has a moisture content of 12 percent to start with, will lose 2.1 ounces, or 3.25 percent.

In another store, with an average relative humidity of 45 percent, the 5-pound sack of flour will lose only half as much weight. Leaving it there for 7 days, it will lose 1.94 percent of its weight.

Those are about the average relative humidities in grocery stores throughout the 14 States in which the tests were made.

Flour in transit by carload will also lose weight. In a box car the top sacks will lose weight, while the sacks on the floor will weigh the same as they did when packed.

In the milling of flour, a constant moisture content is absolutely necessary. If it is too dry, the particles of bran will break off and go into the flour. If it is too moist, the flour gums up and cannot be sieved. So flour, at the time of manufacture, is different from any other commodity. It must, from a milling standpoint, be one consistent moisture and temperature at all times.

the problem is a real one, since flour is so affected by the surrounding humidity. I might give an illustration. In one large store they had all flour weighing short—very much short. We refused to take the flour back, and we suggested that they place the flour in a back room. After it had lain in the back room for a week, every sack was the weight.

At what point would you say it was proper to weigh this flour? In the State of California, sacks of flour were weighed each week for 52 weeks. During those 52 weeks, at no time did the sack weigh the same in two successive weeks. Some weeks the weight would be up, some down.

We maintain that the only place to control the weight of flour is at the mill. All mills are controlled and regulated by the States, both as to packing and as to weights. Further, the transportation agencies come in and weigh the flour from two to three times each year. They do it to get an average of what each sack will weigh. That is how freight charges are arrived at.

We feel that the only logical place to weigh flour is at the mill, or when it arrives at destination.

MR. MCBRIDE: What is the moisture content of the product at the mill?

MR. GALLAWAY: It runs around 13½ to 14 percent.

MR. MCBRIDE: Is that true of all mills?

MR. GALLAWAY: Yes, otherwise the flour cannot be milled.

MR. MCBRIDE: Is there a constant temperature at which you pack?

MR. GALLAWAY: Usually at the mill the flour is coming out at 92° F.

MR. MCBRIDE: If we could simulate mill conditions as to relative humidity and temperature, we could probably arrive at the same weight.

MR. GALLAWAY: You would come back to the same weight as when the flour was packed.

MR. SCHUSTER: Our city (Buffalo, N. Y.) has in recent years passed Minneapolis as a flour center. We do weigh flour at the mill, and so in the field. While the flour weights do vary in the field, the mill weights are pretty fair. They have their scales tested periodically, possibly every 6 weeks.

MR. ACKERMAN: Probably five or six times a year we go to the mills in our district and check all sizes of packages. In the last 5 years we have had nothing but OK's for the milling companies.

MR. AUSTIN: Could we have a comment from the industry regarding what we know as the heart of the problem? That is, an overpack at the mill to take care of the normal shrinkage in the early stages of transportation and delivery.

MR. FAKLER: That is a problem that has been given very serious consideration by the industry. It involves, however, a number of problems. First, there is the economic problem. An overpack does increase the cost, and it will increase the cost to the consumer. There is also a problem in connection with transportation. An overpack might solve the shortages in a short distance or a short time, but the judgment of the industry is that it does not solve the problem permanently.

CHAIRMAN LEITHAUSER: I would like to suggest that our incoming President consider the suggestion of the industry and that he designate the proper committee to work with the milling industry.



## SHOULD WORD "NET" BE MANDATORY IN QUANTITY STATEMENTS

BY J. F. BLICKLEY, *Director, Bureau of Standard Weights and Measures, Commonwealth of Pennsylvania*

Since our last Conference, the question as to whether or not the word "net" be included in all quantity statements on commodities in package form has been brought to the attention of some weights and measures officials for an official ruling. In Pennsylvania I have been requested on many occasions to rule on this subject; my decision has always been that the word "net" must be part of the quantity statement. Many other State officials have the same opinion and have ruled in the same manner and have insisted that the word be part of the quantity statement.

Unfortunately, some few manufacturers and processors of commodities take exception to these rulings and insist that the laws are complied with when the quantity is declared. If the language of Section 22 of the Model Law, as revised and recommended by the 36th National Conference on Weights and Measures in 1951, were part of a State law, there would be no further need for discussing this subject for commodities sold on a weight basis; this section specifically defines the word "weight," and I quote Section 22 of the Model Law:

That the word "weight" as used in the Act in connection with any commodity shall mean net weight. Whenever any commodity is sold on the basis of weight, the net weight of the commodity shall be employed, and all contracts concerning commodities shall be so construed.

This removes all doubt as to the actual meaning of the word "weight" if the word "net" were not included in the quantity statement.

Section 19 of the Model Law is also very specific in stating that  
"\* \* \* any commodity in package form shall bear on the outside of the package a definite, plain, and conspicuous declaration of (1) the net quantity of the contents in terms of weight, measure, or count \* \* \*."

Many State laws were on the statute books before the Model Law was revised and recommended to the various States for adoption. In States where the provisions of the law are not as specific as the Model Law, it may be necessary to seek clarification by legislation, especially where decisions of the proper authority are disputed or ignored.

With the thought in mind of adding to the clarification of the subject, permit me to cite my experience.

The decision that the word "net" must be used in quantity statements was disputed by some manufacturers. In order to settle the dispute I sought the advice of our Department of Justice and requested a formal opinion as to whether Section 7 of our Commodity Law made it mandatory to use the word "net" with quantity statements. The section of the law reads as follows:

No person shall distribute or sell or have in his possession with intent to distribute or sell any commodity in package form, unless the net quantity of the contents shall be plainly and conspicuously marked on the outside of the package in terms of weight, measure or numerical count.

(Word for word, it is not exactly the same as the Model Law; however, the meaning is exactly the same.)

That a careful study was made and extreme caution used in deliberations before opinion was rendered is manifested by the citations of various court decisions in the United States. The opinion cites a case from the State of Indiana in 1890, one from the State of Washington in 1906, one from the State of California in 1942, and another from

State of Washington in 1913 which I think is worth mentioning part of this subject to justify our decisions.

A manufacturer of a commodity, who was prosecuted under an ordinance requiring the net weight of the contents to be stamped on containers, made the defense that he had complied sufficiently with the ordinance by stamping the weight of the contents when packed.

The Court in the City of Seattle, Washington, held as follows:

\* \* \* Many other like rulings might be cited to the effect that what the law will imply as a necessary incident is as much within a legislative enactment, whether state or municipal, as though specifically set forth in terms. And it is not a departure from such a rule to say that a requirement to stamp the net weight on a container is implied from the power to regulate weights. It is a regulation and one of the most effective in so regulating weights and measures as to reduce the opportunities for fraud and deception to the consumer to a minimum.

\* \* \* It is not unreasonable to require that the packer and manufacturer shall ascertain this loss by evaporation as he is best in position to do, and overcome the loss by increasing the size of the package or the weight of the commodity packed therein, or withhold his goods from the market until it is possible to ascertain the true net weight. Whatever may be the necessary course to adopt to enable the container to correctly indicate the weight of the commodity it contains, it is not unreasonable to place that burden upon the one who puts the article before the public as a sale commodity, and compel him, if he wishes to retain his trade, to so pack his commodities that the consumer may know the true quantity of the thing he buys, and thus protect himself in paying the value of the thing he buys.

The opinion also cites the definition of the words "Net Weight" as described in *Black's Law Dictionary De Luxe*, 3d edition 1940, which is as follows:

*Net Weight.* The weight of an article or collection of articles, after deducting from the gross weight the weight of the boxes, coverings, casks, etc., containing the same. The weight of an animal dressed for sale, after rejecting hide, offal, etc.

The opinion as rendered by the Pennsylvania Attorney General reads as follows:

If the word "net" is omitted from the description of the quantity of a commodity enclosed in a container, confusion would arise in the mind of the buyer as to the actual volume or weight of the commodity in the package, and give rise to possibilities for fraud.

The statute directs in no uncertain terms that the net quantity of the contents is marked on the outside of the package, and it follows to mark the package as to the quantity of the commodity contained therein, without including the word "net" would amount to a failure to comply with the mandatory direction of the statute.

It is our opinion, and you are, therefore, accordingly advised that the word "net" must be included in all quantity declarations required under Section 7 of the Commodity Law.

It has always been my personal opinion that when the words "net contents" or "net weight" are used in the law, it was the purpose and intent of the law to use the word "net" in conjunction with the declaration; this opinion was sustained by the ruling of the Attorney General of Pennsylvania and further resolved by judicial determination.

Weights and measures officials have always construed the quantity statement to represent the net contents of the package, regardless if the word "net" was included in the statement or not.

It is very apparent that, at the present time in a few cases, statements that do not include the word "net" are being purposely misconstrued as a method of evading the intent of the statute.

Wherever laws are worded properly, it may not be essential to include the word "net"; however, it certainly can do no harm if it is included in the statement. If quantity statements are misconstrued for the reason that the existing statute of the jurisdiction is not specific, weights and measures officials who have been delegated with responsibility of consumer protection should secure clarification.

As this has now entered the field of controversy, whenever statutes are being amended or rewritten, it may be well for all weights and measures officials to include a change in their statute, making the use of the word "net" compulsory in all quantity statements. It certainly will not impose a hardship on any industry. It surely will relieve of another problem and will enable us to devote our time to other problems that are forever confronting us.

MR. KENNEDY: Would it not be well to amend the Model State Law on Weights and Measures, by moving the word "net" in Section 10 so that it would read, "Any commodity in package form shall bear on the outside a definite declaration of the quantity of contents in terms of net weight."

MR. BLICKLEY: That is a good suggestion for the Legislative Committee.

## STANDARDIZATION OF FOOD PACKAGES

BY I. M. LEVY, *Sealer of Weights and Measures, Chicago, Illinois*

Standardization of weights for prepackaged foods is not a new subject. It has held the serious attention of weights and measures officials for many years; and, while no over-all State or National law has been enacted, it can be said that progress has been made in the general direction of standardization—notably, State and local laws, laws pertaining to milk containers, and those which regulate the size of berries and small fruit containers. But we are far short of our ultimate goal. Modern distribution methods tend more and more toward prepackaging. The old cracker barrel has long lost its picturesque place in the grocery store, and in its stead are displays of brightly colored cartons of crackers and cookies. Cereals, likewise, have come out of their bins and are sold in cardboard and paper containers, with the weights printed on each, but what a variety of weights—such as 7½ ounces, 7⅜ ounces, 3⅜ ounces! The same could be said for a long list of other commodities.

Let us, for the moment, consider ordinary uncooked grain rice. In one store, I found the following sized packages: 1 pound 15 ounces, 14 ounces, and 5 ounces. Another example, peanut butter, a processed item, the packaged weight of which is completely under the control of the packer. Again, what did I find in the supermarkets—the following glass containers: 15 ounces, 14 ounces, 13 ounces, 12 ounces, 11 ounces, 9 ounces, 8 ounces, 5 ounces; and in one store, a 5½-ounce jar. All of these brands are well-known, nationally advertised products.

At this point, I wish to state briefly the case for standardizing weights of prepackaged foods. It is my belief that it would be in the public interest if prepackaged food products were sold in standard units of weights and that the sale of the same prepackaged commodities would be prohibited were they not of the weights prescribed by law. By the public interest, I mean it in an all-embracing sense—the processor, the packer, the wholesaler, and the retailer, as well



consumer, would be the beneficiaries of a fair, equitable, and well-  
ned law. The free flow of commodities from and into all sections  
our country necessitate that the laws and regulations be on a  
onal level.

he consumer, typified by the woman shopper for foodstuffs, is  
stomed to buying in standard units of weights, represented by  
pound or generally accepted subunits of the pound, such as  $\frac{1}{2}$  or  $\frac{1}{4}$   
nd. When a package placed on the grocer's shelf equals or ap-  
imates in size a pound container, but is labeled 15 ounces, it is  
the most discerning shopper who, by scrutinizing the label, will  
the difference.

n the purchasing of packaged commodities by the consumer, there  
marked tendency to buy by size, to call for a "small package of  
" or a "large package of that." This is another reason why the  
man shopper should be able to buy with confidence in the knowledge  
t all brands of the same item will be the identical net weight. We,  
weights and measures, who constantly advocate exactness in all  
sactions by weight, must frown upon any practice which under-  
es this fundamental principle. We strive by every means of edu-  
on and publicity to impress upon the shopper the wisdom of buying  
weight, of watching the scale, of asking the price per pound, so that  
knows that she is getting all for which she pays. It is true that  
leral laws require that the net weight be printed on the package,  
I am sure that I need not develop a case among you gentlemen how-  
ing in visibility are the hidden weight markings on so many of our  
kaged food products. May I mildly put it that they are not con-  
ive to encouraging Mrs. Careful Housewife to watch her pounds  
ounces.

The greatest evil which accrues from lack of standardization is a  
fusion in the customer's mind as to the best buy, when there are a  
iety of brands of the same product and when there are two vari-  
es—weights and prices. Let us give a couple of illustrations. In  
store that I recently visited, there were three brands of apple sauce,  
labeled 1 pound 4 ounces, priced at 19 cents; another 1 pound 1  
ce, priced at 16 cents; the third 1 pound at 14 cents. Which of-  
ed the best buy, quantity only considered? I will not claim this  
be an intricate mathematical problem, but, on the other hand, I am  
fident that the average shopper will not spend the time necessary  
etermine the best value. Let us take another illustration. In the  
ne store, I noted two well-known brands of macaroni. One was a  
unce package at 11 cents, the other an 8-ounce package at 14 cents.  
ain, I ask which brand gives the most macaroni for Mrs. House-  
e's money? And, again I say, Mrs. Average Housewife either  
ld not or would not take the time to figure it out. Just imagine  
at goes on in her mind when she is confronted with labels marked  
ounces,  $6\frac{1}{2}$  ounces,  $4\frac{1}{2}$  ounces,  $14\frac{1}{2}$  ounces, 9 ounces, 11 ounces,  
ounces,  $5\frac{1}{2}$  ounces. These are actual label markings taken from  
ew common items which I chose at random in one store and include  
eals, condensed milk, mustard, and relishes. A vast number of  
mples too numerable to mention could be given.

We have noted the progress in prepackaged foods; keeping pace  
th this trend is the advance of the self-service stores. Neatly ar-  
ged cans and packages are stacked on the shelves awaiting Mrs.  
merican Housewife's choice. But she is strictly on her own. The

prices are displayed and the weights are on the labels; but if the weights were always comparable among brands, the thrifty shopper would be in a position to determine the best value, that is, as in regard to quantity in standardized weights. This is the only practical means by which to gain this worthy objective.

A manufacturer may discharge his legal obligations by setting forth the net content of the package on the label, but I cannot agree that it is realistic or reasonable that the average housewife be confronted and confused by odd and out of ordinary weights on packages. In an important case, a Federal judge charged the jury as follows:

The law requires a manufacturer to be honest in his statement of the contents of a package containing a food product and it requires him to be honest in stating the truth of the labels put on it. It is the purchasing public, the ultimate consumer, whom the provisions of the law are primarily intended to protect. The law is not made for the protection of experts, but for the people, that vast multitude which includes the ignorant, the unthinking and the credulous who in making purchases do not stop to analyze but are governed by appearances and general impression. It makes no difference that the dealers in the article are not deceived. It is the probable inexperience of the customer that you should consider.

Now let us consider standardization from the seller's viewpoint. Why is there such a hodgepodge of weights in prepackaged foodstuffs? I shall not attempt to enumerate the various reasons given, but I will relate what appear to be the most common ones. A manufacturer, processor, or possibly a large retailer possessed of a desire to increase the sale of one of his items will reduce the quantity in the container so that the price will be below his competitor, or he may desire to maintain a standard price which he could not otherwise do unless the quantity is reduced. The second reason has, of course, almost vanished because of recently widely fluctuating costs and prices. Sometimes a more acceptable reason is given. A package is developed to yield a certain number of servings that it may better meet the needs of the average family. Frankly, while not wishing to tangle with the experts in the field of home economics, I am not convinced that this reason is a valid one, except in a comparatively few instances.

I think it is not farfetched to conclude that, in many cases of odd and fractional weights, the sales, rather than the production, department was dominant, at least in the original weight determination. Of course, when production facilities are once set up for certain sizes and weights—ovens, forms, and filling machines—then it would be costly to make changes. But in the long run, the more numerous package sizes necessitate larger container inventories and the increased use of storage facilities. It further means more frequent adjustments of machinery. All of these factors add up to increased production costs eventually paid by the consumer.

We made a survey among some food processors and manufacturers in Chicago, and, while we admit it was too cursory and localized to be conclusive, I believe that there are equally as many manufacturers who would welcome the proposed regulations as those who would oppose them. Furthermore, practically every manufacturer who was in a position to give as his reason that the present equipment could not meet the proposed changes, but he did not object in principle.

Of course, I do not advocate that there be any standardization of prepackaged foodstuffs other than that of weight and the standards set up to meet the requirements of the pure food laws. The American system of free competitive enterprise is the best system in the world.



there is still plenty of room for good aggressive merchandising if we do have national standardized weight laws. Quality, consumer preference, price differentials, attractive and convenient packaging are the elements, and it has been the honest and progressive use of these elements which have made our American businessmen world leaders in their respective fields.

A summary of objectives would be that an agency of government be empowered by national legislation to strive towards ultimate standardization. I certainly could not advocate that there be an abrupt, sudden impact upon the American food industry.

I believe that a gradual advance should be made over a sufficient period of time for the changes, and I am thinking in terms of years. I have a number of industries now who in actual practice have standardized upon certain weights. When the overwhelming majority of an industry produces, for example, a 1-pound package, then it should be standardized and become part of the law, and those companies could be given protection against others who would divert to unusual package weights near the set standard. After a sufficient period of time, without dislocating any particular food industry, I believe that the elimination of unnecessary and unwise packages would be accomplished, and there would remain those weights which would be efficient from a manufacturer's and consumer's standpoint.

This brief discussion has but opened the door to a vast and extremely important subject. There is much work ahead. I speak with admiration for the splendid pioneer work and fine contributions made by members of this Conference a decade or more ago. Perhaps it was war conditions which produced the intervening somnolent attitude, but I do hope that we will revitalize the whole matter, and, even though the road may be long, difficult, and beset with obstacles, we should carry the torch of duty to ultimate success.

**MR. MEEK:** Weights and measures people all are in favor of package standardization if and when it can be brought about. I think most of us are familiar with the efforts made by the National Conference a number of years ago to promote food package standardization. At that time I was Chairman of the Conference Committee on Legislation. We held a meeting in Indianapolis, and Mr. Blickley attended this meeting as a member of the committee. I think we had about 40 or 50 industries represented. They presented many arguments and reasons why they could not go along with the idea.

However, the Legislative Committee did report a food package standardization bill (Report of the 33d National Conference, 1947). In action of the Conference at that time, this proposed bill was left in the hands of the committee for further consideration, the idea being that it would be brought out when there was sufficient public demand, when we could show that industry was in a position to go along with food package standardization.

I am wholeheartedly in favor of it. I am aware of the arguments against it. I am also familiar with many of the reasons why such legislation would be highly advantageous to the public.

**MR. BLICKLEY:** I had the pleasure of serving with Mr. Meek on that committee, and some of the arguments against standardization of food packages were somewhat ridiculous. At that time conditions were chaotic in the country, and I believe the time was not ripe to put this matter in the hands of industry. I think that condition has now

passed. Perhaps it would be a good idea if this 37th National Conference on Weights and Measures would again revive the food package standardization bill. I submit that as a suggestion to the Conference.

MR. THOMPSON: I would like to ask Mr. Levy if he has any suggestions from his research as to what steps could be taken toward this uniformity in packaging.

MR. LEVY: I think the first step is one of gaining public support. Get the public to realize what this means in dollars and cents. I think a very fine suggestion has been made by Mr. Blickley that this Conference go on record advocating that work be done toward this goal.

I have gone through the record and I find that members of this Conference did a fine job to arouse interest. I believe that, because time was not opportune, and the intervening war years took attention to other matters which were more urgent, this project fell the way. I think it should be revived, and the first step is to follow the suggestion of Mr. Blickley. From that point on, we should have an educational program.

MR. BLICKLEY: I will move that this Conference go on record being in favor of reviving the effort toward standardization of food in package form, and that this matter be brought to the attention of the interested parties.

(The motion carried unanimously.)

MR. BLICKLEY: Many industries at our meeting in Indianapolis indicated that standardization could not be accomplished, that it was impossible. Two or three years later, the members of the flour industry went before the States and requested that their product be standardized as to weights of packages. I believe that flour packages are now standard weights in some 40 or more States. If the flour industry can do this, I do not see why any of the other food industries cannot do likewise.

(The Conference adjourned, to reconvene at 10 a. m. Wednesday, May 1952.)

### THIRD SESSION—MORNING OF WEDNESDAY, MAY 21, 1952

(E. R. Fisher, Vice President, presiding)

#### REPORT OF THE COMMITTEE ON TRADING BY WEIGHT, PRESENTED BY J. FRED TRUE, CHAIRMAN

The Committee on trading by weight has found that there is considerable interest in doing away with the weight per bushel on many commodities.

At the present time there is some confusion in buying ear corn because of moisture content in the cob. The only solution to the problem is to sell ear corn by the pound or hundredweight. All grains which are now sold by the bushel can be sold by the pound or hundredweight. Grain which is re-sold to the consumer after it has been milled whether mixed or unmixed with other grains is now sold by the pound or hundredweight. There is considerable difference in the legal weight per bushel of apples and other fruits among the States. This error can be corrected if the bushel is used only as a volume measure. The weight for a given volume of apples or fruit varies with the size and condition of the fruit.

We recommend that the committee be continued, that further study be made, and that the State and Federal Agencies be encouraged

to use the hundredweight rather than the bushel in their reports forecasts.

He further recommend that machinery companies be encouraged to make the rates of seeding to show pounds per acre rather than bushels per pecks.

He recommend that each State introduce a bill in its next legislature that will do away with the weight per bushel for all commodities.

(The report of the Committee on Trading by Weight was adopted by the Conference.)

#### REPORT BY E. C. CRITTENDEN, CONSULTANT TO THE OFFICE OF THE DIRECTOR, NATIONAL BUREAU OF STANDARDS

There is proposed an international organization intended to obtain a degree of uniformity in the regulation of practical weights and measures in European countries. There is already an international organization which provides for uniformity in basic standards of measurement. The top body in that organization is the General Conference on Weights and Measures which was established by treaty in 1875 and now includes 33 countries. Under the General Conference is the International Committee on Weights and Measures and the International Bureau of Weights and Measures. The International Bureau is a laboratory located at Sèvres, just outside of Paris, which keeps the prototype international standards and periodically compares national standards with them.

The International Bureau thus provides, internationally, a service similar to that given by the laboratories of the National Bureau of Standards in connection with weights and measures in this country, but it has neither authority nor means to do anything about trade practices in the various countries. Each country has its own weights and measures service, and it has been long recognized that the diversity of practice which exists among European countries is a serious handicap.

For instance, our own Mutual Security Administration and other Government organizations which are encouraging collaboration between European countries to strengthen them industrially have urged removal of barriers to permit freedom of exchange of goods. Customs barriers are a very serious obstacle to the effective use of the economic resources of those countries, and diversity of practice in regard to packaging, weighing, and other trade requirements add further difficulties. Recognizing that handicap, there have been discussions for many years of the need for some organization like yours, including officials of the different countries, as your Conference does, of States, counties, and cities, to bring about uniformity of practice in regulations and to remove some of the obstacles to trade across international boundaries.

So in 1937 the French Government called a formal international conference to consider this question. It was proposed to establish an organization which might begin by collecting information about the various rules and regulations and then draw up model laws and regulations, just as you have done in this country. Finally, it might even go about joint approval of equipment, because in Europe they go much further than we do in requiring approval of types of measuring devices, and the fact that each country has its own types limits the



market of manufacturers very severely. That is particularly true because in Europe the same organizations usually cover not merely the ordinary weights and measures but also gas and electricity meters which are, of course, widely used.

The 1937 conference was attended by representatives of 37 countries. The widespread interest was evidenced by the fact that those countries ranged alphabetically from Afghanistan to Yugoslavia. However, many representatives were diplomatic staff men who knew nothing about the subject; when they got down to real business, delegates of 2 countries, including all the important countries of Europe, signed resolutions looking to the establishment of an international organization, and set up a committee to draw up definite plans for it.

Following 1937 there came various troubles. The Chairman of the organizing committee was a Polish official. Poland got in trouble right away, the war broke out in 1939, and nothing further was done about the proposed organization until 1948. The proposal was then revived at the meeting of the General Conference on Weights and Measures, but of the original 15 members of the organizing committee only 5 had survived or retained their connection with weights and measures.

A meeting was called for 1950; by that time the Communists had overrun Poland and thrown out of office the man who had been head of the organizing committee. So a fresh start was made with a new chairman, from Belgium. Ten countries were represented at the 1950 meeting; 4 of the original 15 members were present. The committee has now prepared a draft of a proposed treaty to set up an international organization and it will be considered at a meeting in Brussels in October. If approved it will be sent out formally by the French Government, and maybe in the course of a few years there will be set up an international organization to do, in European countries and other parts of the world, much the same job that you gentlemen are doing here.

Whether this country should join or not is a matter to be decided by the Department of State and the Senate. Nearly all the other countries use the metric system of weights and measures. This, in addition to our distance, the difference of our customs and requirements, and the absence of a national weights and measures service, makes it doubtful whether we can take an effective part, but it may be worth while for our country to take part, at least as an observer, to give such help as we can, and also to see that no rules or regulations are set up that may handicap our manufacturers or exporters unduly. If and when an organization develops, the details will be reported to you at later meetings, and presumably your advice will be sought regarding participation in it.

### FARM HOLDING TANKS

By H. J. McDADE, *Scaler of Weights and Measures, San Diego, California*

In preparing this paper, I assumed that many among you are not acquainted with the use or the procedure employed by the weights and measures official in testing such tanks.

Farm holding tanks represent a great forward stride in the measurement and handling of wholesale quantities of commercial milk between the producer and the processor or creamery.

At present, there are two types of these tanks in use in California, namely, the conventional farm holding tank and the cold-wall tank.

These tanks range in size from 300 to 3,000 gallons, and I am informed that some are even larger. The conventional tank is constructed with an outer wall around the stainless-steel measuring vat, allowing approximately 3 inches for insulation. The milk is cooled and aerated before it flows into the tank. This type of tank will hold a quantity of milk for about 10 hours with a change of temperature not exceeding 2 deg F.

The cold-wall, or refrigerated, tank (see fig. 1) is like the conventional tank, except that, in addition to the insulation in the walls of the tank, refrigerating coils also are used. There is also a trough running around the top of the tank with small holes through which the milk trickles and is aerated and cooled right in the tank itself.

These two types are further divided into the glass gage and the measuring-stick types, either of which is satisfactory. When filling the glass-gage type with milk, the glass gage is kept closed by a valve at the bottom and is not allowed to fill until the reading is to be taken. It is then opened wide, allowing the milk to enter the tube with a surge, going beyond the true level and then settling back. This procedure gives you an accurate reading. We must keep in mind, however, that, milk being an opaque liquid, all readings must be made at the top of the meniscus and not at the bottom.

We have learned that, if the tube is left open and the milk allowed to creep up the tube as the tank is filled, the milk will stick in the dry tube, and the reading may be one graduation less than a true reading. Under the present California code, which limits the volumetric value of these graduations, a one-graduation error might be equal to as much as 2 gallons for tanks having a calibrated capacity in excess of 100 gallons. For tanks of lesser capacity the resulting error might be equal to 1 gallon.

The measuring-stick type is preferred by some, for various reasons,

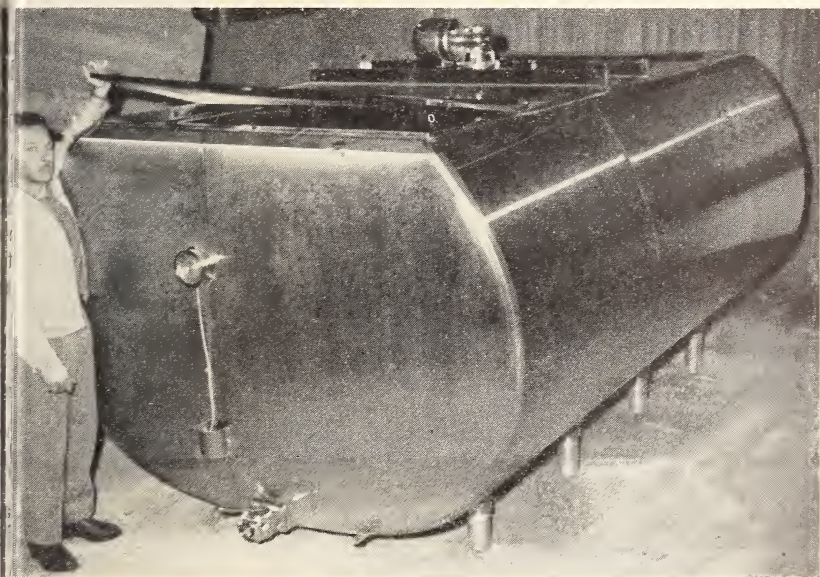


FIGURE 1. *Farm holding tank.*  
Refrigerated, or cold-wall, type.

one being the greater ease of cleaning as compared to the glass gage another, the freedom from danger of breakage.

In measuring the quality of milk with the gage stick, the stick is not put into the tank until the measurement is to be taken, thus obtaining a measurement of the greatest possible accuracy.

Both types of tanks are equipped with a power-driven agitator which is used to thoroughly mix the cream, which has risen to the top, back into the milk, so that a representative sample can be taken for a butter-fat test. It is of the greatest importance, however, that the agitator not be started until after the milk has been measured. To do so would create a turbulence in the tank and incorporate air into the milk, which would result in an inaccurate reading. I might add that all measurements are made by the driver of the tank truck, who, by law in California, must be a licensed and bonded sampler and weigher.

The graduations on both the measuring rod and the column gage are in terms of inches or fractions of an inch. The measurement on the gage is then referred to a chart that has been prepared by the manufacturer or his agent, which converts each graduation into terms of liquid measure.

Both the gage and the chart are integral parts of the tank, and each must be carefully inspected, compared, and sealed. In testing a tank the weights and measures official compares his findings with the measuring device, whether it be a gage glass or a measuring rod, and the chart as prepared by the maker. Under no conditions does he make the capacity indications on either the glass gage, measuring stick, or chart. It is the duty of the weights and measures inspector to verify that the respective indications conform to known standard measurements. For him to mark the graduations on the gage or chart would be as improper as it would be for him to place or locate the weight indications on the beam or chart of a scale.

To give you a comparison of the accuracy of the farm holding tank as compared to the practice of measuring by the 10-gallon milk can method, which was universally used before the advent of farm holding tanks, I offer you the following: Allowing for an error of one graduation in reading either the measuring stick or gage glass, the farm holding tank will measure 1,000 gallons of milk with a maximum error of 2 gallons per 1,000.

Records of creameries show that, in California, milk purchased from the creameries in 10 gallon cans averaged only  $9\frac{7}{8}$  gallons per can yet they were paying for 10 gallons. This short measure was due to excess foam and dents in the cans, and equals 12.5 gallons per 1,000.

No one can successfully challenge the advantage of the holding-tank method of handling milk from the point of accuracy of measurement, which is, of course, our chief concern. There is, moreover, the additional advantage of improved sanitation in this method of handling the milk being kept at a temperature of between  $40^{\circ}$  and  $50^{\circ}$  F., until it is picked up by the stainless-steel insulated tanker, which will deliver the milk to the creamery, even over the longest hauls, with a change in temperature not exceeding  $1^{\circ}$  F.

When farm holding tanks were first introduced in California the weights and measures officials were called upon to test and seal the tanks. This we refused to do, they being subdivided measures and, as such, not entitled to our approval.

The milk industry and milk-tank manufacturers were persistent



request that regulations be promulgated to legalize this method of measurement. They wanted the feeling of security that goes with the use of weighing and measuring equipment that has been adequately tested and sealed by a competent authority.

After many meetings with representatives of both the milk industry and manufacturers of farm holding tanks, rules and regulations, tolerances, and specifications were drawn by James E. Brenton, Chief of the Bureau of Weights and Measures in California. Then, after a formal signing, these regulations, etc., were approved and became effective in California.

Following the presentation of this paper, a number of slides were shown by McDade and J. E. Brenton. These slides depicted various types of farm holding tanks and testing equipments. In the discussion, points were raised regarding (1) the possibility of frost heave in cold climates, (2) the difficulty in obtaining rapid and accurate readings on stainless steel gage sticks, (3) methods of fastening tanks to foundations, (4) methods of testing, (5) manufacturers' responsibilities, and (6) the possibility of sale by weight from farm holding tanks.)

## THE MEASUREMENT OF PETROLEUM

By E. L. HOFFMAN, *Socony-Vacuum Oil Co., Inc., New York, N. Y.*

Mr. Chairman, members and guests of the National Conference on Weights and Measures, I would like to express my appreciation for the kind invitation extended to me by Mr. Bussey to address you today on the subject "The Measurement of Petroleum." In my talk I will discuss some of the history of petroleum, the necessity for accurate measurements and also comment upon measuring practices in use today.

Let me take you back to the first measurement of petroleum in this country; to Saturday, August 28, 1859. You will recall that the first oil well was driven by Colonel Drake at Titusville, Pa. On that day the Drake well had reached 69 feet and drilling had been stopped at that point. On Sunday morning, "Uncle" Billy Smith, the driller, took a look down the well and found a liquid standing in the pipe quite near the surface. He dipped some up and it was petroleum. He sent word to Colonel Drake in Titusville and borrowed Mrs. Smith's tub and wash boiler and kept on dipping. By the time Colonel Drake arrived, every vessel at the site was filled with oil. The next morning, Colonel Drake started to search Titusville for empty whisky barrels. He collected a dozen or so and rushed them back to the well, but they were all filled by sundown. These whiskey barrels were made of stave and had a capacity of 42 gallons—2 gallons of the 42 being allowed for stave or leakage. This works out to a rough "tolerance" of 2 parts in 40, so you can see what progress has been made in "tolerance" since those days.

As the news of the Drake well spread, thousands of promoters and investors poured into Titusville, and soon hundreds of wells were producing oil. The problem of containers was critical from the outset. The wooden barrel was all that was available and the barrel factories worked night and day to keep up with the flood of oil. But the wooden barrels leaked more with oil than they did with whisky or vinegar, because the oil had little effect upon the wood, whereas whisky and vinegar caused it to swell. To improve accuracy of measurement by reducing leakage, the infant oil industry attempted to tighten up the wooden barrel, thus laying the foundation at this

early date for a sustained effort for sound measurement. The Report of the Commissioner of Patents for the year 1863 stated, "Fourteen patents have been issued for more oil-tight barrels, besides as many for tanks and cans."

As an illustration of the growth and rapid expansion of the petroleum industry, in 1920 the quantity of crude oil produced in the United States was 18,603,000,000 gallons, while in 1950 this quantity was 88,900,000,000 gallons or over four times greater than in 1920. If the quantity handled had been contained in a pipeline the same size as the "Big Inch", its length would be sufficient to encircle the earth about 25 times at the equator.

As evidence of the magnitude of the demand for petroleum and its products, I need only remind you that during the four days of the meeting of this Conference, the petroleum industry will measure over 1 billion gallons of crude petroleum and then remeasure it about 25 times on its way to the customer. The complications in many of these measurement operations are considerable. There are over 1,000 various kinds of crude oil, some so thick they flow like the heaviest molasses and some so thin they flow like water. The distance from the center of production to the center of consumption averages over 6 miles and may range as high as 8,500 miles, as in the delivery of crude oil from Arabia. Over this distance it may move by pipeline, tank barge, tank car or truck, or a combination of these methods. For each movement in each conveyance, it must be measured. It must also be measured many times on its way through the refineries and through the storage terminals. While it will only be possible for me to describe these measurement operations in general, I direct your attention to the fact that perhaps 90 percent of them take place, in succession, prior to the sale to the customer and thus form a general procedure for an over-all check of crude oil from the well to finished products in the customer's tank.

I believe you will agree that the most important single asset of any business is the good will of customers with whom business is transacted. A company will stay in business only as long as the public wants to buy its products. In the petroleum industry good will can be achieved by giving full and accurate measure on all sales of products which meet established specifications. In many other industries this can be effected with a minimum of effort because it consists merely of a physical count of packages of varying sizes. On the other hand, petroleum and its products are in such general demand throughout the world that a vast measurement problem is produced. The volume of petroleum and products transported and handled by the petroleum industry is tremendous. The vastness of the operation of the industry, the complexity of the measurement problem and, finally, the value of crude oils and finished products all point to the fact that special care and attention must be given to measurements to insure accurate results. If these results are achieved, customers are assured of full measure and essential loss controls can be maintained on the various phases of producing, manufacturing, transportation and marketing of petroleum and its products.

The importance of accurate and careful gaging cannot be overemphasized. The data secured becomes the basis for all future records and calculations. If the original gaging figures are incorrect, it is obvious that subsequent records, reports, or invoices will not balance.



ile it may be possible to trace and correct inaccuracies in gaging, represents a costly, time-consuming procedure.

You might well ask why the members of this Conference should be interested in this subject. Primarily, State and municipal sealers of weights and measures participate in many important phases of measuring operations of the petroleum industry. In all probability, sealers devote more of their time to activities involving the gaging of petroleum and related products than to any other single commodity. In the second place, one of the most important phases of the work done by the National Bureau of Standards is the establishment of standards which are used as the basis for measurements involving equipment such as calibrated containers, steel tapes, standard thermometers and other items used by the petroleum industry.

During the early expansion of the petroleum industry, facilities for measuring vast quantities of crude and products lagged in their development. As a result, many difficulties were experienced, some of which ultimately reached the consumer level. Not only was there a lack of uniformity and procedures from one company to another, but frequently this same difference was experienced in various phases of any company's operations. The inadequacy of measurement facilities created a condition where accurate accounting for stocks and yields was not possible. As a result, many oil companies realized that the problem merited special attention. In many cases this, in turn, led to the formation of committees and departments within the company to handle this problem. These committees and departments were charged with duties the major purposes of which are the following: (1) Calibration of storage tanks and transportation media. (2) Design and construction of uniform gaging and sampling equipment. (3) Establishment of uniform procedures in the use of this equipment.

As early as 1898 the American Society for Testing Materials had been formed, and the American Petroleum Institute was organized in 1919. One of the important functions of these organizations is to promulgate codes establishing uniform procedures and equipment for accurate measuring of petroleum and its products. The exchange of measurement ideas and practices of the various segments of the industry is of benefit not only to the industry as a whole and the individual parts thereof but also to the consuming public. This exchange of ideas and practices has, under the sponsorship of the two groups mentioned, resulted in the issuance of the following codes among many others: (1) API Gravity Tables. (2) ASTM Manual for Measurement and Sampling of Petroleum and Its Products. (3) API Code 25—Measuring, Sampling and Testing Crude Oils. (4) API Code 1201—Code for Non-Pressure Type Tank Car Quantities. (5) API Code 1202—Code for Pressure Type Tank Car Quantities. (6) API Code 1101—ASME-API Code for Petroleum Positive Displacement Meters.

All codes and manuals, whether issued in a tentative or final form, are subjected to almost constant review so that when revisions are necessary, the changes can be effected and all members of industry are advised.

The basis for computing volumes of liquid quantities of petroleum and its products is the incremental capacity table for the container involved in any particular transaction. Therefore, before discussing the actual measurement of petroleum, I would like to outline for you in general way how the capacities of containers are determined. Ob-

viously, capacity tables must be accurate; otherwise, all subsequent calculations of volumes handled will be incorrect.

Various methods, depending on the type of container being calibrated, are employed to determine the total and intermediate capacities of the container. In my discussion today I will consider the strapping method as it applies to atmospheric tanks with fixed roofs (also known as cone roof tanks) as this is the most common type of tank in use today, builder's plan method as it applies to tank ships and the liquid calibration method as it applies to barges, tank cars and tank trucks.

Basic measurements are secured by the use of steel tapes of 100-foot or 400-foot lengths. These measurements consist of height of the tank, its circumference at various levels, the thickness of steel plates and, when necessary, measurement of "deadwood." "Deadwood" is a term used to describe any construction detail inside of a tank, the presence of which decreases its liquid capacity. After basic measurements are secured, tank capacity tables are prepared by determination of actual volume at the various heights measured and interpolation of circumference measurements where necessary. If the tank is cylindrical in shape and if all cross-sectional areas are uniform, the calculations are relatively simple. They are based on the standard formulas of the area of a circle and the volume of a cylinder.

On tank ships, total capacities for each tank and the volume at desired levels are secured by calculation of cubical contents based on measurements from builder's plans. Consideration is given to deadwood, such as pipe lines, ladders, bulkheads, etc., and the change in incremental volume due to changes in the shape of tanks. It is of interest how this is done. An engineering draftsman with considerable experience will study the builder's plan with an apprentice, and together they will make all the necessary calculations. This may take from 3 to 6 months and the resultant calculations would apply to similar vessels of the same class.

In the case of barges and tank cars, one popular method of determining capacities is the water calibration method. Quantities are loaded into the tanks from calibrated prover tanks. By stopping the loading operation at desired intervals and computing the quantity of water turned from the loading tank, the volume capacity can be determined at any level within the barge or tank car tank.

When tank trucks are first put into service, their capacities are determined by using a liquid (usually kerosene) measured from calibrated containers, the capacity of which has been certified. After the capacity of each tank has been determined, capacity markers are affixed in the proper position and the full capacity shown on the dome collar.

In general, gaging procedures involve two separate steps. The first of these consists of actually measuring the product, and this may be done by manual or automatic means. The second step consists of temperature taking, and this may also be done manually or automatically.

In the actual gaging of most bulk-storage tanks, there are two generally accepted methods, namely, innage and outage. The several modifications of each depend upon the type of tank to be gaged. An innage gage is the depth of liquid in a tank measured from the surface of the liquid to the tank bottom or to a datum plate attached to the tank.

om. An outage gage (in the case of marine equipment, called  
ge) is the measurement of the distance between the surface of the  
uct in the tank and the reference point, which is a fixed point or  
k at or near the top of a tank. These measurements are used  
the tank-capacity table and temperature of the product to calcu-  
the volume being measured.

general, measurements are secured by the use of calibrated steel  
s of varying lengths in conjunction with calibrated plumb bobs.  
latter have pointed ends for taking innage gages and flat ends for  
g outage gages. The tapes in use in the United States conform  
e tolerances and standards established by the National Bureau of  
dards. Tapes not meeting tolerances are withdrawn from service.  
hen an innage or outage gage is taken in a nonpressure container,  
ape and bob are lowered to prescribed levels, care being taken in  
ase of the innage gage to insure that the bob does not tip. On  
ge gages the measurement is read directly from the tape, while on  
ge gages the total reading is the sum of the tape and bob readings.  
e procedures for innage and outage gages are basic and are those  
generally. In other cases, however, special types of tankage re-  
special procedures and devices to measure their contents, for  
ple, the pressure lock for pressure tanks and the slip-tube gage for  
fied petroleum gas containers.

l companies generally have made considerable progress in the  
opment and acceptance of uniform gaging equipment and the  
lishment of uniform procedures in the use of this equipment.  
example, difficulties were experienced in securing accurate meas-  
ents of volatile products because of an uneven creep on the tape  
b, thus resulting in inflated measurements. To overcome this, a  
ine-level indicator paste was developed and is being used gen-  
y today. Prior to the promulgation of standardization codes,  
urements were taken to the nearest  $\frac{1}{4}$  or  $\frac{1}{2}$  inch. The stand-  
oday is to the nearest  $\frac{1}{8}$  inch, and in some companies, to the  
est  $\frac{1}{16}$  inch. The need for and the advisability of accurate read-  
to the nearest  $\frac{1}{16}$  inch becomes evident when it is realized that  $\frac{1}{16}$   
inch in a tank 50 feet in diameter accounts for 77 gallons, while  
tank 140 feet in diameter the gallonage value of this measurement  
0 gallons.

the procedures in vogue and the standardization already ac-  
olished eliminate the possibility of inaccurate measurements?  
In the case of manual gaging, the human element is always pres-  
Consequently, oil company managements must constantly stress  
e gagers the importance of the care to be exercised when gaging.  
ome instances, flexible tank bottoms cause inaccurate measure-  
s. Every effort is made when constructing tankage to insure that  
ottom will remain firm and level. However, bottoms sometimes  
nder varying load conditions. In such cases, accuracy will be  
ly improved by maintaining a water bottom of such depth that it  
cover the entire bottom when flexed either up or down. This is  
in an effort to provide a level surface to measure the volume of  
e or products involved. Difficulties are also experienced in secur-  
accurate measurement of the contents of floating roof tanks as the  
ne of product displaced by the roof is affected by friction between  
dge of the roof and the tank, by change of temperature due to  
ine, by wind, rain, snow, or ice, by settling time after pumping



product into or from the tank and by partial suspension of the on its supports.

Gaging problems are considered as they arise and are subject almost continual study. In some instances, these studies involve observance of the actual operation of tankage and facilities in the field.

At the present time the use of automatic gages is being studied by many oil companies. Many such devices are actually in use but in general, they are used only in connection with movements of large quantities within a particular company. However, if mutually agreed upon, they can be used in connection with movements between the companies concerned.

One such device which has been in use for some time is called automatic float gage and consists, in general, of a float gage attached to a wire cable which, in turn, is attached to a completely enclosed counterweighted measuring tape which registers in-gage measurement and is usually read at ground level. Potential sources of error in automatic float gage include change in the buoyancy of the float, the gravity of the liquid changes, undue friction at sheaves, ground-reading pulley, and corrosion and distortion of the cable. The newer equipment these sources of error have to a large extent eliminated.

Another device actually weighs the tank contents and is spoken of as a hydrostatic gage. This also has the distinct advantage of providing the means of reading tank measurements, either at the top of the tank or at some central point remote from the tanks themselves. This device generally uses dry air or gas to force the liquid to be gaged out of a vertical pipe within the tank. The pressure required to force the liquid out of the pipe is registered through a gage outside the tank or at a central gaging house by means of a gage filled with a special, heavier-than-water liquid. This gage is calibrated on the basis of water at standard temperature; therefore, all measurements are at that temperature. By knowing the exact specific gravity of the liquid being gaged, the reading of the gage can be converted to exact feet and inches of the liquid at standard temperature.

Another item that must be considered in the determination of liquid volumes of petroleum and its products is the temperature of the tank contents. Accurate temperature readings are essential as they form the basis for conversion to 60° F of quantities involved on international company transactions and also provide an important phase of adequate stock control.

Usually only one temperature reading is taken at the vertical center of the product, although in some cases it may be necessary to secure more readings, as specified by API and ASTM codes on this subject.

When taking thermometer readings, care must be taken to insure that the thermometer has been immersed in the liquid for a period sufficiently long to attain the temperature of the liquid. Also, when withdrawing the thermometer from the tank, care must be taken to avoid change in the thermometer indication, which may easily be caused by atmospheric temperature or wind blowing across the liquid contained in the cup at the base of the thermometer. This effect may be minimized by sheltering the thermometer cup within the gage while reading the thermometer to the nearest degree.

The accuracy tolerance for thermometers, previously plus or minus 1 deg F, has recently been changed to plus or minus 1/2 deg F.

nometers used for gaging purposes. Studies of tanks in operation have revealed that different temperatures prevail at different points. This is especially true on tanks containing viscous materials or products that must be heated to expedite their flow. Partially as a result of the foregoing, oil companies are turning their attention to accuracy that might be secured by the use of automatic devices which provide the means of securing mechanically average temperatures of tank contents. In most instances, the temperature readings are taken at some central point remote from the tanks themselves. Tests of one of these devices have indicated that it has a high order of accuracy. This device is known as an electrical resistance thermometer, which measures the increase or decrease in electrical resistance in a fine copper wire caused by any change in temperature and transfers the results of these measurements on a temperature indicator. The device will operate satisfactorily when used in connection with tanks containing heated or unheated products.

The whole subject of measuring and allied operations is in a state of continual study, so that the latest available procedures can be applied, and the accuracy and practicability of devices can be determined. Decisions made as to their installation and acceptance by industry are general.

As you are aware, meters used for the dispensing of liquids are an important phase of petroleum measurements. The first meters used were converted water meters which were accurate to about plus or minus 2 percent. The introduction of displacement meters and continued experiment and development have brought greater perfection. The accuracies now obtainable are quite remarkable. The development of higher accuracy in measurements has made it possible to meet the strict tolerances required by the various State regulatory bodies. After meters have been properly installed, by far the most important requirement for proper operation, regardless of the type of meter used, is meter proving and calibrating as frequently as necessary. This is important because not only must the oil company ascertain that customers of their products receive accurate measure on deliveries, but it must also take reasonable precautions against overloading or underdeliveries. To achieve the desired results, oil companies generally obtain proving equipment on mobile trucks that is of adequate size for both loading rack meters and tank-truck meters. In most instances, meter manufacturers are also equipped with mobile calibrated proving equipment.

The basic requirements for good performance in all meter installations are that the installation shall be (1) Capable of and adapted for accurate meter proving. (2) Conducive to the elimination of air and vapors that might become trapped or induced ahead of the meter. (3) Provided with a suitable means of segregating dirt, scale, foreign particles, and water from the measured stream. (4) Such that identical physical conditions of equipment, liquid and operating characteristics can be maintained for the meters during their provings. All these conditions will exist while they are later operating normally on the metered stream.

The use of meters has tremendously increased in recent years. This is particularly true of meters used on loading racks, pipelines, and trucks dispensing household heating oil. As the trend is toward further increase in the use of meters, it becomes essential and most

important that the degree of accuracy required by the weights measures authorities be maintained at all times.

I have previously mentioned that a code has been issued through joint efforts of the American Society of Mechanical Engineers the American Petroleum Institute on positive displacement meters. This code, which is further evidence of the active interest in this subject, provides a suitable basis for the installation, proving and operation of positive displacement meters suitable for measuring liquid hydrocarbons to be purchased, sold, or exchanged in the petroleum industry or elsewhere. The provisions are deemed applicable to practically all such installations. However, with respect to meters used for the measurement of retail sales, the provisions of various State weights and measures regulations govern and shall take precedence over this code. On one major pipeline in the South, the use of meters for measuring the flow of petroleum products has become indispensable. This pipeline transfers several petroleum products and serves different oil companies. When any new product is sent through the line, as, for example, kerosene, the meters are recalibrated, the calibration taking the form of a factor that is applied to the meter readings.

Under certain conditions, the meters may be recalibrated as frequently as twice a day. Because a meter as large as the pipeline would be uneconomical and difficult to handle, there may be three or four 6-inch meters in parallel on an 8-inch line, thus providing the necessary flexibility in operation.

The measurement of petroleum presents a serious problem to the industry. The complexity of this problem, increased by the need for numerous, accurate measurements, is not generally known by the consumers of petroleum products. Oil companies and manufacturers engaged in continual research so that the most accurate procedure, equipment, and devices can be applied in the measurement of petroleum. Ultimately, a large share of these measurements will undoubtedly be obtained by automatic or semiautomatic means.

The work of the sealers in the oil industry, which for the most part consists of checking the capacities of various types of transportation media, the calibration of dispensing equipment, and the establishment of accuracy tolerances for this dispensing equipment, has had an important influence on the development of accurate measurement. Their activities serve the dual purpose of assuring the consumer that full measure is received and of assuring the dispenser of the product that an equitable compensation is secured for the quantity handled and sold.

## GRAIN WEIGHING

BY DAVID LUNDEEN, *State Weighmaster, Track and Hopper Scale Department, State of Minnesota; President National Scale Men's Association*

As this year's president of the National Scale Men's Association, I deem it a great honor to represent our splendid organization at the Conference, and I wish to take this opportunity to greet you on behalf of our membership. Our annual Convention at Chicago last March was one of the finest and most instructive meetings ever held by our group. I feel, as I am sure all members of the National Scale Men's Association feel, that we should work very closely with the National Bureau of Standards and representatives of weights and measures departments in matters relating to scales, in which we all have a common



interest. As far as scales are concerned, we have the same goal—  
r scales, resulting in more accurate weights.  
rain weighing” is, without a doubt, one of the most important  
hing functions in the country. Many farmers weigh their grain  
eir own scales before taking it to the local market. At the local  
tor it is weighed when the producer sells the grain. It is usually  
hed by the local elevator when the grain is shipped to the terminal  
ets, and at the terminal markets it is weighed on arrival, as well  
en shipped out. Millions of bushels of grain are weighed within  
levator itself as the grain is transferred from one bin to another.  
total amount of grain that is weighed in this country and the  
e of the grain are probably impossible to estimate accurately, but  
safe to say that it runs into billions of bushels and billions of  
rs.

the Minnesota Grain Weighing Department, we weigh approxi-  
ly 500,000,000 bushels of grain annually. About 300,000,000  
els of this grain are weighed in and out of boxcars. Approxi-  
ly 175,000,000 bushels of grain are weighed into boats at Duluth,  
igned to points on the Great Lakes and onto barges on the Missis-  
River at Minneapolis and St. Paul to points south. The balance  
ain weighed in truck-load lots and in transfers within the terminal  
tor itself. You will note the tremendous amount of grain that  
ighed into boats, most of which emanates from Duluth.  
w people, living in other parts of the country, realize that, from  
andpoint of tonnage handled, the Duluth-Superior port is second  
to New York.

might also be interesting for you to know that the largest aggre-  
n of grain elevators in any one city in the world is in Minne-  
s, where some 65 elevators have a total storage capacity in excess  
0,000,000 bushels.

the Minnesota Grain Inspection and Weighing Departments were  
lished in 1885 by the Minnesota State Legislature, by a law passed  
e fifth of March of that year. Under that law operations com-  
ed on the first of August 1885. This law provides for the inspec-  
of grain and the weighing of grain as it arrives and leaves terminal  
tors. The State being rather young at that time, only three  
s were designated by the Legislative Act as Terminal Grain Mar-  
They were Minneapolis, St. Paul, and Duluth. The law, how-  
gave authority to the Railroad and Warehouse Commission,  
r which these departments function, to designate other points  
terminal Markets. At the present time, we have State grain  
hing at ten markets.

might be interesting to know that this was the first grain depart-  
e of its kind, established in the United States, where inspection  
weighing of grain was under State jurisdiction.

ter the department was established, grain weighing was per-  
ed by Minnesota State weighers, not only in Minnesota, but in  
onsin, Iowa, North Dakota, South Dakota, and as far west as  
oland, Oregon. Since that time, most of these States have estab-  
ld their own grain inspection and weighing departments, and the  
nesota department now only functions within the boundaries of  
State.

the first testing of scales in the State was by “Scale Experts,” as  
were called in those days, who worked under the supervision of  
e State Weighmaster, who is in charge of grain weighing. The

first so-called "Scale Expert," who now would be called a "Scale Inspector," was a man by the name of L. D. Berry. He was appointed to this position shortly after the department began to function. commenced testing scales, over which grain was weighed, in terminal elevators, early in 1889. Later, he was given an assistant, with whom a great many of you are acquainted, and who has been for over a century one of the leaders in weights and measures work in this country. I refer to none other than the venerable C. C. Neale, a Minnesota man of whom we are very proud. Mr. Neale worked until the State Weighmaster until the Weights and Measures Department was established in 1911, at which time he was appointed the Commissioner of Weights and Measures in Minnesota. The scale inspectors, however, who tested the scales on which grain and its products were weighed remained under the supervision of the State Weighmaster.

To put it differently, the Weights and Measures Department in the State of Minnesota has supervision over all scales and measuring devices, except railroad track scales and the other scales over which grain, its by-products, hay, straw, and coal are weighed, and on which commodities the State Grain Weighing Department issues certificates of weight to the trade. These scales are under the jurisdiction of the State Weighmaster. This is a common practice at most large terminal markets. The advantages of such an arrangement are well recognized and too obvious to require comment.

We have, in Minnesota, approximately 85 State grain weighing stations and an average of 130 State Grain Weighers. At the terminal elevators we have both hopper and track scales. At some elevators we have both. The hopper scales are tested with 8,000 pound known weights and, on the step-up test, to the capacity of the hopper. The tolerance on hopper scales is  $\frac{1}{4}$  pound per 1,000 pounds.

The State of Minnesota has two State-owned Master Scales. One of these scales has a 12-foot weigh-rail and the other a 34-foot weigh-rail. These Master Scales are tested each year by the National Bureau of Standards. This is a service of real value for which we are most grateful. As far as I know, these are the only Master Scales owned by any one State in the Union. Our Master Scales are the only ones in the northern section of the country between Clearing, Illinois, and Portland, Oregon.

On our track scales, not used for grain weighing, we maintain a tolerance of one pound per 1,000 pounds and, on track scales used for weighing grain, a tolerance of  $\frac{1}{2}$  pound per 1,000 pounds.

We have four railroad test cars, owned and operated by the State. Two of these cars have a 20-foot wheel-base, one calibrated at 82,000 pounds and the other at 90,000 pounds. We also have two 7-foot wheel-base test cars, each calibrated at 80,000 pounds. We make every effort to have these test cars calibrated once every month. At periodic intervals we test all the railroad track scales with both of the 20-foot wheel-base test cars, testing at 160,000 pounds.

We have six scale inspectors in the department. Two inspectors are constantly on the road with the railroad test cars. Three inspectors work in Minneapolis, St. Paul, and suburbs. In Minneapolis we maintain a laboratory which is used by both the Weights and Measures Department and the Track and Hopper Scale Department. Here we calibrate counterpoise weights and 50-pound test weights.

inspector is assigned to testing hopper scales in Duluth, where the department also maintains a laboratory.

We test all track and hopper scales twice a year, and occasionally more often. When a scale is taken out of service for repairs, it is tested before being put back into service.

For the master scales we calibrate our own railroad test cars and also railroad-owned test cars used in our part of the country.

For railroad-track-scale test cars are moved by the railroads, free of charge, to whatever points we bill them. This free service is authorized by law, under the law.

We have 228 hopper scales at terminal elevators and 177 railroad track scales, of which 64 are State weight track scales. When hopper scales or track scales are used for the purpose of weighing grain, the State weights are taken, the cost of the test is absorbed in the weighing fee. Otherwise, there is a \$40.00 charge for a railroad-track-scale test and a \$15.00 charge for a hopper-scale test.

For the fiscal year 1951 we made 361 railroad-track-scale tests and 100 hopper-scale tests. We effected 41 railroad-test-car standardizations, and calibrated 729 counterpoise weights, 1,385 50-pound test weights, and 28 slings. During this year we found 60 track scales and 100 hopper scales out of tolerance.

It should be noted, in this connection, that our scale inspectors do not make any scale repairs. However, if a scale is found out of tolerance and adjustments can be made during the test by the inspector bringing the scale within tolerance, that is done.

Very recently, new specifications were adopted by the Railroad and Warehouse Commission, which provide that new railroad track scales installed in Minnesota shall have a minimum capacity of 75 tons per section.

Between the semiannual tests of the track and hopper scales, the inspectors are constantly making inspections of the scales used in the weighing of grain. The objective, from the beginning, has been to have good scales, properly installed and maintained, regularly checked and tested, so that both the buyer and seller of grain can be confident that they are receiving accurate weights.

A track scale or State weight hopper or motor-truck scale may be used in our State until the plans for the scale and plans for the calibration have been submitted to our department and approved. No railroad track scale may be removed unless application is first made to the Railroad and Warehouse Commission and such application approved.

The freight charges on grain cars are fixed on the basis of the weights taken by the State weighers at the various terminal elevators. When a car of grain is weighed, the car number, car initial, capacity of the car, seals on the car, and any leaky or bad order conditions of the car are all noted in weight and seal record books which are kept by the State weighers at the elevators. In addition to this, the weigher issues out scale tickets, which are filed in the office of the Weighing Department.

The weigher also makes a daily report, in triplicate, one copy of which is available, in the Weighing Department office, to the grain elevator and the railroads. From these reports, as well as from the scale tickets, the railroads take the weights on the cars on which they determine the freight charges. In our office, all reports of the weighers are aggregated and posted, according to elevators, so that, if the grain



trade or the railroads desire to check the cars weighed at a particular elevator, they need not be concerned with any other reports. The original copy of the reports, certificates of weight are typed and filed in a Post Office box maintained in the office for each grain elevator.

It is obvious that business transactions, involving millions of dollars transpire every day on the basis of these weight certificates; and the basis of all this somewhat complicated procedure is the good scales properly installed and maintained, tested by the scale inspectors properly handled by the State weigher, under the supervision of the State Weighmaster.

Minnesota was, as already noted, the pioneer in establishing a Grain Weighing Department. Not only was Minnesota the first State in the Union to step into this picture, but we frankly believe Minnesota is today a leader, if not the leader, in the matter of accurate weights in the weighing of one of the country's important commodities, namely, grain.

It might be of interest to you, gentlemen, to know that the department is self-sustaining and always has been since it began operating. A fee is charged for the weighing of each car. The fee, at the present time, is \$2.25 for each car and \$1.00 for each truck, and \$1.25 for each 1,000 bushels weighed into a boat or transferred in the elevator. The total fees taken in by the whole Grain Department vary from year to year, but for the fiscal year 1951-52 will exceed \$1,500,000. The weighing fees alone for this particular year will exceed \$700,000 and will leave a substantial surplus at the end of the fiscal year.

This department, from its inception, has been under the jurisdiction of the Minnesota Railroad and Warehouse Commission, consisting of three elective commissioners.

I trust that the information I have given you may be of some interest and value. I have deliberately given you considerable detail as to the grain-weighing functions of our department. If any additional information is desired, I shall be glad to furnish it.

I feel and always have felt that all of us, who are in government service, whether it be on the local level or in State or Federal service, have a duty and responsibility to perform our work in such a manner that we are a credit to the government for which we work and a benefit to the citizens we serve.

### RAILWAY TRACK SCALE TESTING PROGRAM

By J. N. Todd, *Superintendent, Scales and Work Equipment, Southern Railway System, Washington, D. C.*

I am very grateful for the opportunity to speak to you from the standpoint of the railroads on the subject of railway track scale testing. While I cannot say that I am speaking for the Association of American Railroads, because they have not been asked to give expression of their views, I am quite certain that they will be pleased by any move to better relations between the railroads, the National Bureau of Standards, and those agencies in the States concerned with weights and measures.

My subject is related principally to the program of testing carried out by the National Bureau of Standards, and it seems most appropriate to speak of it at a time when there is such a representative gathering of weights and measures officials from throughout the country. I would like to speak not only of the program as it exists

a little of its history, but also of its future. There is, in my opinion, no reason to be concerned about the future of such a beneficial, and necessary, activity, but it is important to keep all of you informed of its function in trade and commerce; particularly those of the States where divisions of weights and measures have been set up or expanded in recent years. Therefore, its future is something you should know about as you may have a part in it yourself, whether or not you actually do any testing.

It is not intended at this time to make any predictions of things to come nor to imply that you will be brought into the actual testing of track scales, because I know nothing of such a possibility. I do know that, with the increased interest of the State agencies in all such matters, it is well for us to consider how such an interest in track scale testing may be served best. At this time, there are only two places in the country, where track scale testing is carried on with equipment other than that of either the railroads or the National Bureau of Standards. There are special reasons for these agencies requiring they require the calibration services of the Bureau. Before we go into the Bureau activities any further, let us see how the railroads fit into the picture, and then we can better show how necessary is the Bureau's place in this most worthy enterprise.

The railroad industry is one in which scales of large capacity have found their widest use. It is estimated that there are nearly 7,000 track scales in the country counting both those owned by the railroads and by the industries. Ten to fifteen percent of these were tested annually for many years by the National Bureau of Standards in its sample testing. This will be discussed later. The railroad industry is about a century and a quarter old, and the use of track scales came into being after the beginning of the railroads. One of the great forward steps in the field of weighing came about that time, when the Fairbanks brothers brought out their famous platform scale. I am almost sure, from what I have seen, and I believe the scale men of the Bureau would agree, there must be some of those original scales still in use. Speaking seriously, we do have the extremes of good and bad on railroads. Usually, however, the small and obsolete scales are in use only where the service is light.

The present-day test procedure is not very different from that followed more than half a century ago. At that time a special car was set up and assigned for testing scales only. Today we have solid-body test cars for the same purpose weighing from 30,000 to 100,000 pounds each. Test reports showing the results of testing 50 years ago are quite similar in many cases to those in use today, but the accuracy of the scales then and now makes a different story. By present standards most of the scales 50 years ago would have been rejected for lack of tolerance. It is reported that on one railroad a scale was approved if the error did not exceed 400 pounds, regardless of the load. It was about that time that the National Bureau of Standards was engaged in tests and inspections of scales of less than 10,000 pounds and capacity. The frequency and magnitude of errors found in scales of that category led to the belief that scales of greater capacity would have similar errors, and of magnitude in proportion to their capacity. The sequel to that was for the Bureau men to follow railroad testing of larger capacity scales, and, not having test equipment of their own, to observe the results and to inspect the scales.

Many and large errors did occur and as a consequence of these observations congressional approval was obtained for equipping Bureau personnel so that actual testing of track scales could be carried out by them. The first test equipment of the Bureau was completed in 1913, and before the end of that year 38 track scales were tested in four eastern States, in a sort of practice run. The results of these tests were startling, and, to show just how bad conditions were, the following is quoted in part from the annual report for fiscal year ending June 30, 1914. The mention of any particular State here is no reflection on it, as subsequent testing throughout the country revealed conditions equally bad elsewhere.

Allowing for a tolerance of 0.2 of one percent, which in the opinion of the Bureau, is a fair tolerance for such scales, 80 percent of the 16 scales tested in Vermont would have been rejected; on a tolerance of 0.4 of one percent 60 percent would have been rejected; and on a tolerance of 1.0 percent 40 percent would have been rejected. . . . Of the 16 scales tested at the port of New York, 75 percent would have been rejected on a tolerance of 0.2 of one percent, 56 percent on a tolerance of 0.4 of one percent, and 25 percent on a tolerance of one percent.

The above results clearly show the necessity for periodic inspection of such scales and indicate to some extent the great losses which may be sustained by the use of uninspected scales. As previously pointed out, the inspection of railroad track scales . . . should be taken up by or under the supervision of the Federal Government . . . for the reason that practically all shipments weighed upon them are interstate.

A second test car was secured soon after this time. During the following fiscal year, with only the original unit in operation, a schedule of tests over a widely distributed area was arranged for the purpose of obtaining the first overall picture of conditions. The Bureau had adopted a tolerance of 0.2 of 1 percent, and, of the 338 track scales tested during the fiscal year 1915, 68 percent failed to pass. It might be stated that during the succeeding 25 years of Bureau testing, the percentage of track scales passing required tolerance rose from about 32 percent to about 85 percent.

The conditions found during the first year of testing were reported to the American Railway Association, now the Association of American Railroads, which entered into discussion with the Bureau leading to an agreement providing for an expansion of the Bureau's activities. In recognition of the benefits accruing to the carriers, the agreement provided for the free transportation of the Bureau test cars. Later on, two standard type test cars of 40,000- and 80,000-pound capacity were added and during the years that followed, frequently more than a thousand scales were tested per annum. In addition, all master scales were calibrated on approximately an annual basis.

In general, this procedure was followed for many years without a great variation, until the second World War, when activities were curtailed for several reasons. First, the two standard test cars of 40,000 and 80,000-pound capacity were disposed of because it was felt that the purpose for which they were bought had been served. Also, the shortage of personnel and the obsolescence of one of the original testing units further reduced the extent of the testing activities. While steps have been taken to improve conditions in some ways, the service has not yet returned to anything like that existing prior to the last World War.

It might be well to explain briefly here what the practices are, with respect to the testing procedure of the National Bureau of Standards.



how the annual schedule is arranged. The main purpose of the Bureau's work with railroad track scales is to calibrate the 19 master track scales of the country annually, insofar as possible. The second, and of almost equal importance to the first, is to calibrate individual test cars in those areas where master scales are not easily available. Unfortunately, there are two large areas in the country without master scales, and there are some railroads in other areas which own cars but find it difficult to send them to a master scale. In both of these cases test cars are calibrated by the Bureau as well as can be done, using the best track scale available. The least important activity, but that serves a good purpose, is sample testing of track scales. In arranging the schedule each year, an effort is made to select those scales recently tested so as to get a broader picture of scale conditions generally. The way is left open, however, for special requests. The schedule when prepared is submitted to the Association of American Railroads, and by it to the member roads involved. Some changes are usually made, and when approved, copies of the schedule are distributed to all concerned. Then the Bureau's test units start on their circuitous routes to cover the country. Points of interchange between railroads are indicated on the schedule and each road notified when the equipment is approaching its point of connection. Usually a railroad representative is present at all tests, and should, without fail, be present at the calibration of a master scale. The same statement of purpose that I have given above in my own language may be stated more concisely and authoritatively by quoting the following paragraph from one of the Bureau's annual reports of track-scale testing:

The National Bureau of Standards functions as an agency of the United States Department of Commerce. Two of its fundamental responsibilities are to provide industry and commerce with authentic weighing and measuring standards and to pursue such measures as are helpful in assuring that all weighing and measuring operations essential to trade and transportation are performed on a uniform basis and with acceptable accuracy. The railway track scale testing service is the instrumentality through which the Bureau fulfills these important responsibilities to the rail transportation industry and to interstate commerce where the wholesale marketing and distribution of materials are conducted in terms of carload weight and involve the utilization of several thousand railway track scales.

That, in my opinion, is an excellent statement of the high purpose for which the railway track scale testing service was originally instituted.

Now that we have seen the equipment on its way, let us follow it to a master scale. All master scales are quite similar although of different makes and models. Usually they are housed in heated and ventilated buildings in order to have the most uniform and favorable conditions under which to seal cars and to calibrate the scale. It is important also, to the Bureau representative, to have such conditions, for the job of calibration is a tedious one and one requiring great care. Sometimes, when adjustments are required, the calibration requires as much as three days. The scale platform is usually 12 feet long, and the scale has a sensitive weighbeam, with  $21\frac{1}{2}$ -pound graduations generally. The master scale has a capacity, usually, of 100,000 pounds.

The equipment used by the Bureau is in a large car similar to a broad baggage car and consists principally of a generator set, an electric overhead crane, and a set of 10,000-pound weights totaling

80,000 pounds. This includes an electrically driven test truck, with an added weight, equals one 10,000-pound unit. The weights are placed on the test truck, and the test load is moved to various positions on the weighrails. The car has end doors and a crane can be extended beyond the doors so as to transfer weight from the interior of the car to the scale platform.

Ordinarily the calibration of a master scale comprises three separate tests, each being conducted with mass standards of high precision. The first phase is called a maintenance test and is to determine whether the required qualities of performance have been maintained since the preceding calibration. For this test, standard weight loads of 40,000, 60,000, and 80,000 pounds are applied to the scale, in two successive test runs, at each of five positions on the weighrails. If any adjustments or other modifications are necessary, the scale is then given an adjustment test. In this case, the loads range from 30,000 to 80,000 pounds by 10,000-pound increments, the procedure being the same as before. If no adjustments or modifications are necessary, the maintenance and adjustment tests are combined. The tolerance for the adjustment test is one-half that of the maintenance test, and runs from 3.7 pounds at 30,000 pounds to 6 pounds at 80,000 pounds. To show how accurate a master scale is, the 6-pound tolerance at 80,000 pounds is comparable to a 160-pound tolerance under the same load on an ordinary scale. The third phase of calibration consists in testing the counterpoise weights.

Most of the class one railroads perform their testing with their own test cars, the weighing being supervised by weighing and inspection bureaus representing all the railroads of an area or region. The same bureaus supervise weights from private scales along the line, and these scales are tested by the railroad, usually on a free basis, if the weights are used for revenue billing. Such scales are covered by weight agreements and weights may be used only so long as the scale is kept in good weighing condition. The test cars thus used are sealed on master scales calibrated by the National Bureau of Standards. In this way, the standards of mass are transmitted to industry and commerce throughout the areas served by the railroads.

From these facts you can readily see how important is the service rendered by the National Bureau of Standards to interstate commerce. It is, in my opinion, one of the greatest services national in the field of weights and measures. But it has not recovered from the letdown of the second World War, and the condition of our test scales reflects that letdown. The percentage of scales found accurate bears an inverse ratio to the volume of testing by the Bureau. The results last published by the Bureau showed a definite drop in the curve following the curtailed service. Railroad officials have already expressed themselves to the Bureau as favoring a return to a high standard of service. Many favor a return to the full service rendered prior to the last World War.

Another matter that would be of help to the program of testing is one that presents a problem not easy of solution. That is the need for Master scales in two important areas of the country. One of the areas comprises all of the New England States plus New York and New Jersey. The other area includes Texas and its neighboring States.

May I say to you gentlemen that your interest in this matter is in the public interest. It may be true that you, as representatives of

ic weights and measures departments, do not take active part in ing railroad track scales. But you should be informed on the ect and my efforts today have been directed toward that end. are the authority on the subject of weighing in your jurisdic- and some day you may be called on for information. You are ted to come and observe the calibration of our master scales, and testing of our track scales. May your knowledge grow and may find occasion to help in this worthy enterprise.

uring the third session of the Conference three guests representing the onal Bureau of Standards were presented. Dr. Lyman J. Briggs, Past ident, National Conference on Weights and Measures, and Director Emer- National Bureau of Standards, greeted the delegates and made a few ex- oraneous remarks regarding the progress of weights and measures ad- stration in the United States.

t. Wilmer Souder, Consultant Physicist, National Bureau of Standards, ioned a recent survey in Costa Rica which he had made at the request of U. S. Department of State to study the problems of standards and training will fill their exact needs.

t. A. T. McPherson, Associate Director, National Bureau of Standards, who tly supervises the activities of the Office of Weights and Measures, was ented to the Conference and spoke briefly.

The conference was adjourned, to reconvene at 10:00 a. m., Thursday, May 1952.)

On the evening of Wednesday, May 21, an informal party was held at the dman Park Hotel, the Conference headquarters, for those attending the erence.)

## URTH SESSION—MORNING OF THURSDAY, MAY 22, 1952

(Erling Hansen, Vice President, presiding)

### REPORT OF THE COMMITTEE ON WEIGHTS AND MEASURES EDUCATION; PRESENTED BY CHARLES MORRIS FULLER, CHAIRMAN

The formidable obstacle that confronts too many weights and meas- officials is lack of sufficient manpower and equipment to do a ough job. This is not only disheartening to the conscientious ial, but it is most unfair to the people of his jurisdiction who are vented from receiving the protection to which they are entitled.

A miserly attitude toward departments of weights and measures is e economy—another example of “penny wise and pound foolish”; money expended on this kind of law enforcement is a dividend- ing investment, saving the taxpayer many times its cost.

Official recognition was given this problem 2 years ago at the 35th ional Conference, when your Committee on Weights and Measures ucation was directed to make a study on budgetary procedures. e object of the study was to establish a yardstick, based on indis- able facts and figures, that could be used in support of budget uests for legitimate needs.

Our first undertaking was to accumulate a large fund of relevant in- nation. This was accomplished by corresponding with 127 of- als, representative of both large and small departments, and located all sections of the country. They supplied the answers to our estions concerning personnel, equipment, and what they estimated s needed in order to thoroughly cover their respective territories.

The genuine interest and spirit of cooperation on the part of those tached was proof that here was a subject close to their hearts. It



gave an added incentive to our efforts to produce a comprehensive report of practical value.

Last year, the first portion of the report was ready for the 36th National Conference. All pertinent facts, comprising over 800 items, were tabulated and the charts presented, together with an explanation of the same and a review of the work to date.

Since that time, an intensive study has been made of those statistics and opinions. Your Committee has prepared a number of recommendations for your consideration. In arriving at these conclusions we have had the valued assistance of W. S. Bussey, Ralph W. Smith and a considerable number of leading officials. We express our sincere thanks to them.

In considering the matter of personnel, I think that we will agree that weights and measures should be a full-time job. A lot of harm has been done in some sections where an inspector or sealer is appointed in every little town. It is merely considered as a very small political plum. The salary does not amount to much, and little or no work of real value is done. The general public in those places has a pretty low opinion of weights and measures. A number of these communities should join together and maintain one efficient department that would function throughout the year, or the work should be done by the State.

There are certain factors that must be considered in estimating the personnel needed for any particular district. An area that is heavily industrialized will require more time and effort than one that is mostly rural. Therefore, any numbers arrived at, based on average requirements, will be subject to some degree of modification.

In general, one inspector should be allotted for each 50,000 population or major fraction thereof.

The official in a small jurisdiction who carries on by himself needs to make some arrangement by which the public can contact him. This can be provided by setting a certain time each day for taking care of his office work, when he would also be available for visitors and telephone calls. When he is in the field, calls could be transferred to the neighboring office, where a memorandum would be made of the name and numbers for his attention on returning.

Considerable thought has been given concerning economies in operation that can be effected in the larger departments. Although this is true so far as the routine inspection work is considered, we must recognize the fact that there are also heavier responsibilities. The larger department will usually maintain equipment for testing motor-truck scales and large-capacity meters. The State generally handles this work for the small departments that cannot justify the expenditure for their limited operation. There is also a greater ratio of complaints to investigate and prosecutions to institute in the large cities. We feel that the general formula as stated above should be used.

While on the subject of personnel, we might well enumerate several principles that have much to do with the successful operation of the weights and measures department.

The members of the organization should be under some form of civil service and not be dependent upon politics, either at the time of appointment or for tenure in office. You cannot give fair, impartial enforcement of law and regulations if you are controlled by political influence. Neither can you have efficient inspection service in a highly

technical work if trained and experienced men are going to be sacrificed every time there is a change of administration.

The chief and his staff should devote their entire time and energies to weights and measures, and not be burdened with other duties. They should also function as an independent unit of government and be under the direction of a superior whose main interest and sympathies are with some other activity.

Salaries at the present time, in far too many places, are less than "prevailing wage" for other positions whose responsibilities and duties can be considered in the same rank. This must be remedied. You will not attract the desired type of men, who will stay with this office for a career, if they are underpaid. Competition, today, is too keen.

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

Here is how one of the larger departments is set up. The entire organization is under civil service. Entrance is at the lowest grade where the men work under close supervision. They may drive one of the heavy-duty weight trucks and handle the weights for the senior deputy in charge; or they may assist in large-capacity meter tests. The important thing is that, while they are assigned to the heaviest, toughest part of the job, they are also given an opportunity to learn. This might be called a trainee period.

When there is a vacancy in the next or intermediate grade, a promotional examination is held, and the trainee has a chance to step up to that position. He is still under the supervision of a senior deputy, but is doing such work as assisting in the testing of scales in retail stores and markets, or gasoline pumps in service stations.

Then, when there is an opening for a senior deputy, this is filled by a promotional examination open to deputies in the lower ranks. Most of the positions are in this classification. They are trained, experienced men who are capable of handling any situation that may arise in the field.

There are also two complaint deputies who work with women weighing-in investigators, following up complaints about short weight measure, securing evidence, and prosecuting violators in court.

The department is divided into two sections one being scales and weights, and the other, gasoline and liquid-measuring devices. Each under direction of an assistant.

A five-step salary schedule is in operation. The employee receives a base salary on entering each position. This is automatically increased every year until the top of the grade, the fifth step, is reached. In some places, a six-step plan is used; others have three or four.

In studying the salary situation, your Committee has made a survey of salaries paid in governmental positions of comparable duties and responsibilities. It has also been mindful of wages paid by industry. The following are recommended as minimum amounts to be paid men first entering that grade of work, with automatic increases

to take place at the completion of each year of satisfactory service until the maximum is reached. By "minimum amounts," we mean that no salaries should be less than those stated. There will undoubtedly be some places where, owing to living conditions or other considerations, entrance salaries will be higher. As a rule, there is a spread of 20 or 25 percent between entrance salaries on the first and those on the last step.

Personnel	Minimum entrance salary a month
Departments (20 or more employees)	
Trainees.....	\$250
Intermediates.....	275
Senior deputies.....	320
Chief deputy.....	a 450 to 550
Department head.....	a 500 to 650
Departments (10 to 19 employees)	
Deputies.....	\$250 to \$320
Chief deputy.....	a 400 to 445
Department head.....	a 500 to 545
Departments (less than 10 employees)	
Deputies.....	\$250 to \$320
Chief deputy.....	a 350 to 395
Department head.....	a 400 to 495
Departments (1 man)	
Sealer or inspector.....	\$300 to \$350

a Depending on size of department.

We believe that the above recommendations are equitable and in line with present prevailing wages for comparable positions. They should enable us to recruit men of excellent caliber for this valuable service.

The subject of standards and equipment is thoroughly handled in the National Bureau of Standards Handbook 26 (chapter 14 and appendix III). No better guide can be found.

A station wagon will provide good transportation for all-around inspection work, especially for the small department.

Expenditures for maintenance and operation will vary greatly according to the nature of the jurisdiction—industrial or rural, concentrated or scattered, occupying a small or large area. Thus, we find one department, in a compact area, where the maintenance and operation will be only 12 percent of the salary budget. Another department, operating over wide stretches of territory, will require as much as 30 percent. The percentage for State departments is usually greater on account of more travel expense. No set formula can be established. Provision should be made to fully take care of the actual expense of operating sufficient equipment to enable the personnel to cover the work of the jurisdiction.

Capital outlay, of course, will depend upon the needs of a particular department. It will be large for the department that is ju



ting a start and needs almost everything; small for the department that is well established and requires mostly replacements of work equipment. Every effort should be made to keep abreast with the progress of industry by acquiring the type of inspection equipment that will take care of these new demands.

The Report of the Committee on Weights and Measures Education was unanimously adopted by the Conference.)

## REPORT OF THE COMMITTEE ON LEGISLATION, PRESENTED BY R. E. MEEK, CHAIRMAN

SECRETARY'S NOTE.—The text of the Model Regulation for Package Marking Requirements, which was tentatively adopted by the Conference, is not included in this publication. Upon request, the full text of the Regulation is available from the Office of Weights and Measures, National Bureau of Standards, Washington 25, D. C.)

The principal activity of your Committee on Legislation during the past year had to do with a study of existing regulations designed to deal with problems relating to informative and correct net-content labeling of prepackaged commodities. As a result of these studies, your committee is prepared to propose the tentative adoption of a regulation as authorized by Sections 7 and 19, Form 2 of the Model Law. First, and by way of background, your attention should be called to the resolution adopted by the Thirty-Fourth National Conference, which proposed the appointment of a Special Committee on Uniform Regulations. This committee was duly appointed and reported at both the Thirty-Fifth and Thirty-Sixth National Conferences relative to its studies and recommendations. Among the recommendations made and accepted were two of particular interest with respect to this report.

The first of these two recommendations was to the effect the National Conference should adopt a model regulation, paralleling the regulations promulgated by the Federal Food and Drug Administration, for the guidance of those States authorized to adopt such a regulation under provisions of their weights and measures laws. Since so much of the work of weights and measures officials in the package field concerns food products, the importance of uniformity between the Federal Food and Drug Administration's regulations and any model regulations to be adopted by this Conference cannot be overemphasized.

The second recommendation pointed out that the Committee on Uniform Regulations was a temporary and not a standing Committee, and for this reason should be discontinued and its field of activity assigned to the Legislative Committee with authority to draft and offer for adoption such model regulations as may seem desirable and consistent with the Model Law.

With the adoption of the report of the Special Committee on Uniform Regulations by the Thirty-Sixth National Conference, which report contained the two recommendations just referred to, your Committee on Legislation accepted the new responsibility. It proceeded, in its initial effort along this line, with the drafting of a proposed tentative regulation providing for informative and correct net-content labeling of all prepackaged commodities.

The proposed regulation, with the exception of the legal terminology and at the beginning and end of the regulation, which the Committee on Legislation is offering for your consideration, was taken largely

from the regulation promulgated about ten years ago, under authority of the Texas Net Container Act. It is our understanding the Texas regulation has proven to be very satisfactory in that State in coping with problems relating to informative and correct net-content labeling of prepackaged commodities.

The suggested regulation was carefully drafted to cover all prepackaged commodities and, at the same time, not conflict with existing State and Federal food and drug regulations. To avoid conflict which would certainly jeopardize enforcement, it was considered advisable to use, in many instances, the same language as was found in the Federal regulations. The importance of uniformity between State and Federal regulations and the proposed model regulation was not overlooked during the time this matter has been under consideration by the Legislative Committee.

The enforcement of a regulation, modeled after the Federal Food and Drug Regulations, would benefit from the departmental rulings and court decisions handed down over a period of several years. Since a considerable number of States have enacted food and drug legislation and adopted regulations virtually identical with the Federal Food and Drug Law and accompanying regulations, weights and measures officials would benefit from the cooperation to be expected from State and Federal food and drug officials if informative net-content labeling to be enforced by them is in agreement with existing regulations of this character.

Your committee has brought the proposed regulation to the attention of the Federal Food and Drug Administration and a number of State food and drug officials, with the suggestion it be advised wherein the regulation is not in harmony with existing Federal and State net-content-labeling requirements. Since no conflicts have been pointed out, the committee is of the opinion no serious ones exist.

The proposed regulation requires that the name of the manufacturer, packer, or distributor appear on the label or labeling of all prepackaged commodities, as well as the business address of such manufacturer, packer, or distributor. It requires a statement of net contents on all prepackaged commodities, establishes reasonable variations or tolerances to be allowed, and makes exemptions as to small packages. All of these provisions are set out in necessary detail.

(The Committee also gave consideration to a Bill in the House of Representatives of the United States Congress, H. R. 7128. This is a bill to permit transportation in interstate commerce, under certain conditions, of packaged food products without having shown on the labels thereof, the net contents of such packages. The recommendation of the Committee follows:)

The committee does not recommend approval of this bill as, in its opinion, if the bill were enacted into law, it would prove inefficient, unworkable, and undesirable for the following reasons:

1. At the present time the Secretary of Agriculture has only limited jurisdiction over packaged foods as his jurisdiction is limited to fresh fruits and vegetables and to meats and meat food products moving in interstate commerce. This bill, if enacted, would lead to divided responsibility as to the labeling of a given product. In other words, the Food and Drug Administration would have the responsibility for the correct labeling of the product in all respects except the weight declaration on the package which would become the responsibility of the Secretary of Agriculture.

. Enactment of this bill would have the effect of repealing certain provisions of the Federal Food, Drug, and Cosmetic Act relating to labeling of food products.

. Enactment of Federal legislation of this character would make difficult, if not impossible, for the various States to enforce their existing laws which require all prepackaged commodities to be labeled to indicate net contents at the time of sale or offer for sale.

. The provision in the bill requiring the tare weight of the packaging material, container, or wrapper to be placed on the package is workable because the variations in packaging materials would make impractical, if not impossible, to provide an accurate tare weight for each package.

. Enactment of this bill would result in shifting responsibility for accurate quantity labeling from the manufacturer or processor to the retailer and, at the same time, deprive the retailer the protection now afforded him by accurate quantity labeling in the buying and selling of commodities packaged by the manufacturer or processor. In other words, the retailer, upon receipt of a shipment of prepackaged commodities, would have no way of determining if any shortages found in him were due to normal shrinkage, to conditions which normally occur in good distribution practice, or were actually shortweight at the time shipment was made.

. Existing Federal legislation covering the net-content marking of food sold in package form in interstate commerce is adequate, and the activities of State and local weights and measures officials plus the activities of the Federal Food and Drug Administration and various regulatory officials provide adequate protection to the consuming public.

. Any additional requirements designed to give greater protection to the consuming public in the interstate shipment of food should be made within the framework of existing laws.

(The Report of the Conference Committee on Legislation was adopted by the Conference. This action included tentative adoption of the Model Regulation Package Marking Requirements.)

## OUR WORK IN THE FIELD

BY ALFRED DI PIERO, *Superintendent of Weights and Measures, Camden, New Jersey*

Weights and measures has, as we know, been in effect and practiced in one manner or another ever since man has existed on this earth. An attempt to explain the prehistoric methods of weighing and measuring and other supplementary systems is not within my scope. Mine is to describe to you briefly a part of the activity of the most important man in this great weights and measures profession, the man in the field. By the man in the field, I mean that individual who actually goes out every day equipped with his standards, be they weights or measures. It is fair and just at the outset that I point out just how important this man in the field really is in the overall picture of weights and measures. He is the ultimate judge of any quantity determination. He is the man who places the weight, regardless of whether it is on the scale, the liquid in the measure, and the package on the scale, to adjudge trueness and accuracy. He is the man who detects cheating, presents the case before the court, and is constantly under the watchful eye of the public, because he is the man whom they see, actually carrying on the work.



We may view with pride the tremendous progress that has been made, and is still being made, in the field of weights and measures. The basic foundation for 90 percent of this progress which involves changes in engineering, in the laws, and in the methods, is the result of the inspection of equipment, under actual operating conditions, by these field men. The snags that they encounter in the courts, and the response of a scale or pump when a test is applied, are the elements that bring out whether a law is applicable, or an article is fit for use as an accurate measure. The reports of these tests and inspections eventually find their way to these National Conferences, the final link in a vast chain of cooperation that is prevalent and so necessary in maintaining a uniform system of weights and measures throughout the nation.

Our profession, you must agree, is one of the least publicized, most forgotten, and least appreciated in the government, be it city, county, or State. It is a fact that, in most cases, the only time our work is viewed with any concern is when the purchaser encounters us at a place of business, actually applying the standards. It is then that the person becomes aware of our existence and views us with a quizzical attitude, an attitude that seems to hang between the honesty of the merchant and the mystery of the standards that we handle. It would be one of the greatest opportunities for public relations if we could then and there give a short instruction on our work, the customer's alertness, and the dealer's obligation, instead of permitting someone to leave the scene, totally oblivious to the important operation that was taking place. Occasional newspaper items are read, passed on, and forgotten. Talks explaining our work, together with displays before civic groups, are a creditable and instructive means of bringing out our importance, but the viewing of men operating under actual conditions is one of the best means of selling weights and measures. Our potentiality as an agent of information as a missionary, or an instructor, is great, due to our contacts with the people who are affected by our work.

It makes no difference what your title on the statutes may be, whether you represent State, county, city, or township; whether you are an agent, inspector, superintendent, or assistant; the work in the field, in carrying out the plans and designs that are made by the governing bodies, is equally important. The assignments in the field are not easy, physically or technically. The inspection of an ordinary gasoline station presents the task of carrying a test can filled with gasoline, weighing close to 50 pounds, from the pump to the underground-tank pipe, for every test that is made. The ordinary station having three pumps will mean a minimum of six trips if there are no discrepancies, the maximum being dependent upon the result of adjustments. The calibration or meter test of tank trucks presents a dangerous and unpleasant task, dangerous in the climbing about the trucks, and unpleasant in the grime and wear and tear on clothing. Then, too, there are heavy-duty scales, which demand the utmost of physical exertion in every test. I enumerate these activities with the purpose of reminding you who do the actual work, the reason for a certain tired feeling that seems to prevail every midafternoon.

Officials, whose work confines them to the office, perhaps may feel that they are not playing an important part in these various operations. Accurate records of activities are one of the most important

parts of a well-organized department. The uniformity of the work assignments, proper cataloging of territories, the dissemination of information to the public, and many other details that must emanate from the office are projects that call for careful attention. The two assignments, field and office, go hand in hand in cooperation, both working in the interest of proper enforcement of laws most vital to the public today.

If you are one of these men assigned to a branch of the work that is heavy, dirty, or unpleasant, do not feel that you are just another hired hand or one of the forgotten. You are a most vital part in the weights and measures organization, and you should take a rightful place in the organization, realize your responsibility, and apply yourself accordingly. Without you and your intense interest in the work, we would not have the glowing reports of activities to present to the legislators, superiors, and to the public at the end of each year.

We too often underrate our efficiency and responsibility in the work and perhaps neglect to put forth thoughts or ideas that may bring about a worth-while improvement in conditions. These suggestions are always appreciated and should never be underestimated. I know many fine conditions in the State of New Jersey which are the result of accepted suggestions from men in the field. Only this year, an extensive legislative program was presented to the State legislature after conferences between the divisional heads and officials in the various municipalities. Each bill was discussed, and, where necessary, changes were made. After the bills had been presented, the entire weights and measures personnel was notified to contact their representatives and to apprise them of the importance of the legislation that we had presented. This recognition of the importance of field men, even in the legislative phase of departmental activities, is something that should never be overlooked or disregarded, for they are an integral part of a great department.

Our work is demanding and has a dignified tradition. This dignity should be maintained and guarded with an intense regard, if we are to further the cause of weights and measures. It would be beneficial if, from time to time, we take an inventory of ourselves. Are we applying ourselves wholeheartedly to our job? Are we establishing better understanding among the dealer, the official, and the public? Are we a public relations agent that we should be? Lastly, and this is important, do we treat with respect the people with whom we deal? Occasionally, we should check our qualifications. Can we, with confidence, perform every detail in the category of weights and measures? Can we accurately test the drug weights and glass graduates, and the various meters? Can we apply tolerances where necessary, and make technical recommendations with confidence? These are items that efficient officers should be able to carry on, regardless of their place in the departmental enforcement setup.

You are the most important cog in a fine set of gears, operating a highly precisioned machine. If you are not perfectly fitted to this gear, or if you are a trifle out of alignment, the entire machine is thrown askew. This indeed would be catastrophic and would curtail an honorable profession. Therefore, it is important that the link between the field men and the superiors be one of everlasting duration, although at times the conditions may be trying.

Sometimes the titular office is a political football. This is indeed unfortunate and should be eliminated. There may be other strained

conditions brought about by events over which we have no control. We do always have one consolation. Regardless of such exigencies our work is one of honesty, and, as long as we perform it in an honest and sincere manner, time will solve the rest of our problems.

Be fair with yourself in your application to your work. Be understanding and courteous to those whom you serve, honest and upright in your dealings with your superiors, and relentless to those who attempt to destroy the rules that you enforce.

Lastly, if you have a weights and measures association, and even if your department should have one, you should be interested in its activities. Attend its meetings, air the mutual problems, and discuss matters that may tend to bring about better conditions. Support the legislative programs that are proposed from time to time.

I appreciate this opportunity to appear on this Conference program and to deliver this brief talk on one of my favorite subjects.

### SALT LAKE CITY AND ICE CREAM

By E. C. WESTWOOD, *Scaler, Department of Weights and Measures, Salt Lake City, Utah*

In November of last year the Salt Lake City Commission revised the Weights and Measures Ordinance by the addition of a new Section known as "Section 6638 Ice Cream and Related Frozen Food Products to be Sold by Weight." This law was to become effective in May of this year.

During the interim, between the time the law was written and made public and the time it was actually to become effective, the Utah Ice Cream Association entered into the picture and strongly protested its adoption. It was their contention that a weight law governing the sale of ice cream would be impractical and would impose upon the industry an almost impossible task in attempting to comply with such a law. In the first place, they argued, ice cream is packaged by hand and the process, to a great extent, is guess work. As each carton is filled the operator cuts off the flow. For one individual to continue this process hundreds of times each day and arrive at an exact weight in each carton would be impossible.

Another problem, industry argued, was that involving the different solids used in the various flavors they are required to produce. The basic flavor is normally vanilla, and the addition of other ingredients such as fruits and nuts, increases the weight. This, they contend, would necessitate the marking and weighing of each carton after it is packed. The ingredients used by the different manufacturers and the volume of overrun varies in each brand. In order for each manufacturer to pack a certain weight (depending on the overrun and the ingredients used) he would, of necessity, be required to order containers of a size to hold that desired weight. His competitor, using a different base and overrun, would be required to order containers of a different size to pack the same amount of ice cream. This, they argued, would not only create a serious problem for them but would bring many headaches to the weights and measures inspectors.

The problem of temperatures of the different freezing units through which the ice cream is kept in, from the time it is manufactured until the time it is actually consumed, was argued and also the element of shrinkage. These arguments and others were used by the Association representatives toward convincing the Commission that the law was impractical.



al. It is not my desire to burden you with drawn-out details of these arguments. The pros and cons of argument have been given by exhaustive treatment, and there are voluminous records on the subject. While there has been much public demand, as directed to rights and measures agencies, for the adoption of sale by weight, when the final showdown comes, the public does not put in an appearance. The result is the Association representatives usually prevail. In our particular fight in Salt Lake City we were a little disappointed in the retail dealers who have always backed us and encouraged sale of ice cream by weight. When the chips were down they did not come forth and support the proposition as we had hoped they would. After many weeks of constant interruptions by the Association members the Salt Lake City Commission secured withdrawal of the law which had not yet been in actual operation. The arguments mentioned above had considerable weight on the ultimate action of the City Commission, but their strongest point, in my opinion, was the fact that Salt Lake City is only one of many distributing points for their product in the State of Utah, and that to have a weight law in Salt Lake City and not elsewhere in the State of Utah would create definite hardship on the industry and would slow down the efficient operation of dispensing their product. In addition there would be expense involved in marking and labeling of cartons and the overhauling required in machinery. This point was strongly stressed by the Association.

In November of last year, when we were successful in having the sale-of-ice-cream-by-weight law passed, we were elated and proud to think that Salt Lake City was the first municipality to pass such a regulation. It was felt we had started the ball rolling toward our ultimate goal of ice cream by weight in the State of Utah, and eventually in all of the 48 States. This, gentlemen, is still our goal. Public demand for the sale of ice cream by weight is becoming more pronounced each day. More and more retailers have adopted this method and the public is becoming more accustomed to purchasing ice cream in this manner. The old factor of custom, which has been so expertly expounded by the Association in their opposition to this law, is becoming a lesser consideration. The argument of lack of proper machinery and weighing devices can no longer be considered a threat to our ultimate goal. Modern weighing devices and machinery have, in recent years, completely tabooed this argument. Sale by weight will establish equity between manufacturers and dealers and will promote honesty in the dispensing of this product.

In 1925 V. F. Hovey, then president of the National Association of Ice Cream Manufacturers, in his remarks to the 18th National Conference on Weights and Measures, stated: " \* \* \* the industry believed that the public was only interested in buying ice cream by volume." Whether this statement was right or wrong, I cannot say. In all probability, the public had not actually given it much thought. Since 1925, however, many industries have streamlined their packaging and merchandising methods. This has been especially so in recent years, since World War II. Many of these changes have been made by industry because they could see where modern packaging equipment could better protect and better display their particular product, making it more acceptable to the public. Many of the modern changes have also been made because more rigid laws have been adopted by

our respective States. Ultimately, of course, the aim is to provide better protection for the public.

It was my hope to give to the Conference, at this time, a report concerning the law after it was in force and to give you the reaction of the public and the dealers to it. I still think, regardless of what the Association representatives say to the contrary, that it will be highly acceptable to the public, and that weights and measures department will receive nothing but favorable comment from it. Although, my knowledge, there are presently no laws in the United States which require the sale of ice cream by weight, the efforts of the weights and measures inspectors toward encouraging such method of sale is being felt. There are many localities in the United States today where ice cream dealers are advertising and selling by weight and are doing so with good reaction from the public. This program has been going on in Salt Lake City for the past three years. The retailers using this method advise me that public reaction to it is excellent, and the complaints regarding measure received are practically nil as compared to the complaints they received when they were dispensing ice cream by volume. This is also true so far as our own weights and measures department is concerned. In the retail establishments where this policy has been in force I cannot recall of one complaint that has come in to our office regarding short measure. With this type of reaction I cannot help but feel the ice-cream-by-weight law will soon be a reality in many localities. The sale of ice cream has been one of the big headaches with which weights and measures departments have been faced, the reason being that we have not had proper laws and regulations to control it. I, for one, want to eliminate this difficulty, and I am sure this can be accomplished through the combined efforts of all weights and measures departments.

If you agree with my thoughts on this subject, may I take this opportunity to offer a few suggestions, which, incorporated with your own thoughts and ideas, will help all of us toward reaching our desired goal. (1) Every time a newspaper reporter walks into your office give him something to write about on this subject. (2) Whenever you are asked to talk on Weights and Measures bring this subject in to your discussion. (3) Give a word of praise to the dealers in your area who are using this method, and encourage others to do so.

All these things go toward informing the public of the advantages they derive from this method of sale. The public generally does not give much thought to matters of this kind, because of the old established custom. It is second nature for an individual to walk into his favorite ice cream parlor or fountain and request ice cream by the quart or by the pint. With proper publicity, through the medium of our local newspapers, and the combined efforts of weights and measures inspectors and dealers, this habit can be changed. When the public is once convinced of the value they receive from sale by weight and the necessity for legislation to control the sale of ice cream, our problem will be solved. It is the desire of all weights and measures officials, I am sure, to protect the public in its purchases of ice cream. It is the right of the public to expect this protection. Industry has the protection of experts; the public is entitled to protection by law.

## NET-WEIGHT MARKINGS OF PACKAGES AND CANS OF TOBACCO

G. H. LEITHAUSER, *Senior Assistant Superintendent of Weights and Measures, Baltimore, Maryland*

One of our inspectors, in the regular course of his work, reported me that packages and cans of tobacco were not marked as to the net weight of the contents. As a result of this report, I wrote to J. S. Bussey, Secretary, National Conference on Weights and Measures, as follows:

Do you consider the Government tax stamp on the outside of cans of Branger and Model tobacco as complying with Weights and Measures Laws which say that "... it shall be unlawful to keep for the purpose of sale, offer or expose for sale, or to sell any commodity in package form, unless the net quantity of the contents be plainly and conspicuously marked on the outside of the package in terms of weight, measure or numerical count, etc." These tobacco cans do not show any net weight statement on them, except the Government tax stamp which shows that the contents of the cans are either 14 or 15 ounces.

As a result of my letter, I received a reply from M. W. Jensen, Assistant Chief, Office of Weights and Measures, National Bureau of Standards. Mr. Jensen advised that Mr. Bussey was out of the city. He stated further that he had investigated the matter and had discussed the problem with a representative of the United States Bureau of Internal Revenue, who advised that the tax-stamp declaration literally indicated that the quantity contained was not more than the weight printed on the stamp when the product left the factory. Mr. Jensen stated that apparently the practice of the industry is to indicate no net quantity upon the exterior of the can and to depend upon the tax stamp to serve in lieu of a quantity declaration. This seems to be a practice of long standing. It was the opinion of the Office of Weights and Measures that such labeling might be questionable under strict interpretation of the provisions of the Model Law. On receipt of this letter, I wrote the various tobacco companies as follows:

Our Inspector reports that you are shipping packages and tins of tobacco to this jurisdiction not marked as to the net weight of the contents in the package.

Your attention is invited to Article 20, Sections 16 (a) and 16 (b) on page 9, ordinances relating to weights and measures, a copy of which is enclosed.

Please advise us promptly what steps will be taken by your company to correct this condition.

I received replies from the various tobacco companies, the summary of these replies being about as follows:

Our pipe smoking tobacco containers do not have any statement of the weight of contents printed or lithographed on the tin containers. All such containers, however, which leave the factory and which are shipped within the continental United States bear United States Internal Revenue Stamps affixed according to law across the top opening of the container. Such stamps state the weight of the contents of the package to which they are affixed. We believe that the presence of the excise tax stamp on the packages of tobacco is being accepted by States, having laws similar to the law of Maryland, as being the net weight declaration of the contents of the package.

From the above, you can see that the problem involved here is as outlined in my first letter to Mr. Bussey. Does the Government tax stamp on the outside cans of tobacco comply with weights and measures laws on declaration of net content of packages?



If we decide that the Government tax stamp could be construed as a net weight declaration, then all the weights and measures officials who have the power to do so should adopt a regulation condoning that practice. If, on the other hand, the Conference feels that there should be a definite net weight statement on the packages and cans of tobacco, I would propose that we give the tobacco companies one year in which to exhaust their present supply of lithographed cans.

I might state here that most of the tax stamps on cans of Grand and Velvet tobacco are covered by the lid of the can. That portion not visible includes the weight indication. Such weight indication does not appear on the outside of the package.

If we decide that the tax stamp does constitute a net weight marking, as required by law, I suggest that Liggett and Myers Tobacco Company be notified to paste their tax stamp completely on the outside of the package so as to comply with the law.

I have an open mind on this subject as to whether or not the tax stamp should be construed as a net quantity declaration, but I feel that, for the sake of uniformity, all jurisdictions should settle that question at this Conference, if practicable.

**MR. O'CONNOR:** I am representing the P. Lorillard Company, manufacturers of smoking tobacco. Our position is this. We feel that the Internal Revenue stamp is sufficient to protect the public, and we feel that another declaration on the can would serve merely to confuse the public. In addition, it would be a needless duplication.

To substantiate our contention, I refer you to the last paragraph of the report submitted by your Committee on Legislation, in which they say existing Federal legislation covering the net content marking of food sold in package form in interstate commerce is adequate; and that the activities of State and local weights and measures officials plus the activities of the Food and Drug and various regulatory officials provide an adequate protection to the consuming public.

Tobacco tins are made in Baltimore, for example, by the Federal Tin Company, for many sellers of tobacco. Those tins are then shipped empty to Winston-Salem, North Carolina, Richmond, Louisville, wherever they are to be packed. Since the can manufacturer would be unable to designate which cans are to be shipped into any given jurisdiction after having been filled, we feel that Mr. Leithaus is perfectly correct when he says that we should have a uniform policy. You gentlemen should decide either that the public is protected by the present declaration on the Internal Revenue stamp, or that something else is needed. It would be a terrific hardship and burden on the tobacco people if a special declaration were required in only one or two communities and not throughout the country.

You might be interested in the regulations of the Internal Revenue Department with regard to the stamps which must be placed on tobacco tins. They provide that the packages must contain up to 15, or 16 ounces. Then they say that manufacturers are required to put up their tobaccos, etc., in certain packages, and in no other manner. A statutory package of tobacco means a package which contains only that article upon which the tax has been paid and no other substance or thing. The contents of a statutory package must be limited to the net number of pounds or ounces of tobacco or snuff, etc., indicated by the stamp affixed to the package.

I think you will agree that tobacco men are not going to pay for a ounce stamp if they are only going to put 14 or 15 ounces of tobacco the package.

I am sure you will agree with Mr. Leithauser that the companies have been very conscientious in giving the exact weight in the package as it is indicated by the stamp on the outside.

If you feel that the Internal Revenue Stamp, which states the net weight, the net weight only, is not sufficient to protect the public, I would suggest that this be considered. It might be possible to have the Internal Revenue stamp contain a trifle more information.

At any rate, our basic position is that the public is not being confused or deceived by the present practice, and that needless duplication would result if we changed that practice.

MR. KENNEDY: I do not agree with Mr. O'Connor that the Internal Revenue regulations protect the public. He used the word "limited." "limited" means that they cannot go above the weight indicated on the stamp. It says nothing about giving less than that weight. However, we are having no trouble with tobacco, and they are being conscientious about putting the weight in. As long as they do that, I commend that we leave them alone. When they fail to do that, let us pass a regulation which requires a marking on the can.

MR. BLICKEY: It has been an accepted practice throughout the States, and I know especially in Pennsylvania, that we recognize the Federal stamp as a declaration of contents. However, I am certain it is a violation not only of the Pennsylvania law, but of every other law which states that the net content must be declared on the outside of the package.

I would suggest that we place this subject in the proper committee, let them study it for a year, and bring it before the Conference next year, when a final decision can be made. In the meantime, we should continue to recognize the Federal stamp as a content declaration.

MR. RAGLAND: I am Executive Secretary of Associated Tobacco Manufacturers, located in Washington. We are a trade association whose members manufacture every type of tobacco product sold in the 48 States of this country and in many other countries throughout the world.

Unlike most commodities, tobacco is under control of a governmental agency from the time the leaf is first sold by the farmer until the consumer purchases the finished product. Even the grower of tobacco, in most instances, is controlled as to the amount of acreage he may use in planting his crop.

My purpose in being here today is to submit, first, an explanation of why the Federal Internal Revenue excise tax stamp is suitable and a simple indication of the net weight of a package of manufactured tobacco at the time of its removal from the factory and, secondly, to request that this Conference adopt a resolution accepting this evidence of tax payment as satisfactory compliance with those ordinances and laws requiring net weight markings on packages of tobacco.

Section 2100 of the United States Code and the definitive regulations issued by the Commissioner of Internal Revenue provides:

All manufactured tobacco shall be put up and prepared by the manufacturer for sale, or removal for consumption, in packages of the following description and in no other manner: (a) Size . . . .

This subparagraph sets forth the weight denominations covering net weight contents of packages of tobacco.

In Section 2002 of the code you will note that :

The Commissioner shall cause to be prepared suitable and special stamps for the payment of the tax on tobacco and snuff, which shall indicate the weight and class of the article on which payment is to be made.

Article 52 of Regulation 8, which implements this section of code, states :

Each package containing a statutory quantity of tobacco or snuff shall before removal from the bonded factory premises where made, have affixed thereto the proper internal revenue stamp or stamps of such denomination as will cover fully the tax on the net weight of the contents. . . .

(a) Every package containing 16 ounces or less of tobacco or snuff must be tax-paid by affixture of a single stamp of the proper class and denomination.

Article 110 of Regulation No. 8 reads in part as follows :

Manufacturers are required to put up their tobacco, snuff, cigars and cigarettes in certain packages and in no other manner. . . . The contents of a statutory package must be limited to the net number of pounds or ounces of tobacco or snuff, or the number of cigars or cigarettes, indicated by the stamp affixed to the package. . . .

In addition to the aforementioned controls, Article 41 of Regulation 8 requires every manufacturer of tobacco or snuff to keep a book in which is entered daily an accurate account of the quantities of the different kinds of manufactured tobacco and snuff produced, removed tax-paid, or in bond for export or for use as sea stores, withdrawn without payment of tax for use of the United States. In addition, this record must indicate the value of all stamps purchased and used. Severe penalties are prescribed for those failing to comply with these requirements.

If this were not enough to exact compliance, please consider the economic aspect. I shall not dwell on this point because surely you can understand why tobacco manufacturers would not pay for an affix to packages of tobacco revenue stamps of larger denomination than is actually required by the net weight involved.

The ordinary conduct of interstate trade is complex enough without making matters more difficult. All sensible people are sympathetic with the objectives of your assignment. The days of "caveat emptor" are outmoded, and that is only proper in this age of enlightenment. Likewise, you officials who are charged with public trust of protecting the consumer against unscrupulous purveyors should adopt a realistic attitude in the fulfillment of your duties. Tobacco manufacturers are honorable businessmen, and I ask you not to place hobbles on the merchandising flexibility. I urge you gentlemen to advocate the acceptance of the Federal Revenue Tax stamp as *prima facie* evidence of the net weight marking on packages of tobacco.

(At the conclusion of the discussion, a motion was made, seconded, and adopted that the matter of content labeling of packages and cans of tobacco be referred to the Conference Committee on Legislation for consideration and recommendation.)

#### SALE OF PEAT MOSS

By T. A. CARTER, Supervisor, Division of Standards, State of Washington

We in the State of Washington, as well as persons in other States of the United States, feel that some regulatory action should be taken



regarding the packaging of peat moss. We have felt that such action would be desirable, and that industry needs some legitimate packaging standards, particularly in reference to baled material. There are certain companies who put out baled peat moss that has a compression ratio of  $2\frac{1}{2}$  to 1, and the size of the bale is 36 by 18 by 20 in. (outside measurements), and that is quoted as a standard bale, and is sold as such. Other companies make a smaller bale, and a little shorter, in both length and width, and compress it much less, and this is also sold as a standard bale.

We have thought of drawing up regulations regarding the sale of peat moss, but before doing so we have communicated with other States relative to this subject. Some States favor weight markings, and some favor measure markings. It seems that most of the States that are most concerned, and have made somewhat of a study of the subject, feel that a statement of quantity in connection with peat moss, should be in terms of cubic content, that is, 7 cubic feet, 5 cubic feet,  $3\frac{1}{2}$  cubic feet, etc., with the additional stipulation that the volume as contained in the respective containers be compressed in a 2 to 1 ratio. The reason for favoring a statement of cubic content rather than by weight is due to the fact that weight markings in this instance can be used for the perpetration of fraud because of the high moisture content.

Of course, it is to be realized that there are a great many factors to be considered, and no doubt any set of regulations or laws that may be adopted will meet with objections from many sources.

I am at this time presenting the subject of peat moss markings to this Conference for consideration. I am sure that any action taken by you will meet the approval of the States.

(Discussion of the Sale of Peat Moss was deferred until after the presentation of the recommendation of the Conference Committee on Methods of Sale of Commodities. This will be found on page 58.)

## WIPING CLOTHS

J. E. BRENTON, *Chief, Bureau of Weights and Measures, State of California*

It is the opinion of the weights and measures officials of the State of California that the attempt on the part of certain persons to legalize the sale of wiping cloths by gross weight was an endeavor that, had it succeeded, would have jeopardized every principle of honest merchandising, principles upon which the economic foundation of every civilized nation is based. A future argument could well be presented and defended that fruits and vegetables should be sold based on the weight of the contents and wooden crate; bulk grain in cars sold on the basis of the combined weight of the grain and car. These possibilities may seem ridiculous, but I assure you that arguments in favor of selling fruits, vegetables, and coal on the basis of gross weight are just as sensible as were the arguments that were advanced in an endeavor to perpetuate the mistake that we, as weights and measures officials, are permitting to take form by our lackadaisical attitude with respect to those dealers of wiping cloths who insisted on selling their product on the basis of gross weight.

In the State of California, a bill was introduced in the State Legislature, the provisions of which permitted the lawful sale of wiping cloths on the basis of gross weight, meaning that the basis of settlement should be the combined weight of contents and container. This pro-

posals actually passed the Assembly of our State Legislature, but were successful in preventing any further advance.

The proponents of this bill used three principal arguments. They were:

1. The weights and measures officials of the State of California were alone in their requirement that wiping cloths should be sold on the basis of net weight, and, as a result of what they claimed was a long effort to enforce net weight, the dealers in the State were being penalized because they could not economically compete with out-of-State dealers who were offering wiping cloths at a lower cost per pound based on a weight that was a gross weight. Also, when wiping rags were shipped into the State for resale, in containers bearing a statement of quantity in terms of gross weight, we could not require that the containers be remarked with a statement of quantity reading in terms of net weight. It was also stated that the different agencies of the United States Government purchased their entire requirement of wiping cloths on the basis of gross weight.

We countered these respective contentions by writing to the weights and measures officials of twenty different cities and States, inquiring as to their acceptance of gross weight in lieu of net weight in connection with the sale of wiping cloths. Without a single exception, the answers supported, without equivocation or reservation, the standard recommended by the National Conference, that wiping rags should be sold on the basis of net weight.

A request was made of the Attorney General of the State of California for an Opinion as to whether or not we could require that a statement of quantity in terms of net weight be placed on a container of wiping cloths shipped from out-of-State to California for resale in California, and also whether or not we could require a dealer in California to sell wiping cloths on the basis of net weight, wiping cloths that he had purchased in another State on a basis of gross weight.

The Attorney General supported our Bureau in both instances. The containers, when offered for sale in California, must bear a statement of quantity in terms of net weight, and the sale itself must be on the basis of net weight. (Copies of this Opinion may be obtained upon request to Mr. Brenton.)

Mr. Bussey, our National Secretary, air-mailed a copy of Federal Specification DDD-W-415, and the provisions as contained in this particular specification definitely refuted the claim concerning gross weight purchases by Federal agencies.

The prompt replies of twenty State and city weights and measures officials, the provisions of Federal Specification DDD-W-415, and a favorable Opinion from our own State counsel all combined in blocking any additional vote gaining, on the basis of the arguments that we have noted.

2. The Office of Price Stabilization would not permit the industry to sell on a net-weight basis due to the fact that the price as established by that agency was on the basis of gross weight. This opinion proved to be the opinion of one man and was not supported by the Washington office of the OPS. Again, through the cooperation and assistance of Mr. Bussey, this argument was quickly and definitely refuted.

3. Their third, and final, contention was that the weights and measures officials were permitting the sale of wiping cloths on the basis

gross weight throughout the United States, and the practice should be disturbed.

Our reply was to the effect that we were not employed to perpetuate stakes, and that the sales of wiping cloths must be on the basis of weight.

As an example of a sale by gross weight, we shall offer you the following:

A county purchasing agent in a county in California ordered fifty-pound cartons of wiping cloths. The actual net weight of these cartons averaged  $46\frac{1}{2}$  pounds, an overcharge of  $3\frac{1}{2}$  pounds per ton, making a total overcharge of 175 pounds. One hundred and twenty-five pounds at  $25\frac{1}{2}$  cents per pound equals \$44.62. You can all imagine the hue and cry that would have been raised had an oil company deliberately short-measured this county 223 gallons of gasoline, which is the quantity that \$44.62 would purchase at 20 cents a gallon.

When ordering a bale or carton of wiping cloths, you specify "white wiping cloths" or "colored wiping cloths." We do not construe or interpret the burlap wrappings to be either a "white wiping cloth" or a "colored wiping cloth," and have insisted that the weight of such burlap wrapping and tie wires be considered as part of the tare.

As previously mentioned, we are of the opinion that the effort to legalize the sale of wiping cloths on the basis of gross weight was an opening wedge, and, because of this probability, we could not afford to compromise in any manner, shape, or form.

It is probable and possible that, in the future, efforts will be made, either through the medium of legislation or adoption of regulations, to legalize the sale of wiping cloths by gross weight.

As your associates and coworkers, the county and State weights and measures officials of the State of California urge you to fight any such move without compromise.

(The Conference was recessed until 2:00 p. m.)

## FIFTH SESSION—AFTERNOON OF THURSDAY, MAY 22, 1952

(J. Fred True and R. D. Thompson, Vice Presidents, presiding)

### REPORT OF THE COMMITTEE ON METHODS OF SALE OF COMMODITIES, PRESENTED BY J. G. ROGERS, CHAIRMAN

*Preamble.*—Your Committee on Methods of Sale of Commodities presents its report for consideration and such appropriate action as the Conference may decide upon in relation to its several sections. The principles, purposes, and policies under which this Committee's actions have been explained in former reports and we believe are now well understood. They are accordingly not being recounted here. The attention of this Committee was focused upon the following items since the last Conference. Our recommendations in relation to them, as now offered for your consideration, represent what we deem to be reasonable, fair, and proper solutions of the problems ended in these various issues, as to methods of sale.

1. *Soap (Bars and Cakes).*—Should be sold by numerical count and the number of bars or cakes in a package should be stated on the outside of the package in a plain and conspicuous manner, provided, however, that where a package contains only one bar or cake of soap such declaration or statement should not be required; and provided,



further, that these stipulations shall not apply to medicated soap required to be marked by weight under the Federal Food, Drugs and Cosmetic Act.

NOTE.—This item which had developed controversy after being given what was assumed to be final action by the 34th National Conference was reopened at the 36th Conference in 1951 and after debate was referred back to your Committee by vote of the Conference, for further study and reconsideration. Your Committee now offers the foregoing recommendations for final adoption.

2. *Ice Cream and Ices on Sticks*.—Novelty items of ice cream and ices frozen on sticks and sold in package form shall have the quantity of contents declared in terms of avoirdupois net weight or in terms of net volume by fluid ounces.

NOTE.—The 36th National Conference adopted a recommendation that these novelty items of frozen products when sold in package form "shall have the quantity of contents declared in terms of avoirdupois net weight."

This was presented as Item 9 of your Committee's report with an appendiceal note of basic reasons for the requirement. Subsequent to that Conference the interests most directly affected made representations to this Committee to reopen the subject for further consideration, as it was their belief that while we had acted in all sincerity of purpose, we were possibly not in possession or had knowledge of all facts in relation to this issue, which could affect the decision we had reached. Consistent with adopted policy, a review of the subject was granted and the Committee then launched a research of all phases involved. The resulting determinations were such as to conclusively show that there are many technical ramifications and other factors related to the issue with which we were not familiar, and that our original recommendation at the Conference was premature.

Consequently what first appeared to be a simple matter to settle became one of considerable proportions and through the further facts we have gathered has impelled this Committee to now offer the recommendation that the action taken at the 36th National Conference on this item be rescinded and that the following recommendation be adopted in substitution:

*Ice Cream and Ices on Sticks*.—Novelty items of ice cream and ices frozen on sticks and sold in package form shall have the quantity of contents declared in terms of avoirdupois net weight or in terms of net volume by fluid ounces.

This now makes declaration by volume permissive, and for which full justification has been found.

In the interest of brevity the many technicalities and phases entering into our findings are not incorporated in this report but can be made available to any member of the Conference who desires to review them.

Among the salient reasons that influenced our final decision are:

(a) That public interest will best be served by the modification of a restrictive requirement which if confined to weight would influence and impose an increase in cost on a popular commodity.

(b) That consumer economy can be adequately protected by a simple displacement method of test to determine the quantity by volume in items of this kind.

(c) That it will remove any nuisance factor inherent in this issue.

(d) That it will permit a method of sale with which all manufacturers can readily conform without difficulties that would increase the cost of production.

(e) That the industry will systematically and fully conform with State approval requirements in relation to the molds and forms it uses as measuring media in the production of novelty frozen desserts.

(f) That the industry has rendered full cooperation in the efforts to reach proper conclusions on this issue and manifests intention to maintain high ethical standards in the operations of their enterprises.

3. *Peat Moss in Package Form (Tentative)*.—The following shall govern the production, packaging, and sale of this commodity.

## I. PACKAGING

) Peat moss shall be put up in packages of the following sizes and dimensions only.

Actual capacity of package	Allowable size in package					
	Length		Width		Depth	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
<i>cubic feet</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>
-----	41	39	25	23	22	20
-----	40	38	21	19	21	19
-----	37	35	20	18	19	17
-----	30	28	18	16	15	13
-----	16	14	11	9	16	14
-----	19	17	10½	8½	6	4
-----	13	11	8	6	6	4
or less-----	(a)	(a)	(a)	(a)	(a)	(a)

be sold in uncompressed or compressed form, provided content in cubic feet and degree of compression are clearly marked on package.

) The ratio of compression on peat moss in package form shall not be less than two to one.

) There shall be an allowable tolerance in cubic content not to exceed 3 percent of the stated package volume.

## II. LABELING OR MARKING

All packages shall be plainly and conspicuously marked with the quantity of contents in terms of cubic feet and/or fractions thereof, together with the ratio of compression, as, for example, "Contents 7 cubic feet", "Compression not less than 2 to 1."

## III. GENERAL REQUIREMENTS AND EXEMPTIONS

Peat moss prepared by a process of briquetting, pelleting, or extruding, with a compression ratio in excess of 5 to 1, shall be sold on a weight basis with no limitation on size of package.

Specialty products from peat moss, such as asparagus pads, floral bolls, floral moss, insulating boards or batts or other specialized forms or preparations, shall be exempt from these recommendations.

NOTE.—The proper method of sale for this commodity has long been a troublesome problem to weights and measures authorities. The production and sale of peat moss has greatly expanded since the subject was first brought up in reports and measures channels and your committee believes there is now a general opinion that our Conference group should take definite action about it without further delay.

There has been considerable study given to this topic by quantity regulating authorities in various sections of the country, and the recommendation now submitted represents the consensus of those who have conveyed their determination to us.

First consideration was given to the possibilities of a weight requirement. The highly hygroscopic nature of peat moss with its great moisture loss and regain factors influenced the rejection of this thought, as it was quickly recognized that a weight method would lend itself to the perpetration of fraud. Such method could only be invoked with the stipulation of complete dehydration, and this in probability would be prohibitive from a cost standpoint.

Reliance by dry measurement in elements of the bushel and its subdivisions was also considered, but this too presented problems and obstacles that made this method unfavorable.

Quantity representation by cubic measurement as now proposed would appear to offer the solution which will serve the interests of all concerned and that can be most simply applied without fear of detrimental results.

There is one factor in our proposal that possibly could be further explored that is in relation to the compression ratio. The two to one ratio as recommended represents the determinations of your Committee up to the time of preparing report. There may be practices of packaging within the industry with which we are not familiar and which might influence a revision upward or downward the compression factor. What we propose in this connection at this time we believe to be reasonable and adaptable. It is in the nature of a standard for packaging and would give us something to start with by way of regulation pending any representations from the industry that would justify an alteration. To provide for such contingency we, therefore, believe that tentative adoption of the recommendation would be advisable at this time and final adoption be accomplished with or without changes at the 38th National Conference. It would at least place the industry under notice that peat moss has received treatment in weights and measures channels, so that it can anticipate and prepare adjustments within its enterprises.

Your committee recommends the tentative adoption of this item.

MR. GRAHAM: We are possibly the largest importers of peat moss operating in the United States. The proposed measurements are completely at variance with a very big share of the industry. None of the many millions of bales imported has been marked with weight or volume. If there is a method of exact measurement, it would be a great boon to the industry. However, I do not believe that regulation as offered here should be forced onto the industry without further consultation and consideration of the machinery now in operation.

CHAIRMAN TRUE: The recommendation is for tentative action, the problem is to be taken under advisement until the next Conference.

MR. ENDRESS: We are perhaps the largest American producer of horticultural peat. In this discussion you must discriminate between the different types of peat. The term "peat moss" includes the product put up in bales and also the product we package in bags.

The latter is more of a peat humus. It is a natural organic material and cannot be compressed. We package it in bags and sell it by weight or volume—whichever is desired. However, when making rules or regulations, you will have to discriminate between the different types of peat.

MR. TURNBULL: The Federal Trade Commission defines peat moss as sphagnum peat moss. That is the item before the Conference. Does your product come within this definition?

MR. ENDRESS: That is a question involving horticultural definition. In one bog we have sphagnum peat, but it is mixed with all of the other types of peat and loses its identity after a certain period of decomposition.

MR. CARNCROSS: Sphagnum peat is a peat humus. It is produced in many points in the United States. I do not think it is intended that this regulation will apply to peat humus. A Federal regulation requires that the term peat moss be applied only when 75 percent of the material comes from a moss. I would say that present regulations would in no way affect the producers of peat humus.

MRS. POPPEL: The last gentleman is slightly in error. The Federal Trade Practice rules indicate that any peat may be labeled peat moss. However, when it is more than 75 percent sphagnum, or more than 75 percent seg, it is called "Peat Moss Seg." If we must have regulation, we want to assist in the formulation of the regulations. We are packing in bags, 25 pounds or 50 pounds—or the equivalent in cubic measurement.



Mr. Rafael, Mr. Goode, and Mr. McBride commented further that the method of sale of peat moss seemed to be a very intricate and controversial subject, and that, while they were in favor of tentative approval of the committee recommendation, they were convinced that considerable additional study and consultation must be given to the subject.) Whereupon the Conference tentatively adopted the committee recommendation.)

*Permalite or any Material or Substance of the Nature or Character Thereof.*—When sold in package form shall bear a plain and conspicuous declaration of quantity in terms of minimum net contents expressed in terms of cubic feet and/or fractions thereof. Provided, however, that a maximum of 15 percent over measure shall be allowed at time of packing to compensate for volumetric shrinkage caused by compression due to handling, stacking or other cause; and provided, further, that an auxiliary declaration of contents shall be allowed, in terms of net weight. When dual quantity markings are employed, neither shall be greater than the other in prominence or be in a more conspicuous position on the package.

NOTE.—There are differences of opinion on how this commodity should be sold. Consideration was given to the method of sale and marking by net weight. The character of the product is such that it has both loss and regain factors. Eight variables are, therefore, considerable and inconsistent. The hygroscopic nature of this product appears to be more pronounced than in other substances with this characteristic and in which the weight method is prescribed. It is, therefore, the opinion of this Committee, based on studies that have been made, that the method of sale and representation by cubic feet should be invoked and now so recommend. Further in this connection, your Committee is informed that there are companies now marketing Permalite under the method prescribed in this recommendation.

*Tomatoes in Package Form.*—When packed in containers or trays wrapped in cellophane or with transparent or "window-face" shall be marked in a plain and conspicuous manner in terms of minimum weight of contents, together with the name and location of the packer, repacker or distributor; provided, that a supplemental marking in terms of numerical count shall be permitted contingent upon all quantity declarations being of equal prominence as to size and position on the package.

NOTE.—This is an instance where an industry has taken undue advantage of literal official interpretations of net weight container laws and especially in relation to numerical count declarations. As a consequence, numerical count declarations on packages are now of little if any worth as a gauge of value to the consumer. What can be termed random packing by count with tomatoes of variable sizes and numerical declaration thereof, certainly is adverse under existing circumstances to the principles and purpose of net weight container laws and definitely does not entitle those invoking them to any concessions whereby the consumer is left unprotected. The justification of now imposing specific weight marking requirement on repackers of tomatoes is conclusively found in the Federal Food and Drug regulations under Section 403 (f) (3) which provides that: "Unless an unqualified statement of numerical count gives accurate information as to the quantity of food in the package, it shall be supplemented by such statement of weight, measure, or size of the individual units of the food as will give such information." What was originally a package of tomatoes weighing one pound has gradually been reduced by the introduction of containers and trays that deliver to the consumer as little as 10 or 11 ounces, yet with the same number of units making up their contents. Your Committee has explored the prevailing situation from all angles, and while it has other ramifications than those cited, we believe that what we have here presented by way of reasons, constitutes a strong brief for the adoption of the recommendation we now offer.

Following the presentation of this item by the Committee Chairman, considerable discussion ensued, including the following.)

MR. MAHONEY: I think this is more a marketing problem than weights and measures problem. As has already been stated, the sale of these cartons started off on a weight basis. It was found to be practical, and now you are proposing that we go back to that method.

MR. KENNEDY: When these cartons were sold by weight in the District of Columbia, we had a lot of trouble with them. I am sure that you gentlemen will find it so in your jurisdictions when you require a weight on the commodity. I do not believe that you are permitted to require "minimum weight." If your laws are like those in the District of Columbia, they require that tomatoes and other commodities be sold by "net weight." That does not mean "minimum weight."

I have talked with store owners and operators who are registered here. They are 100 percent opposed to this proposal. Packaging tomatoes by weight requires additional handling of the product, and additional handling causes spoilage.

MR. MCBRIDE: In relation to the lack of authority to say that a statement in terms of count be otherwise supplemented, the Federal Code permits just that. I think we should bear in mind that, when weight is given, the consumer has an opportunity to exercise selectivity.

MR. GOODE: We have already discussed the proposed Model Regulation for package marking requirements. Under Section (e) (3) it says, "Unless an unqualified statement of numerical count gives accurate information as to the quantity of commodity in the package shall be supplemented by such statement of weight, measure, or sale of the individual units of the commodity as will give such information." Section (d) (2) of this Model Regulation states that "statement shall be expressed in the terms of weight, measure, numerical count, or a combination of numerical count and weight, or measures which are generally used by consumers and users to express quantity of such commodity and which give accurate information as to quantity thereof." I believe it has been the general practice to sell a bushel of tomatoes by weight.

We have had correspondence with W. A. Queen of the Federal Food and Drug Administration, who was very agreeable to this method of sale.

(After additional comment by Messrs. Mullen, Lirio, and Chairman True, a question was taken, and the Committee proposal was carried by a vote of 24 ayes as against 24 noes.)

6. *Prepackaged Meats at Retail.*—When sold or offered for sale at self-service markets should be marked with the net weight of contents, the basic price per pound and the total cost of the package.

NOTE.—This recommendation speaks for itself. It is designed to promote uniformity in enforcement operations which are now variable as relating to this subject. Those who have adopted this method of sale for meats have done so for their own interest and convenience. They should, therefore, assume responsibility for the condition of packages as to weight and pricing so that the consumer will have the means of gaging values the same as when making purchases directly at the butcher block or counter.

(The Committee's tentative recommendation included the following stipulation: "To provide assurance of weight accuracy, all such packages should be reweighed by the merchant, manager, or employees within a lapsed time not to exceed 24 hours." After considerable discussion by the delegates, the Committee Chairman accepted the recommendation that this sentence be deleted from the report, and the report was so amended.)

MR. KENNEDY: It may be all right to say in accordance with the that the package should be marked with the net weight of content. the price per pound, under no law that I know of, has to be indicated on the package.

MR. HOWARD: The buyer has no comparative method of determining values unless the price per pound is shown.

MR. KENNEDY: I do not think the weights and measures officials demand that the unit price per pound be shown on the package.

MR. SAXTON: We have had four court cases on this matter. It can be done legally. We have this requirement in our city, by ordinance. It is up for consideration now by the State of Michigan.

MR. SLOUGH: This proposed price requirement is the law in the City of Akron, and also in the City of Columbus, Ohio.

MR. ROGERS: Under the net-weight container law, the weight must be shown. You see the basic need for pricing, in connection with your packaged commodities. You have to establish a basic price to find out whether you are getting proper value for your total cost. I want to explain that we have used the word "should," and not "shall," in this recommendation.

MR. CARPENTER: Gentlemen, 2 years ago I attended this Conference and addressed you on the subject of prepackaged meats. At that time I dwelt on many of our problems as a retailer endeavoring to secure proper weight determination at the time of sale.

The original Committee suggestion, that every package be reweighed every 24 hours, is a necessity on certain items. However, that necessity does not extend throughout all of the items that are handled on the self-service basis in a package meat store.

Poultry, according to our standard, and the standard issued to our market personnel, must be checked, not for weight alone, but also for condition, every 24 hours. This is the case with variety meats, such as liver, etc. We give items such as sliced luncheon meats three days shelf life before they have to be checked for weight and condition. It would be difficult to set a specific time requirement such as 24 hours to cover the entire meat line. Sliced bacon, for example, you might keep as long as 10 to 12 days without a sufficient amount of shrinkage occurring to jeopardize the weight factor.

The Committee recommendation, as amended, was unanimously adopted.)

*Fractional Terms of Ounces.*—When used in connection with quantity declarations on commodities in package form, shall be in terms of the ounce divisible by the number two or a power of the number two.

*NOTE.*—The purpose of this recommendation is to prohibit the use of odd fractions, such as thirds and fifths of the ounce in package markings. There have been recent attempts on the part of packers of certain commodities to use terms which are not in coordination with the standards of weight and measurement normally employed in commercial pursuits and by weights and measures officers. The Committee believes that the use of odd fractional terms creates confusion; that they would make quantity determinations difficult in enforcement operations through the necessity for conversions; that there is no need in packaging enterprises for refining fractions to elements not representative of existing standards; and that no benefits would accrue to the consumer.

3. *Quantity Declaration on Commodities in Package Form.*—Shall include the word "net" in their marking terms relating to the contents of such packages by weight or volume.



NOTE.—By this recommendation it is hoped to settle the mooted question has come up from time to time as to whether the word "net" should be required in quantity declarations. There have been rulings permitting the deletion of the specific word "net" regardless of the fact that laws requiring quantity declarations on commodities in package form generally stipulate that the contents shall be declared. These permissives have been given under the interpretation that a quantity marking of any kind implies and is intended to mean net contents and that the word "net" is not needed and, therefore, is discretionary as to its use.

There have been court decisions and legal opinions that have reversed such interpretation, on the premise that if the word "net" is omitted from the description of the quantity of a commodity enclosed in a container, confusion can arise in the mind of the buyer as to the actual weight or volume in the package, and give rise to possibilities for fraud. It has been further pointed out in such decisions and opinions that the statute directs in no uncertain terms that the net quantity of the contents is to be marked on the outside of the package, and it follows that to mark the package as to the quantity of the commodity contained therein, without including the word "net" would amount to a failure to comply with the mandatory direction of the statute.

This Committee, therefore, offers this recommendation for adoption to establish uniform procedures among the packing interests and weights and measures officers in relation to the terms employed in quantity markings.

(At this point the remainder of the Report of the Conference Committee on Methods of Sale of Commodities was deferred until a subsequent session of the Conference. Continuation of the Report will be found on page 72.)

## TRAINING SCHOOLS FOR WEIGHTS AND MEASURES OFFICIALS AND SERVICEMEN

By W. M. HOXIE, *Service Manager, Bennett Pump Division, John Wood Company, Muskegon, Michigan*

(Mr. Hoxie described the organization of a State-wide training school for gasoline pump mechanics and weights and measures inspectors. This school was sponsored by C. D. Baucom, Superintendent, Weights and Measures Division, State Department of Agriculture, Raleigh, North Carolina, and the Institute of Government of the University of North Carolina, and was held on the campus of the University in Chapel Hill. The various pump manufacturers participated in the 2-day affair, at which were registered over 450 persons. Mr. Hoxie expressed the appreciation and approval of the manufacturers for such an undertaking by a State.)

## REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON NOMINATIONS, PRESENTED BY J. E. BRENTON, CHAIRMAN, AND ELECTED OFFICERS

The Committee submitted the following nominations for office in the National Conference to serve during the ensuing year, or until such time as their successors are elected.

### OFFICERS

*For President:* A. V. ASTIN, Director, National Bureau of Standards.

*For Vice Presidents:* ERLING HANSEN, of Minnesota; R. D. THOMPSON, of Virginia; J. F. TRUE, of Kansas; F. M. GREENE, of Connecticut; I. M. LEVY, of Chicago, Ill.; D. G. NELSON, of Morris County, N. J.

*For Secretary:* W. S. BUSSEY, National Bureau of Standards.

*For Treasurer:* G. F. AUSTIN, Jr., of Detroit, Mich.

### EXECUTIVE COMMITTEE

*For members of the Executive Committee:* R. E. MEEK, of Indiana; J. A. PIERCE, of Sheboygan, Wis.; J. M. O'NEIL, of Cambridge, Mass.; C. H. STENGER, of South Carolina; M. G. RICE, of New York; H. E. CRAWFORD, of Jacksonville, Fla.; E. C. WESTWOOD, of Salt Lake City, Utah; J. A. BOYLE, of Maine; J. MAHONEY, of Maryland; R. W. SEARLES, of Medina County, Ohio; C. FULLER, of Los Angeles County, Calif.; A. C. SAMENFINK, of Rochester, N. Y.; W. H. ISING, of Louisville, Ky.; J. M. BOUCHER, of Washington, D. C.; R. DAGGETT, North Girard, Erie County, Pa.

Respectfully submitted.

(Signed) J. E. BRENTON, *Chairman*,  
C. A. BAKER,  
J. F. BLICKLEY,  
J. ROY JONES,  
J. J. LEVITT,  
C. C. MORGAN,  
R. J. ZIERTEN,  
*Committee on Nominations.*

The report of the Committee on Nominations was adopted and the officers elected unanimously.)

## BELT CONVEYOR SCALES

BY R. O. BRADLEY, *Toledo Scale Co., Toledo, Ohio*

At the 36th National Conference on Weights and Measures, Leonard Maguire presented a paper to contribute the knowledge and experience of the Fairbanks Morse Co. relative to belt conveying scales. In that paper he pointed out several basic reasons why belt conveyor scales offer tremendous problems in regard to accuracy. Mr. Maguire's points were well made and quite understandable. In the discussion following his talk, he made the following statement—"It is a processing scale. Some day it may develop into a commercial scale and in some cases there are conditions that are such that it could almost be classified as a commercial scale. But generally speaking, it is strictly a processing or industrial machine."

During the period of the last 15 years our company has had experience with integrating belt conveyor scales. As a result of this experience, we have in the last 2 or 3 years incorporated two new features which we claim have changed the status of belt conveyor scales from the processing class to the commercial class.

At a meeting in February of this year, I explained those features to Mr. Maguire to see if he, as a representative of his company, would agree that there was probably some basis for our claim. He agreed that there was probably some basis, but that naturally it would be necessary for their engineers to incorporate the features in one of their scales, in order to secure test data and evaluate the improvements.

The first feature to be explained is very simple. It consists in feeding the speed of the carrying strand of the belt into the integrating device, rather than the speed of the return strand. We have proven actual belt-speed measurements that the carrying strand on a long belt conveyor may travel as much as 1 percent faster than the return strand with zero belt load, while traveling 5 to 6 percent faster on the return strand when a belt load of 100 percent capacity is being carried. Essentially, the integrating device on a belt conveying scale multiplies belt speed by belt load in pounds per unit of length. The belt speed that is fed into the integrating device is not the same as the speed of the belt passing over the weighing section, the belt speed factor, and thus the product of speed and weight, are naturally in error. The result of this error is always a slow reading from the integrating device because the return strand always travels slower than the carrying strand (provided the motor is driving the conveyor head pulley and not the tail pulley). An integrating device using the speed of the return strand can then be accurate only at the load at which it is tested and found accurate, as a change in load changes the relation between the belt speed fed to the integrator and the speed of the belt passing over the scale. When the speed of the carrying strand

(at a point adjacent to the scale) is fed into the integrator, the scribed error is eliminated.

The second feature is as simple in fact as the first but results in higher manufacturing cost. It involves the addition of a device that will automatically keep the belt carrying idlers on the scale exactly the same plane with the belt carrying idlers adjacent to the scale. When the belt lies across the scale and a leveling device is not used, an error of 10 to 30 percent, depending on belt stiffness in relation to total load, must be balanced into the scale. If there was a good temperature compensated spring, belt tension would be the only remaining variable force factor on the scale. However, the belt is a very poor spring, and belt-tension effects must also be eliminated. Addition of the leveling device allows balancing of the scale with or without the belt lying across the scale belt idlers with ideal results. Thus the effects of belt spring and belt tension are, for all practical purposes, eliminated by addition of a leveling device.

We have found that incorporation of the two features explained enables us to build belt conveyor scales that will give a weighing accuracy for a given load that is just as accurate or even more accurate than other approved methods of weighing the same loads.

For the reasons outlined, I believe that integrating belt conveyor scales are adequate for commercial use. Further, I respectfully suggest that complete regulations regarding allowable tolerances, minimum runs, and standard tests be written in order that local weighing and measures officials have some basis for approval of integrating belt conveyor scales.

Approximately 18 months ago we prepared a set of proposed integrating scale regulations. Only two or three people at this meeting have seen that proposal. I know that several items in the proposal should be altered but believe it is a starting point for making some usable regulations.

(In answer to questions by Mr. Kerlin, Mr. Bradley explained that a perfect test procedure is difficult to arrive at, that the conveyor idlers are kept in alignment by the application of sensing devices, and that his term "commercial accuracy" related to accuracy required of other commercial scales used in weighing similar loads.)

## TESTING OF VEHICLE TANK METERS

BY W. A. KERLIN, *Sealer of Weights and Measures, Alameda County, California*

We have divided the problems of testing vehicle tank meters into three component parts, namely, *Design, Location, and Operation and Calibrating Equipment*. Following is a general outline of these three main divisions:

### DESIGN OF PROVER

1. Should meet all requirements of Handbook 45 and ASME-API Meter Code.
2. Size and proportion should be governed by rates of flow and other physical conditions within the jurisdiction.
3. Must drain completely and uniformly.
4. Must not trap air.



Outlet valve must not leak.

Must retain shape and capacity.

Interior should be protected against the elements.

Should be painted with a heat-reflecting color and paint.

#### LOCATION OF PROVER

Gravity provers should be in a pit so as to approximate filling conditions as to depth and venting.

Prover for power-operated meters can either be elevated or be in pit, depending upon local conditions.

Should be protected against direct sun.

#### OPERATIONS (MAKING THE TEST, OR THE "HUMAN EQUATION")

Must have well-trained personnel.

Inspection of installation for necessary accessories, air eliminator, venting, etc.

Prover must be kept wet (tanks of this class are calibrated to deliver). In this factor we have two liquid characteristics to consider; namely, volatility and viscosity.

Draining time must be constant; elapsed time between tests when using volatile liquids must be reasonably constant. Temperature effect on draining time of the more viscous products such as No. 2 and No. 3 fuel oils must also be taken into consideration.

Testing of gravity meters.

Testing of power meters.

Evaporation.

Temperature change, or expansion and contraction.

It is upon evaporation and temperature change that I base my remarks before our general discussion. In corresponding with W. S. Halsey concerning this discussion, he stated that many jurisdictions are encountering difficulties with inaccuracies in gravity meters. Gentlemen, I doubt very much that the inaccuracies of which he speaks are due to the meter itself, but I believe they are due to inaccuracies arising from our own methods of testing and our provers. I say this, not as a champion of any meter manufacturer, but as a weights and measures official who has taken the time to isolate the inaccuracies. In connection with this particular problem, we have been doing the research that indicates that a good many of these variations are due to temperature changes not compensated for, plus the evaporation factor of a volatile testing fluid, such as gasoline. I will give some data that support these beliefs.

These tests were conducted in a test measure that met all requirements of the ASME-API Meter Code. In making the tests we used a removable fill pipe that extends to the bottom of the prover tank (see fig. 2). This feature is also shown in the latest revision of the ASME-API Meter Code. We have made tests both with and without a fill pipe and, as it is realized that most prover tanks do not have this feature, we are not presenting this to suggest that you add it to your equipment. We do feel quite strongly, however, that the phenomena should be given consideration in your testing work. Because

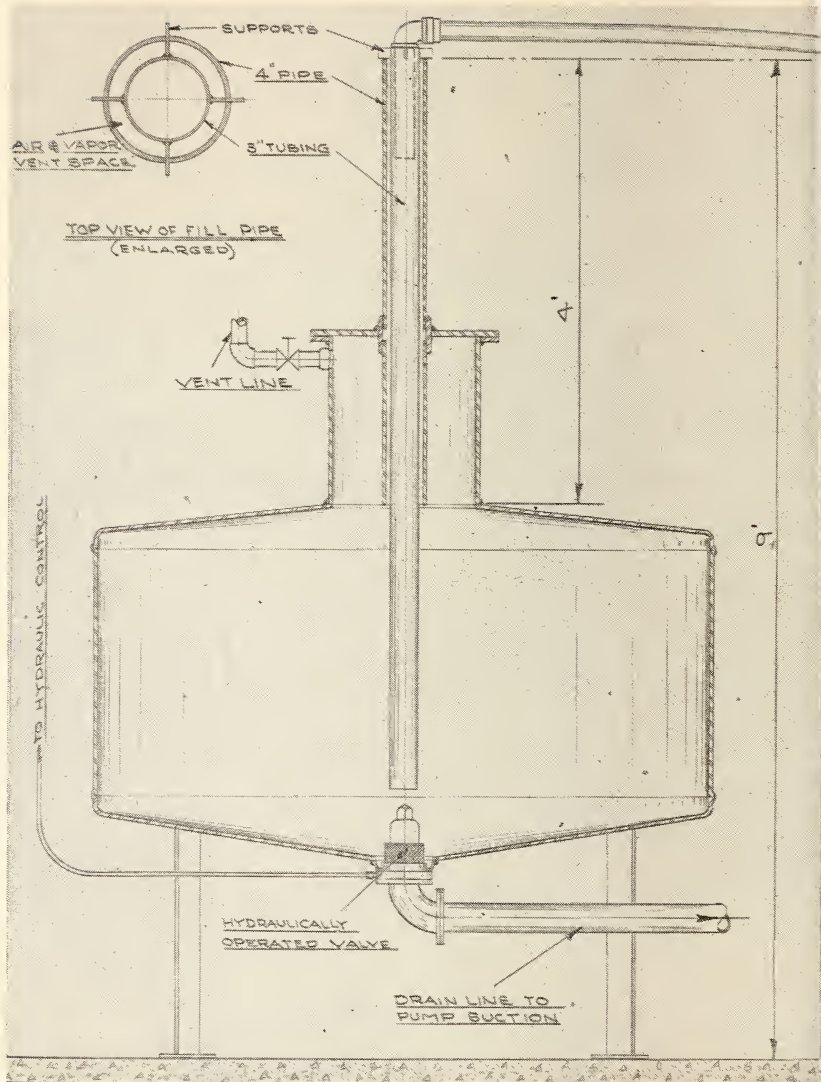


FIGURE 2. Meter prover for gravity meters.

st provers do not have this feature, the following tests were made with both types:

TEST 1. (Using removable fill pipe)									
Run	Meter	Size	Type	Rate of flow	Temperature at—		Prover—		Test type
					Meter	Prover	Reading	Capacity	
1-----	A	in. 2	Rotary-----	gpm 60	° F. 62	° F. 62	cu in. -2	gal. 100	Normal.
2-----	A	2	do-----	60	62	62	-2	100	Do.

TEST 2. (Using open neck of prover and fill pipe removed; otherwise, same conditions existing, and same meter)									
1-----	A	2	Rotary-----	60	62	62	-44	100	Normal.
2-----	A	2	do-----	60	62	62	-44	100	Do.

TEST 3. (Using open neck of prover and fill pipe removed; prover cooled by water spray to introduce temperature change; all other conditions equal, and same meter)									
1-----	A	2	Rotary-----	60	62	60	-70	100	Normal.
2-----	A	2	do-----	60	62	60	-70	100	Do.

As can readily be seen from an analysis of the three sets of tests mentioned above, there was an evaporation of 42 cu in. on the second set of tests. This same evaporation was present on the third set of tests, plus a 28-cu in. variation for temperature differential. Deducting the 28 cu in. for temperature, we find the results of tests 2 and 3 to be the same within 2 cu in.

Of course, there were many, many tests of this type made to establish, beyond a doubt, that the data presented herein is correct; not only were many tests run, but several different makes of meters were used. In the tests of which I speak, there were actual meter variations, but these did not vary more than 5 cu. in. The actual meter variations were negligible when compared to the variations caused by temperature and evaporation.

I was requested also to give information and data concerning gravity meter tests made from a full compartment and tests made from a compartment with just slightly more than enough fluid to complete the tests.

These tests are standard procedures in our testing plant and are of the "normal test" type. As you will note from the tests shown below, there is a slight variation in some cases, probably due to increased slippage at slower speeds:

Meter	Size	Type	Full head		Partial head	
			Rate of flow	Error	Rate of flow	Error
A-----	in. 2½	Rotary-----	gpm 100	cu in. -8	gpm 85	cu in. -2
A-----	2	do-----	92	-6	81	-6
A-----	2	do-----	85	-10	75	-2
B-----	2	do-----	80	+2	70	+6
B-----	2½	do-----	106	-6	96	+6
B-----	2	do-----	95	+4	90	+4



We have found very little variation in tests of this type, and I give them to you only for purposes of discussion.

We now come to power meters and find we have the same variables, plus one or two more. Let us again return to ideal conditions and note the results.

Test 1. (Using removable fill pipe; test measures are on overhead platform, seven feet above ground)										
Run	Meter	Size	Type	Rate of flow	Temperature at—		Prover—		Test type	Motor
					Meter	Prover	Reading	Capacity		
1-----	B	1½ in.	Rotary----	gpm 32	° F 64	° F 64	in. u. +4	gal 50	Normal---	rpm 750
2-----	B	1½	-----do-----	32	64	64	+4	50	-----do-----	750
Test 2. (Using open neck of prover; no tube; same conditions; otherwise, same meter)										
1-----	B	1½	Rotary----	32	64	64	-50	50	Normal---	750
2-----	B	1½	-----do-----	32	64	64	-50	50	-----do-----	750
Test 3. (Motor speed the same and nozzle controlled; ideal conditions, using removable tube)										
1----	B	1½	Rotary----	22	64	64	-14	50	Slow-----	750
Test 4. (Same unit used; ideal conditions; slow speed test using motor control)										
1----	B	1½	Rotary----	24	64	64	-2	50	Slow-----	450
Test 5. (Same operating conditions as test 2)										
1-----	B	1½	Rotary----	32	64	64	-82	50	Normal---	750

As can be seen, the evaporation factor is still present but increase probably due to higher nozzle velocity.

We will eliminate the temperature test, for the sake of brevity, for we know the results of that one.

The added variables on power meters depend upon whether the speed is controlled by nozzle or by motor. Let us look at a "slow test" taken on the same unit as tests 1 and 2.

From the illustrations given we can see that the motor-controlled test gives the more accurate result. Although neither test 3 nor 4 is out of tolerance in this case, we have found aggravated conditions existing on many vehicles, and it is a variable that must be taken into consideration.

One more test, in which I am sure you will be interested, is the testing of a power meter using a prover located below ground level. For test 5 we used the same unit.

For test 2, using the overhead 50-gal. measure, the error was minimum 50 cu in. In the pit test measure of 50 gal., the error should be the same. This, however, is not true. With a vaporization error present the length of drop of the liquid is also a factor; therefore, we have compound error produced.

It is my understanding that considerable difficulty has been experienced on power meters with or without predetermined shut-off valve

The difficulty seems to be a "creep" in the meter due to the difference between the "operating" pressure and the "relaxed" pressure. This creep may be caused by "hose stretch." In fact, extreme caution must be used in the testing of power meters to insure that tests are started and stopped with the same hose condition. That is, if the test is begun with a pressurized hose, it must be terminated with a pressurized hose. Unless this procedure is followed there will be a slight error, depending upon the type and size of hose used. A spring-loaded back-pressure valve in the line at the entrance to the hose reel will minimize this condition to a great extent. This valve does double-duty because it reduces hose stretch and also helps the air eliminator at the tailing-off point.

Creep should not be present in equipment with predetermined shut-off valves unless the valve is leaking. There are other phenomena present, however, with this type of device.

Many of you will remember the heated arguments on the floor of the 34th National Conference to reduce, or cut, the tolerances on wholesale liquid-measuring devices as recommended by the Committee

Specifications and Tolerances. While I do not wish to take issue with the action of the Conference at that time, I do wish to point out that actually the Acceptance Tolerance was increased on "Special Tests" and decreased by only  $12\frac{1}{2}$  cu in. on a 100-gal. normal test.

My point in bringing this to your attention is not to campaign for further reduction in tolerance but to point out that a temperature change in gasoline of only  $1^{\circ}$  F. from the truck compartment to the cover will result in an expansion or contraction of a sufficient amount to nullify this reduction in tolerance. In order to even record this reduction in tolerance, the "calibration plant" or "prover" must be treated as a laboratory by weights and measures officials and not just a test can.

The test results noted indicate that, before any further reduction in tolerances can be seriously considered, we must take into consideration the two variables, evaporation and temperature change.

(After the presentation of his paper, Mr. Kerlin answered questions from the floor. These questions dealt with items brought out in the paper, and Mr. Kerlin elaborated on such items.)

(The Conference was adjourned, to reconvene on Friday, May 23, 1952, at 30 a. m.)

## **XTH SESSION—MORNING OF FRIDAY, MAY 23, 1952**

(J. F. True, Vice President, and A. V. Astin, President, presiding)

### **DR. A. V. ASTIN PRESENTED**

(Dr. A. V. Astin, Director of the National Bureau of Standards, and newly elected President of the National Conference on Weights and Measures, was presented to the Conference by the Chairman. Dr. Astin made the following remarks and committee appointments. He continued to preside as chairman until the completion of the report of the Committee on Methods of Sale of Commodities).

**DR. ASTIN.** I appreciate very much this honor you have conferred upon me, and I hope that I will be able to put in a fair amount of time on problems of interest to the Conference during the coming year.

I know that, with Mr. Bussey available to work with, things will get done, and you can be assured that he will be given my full support in anything he wants to do in connection with the affairs of this conference.

## APPOINTMENT OF STANDING COMMITTEES

It is appropriate at this time for me to announce appointments to the several Standing Committees of the Conference.

### COMMITTEE ON SPECIFICATIONS AND TOLERANCES

I appoint Rollin E. Meek, State of Indiana, to a five-year term to succeed Nalls Berryman, State of Florida, whose term is expiring.

### COMMITTEE ON METHODS OF SALE OF COMMODITIES

I appoint George H. Leithauser, City of Baltimore, Maryland, a five-year term to succeed Russell Ackerman, City of Minneapolis, Minnesota, whose term is expiring; and Irvine M. Levy, City of Chicago, Illinois, for one year to complete the term of Llewellyn R. Roper, City of Seattle, Washington, who has resigned because of a change of positions with the City of Seattle.

### COMMITTEE ON LEGISLATION

I appoint Miles A. Nelson, State of Michigan, to a five-year term to succeed C. H. Oakley, formerly of the State of Wyoming, now an employee of the National Bureau of Standards, whose term is expiring; and Donald M. Turnbull, City of Seattle, Washington, for three years to complete the term of Rollin E. Meek, State of Indiana, who has resigned to accept appointment on another Conference Committee.

### COMMITTEE ON EDUCATION

I appoint Joseph F. Blickley, State of Pennsylvania, to a five-year term to succeed Robert K. Slough, City of Akron, Ohio, whose term is expiring.

### COMMITTEE ON TRADING BY WEIGHT

I appoint A. J. Mayer, State of Louisiana, to a five-year term to succeed Erling Hansen, State of Minnesota, whose term is expiring.

### CONFERENCE CHAPLAIN

To serve as Conference Chaplain for the 38th National Conference I reappoint R. W. Searles of Medina County, Ohio.

## REPORT OF COMMITTEE ON METHODS OF SALE OF COMMODITIES PRESENTED BY JOSEPH G. ROGERS, CHAIRMAN

(Continued from page 64.)

We will now call on Mr. Rogers, of New Jersey, to continue the report of the Committee on Methods of Sale of Commodities.

MR. ROGERS: The items left over from yesterday are 9, 10, and 11 of the Report of the Committee.

9. *Preheated Fuel Oils*.—This item was referred to your Committee by vote of the 36th National Conference for recommendation as proper method of sale for such oils. While the Committee has devoted some study to the question it has not, up to the time of preparing this report, reached definite conclusions to submit to the Conference, and indulgence is, therefore, asked for continuation of our research on this subject.

10. *Homogenized Concentrated Milk*.—Action was deferred on this Committee's recommendation covering this subject which appeared



in No. 2 in our report to the last annual Conference and was referred to Committee for further study.

No further conclusions have been reached than those originally presented. The dairy interests contemplating the production of such milk seem to have lost interest and there appears to have been no intensity in proceeding with further developments. Under the circumstances this Committee feels that further consideration of this item can be deferred pending the necessity for definite action.

*11. Meats and Poultry in Plastic Wrappings and Casings.*—For the purpose of clarification this Committee reopens this topic which appeared as item 3 in our report to the 36th National Conference. The commendation it contained was adopted at that time. It reads as follows:

*Meats and Poultry in Plastic Wrappings and Casings.*—Shall be exempt from net quantity declarations at packing sources and shall be sold on the basis of actual net weight at time of sale; provided that each item of meat or poultry so wrapped or contained shall be plainly and conspicuously marked with the legend: "To Be Weighed At Time of Sale", and, where the weight of the wrapping or casing exceeds  $\frac{1}{8}$  ounce, the tare weight shall be plainly and conspicuously marked for deduction to determine the net weight.

The Southern Weights and Measures Association through an action of its Committee on Methods of Sale of Commodities subsequently filed objection emanating from their Conference session at Richmond, Virginia, on November 7th, 1951. It was referred in report form, incorporating other items, to our Committee through the Office of Weights and Measures of the National Bureau of Standards. We quote from the said report:

*3. Meat, Poultry, Fish and Cheese in Plastic Wrappings and Casings.*—This Committee feels that commodities of variable weights in package form and those commodities that because of their method of processing prior to sale do not lend themselves to consistent quantity declarations when in package form should be sold from bulk and should not be exempt from the requirement of net weight markings on individual consumer packages. This legend—"To be weighed at time of sale," is contrary to the Model Law which requires that all commodities in package form be labeled as to weight, measure or numerical count. Experience and tests have shown that some packages of fish and cheese, even though marked with the legend, "To be weighed at time of sale," are not being weighed by some merchants when a retail sale of these commodities is made.

Therefore, your Committee is of the opinion that this recommendation is inconsistent with the Model Law and should be referred or amended so as to be consistent.

The Committee of the Southern Weights and Measures Association appears to have amplified the items under this heading in their report and have added fish and cheese which the adopted recommendation did not include.

Dealing with the points of contention in their order as raised in the remonstrance of the Southern Weights and Measures Association, we would first mention that our reasons behind the recommendation were fully given when it was offered to the last Conference for consideration. Those reasons we consider to be as logical and sound now as they were when the Conference in its wisdom saw fit to adopt what we proposed.

The Committee of the Southern Association now proposes that those commodities which because of their method of processing prior to sale do not lend themselves to consistent quantity declarations when in package form should be sold from bulk and should not be exempt from

the requirement of net weight markings on individual consumer packages. The catch in this is the proposed sale from bulk. This would presuppose that we would require the packing enterprises putting the types of commodities involved in this controversy, to change the methods of production and revert to packaging in barrels, tubs, pails and crocks as employed in the era before the age in which we are now living, and when sale from bulk was the rule and not the exception. It is not difficult to visualize the reaction that would set in were we now to attempt such restriction. Whether we like it or not, we must realize that the individual consumer package is here to stay, as we are aware that production methods along this line are increasing and not decreasing.

The Bureau of Animal Industry of the Federal Government has already taken cognizance of methods now inherent in packaging of essential foods and has ruled that meats in casings are exempt from marking requirements. In this they probably were influenced by the same reasons as those upon which the adoption of our recommendation was based. Our action is, therefore, not without precedent. In dealing with the matter of exemptions, however, we incorporated a protective factor by the stipulation that packages entitled to quantitative marking concessions should bear the legend "To Be Weighed At Time of Sale" to place merchants under notice as to their obligation in vending such packages. As to the effect of such legend and the observation offered that packages so marked "are not being weighed by some merchants when a retail sale of these commodities is made," the enforcement of the instructions contained in the legend naturally becomes the obligation of local supervision at retail outlets. Its effectiveness would, of course, not be self-sufficient without this.

On the question of the recommendation being contrary to the Model Law requiring packaged commodities to be labeled as to weight, measure or numerical count, we agree that it is a departure not only from this but from existing laws in State jurisdictions, but we must at the same time consider that these statutes were placed on the books long before the packaging situation has become what it is today, with all its technical and troublesome ramifications and problems. With the development of this situation it was natural that ideas for new methods and processes would be conceived and born. They are looked upon in the light of progress. The challenges they offer call for readjustments of regulatory affairs if we are not to obstruct such progress which represents America at work.

Your Committee is further cognizant that the contents of its recommendation represents new thought in relation to marking regulations under net weight container laws. However, it is a thought influenced and necessitated by evolutionary trends in the packing industry, which appear to justify a modification of marking requirements in certain circumstances as relating to the commodities entailed in this issue.

The sole purpose of our recommendation on this issue is to establish a means by which the consumer will pay for only what he gets. At the same time it sets up a procedure with which all engaged in packing and trade pursuits can readily conform without detriment to consumer welfare. The consumer in fact benefits by the principles of this recommendation as it has the effect of bringing the packaged product back to the days when purchases were weighed at the butcher block or store counter and the buyer was not saddled with shrinkage loss.

ich, we believe all agree, is the most objectionable feature in relation to packaging.

As the result of our review and reconsideration of all factors involved in this issue, your Committee is of the opinion that the recommendation as adopted by the 36th National Conference should stand originally constituted without amendment, and we so recommend.

MR. KENNEDY: I feel that this recommendation is entirely too broad. We now have chickens in plastic bags. I presume you call them plastic wrappers. They are susceptible of being marked with the weight. I can see no reason to eliminate such items from a prepacked container. We must seek, and we must have, the cooperation of the merchants. They want to cooperate. But you are throwing obstacles in their way whereby they cannot cooperate. I think the recommendation of last year should be reviewed and rewritten.

MR. ROGERS: This will have no effect on the prepacking situation. The man that uses those methods must price, mark, and weigh his packages. This exemption is at the processing source. It is to cover items especially subject to shrinkage. The merchant sometimes finds himself in trouble. He buys in good faith and sees that the package is properly marked. That marking is not good because there has been shrinkage during the marketing process.

MR. KENNEDY: Are you opposed to the inclusion of fish and cheese, as included in the Southern Association recommendation?

MR. ROGERS: We were trying to cover two items only. We thought it most essential. We want to pursue it further. There are a number of items of cheese that should be under the same recommendation. There are types of cheese today which are put up in tin containers with holes. This cheese is in package form. You put a marking on it today, and in several hours that marking is no longer correct. They must weigh it when it is sold. Many commodities are handled in the same manner.

MR. KENNEDY: You did not include cheese.

MR. ROGERS: No, we did not. We were trying to comprehend the items sold in the package in which they are processed.

MR. KENNEDY: There are some fish that are processed at the point of origin.

MR. ROGERS: The packers are willing to mark packages of fish, but the marking is not valid because of shrinkage.

MR. KENNEDY: The Southern Association recommended fish and cheese. If you are going along with them, why not include fish and cheese?

MR. ROGERS: We are certainly not objecting at all to the inclusion of those items, if you gentlemen want to do it.

MR. KENNEDY: There is no recommendation to that effect.

MR. HART: I am Secretary of the Gloucester Fisheries Association, Gloucester, Massachusetts. We are a substantial fishing port, 10,000,000 pounds a year. Of that total, 90 percent of the fish is iced and frozen. Within the past 4 to 5 years we have developed the so-called 1-pound pack. Probably from 20 to 25 percent of our total pack now is in 1-pound packages. The bulk of our fish is put up in what we call 5- and 10-pound cartons. They contain in the case of 5-pound cartons five packages of fish. They will take a 5-pound box, fill it with fillets, and allow a tolerance possibly of 2½ or 3 ounces. The packages are wrapped. The weight is indicated on the outside of the carton.



The same principle applies on the 10-pound pack. We have something like 65,000,000 pounds of fillets a year. It would be physically impossible to weigh your cellophane wrapped fillets at the time of packing. We are using inserts in the carton. The insert reads "Reweight at time of sale."

MR. McBRIDE: I wish to offer an amendment to the original motion. I believe this is consistent with Mr. Kennedy's remarks, and I think that the subjects "fish and cheese" be included with the commodities that the committee has enumerated.

CHAIRMAN ASTIN: Mr. Rogers indicates that he will accept the amendment.

(The motion was seconded and adopted by the Conference.)

Item 11, as amended and adopted by the Conference reads as follows:

*Meats, Poultry, Fish, and Cheese in Plastic Wrappings and Casings.*—Shall be exempt from net quantity declarations at packing sources and shall be sold on the basis of actual net weight at time of sale, provided that each item of meat or poultry so wrapped or contained shall be plainly and conspicuously marked with the legend: "To Be Weighed at Time of Sale" and, where the weight of the wrapping or casing exceeds  $\frac{1}{8}$  ounce, the tare weight shall be plainly and conspicuously marked for deduction to determine the net weight.

(The report of the Committee on Methods of Sale of Commodities was adopted as amended.)

## REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES PRESENTED BY J. P. McBRIDE, CHAIRMAN

The tentative report of the Committee has been in the hands of the Conference members, and representatives of industry, for some time.

It was stated in this report that the committee would be glad to receive suggestions and to afford opportunity of hearing on the matters treated in the report. Sunday was devoted to hearing interested parties, and, as a result of these hearings, your committee is offering for your consideration the final report. I shall present for your consideration and action, the tentative report of the committee as amended by the final report.

Your Committee has had two interim meetings with the ice cream and carton manufacturing industries and one with the scale industry. Correspondence has been carried on with other affected industries and with Conference members in relation to the various matters. This report, therefore, represents Committee conclusions in relation to matters referred to it by the 36th National Conference and to those coming before it from other sources.

### TENTATIVE CODE FOR PRE-PACKAGED-ICE-CREAM MEASURE-CONTAINERS

At the 36th Conference, this code was first submitted and tentatively adopted.

The last sentence of specification S.2.1 CAPACITY POINT reads as follows:

... A pre-packaged-ice-cream measure-container shall contain its indicated capacity without apparent distortion from its designed regular shape.

The phraseology "without apparent distortion" is conceded to be equivocal language and conducive to vacillating procedure which would result in lack of uniformity.

In this type of measure-container, cognizance must be taken of the fact that it is susceptible to distortion, and that such distortion begins when the measure-container is assembled or shaped so as to receive

ice cream. Further distortion occurs in the filling and hardening of the product. A measure-container equal to the calculated capacity, therefore, presents a factor of excess quantity which becomes a concern of the weights and measures official, as it is his duty to protect the producer as well as the consumer. It is obvious, therefore, that to require a container to be of dimensions equal to its calculated capacity, though it offers an easy method of test, would not be in keeping with the obligation of the weights and measures official to preserve the equities between all parties.

One answer to the distortion problem might be to require the use of a board of sufficient quality and thickness, so as to maintain rigidity. This would involve specifications on quality of material, and it is not the purpose of our code to enter this field. It could also be offered that a supporting frame should be employed when the measure-container is being filled. Inasmuch as these are single-use containers, the economic factors of cost of the container and cost of production enter into consideration, as these costs would be reflected to the consumer.

A third method might be to allow the use of a container of dimensions less than the indicated capacity, and anticipate the yield to be less than as to provide for such indicated capacity. This, too, would not be good weights and measures practice, as there would be a variable, depending on quality and thickness of board, as well as on shape and design of the carton, and method of fill and handling. It would leave it open to the unscrupulous the advantage of controlling the fill with a minimum distortion, and thus giving short measure.

Your Committee has spent considerable time during the year on this problem in initiative and in cooperation with the ice cream and carton industries, as was its promise in the report to the 36th Conference. We were seeking to develop a uniform test procedure and a testing medium to meet this problem.

In its final analysis, the question is as to whether a square, rectangular, or other flat-sided container could be acceptable if its calculated cubical content was somewhat less than actual (or indicated) cubical content, provided the ice cream packed in such container was, in fact, equal to or in excess of the indicated capacity.

Numerous experiments were conducted, and various tests were employed, to prove the point that the required volume could be accomplished in a measure-container of these characteristics. This was satisfactorily established, but in some instances the methods employed were involved and somewhat complicated. Furthermore, practical facilities for some of these tests would not be readily available to weights and measures officials for field tests. All parties were agreed that the container is the most readily available and most satisfactory testing medium.

We finally resolved the question of distortion to be confined to the so-called normal shape which would result solely from the assembly and shaping of the container in form to receive the ice cream. It would be the obligation of the ice cream manufacturer to fill these containers in a manner so as to follow the normal design and shape of the container as assembled. Moreover, the manufacturer would not be apt to fill beyond this conformation, since this would cause a loss of product to him.

This method of test would require that the measure-container be tested with support. The problem then was to develop a holding or

supporting device, for containers larger than one quart, which would be readily available, and into which the assembled empty carton could be placed, so that this normal distortion on all four sides would rest on the supports and be thus confined when the carton was tested for capacity with water.

This method, in the opinion of the Committee, offers the best and most practical means of resolving the difference between the so-called calculated cubical content and the actual volumetric content. This method requires that further distortion shall be controlled by the cream manufacturer—his guide being to follow the intended design and shape of the carton. The method also follows the test procedure outlined in National Bureau of Standards Handbook 45 for measuring containers.

Your Committee, therefore, recommends that this code be amended as follows:

Amend S.1. by changing the side title "CAPACITIES" to "UNITS".

Amend S.2.1. to read as follows:

S.2.1. CAPACITY POINT.—The capacity of a pre-packaged-ice-cream measure-container shall be sharply defined by (a) the top edge, (b) a graduation on the top edge, or (c) the lowest portion of a shoulder, cap seat, lid seat, or indentation near the top edge, of the container. A graduation or indentation shall extend at least half-way around the circumference or across two opposite sides of the container.

Add a new paragraph S.2.2., as follows:

S.2.2. SHAPE.—A pre-packaged-ice-cream measure-container shall be designed as some regular geometrical shape, and its capacity shall be determined without distortion from its normal assembled shape.

Add a new section, N. NOTES, to read as follows:

## N. NOTES.

### N.1. TESTING PROCEDURES FOR WATER TEST.

N.1.1. PREPARATION OF KNOCKED-DOWN CONTAINER.—A knocked-down pre-packaged-ice-cream measure-container shall be properly assembled, tape shall be applied to the outside of the bottom of the container, if necessary, to maintain its normal assembled shape, and melted wax shall be applied to the inside of the container to the extent necessary to make the container water tight. (Extreme care should be exercised to avoid applying more wax than necessary or under that the capacity of the container may not be significantly reduced.)

N.1.2. PREVENTION OF DISTORTION OF FLAT-SIDED CONTAINER.—A pre-packaged-ice-cream measure-container having flat sides shall be, if necessary, so restrained before the actual test is begun that its sides will not bulge when it is filled with water. For containers having capacities of 1 liquid quart or less, this can be accomplished by applying a metal plate or a piece of heavy cardboard to each side of the container. These pieces shall be only slightly smaller than the sides to which they are applied. They can be held securely in place by means of rubber bands, cord, or tape. Larger containers shall be supported by a restraining form having a design symmetrical with the container being tested. This form shall support against distortion not less than the entire area of the central two-thirds of each side panel of the container, measured from bottom to top. The inside width dimension of any side panel of the restraining form shall be  $\frac{1}{16}$  inch greater than the corresponding outside dimension of the container. (The outside width dimension of any side panel of the container shall be established by adding to the inner side center-of-score to center-of-score dimension two thicknesses of the board used, and the sum thus obtained shall be rounded off to the nearest  $\frac{1}{64}$  inch.)

It is the understanding of your Committee that the ice cream and carton industries will proceed immediately, after the final adoption of this code, to establish, if possible, one size and shape for  $\frac{1}{2}$  gallon flat-sided ice-cream measure-containers.



With the adoption of the above amendments, your Committee recommends the final adoption of the code for pre-packaged-ice-cream measure-containers.

Tested Tentative Test Procedure for Volumetric Measuring of Pre-packaged-Ice-Cream Measure-Containers, see figures 3, 4, 5, and 6

Carton in flat.

and c. Folding back carton to break all scores. This tends to set up the package and prevent propelling.

Block of wood or box made about  $\frac{1}{32}$  inch short of inside dimensions of carton.

Place carton over block and lock bottom.

Apply pressure to carton bottom over form so that the full flap lie flush and square. Holding this down tightly apply tape (any Zen-food locker tape will do nicely) to the center edges of carton shown in figure 3, f.

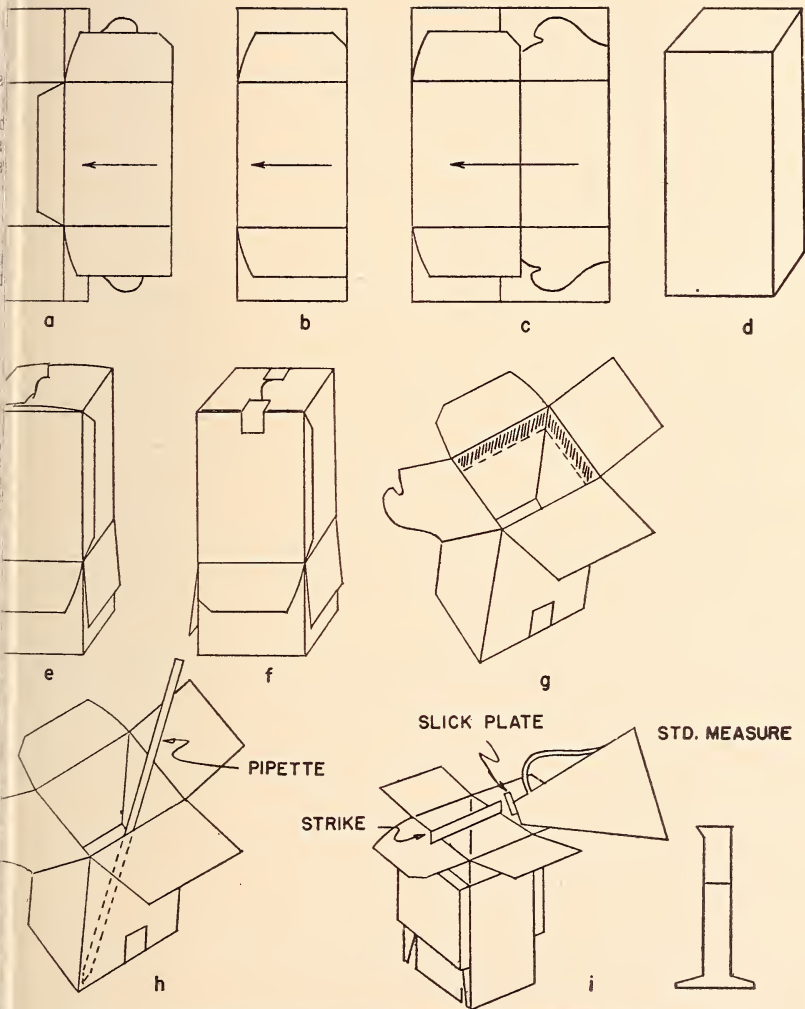


FIGURE 3. Pre-packaged-ice-cream measure-container ( $\frac{1}{2}$  gallon).  
Preparation for test.

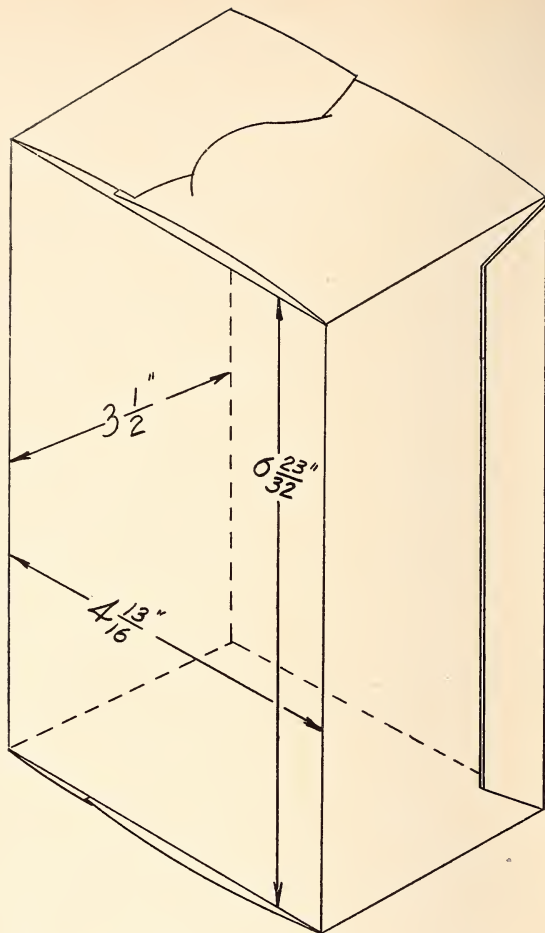


FIGURE 4. *Proposed standard 1/2-gallon carton.*

$4\frac{13}{16}$  by  $3\frac{1}{2}$  by  $6\frac{23}{32}$  inches. Calculated cubical content 113.1689 cubic inches. Actual volumetric content by tentative test method 115.622 cubic inches outside seal, 115.1 cubic inches inside seal.

g. A detergent or liquid soap is wiped on the top sides of the carton to break the surface tension of the water used in measuring carton.

h. Using a 1.1-ml pipette (or a pipette graduated so that a known volume of wax may be measured) deposit all the wax in the corner where the bottom flaps meet (bottom flap). The carton at this time is held at an angle and the carton rotated to let the wax run along the cut edge of the bottom flap and back to the original starting point. This should give a tight seal to the bottom.

It is recommended that a mixture of 20 percent of amorphous wax and 80 percent of regular paraffin be used.

i. The carton is now ready for volumetric measuring, and the only caution suggested is that in releasing the water from the standard measure to the carton, that it should not be done too quickly. If released too quickly, the seal is most likely to break. Fill to the strike using additional water from a graduate holding a known volume of water. If the water reaches the strike before all water is drained from the standard measure, pour remaining water into graduate.

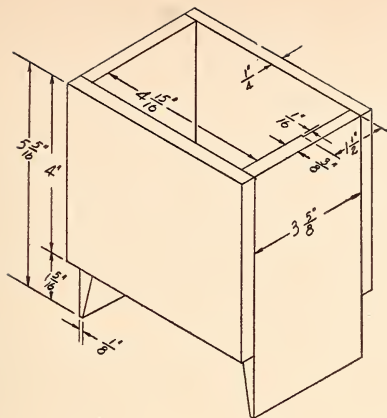


FIGURE 5. *Proposed restraining form for volumetric measure  $\frac{1}{2}$  gallon.*  
Carton based on center-of-score dimension. Plus 2 stock thickness +  $\frac{1}{16}$  inch.

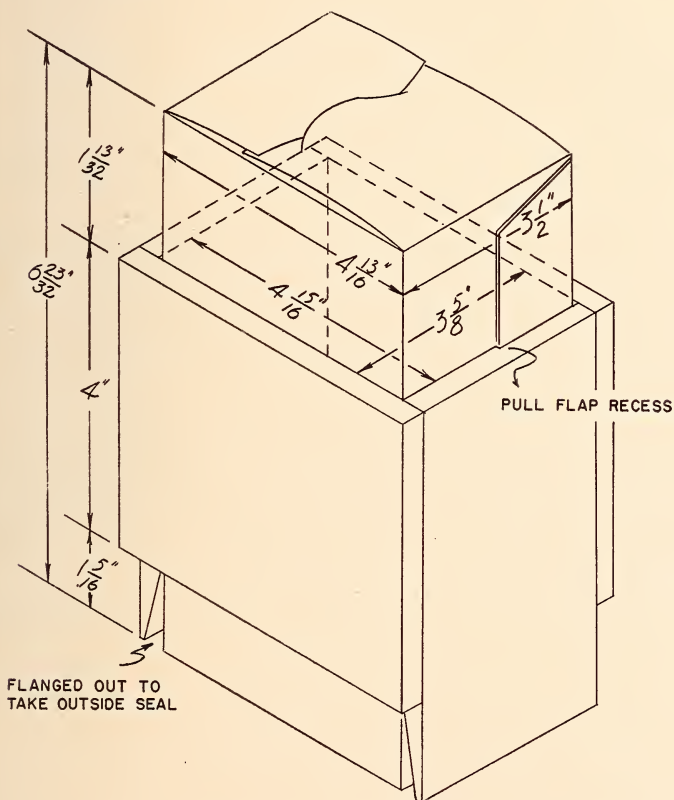


FIGURE 6. *Determination of restraining form dimensions.*

Side dimension of form is based on center-of-score to center-of-score measurement, plus two thickness of stock plus  $\frac{1}{16}$  inch.

$$3.5 + .052 + .0625 = 3.6145, \text{ or } 3\frac{5}{8}, \text{ inches.}$$

$$4.8125 + .052 + .0625 = 4.927, \text{ or } 4\frac{13}{16}, \text{ inches.}$$



## Amend S.2.2., INDICATING MEANS, to read as follows :

S.2.2. INDICATING MEANS.—This shall be so constructed that the proper method of reading the indications will be readily apparent. The motion of the most sensitive indicating element shall be continuous as material being measured is passed through the device; the motion of other indicating elements may be intermittent. If the most sensitive element of the indicating system utilizes an indicator and graduations, the relative movement of these parts corresponding to a measurement of 1 foot shall be not less than  $\frac{1}{4}$  inch. If separate elements are utilized to tally feet, tens of feet, hundreds of feet, and so on, complete revolutions of each such element shall be accurately and definitely tallied, and such elements shall be accurately synchronized. The indicating elements shall be readily returnable to a definite zero indication.

## Amend Tolerance Table 1 to read as follows :

TABLE 1.—Maintenance Tolerances for Cordage-Measuring Devices

Indication of device	Tolerance	
	On over registration	On under registration
<i>Feet</i>	<i>Inches</i>	<i>Inches</i>
0 to 20, incl.....	1	2
21 to 30, incl.....	1½	3
31 to 40, incl.....	2	4
41 to 50, incl.....	2½	5
Over 50.....	Add 1 inch per indicated 50 feet.	Add 2 inches per indicated 50 feet.

The reason for the first amendment is that the original wording of S.2.2 is more severe than like provisions in other similar codes. Your Committee feels that the relative low cost per unit of the material measured by these devices does not justify this extreme degree of control by weights and measures officials. Furthermore, so far as your Committee has been advised, no manufacturer in the United States has yet produced a device which will meet the original requirements. Your Committee believes that this proposal is reasonable and proper.

The second amendment has been found necessary for the reason that these devices must perform both forward and backward. This causes an extreme amount of backlash in the gears, etc. Therefore, a large tolerance to take care of the initial error is required. Also, many deliveries through these devices will exceed 20 feet.

With the adoption of the above amendments, your Committee recommends the final adoption of the code for cordage-measuring devices.

During the 36th National Conference on Weights and Measures, it was suggested that the Committee on Specifications and Tolerances study and make recommendations for specifications, tolerances, and regulations covering measuring equipment for liquefied petroleum gases. At that time it was indicated that substantial assistance would be volunteered and rendered by the various industry organizations involved. Since such assistance was not forthcoming, and since the Committee has no facilities at its disposal for the necessary research and investigation, your Committee is unable to offer recommendations at this time. Your Committee hopes that further developments in testing equipment and procedures for liquefied petroleum gas measuring devices will be forthcoming in the near future. The cooperation and assistance of industry is invited.

#### RECOMMENDATIONS OF THE SOUTHERN WEIGHTS AND MEASURES ASSOCIATION

The Southern Weights and Measures Association, at their November, 1951, Annual Conference voted to submit to the National Conference Committee on Specifications and Tolerances four recommendations, as follows:

*Recommendation 1.*—That the conference again call upon the National Conference to eliminate from the scale tolerances the excess tolerance permitted for scales with stabilized load-receiving elements.

*Recommendation 2.*—That this conference recommend to the National Conference that serious consideration be given to the development of separate codes of tolerances for each of the following: 1, bulk plant and terminal meters; 2, tank truck meters under pressure; and 3, gravity meters.

*Recommendation 3.*—That this conference request the National Conference give study to revising the tolerances for Retail Liquid Measuring Devices, and that tolerances, as indicated below, be inserted in Table 1, in lieu of the present tolerances, provided, however, that this amendment shall not apply to pumps and delivery hoses in excess of 15 feet.

<i>gallons</i>	<i>cubic inches</i>
1/2 or less	2
1	3
2	4
3	5
4	5
5	5
Over 5	Add 1 cubic inch per indicated gallon.

*Recommendation 4.*—That this conference request the National Conference eliminate in paragraph R. 5. of the Scale Regulations, the word "retail."

## RECOMMENDATION 1

In connection with Recommendation 1, the Southern Association proposed to the National Conference last year that the special Shift Test tolerances allowed on small-capacity scales, with stabilized load-receiving elements, as provided in T.1.1.2. be eliminated; the reason for the recommendation being that strict adherence to the T.1.1.2. tolerances would lead to inconsistent results. In given situations a scale with a zero error on center loading would be condemned if the shift-test error on the scale in question exceeded the special tolerance even though the error was less than the basic tolerance on the scale under test.

This matter was considered by your Committee last year. However, in the absence of adequate evidence as to the extent of this condition and of the industry picture in relation thereto, this matter was left for further study by the Committee. A report was to be made at this Conference.

A comprehensive study has been made. More than 700 tests were conducted by selected officials in various sections of the country, and by scale manufacturers. The results of these tests, which were conducted strictly in accord with code requirements, have led us to the conclusion that the special shift-test tolerances for small-capacity scales, with stabilized load-receiving elements, are no longer required.

This matter has been discussed with the scale industry. Your Committee understands that the present attitude of the industry is sympathetic to this recommendation. The scale industry is vitally concerned over the method to be employed in making the shift test. With the adoption of this amendment, weights and measures officials should be doubly careful to make their tests in strict accordance with the provisions of National Bureau of Standards Handbook 44, and as outlined in National Bureau of Standards Handbook 37. Your Committee urges all officials to cooperate fully in this respect (see fig. 7).

Your Committee recommends that tolerance T.1.1.2. of the Scale Code be amended to read as follows:

T.1.1.2. TO SHIFT TESTS.—Basic tolerances shall be applied.

## RECOMMENDATION 2

In connection with Recommendation 2, your Committee would point out that there are now separate codes for bulk plant meters (liquid measuring device code) and vehicle tank meters (vehicle tank code). Furthermore, the same accuracy should be maintained in behalf of receivers of products from these several types of meters. We should avoid, insofar as possible, differentiations because of method or type of device used. All of these devices handle a common product, and the choice of devices lies with the vendor of the product. In fairness to the receivers of the product, we feel that the present codes are adequate.

Your Committee recommends that no action be taken on this recommendation.

## RECOMMENDATION 3

In regard to Recommendation 3, it was represented that the present tolerances are not being generally observed, and that tests of the



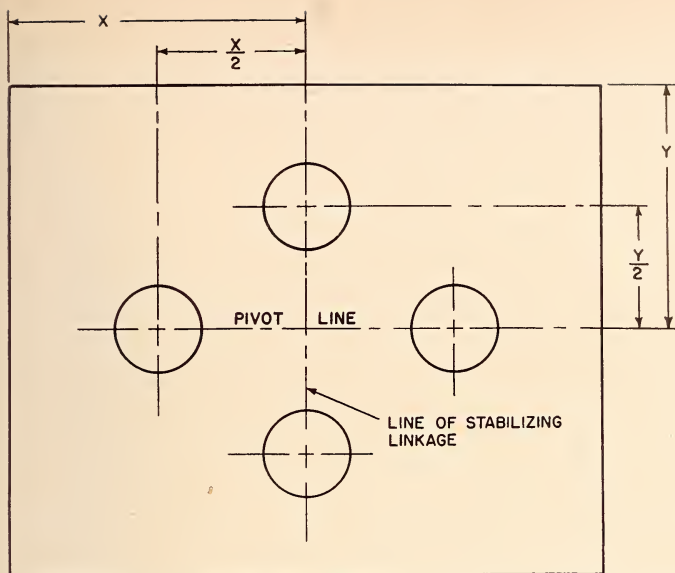


FIGURE 7. Test-weight positions for shift test on small-capacity scales with stabilized load-receiving elements.

distance between center and edge of load-receiving element—parallel to pivot line;  
 $\frac{Y}{2}$  distance between center and edge of load-receiving element—parallel to line of stabilizing linkage; circles indicate positions of test load equal to one-half capacity of the scale.

scales are usually made with 5-gallon standards; that devices reaching the maximum tolerance of 7 cubic inches on 5 gallons would, on a progressive error, be off more than the tolerances allowed on deliveries of 10 gallons or more. It has also been pointed out that these tolerance values have not been amended since 1921.

Presently, this portion of the table particularly affects retail gasoline dispensing units. Correspondence has been had with the various manufacturers of these units, and they have indicated to your Committee that their devices can meet the new proposed tolerances.

A hearing was granted by your Committee to the interested parties in relation to this proposed change, consisting of representatives of the petroleum industry and representatives of the Gasoline Pump Manufacturers Association. Objection was offered to this change by both phases of industry on the ground that the present tolerance is more severe than tolerances in relation to some other types of measuring devices. They further argued that attendant on this type of measuring element are certain related mechanical devices which, of themselves, present certain problems, and that at the moment they have some doubt as to whether further perfection can be achieved in these related elements to accomplish compliance with reduction in the tolerance. The further argument was advanced on the part of the petroleum industry that this reduction would entail them considerable expense from the maintenance standpoint. The suggested change is not one of great degree, and there is some question in the minds of your Committee as to the possibility of improvement in devices to meet the suggested change, as well as the added burden of maintenance of these devices. In some measure it may

be true that in some jurisdictions adequate equipment may not be present for desirable tests. Your Committee has deliberated to great length and has carefully weighed all the arguments, and we have recommended that this matter be committed to further study during the ensuing year, the study to be participated in by industry as well as by weights and measures officials.

#### RECOMMENDATION 4

With reference to Recommendation 4, the Southern Association recommended to the National Conference last year that Scale Regulation R. 5. be amended by striking out the word "retail". At that time it was the thought of your Committee that, in view of the difficulties encountered in attaining compliance with Regulation R. 5, which was of recent adoption, this proposed amendment was too precipitate. It was also the opinion of your Committee that the primary purpose of the aforementioned regulation was consumer protection. No action, therefore, was recommended by your Committee last year.

It now appears that progress has been made in the production of low priced, compensated spring scales for use in the retail field. Although some progress has been made in the production of these scales suitable for use in the wholesale field. A hearing was held on Sunday with representatives of industry present, and, as a result of the hearing, your Committee recommends the following amendment:

Amend Regulation R. 5. of the scale code by deleting the word "retail" in the second line thereof. This amendment to become effective January 1, 1953.

The effective date of the proposed change was deferred so that manufacturers and users would be allowed time in which to comply with this new requirement.

#### CODE FOR LIQUID-MEASURING DEVICES

It has been called to the attention of your Committee that there is some confusion in the interpretation of the language in Specification S. 2.6., which reads as follows:

S. 2.6. AIR ELIMINATION.—A meter device shall be equipped with an effective mechanical air eliminator or other effective means to prevent passage of air or vapor through the meter.

This situation has precipitated lack of uniformity in methods of test and probable inadequacy of scope of test particularly involving multiple dispensing units operating from a single source of power. This specification as now written is intended to cover in its requirements each dispensing unit. This same requirement was expressed in NBS Handbook 22, Specification 5, as follows:

In a pump discharge unit, a mechanical air eliminator or other means shall be installed *adjacent to the meter inlet*. [Italics ours.]

and in NBS Handbook 29, Specification 5, the last sentence thereof, follows:

\* \* \* In a pump discharge unit, a mechanical air eliminator or other means shall be provided in such a position that it will effectively prevent the passage of air or vapor through the meter.

amend S.2.6. on page 61 of the Code for Liquid Measuring Devices make the last sentence thereof read as follows :

a pressure-type unit, a mechanical air eliminator or other effective means be provided in such a position that it will effectively prevent the passage of air or vapor through the meter.

It has been brought to the attention of the Committee that there is some confusion in interpretation of N.1.2. TESTING DRAFTS, both in relation to some types of retail devices and wholesale devices. The present wording at the end of the first sentence reads :

\* \* \* for other types of retail devices used for dispensing motor fuel, testing drafts of at least 5 gallons shall be utilized.

Apparently this language has given rise to the thought that no test less than 5 gallons should be made on a meter type device. This is not the thought of the Committee. As you are doubtless aware, the prevalent type of retail device for dispensing motor fuels is the so-called meter type. It is not necessary to regularly test this type of device at each indication throughout its designed delivery range. Testing drafts of 5 gallons are suggested as convenient units. It is suggested that testing drafts of at least this amount shall be employed in any series of tests on a meter type device. This is not intended to preclude the testing of these devices at any other point, however.

We recommend that paragraph N.1.2. be amended, for the purpose of clarification, to read as follows :

N.1.2. TESTING DRAFTS.—The full capacity delivery and each intermediate delivery for which the device is designed shall be tested in the case of retail non-type and visible-type devices; for other types of retail devices used for dispensing motor fuel, testing drafts of one or more amounts, including drafts of at least 5 gallons, shall be utilized. For wholesale devices, testing drafts shall be equal to at least the amount delivered by the device in 1 minute at its minimum discharge rate, and shall in no case be less than 50 gallons.

The report of the Committee on Specifications and Tolerances was discussed item by item, as it was presented by the Committee chairman. Each amendment was acted upon individually, and, at the conclusion of the report, the Committee's recommendations were adopted as a whole.)

#### REMARKS OF MR. ARTHUR SANDERS

MR. SANDERS: I would like to call the attention of the Conference to two things concerning the changes which have been made in the 1944 scale code. The first relates to the shift test. I want to emphasize that the Specifications and Tolerances Committee asked the National Bureau of Standards to prepare a chart showing the correct positioning of weights in making the shift test on small-capacity scales with stabilized load-receiving elements. We believe that the chart which the Bureau prepared should be widely distributed and publicized among all weights and measures inspectors. We hope to do this among all the sales and service people in the scale industry, so that everyone can be operating according to the same correct procedure. What was really the only objection that the scale industry had to this change in the scale code, which eliminates this special tolerance (see fig. 7).

The other matter that I would like to call to your attention is the prohibition against the use in wholesale sales of foodstuff, except fruits and vegetables, of uncompensated spring scales. We have made an extensive survey and have had many discussions with the Specifica-



tions and Tolerances Committee. I think it should be brought to attention of weights and measures departments all over the country that there are some very good manufacturers of spring scales, hanging type, who do not have an uncompensated spring scale. I think all have worked toward the development of such scales, particularly the small-capacity scales. It is not such an easy matter. You do not just put a compensating spring in the old uncompensated spring scale housing and develop a satisfactory compensated spring scale. I think it should be called to your attention that this program is not going to be easy, and that some of the manufacturers may be able to develop satisfactory scales by the first of January 1953.

Some of our association members do have these scales. Some of them do not. The association took a neutral position on this matter. In fairness to those manufacturers who have not been able to develop these scales, I want to call this situation to your attention.

## **REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON RESOLUTIONS, PRESENTED BY MILES A. NELSON, CHAIRMAN**

### **CONGRATULATIONS TO DR. A. V. ASTIN**

Whereas, Dr. A. V. Astin has been appointed Director of the National Bureau of Standards by the President of the United States; and

Whereas, the said Dr. Astin favored the 37th National Conference on Weights and Measures with a very interesting and educational talk on the activities of the National Bureau of Standards; and

Whereas, Dr. Astin has always demonstrated a keen appreciation of the problems facing weights and measures officials and has evidenced a sincere desire to aid weights and measures officials in the development of uniform procedures and solving tricky problems; Therefore, be it

*Resolved*, That the 37th National Conference on Weights and Measures congratulate Dr. A. V. Astin on his appointment and extend to him our best wishes for a progressive administration.

### **APPRECIATION TO DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS**

Whereas, Dr. A. V. Astin, Director; W. S. Bussey, Chief of the Office of Weights and Measures; and their very able and efficient staff have extended valuable assistance and guidance to the 37th Conference, for which the Conference is very grateful; Therefore, be it

*Resolved*, That this, the 37th National Conference on Weights and Measures does appreciate such cooperation and assistance from the National Bureau of Standards and wishes to make this resolution a part of the records of the Conference.

### **APPRECIATION TO COOPERATING OFFICIALS**

Whereas, the governing officials of the various States, counties, and municipalities, through their manifest interest in weights and measures work, have made it possible for their respective jurisdictions to be represented at this 37th National Conference on Weights and Measures; Therefore, be it

*Resolved*, That this, the 37th National Conference on Weights and Measures does appreciate such cooperation and assistance and wishes to make this resolution a part of the records of this Conference.

### **APPRECIATION TO MANAGEMENT OF HEADQUARTERS HOTEL**

Whereas, the management of the Wardman Park Hotel has done everything within its power to make our Conference a success; Therefore, be it

*Resolved*, That this, the 37th National Conference on Weights and Measures does express its warmest appreciation and thanks to the management of the hotel for their cordial hospitality and cooperation during our meetings; be it further

*Resolved*, That the Secretary of this Conference transmit a copy of this resolution to the management of the Wardman Park Hotel.

## APPRECIATION TO THE HON. F. JOSEPH DONOHUE

Whereas, The Honorable F. Joseph Donohue added much to the success and enjoyment of our meeting by delivering a most cordial welcome to the City of Washington; Therefore, be it  
*Resolved*, That this, the 37th National Conference on Weights and Measures hereby acknowledge its appreciation for the courtesies extended by Mr. Donohue.

## APPRECIATION TO THOSE PARTICIPATING IN PROGRAM

Whereas, various committees, speakers, and individuals have given generously their valuable time and efforts to make the 37th National Conference on Weights and Measures a success; Therefore, be it  
*Resolved*, That the 37th National Conference on Weights and Measures hereby record its grateful appreciation to all who have contributed to the success of the Conference.

## APPRECIATION TO THE PRESS, RADIO, AND THE SCALE JOURNAL

Whereas, the press and radio of the City of Washington have been generous in reporting the activities of our present meeting; and  
Whereas, the Scale Journal has likewise been generous in publishing news and advance notices of our present meeting; Therefore, be it  
*Resolved*, That this, the 37th National Conference on Weights and Measures, hereby record its appreciation to the press and radio of the City of Washington and to the Scale Journal.

## ON INVESTIGATION FOR ACCURATE DETERMINATION OF AXLE LOADS ON HIGHWAY VEHICLES

Whereas, weights and measures officials throughout the nation are continually requested to test axle load scales and loadometers and to recommend weighing procedures in order to obtain accurate determinations of axle loads of highway vehicles; and,  
Whereas, there is no record of a comprehensive and scientific investigation or having been made into a method for an accurate determination of axle loads of highway vehicles; and  
Whereas, the extent and causes of wide variations in results of such tests of axle loads are unknown; Therefore, be it  
*Resolved*, That this 37th National Conference on Weights and Measures recommend and request that the National Bureau of Standards, in cooperation with the States, the U. S. Bureau of Public Roads, and the trucking industry, institute extensive and scientific investigation into the entire field of testing axle loads and devise a method for accurately obtaining a determination of such loads.

(Signed) MILES A. NELSON, *Chairman*,  
A. C. BECKER,  
WALTER L. DANIELS,  
JOHN E. MAHONEY,  
M. G. RICE,  
LOUIS SNOW,  
*Committee on Resolutions.*

The report of the Resolutions Committee was adopted by the Conference.)

## REPORT OF THE NATIONAL CONFERENCE TREASURER, GEORGE F. AUSTIN, JR.

May 1, 1952

Balance on hand May 1, 1951..... \$636. 47

### RECEIPTS:

May 25—Registration fees—1951 Conference 273 at \$5.00	\$1,365. 00	
Interest accrued.....	14. 35	
		1,379. 35
Total .....		2,015. 82

# DISBURSEMENTS :

May 22-25, 1951—

Expenses of 36th National Conference-----	\$946. 30
National Bureau of Standards testimonial scroll-----	45. 00
Rubber stamp (Registration Fee)-----	1. 44
Two receipt books at \$3.30 ea-----	6. 60
Twelve copies "Parliamentary Law" booklets-----	2. 45

Total expenses----- \$1, 001

Balance on hand May 1, 1952----- 1, 014

Respectfully submitted,

(Signed) GEORGE F. AUSTIN, *Treasurer*

(The Treasurer's report was adopted by the Conference.)

(Upon motion of L. E. Witt, the Conference voted to authorize the Secretary to draw upon the Treasury to pay the customary and usual expenses of the Conference.)

## RALPH W. SMITH MADE HONORARY LIFE MEMBER

MR. WITT: Gentlemen, attending with us at this year's Conference are an outstanding weights and measures personality. He is wearing with inordinate pride the Conference badge of identification. It should be the other way around. We are signally honored by his presence upon this occasion. He has served the National Bureau of Standards for more than thirty years. He has done much for the National Conference. He has guided us. He has written many practical handbooks, which are in fact our official manuals in the conduct of our business. I, therefore, move that this gentleman, Ralph W. Smith, be accorded the recognition which he has so rightfully earned, and that this 37th National Conference on Weights and Measures bestow upon him an honorary life membership; and that the Secretary of the Conference be authorized to address a communication to Mr. Smith apprising him of the action of the Conference.

(The motion was adopted unanimously.)

(R. W. Searles, Chaplain, closed the meeting with prayer, and the Thirty-seventh National Conference on Weights and Measures adjourned at 11:30 a. m.)

## MEETING OF THE EXECUTIVE COMMITTEE

SECRETARY'S NOTE.—Immediately following adjournment of the Conference a meeting was held of the newly elected Executive Committee of the Conference. This meeting was attended by 15 of the 24 members. Dr. A. V. Astin, President, presided. The following decisions were made with respect to the Thirty-eighth National Conference on Weights and Measures:

The Conference will extend over 4 days, with two sessions on the first day, one session on the second day, two sessions on the third day, and one session on the fourth day.

The dates for the Conference will be May 19, 20, 21, and 22, 1953.

The headquarters for the Conference will be Wardman Park Hotel, Washington, D. C.

The morning session on the second day of the Conference will be held at the National Bureau of Standards if suitable arrangements can be made. Other sessions of the Conference will be held at the headquarters hotel.

The customary informal Conference party will be held on the evening of the second day of the Conference.

Some form of special entertainment will be provided for the ladies attending the Conference.



S. Bussey, Conference Secretary, was instructed to arrange the program for Thirty-eighth National Conference.

The Secretary was requested to arrange for an informal open house and tour of the National Bureau of Standards laboratories on the afternoon of the second of the Conference.

In addition to the above decisions in regard to the Thirty-eighth National Conference on Weights and Measures, the Executive Committee recommended the practice of furnishing to the delegates various interesting publicity uses by the National Bureau of Standards be continued and expanded.

The Committee also instructed the Secretary to furnish an appropriate Honor-Life Membership card or certificate to Ralph W. Smith.

## PERSONS ATTENDING THE CONFERENCE

### DELEGATES—STATE, CITY, AND COUNTY OFFICIALS

#### CALIFORNIA

----- JAMES E. BRENTON, Chief, Bureau of Weights and Measures, Department of Agriculture, Mull Building, Sacramento.

Alameda ----- WILLIAM A. KERLIN, Sealer of Weights and Measures, 333 Fifth Street, Oakland 7.

Los Angeles ----- CHARLES MORRIS FULLER, Sealer of Weights and Measures, 3200 North Main Street, Los Angeles 31.

San Diego ----- H. J. McDADDE, County Sealer of Weights and Measures, 1480 "F" Street, San Diego.

#### CONNECTICUT

----- FRANK M. GREENE, Deputy Commissioner, Food and Drug Commission, State Office Building, Hartford.

FRANK J. DELANEY, State Inspector of Weights and Measures, State Office Building, Hartford.

CLARENCE F. ROBERTS, State Inspector of Weights and Measures, State Office Building, Hartford.

: Bridgeport ----- LOUIS SNOW, Sealer of Weights and Measures, 925 Main Street.

Fairfield ----- WILLIAM E. SHEEHY, Sealer of Weights and Measures, County Court House, Bridgeport.

ALVIN B. COGER, Deputy Sealer of Weights and Measures, Newtown.

ERNEST R. WILSON, Deputy Sealer of Weights and Measures, P. O. Box 269, Norwalk.

Hartford ----- FRED E. MCKINNEY, Sealer of Weights and Measures, Hartford County Building, 95 Washington Street, Hartford.

JOSEPH J. FANELLI, Deputy Sealer of Weights and Measures, Hartford County Building, 95 Washington Street, Hartford.

Tolland ----- WILLIAM F. MASINDA, Sealer of Weights and Measures, West Willington.

Windham ----- JOHN T. BENNETT, County Sealer of Weights and Measures, Box 76, Canterbury.

#### DELAWARE

----- MARTIN L. KINNEY, Regulator of Weights and Measures, 600 Delaware Street, New Castle.

# DISTRICT OF COLUMBIA

Department of Weights, Measures, and Markets, 300 Indiana Avenue, N  
Washington

District----- J. THOMAS KENNEDY, Director.  
JAMES G. DANCE, Deputy Director.  
JOHN M. BOUCHER, Supervisor.  
G. STUART REEDER, Supervisor.  
WALTER W. BRANDT, Inspector and Investigator.  
LEO F. BROOKS, Inspector and Investigator.  
WILLIAM T. BRUNSON, Inspector and Investigator.  
WALTER R. CORNELIUS, Inspector and Investigator.  
LEO A. GNOTTA, Inspector and Investigator.  
FENTON C. HARBOUR, Inspector and Investigator.  
WILLIAM H. JENNINGS, Inspector and Investigator.  
THEODORE B. MIDDLETON, Inspector and Investigator.  
RALPH A. MONTGOMERY, Inspector and Investigator.  
BERNARD A. PETTIT, Inspector and Investigator.  
FRANCIS M. WARNER, Inspector and Investigator.  
WOODBROW W. WELLS, Inspector and Investigator.

## FLORIDA

State----- NALLS BERRYMAN, Supervisor, Weights  
Measures Division, Department of Agriculture,  
Nathan Mayo Building, Tallahassee.  
City :  
Jacksonville----- HOWARD E. CRAWFORD, Inspector of Weights  
Measures, 431 West Eighth Street.  
Miami----- HARVEY E. HOWARD, Supervisor of Weights  
Measures, Department of Public Welfare.

## GEORGIA

State----- JOHN W. D. HARVEY, Assistant Chemist, S  
Oil Laboratory, 524 State Office Building,  
Atlanta.

## ILLINOIS

State----- JOHN J. LEVITT, Superintendent of Standards,  
615 Armory Building, Springfield.  
WILLIAM R. OTTO, State Inspector of Weights  
and Measures, 505 South Clinton Street,  
Bloomington.  
City : Chicago----- IRVINE M. LEVY, Sealer of Weights and Measures,  
Room 608 City Hall.  
FRANK J. FITZGERALD, Chief Deputy Inspector of  
Weights and Measures, Room 608 City Hall.

## INDIANA

State----- ROLLIN E. MEEK, Director, Division of Weights  
and Measures, Board of Health, 1330 Vermont  
Michigan Street, Indianapolis.  
City :  
Fort Wayne----- JAMES A. HILGEMANN, Deputy State Inspector of  
Weights and Measures, 301 South Clinton  
Street.  
Gary----- CLEO C. MORGAN, City Sealer of Weights  
Measures, City Hall, Room 204.  
Terre Haute----- JOHN T. HARPER, Inspector of Weights and Measures,  
205 City Building.  
County :  
Grant----- REUBEN C. PARKS, Inspector of Weights  
Measures, Court House, Marion.  
Vigo----- WILLIAM H. ROBERTS, Inspector of Weights  
Measures, Room 5, Court House, Terre Haute.

## IOWA

te----- JAMES W. REESE, Supervisor, Division of Weights and Measures, Department of Agriculture, Des Moines.

## KANSAS

te----- J. FRED TRUE, State Sealer, Weights and Measures Division, Board of Agriculture, 915 Harrison Street, Topeka.

LEW GALLOWAY, Chairman, Weights and Measures Committee, Board of Agriculture, 915 Harrison Street, Topeka.

## KENTUCKY

ate----- BEN S. ADAMS, Commissioner of Agriculture, Frankfort.

GEORGE L. JOHNSON, Director, Division of Weights and Measures, Department of Agriculture, New State Capitol, Frankfort.

y: Louisville----- WILLIAM H. ISING, JR., Superintendent, Division of Weights and Measures, Department of Public Safety, Room 3, City Hall.

## LOUISIANA

ate----- ALOIS J. MAYER, Director, Division of Weights and Measures, Department of Agriculture and Immigration, P. O. Box 951, Baton Rouge 1.

## MAINE

ate----- JAMES A. BOYLE, Deputy State Sealer, Bureau of Weights and Measures, Department of Agriculture, State House, Augusta.

ty: Portland----- CHARLES JAMES WILLS, Sealer of Weights and Measures, 389 Congress Street.

## MARYLAND

ate----- JOHN E. MAHONEY, Superintendent of Weights and Measures, State Department of Markets, Board of Agriculture, University of Maryland, College Park.

DR. PAUL E. NYSTROM, State Department of Markets, University of Maryland, College Park.

ty: Baltimore----- GEORGE H. LEITHAUSER, Senior Assistant Superintendent of Weights and Measures, 1106 Municipal Building.

MORRIS BRATMAN, Inspector of Weights and Measures, 1106 Municipal Building.

EDWIN EDWARD JAFFA, Inspector of Weights and Measures, 1106 Municipal Building.

ounty: Baltimore----- FRANK J. VITTEK, Chief Inspector of Weights and Measures, Offutt Building, Towson 4.

GEORGE A. KLEIN, Assistant Inspector of Weights and Measures, Offutt Building, Towson 4.

Montgomery----- A. MORTON THOMAS, Director, Department of Inspection and Licenses, Court House, Rockville.

WILFORD ELLIS DAYHOFF, Inspector of Weights and Measures, County Court House, Rockville.

## MASSACHUSETTS

ate----- JOHN P. MCBRIDE, Director of Standards and Necessaries of Life, 194 State House, Boston.



City:	
Cambridge-----	JOSEPH M. O'NEIL, Sealer of Weights and Measures, Municipal Building.
Fall River-----	JAMES A. BENSON, Sealer of Weights and Measures, City Hall Annex.
Malden-----	JOHN J. KELLEY, City Sealer of Weights and Measures.
Medford-----	WILLIAM S. VINCE, Deputy Sealer of Weights and Measures, City Hall.
West Springfield-----	CARL A. JACOBSON, Sealer, Department of Weights and Measures.
County: Arlington-----	JAMES J. DOLAN, Sealer, Weights and Measures Department, Arlington Town Hall, Arlington.

#### MICHIGAN

State-----	MILES A. NELSON, Chief, Bureau of Market and Enforcement, Department of Agriculture, 725 State Office Building, Lansing 13.
City:	
Dearborn-----	MARTIN C. GRIFFITH, Councilman, City Council; MITCHELL O. NICKON, City Sealer of Weights and Measures, 4731 Korte Street.
	CHARLES H. WALLER, Inspector, Department of Licenses, Weights, and Measures, Police and Courts Building.
Detroit-----	GEORGE F. AUSTIN, JR., Deputy Sealer of Weights and Measures, 740 Elmwood Avenue.
	WILLIAM B. HEASLIP, Supervising Inspector, Bureau of Markets, Weights, and Measures, 740 Elmwood Avenue.
Highland Park-----	JAMES F. BAKER, City Sealer of Weights and Measures, 25 Gerald Street.
Lansing-----	WALTER M. SAXTON, City Sealer and Market Master, 333 North Cedar.
Pontiac-----	WALTER A. BAERWOLF, Sealer of Weights and Measures, 8 North Perry Street.

#### MINNESOTA

State-----	ERLING HANSEN, Supervisor, Department of Weights and Measures, Railroad and Warehouse Commission, Corn Exchange Building, Minneapolis 15.
	DAVID LUNDEEN, State Weighmaster, Track and Hopper Scale Department, 320 Flour Exchange Building, Minneapolis 15.
	CHRISTIAN CHRISTENSEN, Inspector, Weights and Measures Department, 216 Corn Exchange Building, Minneapolis 15.
	MELVIN C. ILSTRUP, State Inspector of Weights and Measures, 2124 Riverside Avenue, Minneapolis.
City: Minneapolis-----	EDWARD J. EGAN, Alderman-Chairman Weights and Measures, Court House.
	RUSSELL S. ACKERMAN, Superintendent, Department of Licenses, Weights, and Measures, Room 3, City Hall.

#### MISSOURI

City: University City-----	D. J. ALMON, General Inspector, City Hall.
----------------------------	--

#### NEVADA

State-----	A. J. RAFAEL, Resident Inspector, Department of Weights and Measures, Public Service Division, University of Nevada, P. O. Box 747, Las Vegas.
------------	--

## NEW HAMPSHIRE

te----- C. A. LYON, Director of Markets and Standards,  
Department of Agriculture, Concord.  
ALFRED H. DITTRICH, Chief Inspector, Bureau of  
Weights and Measures, Department of Agri-  
culture, Concord.  
MAURICE W. MULLEN, Inspector of Weights and  
Measures, Department of Agriculture, Con-  
cord.

## NEW JERSEY

te----- JOSEPH G. ROGERS, State Superintendent, Divi-  
sion of Weights and Measures, 187 West  
Hanover Street, Trenton 7.  
ARCHIE T. SMITH, Assistant State Superintend-  
ent, Division of Weights and Measures, 187  
West Hanover Street, Trenton 7.  
SAMUEL H. CHRISTIE, JR., Senior Inspector, Divi-  
sion of Weights and Measures, 187 West  
Hanover Street, Trenton 7.

y:  
Camden----- ALFRED DIPIERO, Superintendent of Weights and  
Measures, City Hall.  
Clifton----- FELIX J. SANDRI, Superintendent of Weights and  
Measures, City Hall.  
Englewood----- LEONARD DERIENZO, Superintendent of Weights  
and Measures, City Hall.  
Hoboken----- CHARLES P. ROMANO, Superintendent of Weights  
and Measures, City Hall.  
Jersey City----- JOHN S. BURKE, Municipal Superintendent of  
Weights and Measures, City Hall.  
Passaic----- PAUL DEVRIES, Superintendent of Weights and  
Measures, P. O. Box 663, Municipal Building.  
JOSEPH SHAW, Assistant Superintendent of  
Weights and Measures, Municipal Building.  
Paterson----- JOSEPH P. LEONARD, Superintendent of Weights  
and Measures, 115 Van Houten Street.  
WILLIAM J. KEHOE, Assistant Superintendent  
of Weights and Measures, 115 Van Houten  
Street.  
Union City----- ALFRED O. OSLUND, Superintendent, Department  
of Weights and Measures, 3715 Palisade  
Avenue.

nty:  
Bergen----- MICHAEL J. SANTIMAURO, Superintendent of  
Weights and Measures, 66 Zabriskie Street,  
Hackensack.  
ERNEST E. DAWSON, Assistant Superintendent of  
Weights and Measures, 66 Zabriskie Street,  
Hackensack.  
Camden----- ALBERT C. BECKER, County Superintendent of  
Weights and Measures, City Hall, Camden.  
Cumberland----- ALFRED LIRIO, Superintendent of Weights and  
Measures, Court House, Bridgeton.  
WINFIELD K. THOMPSON, Assistant Superin-  
tendent of Weights and Measures, Court  
House, Bridgeton.  
Mercer----- RALPH M. BODENWEISER, Superintendent of  
Weights and Measures, Court House, Trenton.  
Middlesex----- CHARLES F. SULLIVAN, Superintendent of  
Weights and Measures, Room 208 Sheriff's  
Office Building, New Brunswick.  
Monmouth----- GLENN L. BERRY, County Superintendent of  
Weights and Measures, 706 Eighth Avenue,  
Asbury Park.  
Morris----- DEL G. NELSON, Superintendent of Weights and  
Measures, Court House, Morristown.

County—Continued

Passaic-----	WILLIAM MILLER, Superintendent of Weights and Measures, Administration Building, Paterson.
Union-----	JAMES M. DIETZ, Superintendent of Weights and Measures, Court House, Elizabeth 4.

NEW YORK

State-----	DR. ERWIN V. MOORE, Assistant Commissioner, Department of Agriculture and Markets, State Office Building, Albany. CLEMENT A. BAKER, Director, Bureau of Weights and Measures, Department of Agriculture and Markets, State Office Building, Albany. JOHN J. LEONARD, Supervising Inspector, New York State Bureau of Weights and Measures, 24 Griswold Avenue, Troy. MATTHEW G. RICE, Inspector, Bureau of Weights and Measures, Department of Agriculture and Markets, 8 Marlette Place, White Plains.
------------	--

City:

Binghamton-----	HARRY A. LASON, Sealer of Weights and Measures, 60 Robinson Street.
Buffalo-----	LOUIS J. SCHUSTER, City Sealer of Weights and Measures, Room 5, City Hall.
Jamestown-----	CARL A. LARSON, City Sealer of Weights and Measures, 1 Fenton Place.
Lackawanna-----	JOHN J. SERES, City Sealer of Weights and Measures, 4 Rosary Avenue.
Rochester-----	ANTHONY C. SAMENFINK, City Sealer of Weights and Measures, Department of Commerce, Rochester Food Terminal.

County:

Erie-----	O. F. GAYLORD, County Sealer of Weights and Measures, County Hall, Buffalo.
Monroe-----	EARL D. HUBBLE, Sealer of Weights and Measures, Room B, 1400 South Avenue, Rochester.
Nassau-----	ROBERT WILLIAMS, Sealer of Weights and Measures, Old County Court House Annex, Mineola. WILLIAM KIRK, JR., Assistant Sealer of Weights and Measures, Old County Court House Annex, Mineola.
Niagara-----	HENRY C. HULSHOFF, Sealer of Weights and Measures, 17 High Street, Lockport.

NORTH CAROLINA

State-----	C. D. BAUCOM, Superintendent, Weights and Measures Division, Department of Agriculture, 415 Agriculture Building, Raleigh. JOHN I. MOORE, Supervisor, Weights and Measures Division, Department of Agriculture, 318 Morrison Avenue, Raleigh.
------------	--

NORTH DAKOTA

State-----	J. C. GOLL, Chief Inspector, Weights and Measures Department, Public Service Commission, Bismarck.
------------	--

OHIO

State-----	V. D. CAMPBELL, Deputy State Sealer, Division of Foods and Dairies, Department of Agriculture, 710 State Office Building, Columbus 15.
City:	
Akron-----	ROBERT K. SLOUGH, City Sealer, Division of Weights and Measures, 102 Municipal Building.
Cincinnati-----	WM. E. G. RHEIN, Superintendent, Division of Markets, Weights and Measures, Department of Safety, 2nd Floor, Market House.



—Continued

Lorain----- GABOR TOTH, City Sealer of Weights and Measures, 3019 Caroline Avenue.  
City : Medina----- ROBERT W. SEARLES, Deputy Sealer of Weights and Measures, Court House, Medina.

#### PENNSYLVANIA

----- JOSEPH F. BLICKLEY, Director, Bureau of Standard Weights and Measures, Department of Internal Affairs, Capitol Building, Harrisburg.  
SPENCER H. SEIGHMAN, Assistant Director, Bureau of Standard Weights and Measures, Department of Internal Affairs, Capitol Building, Harrisburg.  
City : Erie----- PAUL F. WATSON, City Inspector of Weights and Measures, City Hall.  
City : Erie----- ROBERT W. DAGGETT, County Inspector of Weights and Measures, North Girard.

#### RHODE ISLAND

----- EDWARD R. FISHER, State Sealer of Weights and Measures, Department of Labor, State House, Providence.  
JAMES F. CORRIGAN, Deputy State Sealer of Weights and Measures, Department of Labor, Providence.  
Cranston----- ARMAND E. RENZI, Sealer of Weights and Measures, 14 Tulip Circle, Garden City, Cranston.  
Providence----- EDWARD F. MORAN, Superintendent of Weights and Measures, 141 Fountain Street.

#### SOUTH CAROLINA

----- J. ROY JONES, Commissioner, Department of Agriculture, P. O. Box 1080, Columbia.  
CARL H. STENDER, Assistant to Commissioner, Department of Agriculture, P. O. Box 1080, Columbia.  
ALEX H. GIBERT, Director, Bureau of Inspection, Department of Agriculture, P. O. Box 1080, Columbia.  
W. J. SENN, Inspector of Weights and Measures, Department of Agriculture, Box 1080, Columbia.

#### SOUTH DAKOTA

----- FRED LINDEKUGEL, Public Utilities Commissioner, Heavy Scales Department, Pierre.

#### TENNESSEE

Nashville----- TOM WEBB, Sealer of Weights and Measures, 300 Demonbreun Street.  
Oak Ridge----- LONGSTREET CAVETT, Inspector, Management Services, Inc., 313 E. Forest Road.

#### TEXAS

----- FRANCIS L. GOODE, Chief, Division of Weights and Measures, Department of Agriculture, Austin 14.  
BERNIE A. MOORE, Field Supervisor, Division of Weights and Measures, Department of Agriculture, Austin 14.  
Houston----- PETE J. VITOPIL, Weights and Measures Inspector, City Hall.  
San Antonio----- THOMAS H. COGHILL, City Engineer, Department of Public Works.

## UTAH

City: Salt Lake City----- EDWIN C. WESTWOOD, City Sealer of Weights and Measures, 118 East First Street.

## VIRGINIA

State----- R. D. THOMPSON, Supervisor, Weights and Measures Section, Division of Markets, Department of Agriculture and Immigration, 1200 E. Main Street, Richmond.

E. BROOKS GREEN, Inspector of Weights and Measures, Chatham.

JOSEPH EDWARD MICHAUX, Inspector of Weights and Measures, RFD #3, Richmond.

City:

Norfolk----- WEBSTER K. TRIPPLE, Chief, Bureau of Weights and Measures, City Market Building.

JAMES A. PARRON, Assistant Sealer of Weights and Measures, City Market Building.

Petersburg----- C. R. THOMPSON, City Sealer of Weights and Measures, City Hall.

CLAUDE ROANE BRANCH, Assistant Inspector of Weights and Measures, City Hall.

Richmond----- CONWAY C. MUNDY, Chief, Bureau of Weights and Measures, Room 121, Mosque Building, Laurel and Main Streets.

ALVIN L. BROCKWELL, Inspector of Weights and Measures, The Mosque Building, Laurel and Main Streets.

M. L. RICE, Inspector of Weights and Measures, The Mosque Building, Laurel and Main Streets.

County: Arlington----- JOSEPH W. HIGGINS, Assistant Sealer of Weights and Measures, Arlington County Court House, Arlington.

## WASHINGTON

State----- T. A. CARTER, Supervisor, Division of Weights and Measures, Department of Agriculture, Old Capitol Building, Olympia.

City: Seattle----- WALTER L. DANIELS, Director, Division of Licenses and Standards, Room 100, County-City Building.

DONALD M. TURNBULL, Supervisor, Division of Licenses and Standards, Office of the Comptroller, 100 County-City Building.

## WISCONSIN

State----- WILLIAM WATERMAN, Supervisor, Weights and Measures Inspection, 419 S. W. State Capitol, Madison.

City:

Kenosha----- FELIX MAYER, Sealer of Weights and Measures, City Hall.

Milwaukee----- LOUIS E. WITT, Sealer of Weights and Measures, 1331 North Fifth Street.

Racine----- ROBERT J. ZIERTEN, Sealer of Weights and Measures, City Hall.

Sheboygan----- J. A. PEIKERT, Sealer of Weights and Measures, City Hall.

Superior----- OSCAR E. ROESELER, City Sealer of Weights and Measures, City Hall.

Wausau----- A. K. MICHAELSON, City Sealer, Department of Weights and Measures, Market Square Building.

## WYOMING

State----- ELVIN LEEMAN, Superintendent, Division of Weights and Measures, Department of Agriculture, 310 Capitol Building, Cheyenne.

## DELEGATES—NATIONAL BUREAU OF STANDARDS

### Director's Office:

A. V. ASTIN, Director.  
A. T. McPHERSON, Associate Director.  
L. J. BRIGGS, Director Emeritus.  
WILLIAM S. BUSSEY, Chief, Office of Weights and Measures.  
MALCOLM W. JENSEN, Assistant Chief, Office of Weights and Measures.  
H. HAIG RUSSELL, Chief, Scale Section, Office of Weights and Measures.  
CHARLES H. OAKLEY, Coordinator, Office of Weights and Measures.  
HERBERT L. BADGER, Physicist, Office of Weights and Measures.  
MRS. K. M. SCHWARZ, Attorney-Editor, Office of Weights and Measures.  
MRS. F. C. BELL, Chief Clerk, Office of Weights and Measures.  
JOHN FRIEDMAN, Office of Scientific Publications.  
BERNARD H. BARBOUR, Office of Scientific Publications.

### Chemistry Division:

JOHN H. EISEMAN, Chemist, Gas Chemistry Section.

### Mechanics Division:

B. C. KEYSAR, Capacity, Density and Fluid Meters Section.  
JOHN C. HUGHES, Project Leader, Capacity, Density and Fluid Meters Section.  
GRACE C. MULLIGAN, Physicist, Capacity, Density and Fluid Meters Section.  
DOUGLAS R. TATE, Physicist, Engineering Mechanics Section.  
L. B. MACURDY, Chief, Mass Section.  
T. W. LASHOF, Assistant Chief, Mass Section.

### Physics and Metrology Division:

L. V. JUDSON, Chief, Length Section.  
RALPH W. CROUCH, JR., Photometry and Calorimetry Section.

### Substantives:

E. C. CRITENDEN.  
WILMER SOUDER.

## GUESTS REPRESENTING UNITED STATES GOVERNMENT

### U. S. Department of Agriculture:

A. E. BROWNE, Research and Statistics Division, Fruit and Vegetable Branch, Production and Marketing Administration, Washington 25, D. C.  
L. C. CAREY, Fruit and Vegetable Branch, Production and Marketing Administration, Washington 25, D. C.  
EDWARD A. MURPHY, Division of Animal Industry, Washington 25, D. C.  
CHARLES L. RICHARD, Supervisor of Scales and Weighing, Livestock Branch, 3530 South Building, Washington 25, D. C.  
R. L. SPANGLER, Standardization Section, Fresh Products Standardization and Inspection Division, Fruit and Vegetable Branch, Production and Marketing Administration, Washington 25, D. C.  
D. R. STOKES, Research and Statistics Division, Fruit and Vegetable Branch, Production and Marketing Administration, Washington 25, D. C.

### U. S. Department of Commerce:

OLIVER H. WATSON, Section Chief, Scales and Balances Section, National Production Authority, 2147 Temporary T Building, Washington 25, D. C.  
W. E. BRAITHWAITE, Chief, Packaging Section, Commodity Standards Division, Washington 25, D. C.

### U. S. Food and Drug Administration:

ROBERT A. OSBORN, Chemist, Food Division, Washington 25, D. C.  
SUMNER C. ROWE, Chemist, Food Division, Washington 25, D. C.

### U. S. Treasury Department:

NORMAN T. MORSELL, Tobacco Branch, Alcohol and Tobacco Tax Division, Bureau of Internal Revenue, Washington 25, D. C.

## GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

Weather Springs: J. W. ROCKEFELLER, JR., Engineer, 140 Cedar Street, New York 6, N. Y.

American Meter Co.: W. V. STOCKTON, JR., P. O. Box D, Wynnewood, Pa.

Boomer Brothers Co.: RAYNOR M. HOLMES, Research Engineer, Newark, N. Y.

Egg-Erickson Corporation: L. H. ERICKSON, President, 469 East Ohio Street, Chicago 11, Ill.

Wagner, Inc.: WALTER M. HARKS, Vice President, Fort Wayne, Ind.



Brodie, Ralph N., Co., Inc.

C. J. McCAFFREY, Vice President, Eastern Division Headquarters, 550 So  
Columbus Avenue, Mount Vernon, N. Y.

D. S. JOHNSON, Vice President in Charge of Sales, Oakland, Calif.

DON W. KINGSLEY, 550 South Columbus Avenue, Mount Vernon, N. Y.

Chatillon, John, & Sons :

J. G. HUGEL, SR., Sales Representative, 85 Cliff Street, New York 38, N.

GEORGE C. REILEY, Vice President—Sales, 85 Cliff Street, New York 38, N

Container Corporation of America : WILLIAM W. DEISSLER, JR., Sales Resear  
Manayunk, Philadelphia 27, Pa.

Continental Can Co., Inc. : WARREN D. AYRES, Assistant Product Sales Manag  
349 Oraton Street, Newark, N. J.

Creamery Package Mfg. Co. : L. T. GUSTAFSON, 1243 West Washington Bouleva  
Chicago 7, Ill.

Dairy Equipment Co. : K. S. HART, Madison, Wis.

Dayton Pump & Mfg. Co. :

JAMES F. PEASE, Field Sales Manager, 500 Webster Street, Dayton, Ohio

ROBERT H. SCHOENING, Assistant Chief Engineer, 500 Webster Street, Dayt  
Ohio.

Detecto Scales, Inc. :

D. S. HAMMERMAN, Executive Vice President, 540 Park Avenue, Brook  
5, N. Y.

MACK RAPP, Vice President, 540 Park Avenue, Brooklyn 5, N. Y.

MRS. CARRIE G. WOODLAND, Representative, Woodland's Temple Gro  
Fellsmere, Fla.

Erie Meter Systems, Inc. :

PAUL R. FISHBURN, Chief Engineer, Erie 6, Pa.

RANDALL L. HOLDRIDGE, Manager, Air Port Fueling Division, P. O. Box 5  
Erie, Pa.

WILLIAM B. JOHNSON, JR., Manager of Sales, P. O. Box 559, Erie, Pa.

Exact Weight Scale Co. :

JOHN BEESON, 944 West Fifth Avenue, Columbus 8, Ohio.

K. B. NEFF, President, 944 West Fifth Avenue, Columbus 8, Ohio.

W. A. SCHEURER, Vice President, 944 West Fifth Avenue, Columbus 8, Oh

JAMES F. SULLIVAN, Chief Engineer, 944 West Fifth Avenue, Columbus  
Ohio.

M. D. VARNEY, 944 West Fifth Avenue, Columbus 8, Ohio.

Ex-Cell-O Corporation, GENE R. ANDRE, Pure Pak Division, 1200 Oakman Bou  
vard, Detroit, Mich.

Fairbanks, Morse & Co. :

ARTHUR A. HAFNER, Chief Engineer, St. Johnsbury, Vt.

C. A. HENNIE, Field Engineer, 657 East 25th Street, Baltimore 18, Md.

CHAS. W. KING, Manager Scale Department, 760 Lee Street, S. W.,  
Atlanta, Ga.

LEONARD J. MCGUIRE, Manager, St. Johnsbury, Vt.

G. C. WORTHLEY, Manager Scale Division, 600 South Michigan Aven  
Chicago, Ill.

Forschner, R. H., Co. : RICHARD A. FORSCHNER, 205 Third Avenue, New Yo  
3, N. Y.

Fuller, H. J., C. O. : H. J. FULLER, President, 1371 West Third Avenue, Columb  
12, Ohio.

Gilbert & Barker Manufacturing Co. :

CLIFFORD A. BELLOW, West Springfield, Mass.

WILLIAM KEAY, West Springfield, Mass.

JOSEPH A. LOGAN, Manager, Patents and Weights and Measures, We  
Springfield, Mass.

Girton Mfg. Co. : THOMAS F. DOUGLAS, Millville, Pa.

Gould Equipment Co. : EARLON W. BARRETT, Representative, Portland, Me.

Granberg Corporation : FRED H. FIELDING, Washington Representative, 1507  
Street N. W., Washington, D. C.

Gurley, W. & L. E. : FRANKLIN G. WILLIAMS, Washington Representative, 551  
Nevada Avenue N. W., Washington 15, D. C.

ey, H. A., Associates, Inc.:  
 H. A. HADLEY, President, 25 Pearl Street, Burlington, Vt.  
 JOSEPH S. PETERSON, General Sales Manager, 25 Pearl Street, Burlington, Vt.  
 rt Manufacturing Co.:  
 MURRAY W. CRAIG, Weights and Measures Representative, Dayton Scale  
 Division, Troy, Ohio.  
 BURNS H. DREESE, General Manager, Penn Avenue at Simpson Street, Troy,  
 Ohio.  
 ERNEST A. REUSSENZEHN, Chief Scale Engineer, Dayton Scale Division, 448  
 Huffman Avenue, Dayton 3, Ohio.  
 e Scale Co.:  
 EDWIN W. COUNTS, Sales Engineer, P. O. Box 611, Radford, Va.  
 ROBERT A. PARHAM, Branch Manager, 309 East Saratoga Street, Baltimore 2,  
 Md.  
 RICHARD F. STRAW, Vice President, Rutland, Vt.  
 man Mfg. Co.: ROBERT E. DORMAN, General Manager, Automotive Division  
 O. Box 69, Delphos, Ohio.  
 son Scale Co.: ALLEN Y. JOHNSON, President, 84 Walnut Street, Newark, N. J.  
 id-Tight Paper Container Association: ARTHUR W. HOWE, JR., 1532 Lincoln-  
 erty Building, Philadelphia 7, Pa.  
 e. Joe, Corp.: NORMAN H. THOMAS, Sales Manager, 601 West Twenty-sixth  
 reet, New York, N. Y.  
 vel Rack Mfg. Co., Inc.: CHARLES M. MCCARTHY, President, 24 North First  
 reet, Minneapolis 1, Minn.  
 tyre, John J., Sons:  
 F. L. MCINTYRE, 514-16 Knorr Street, Philadelphia 11, Pa.  
 JOHN LAWRENCE MCINTYRE, 514-16 Knorr Street, Philadelphia 11, Pa.  
 suregraph Co.: GENE A. POWELL, Regional Manager, 2306 Poplar Grove  
 reet, Baltimore 16, Md.  
 omier Bros. Co.: ALFRED C. WOODRUFF, Sales Representative, 324 Spring  
 alley Road, Springfield, Delaware County, Pa.  
 dy, Edward G., & Son, Inc.: EDWARD G. MOODY, Nashua, N. H.  
 onal Scale Service: MRS. E. W. COUNTS, Office Manager, Box 611, Radford,  
 Va.  
 onal Store Specialty Co.:  
 JOHN H. LANDVATER, Engineer, Bareville, Pa.  
 WALLACE E. SHEAFFER, President, Bareville, Pa.  
 tham Mfg. Co.: CARL F. SPANG, Partner-General Sales Manager, Division  
 arnes Scale Co., 591 Hillside Avenue, Needham Heights, Mass.  
 tune Meter Co.:  
 CHARLES S. HAZARD, Director of Research, 192 Jackson Avenue, Long Island  
 City, N. Y.  
 H. A. LENTZ, JR., 14 Bell's Mill Road, Philadelphia 18, Pa.  
 WALTER H. SIEGER, Assistant to General Sales Manager, 50 West Fiftieth  
 Street, New York 20, N. Y.  
 EMMETT F. WEHMANN, Engineer, Engineering Department, 192 Jackson  
 Avenue, Long Island City, N. Y.  
 mpic Instrument Laboratories: CARLYLE A. CRECELIUS, Manager, Box 62,  
 ove, Wash.  
 ens-Illinois Glass Co.: J. D. LAIRD, Chief Supervisor, Quality and Specifica-  
 ons, Toledo, Ohio.  
 -Tee Equipment Co.:  
 FIRMAN NIEUWLANDT, Superintendent, Spencerville, Ind.  
 TOM PARTEE, Vice President—Sales, Spencerville, Ind.  
 less Weighing & Vending Machine Corporation:  
 PAUL W. BARRAS, Philadelphia District Manager, 218 Huntley Road, Upper  
 Darby, Pa.  
 JAMES J. CROSBY, Vice President, 29-28 Forty-first Avenue, Long Island City,  
 N. Y.  
 n Scale Mfg. Co., Inc.: SYDNEY BLACK, President, 150 West Berks Street,  
 hiladelphia 22, Pa.  
 ublic Steel Corp.: K. A. BLOM, Corporation Weighing Supervisor, 1106 Re-  
 ublic Building, 25 Prospect Avenue, Cleveland 1, Ohio.

Rockwell Manufacturing Co.:

EDWARD R. EYLER, Sales Engineer, 12 Mayflower Court, Baltimore, Md.  
CHAS. B. JOHNSON, Chief Engineer, 400 North Lexington Avenue, Pittsburgh 8, Pa.

ROBERT A. JOHNSON, Assistant Sales Manager, L. P. Gas Products, 400 N Lexington Avenue, Pittsburgh 8, Pa.

JAMES H. JUDGE, Sales Manager, Gasoline, Oil & Industrial Meters, 400 N Lexington Avenue, Pittsburgh 8, Pa.

R. F. McCORMICK, Chief Engineer, Gasoline and Oil Division, 400 N Lexington Avenue, Pittsburgh 8, Pa.

CHAS. H. OBROCK, Sales Engineer, 7701 Empire State Building, New York 38, N. Y.

Sanitary Scale Co.: J. V. FARWELL, III, President, 664 North Michigan Avenue, Chicago, Ill.

Saybolt, E. W., & Co.:

JUSTIN E. KEITH, Manager Pacific Division, 529 Avalon Boulevard, Wilmington, Calif.

HAMMOND C. SPINDELL, 265 Bayway, Elizabeth, N. J.

Sealright Co., Inc.: EARL FOSTER, Chief Chemist, Fulton, N. Y.

Seraphin Test Measure Co.: T. A. SERAPHIN, General Manager, 1314 N Seventh Street, Philadelphia, Pa.

Sharpville Steel Fabricators, Inc.: CHARLES D. FAGAN, President, Sharpville, Pa.

Smith, A. O., Corporation:

THOMAS C. FICKEN, South East District Manager, Meter Division, 153 N Street, Atlanta, Ga.

WILSON M. MILLIGAN, Sales Manager, Eastern Area, Meter Division, I Box 500, Succasunna, N. J.

W. G. MOSER, General Manager, Meter Division, 5715 Smithway Street, Angeles 22, Calif.

Stimpson Computing Scale Co.:

FRANK M. DOYNE, General Distributor, 468 Weaver Street, Larchmont, N. Y.

JOHN J. WAAGE, President, 829 Logan Street, Louisville, Ky.

Streeter-Amet Co.: VERNE C. KENNEDY, JR., Supervisor of Engineering, Ravenswood Avenue, Chicago 13, Ill.

Sutherland Paper Co.: L. J. MOORE, Assistant Manager, Paraffined Ca Division, 243 East Paterson Street, Kalamazoo, Mich.

Thatcher Glass Manufacturing Co., Inc.: JAMES ARRANDALE, Director, Quality Control & Service Department, Elmira, N. Y.

Tokheim Oil Tank & Pump Co.: WILLIAM E. LOUTHAN, Service Manager, 1 Wayne, Indiana.

Toledo Scale Co.:

STANLEY Q. BENNETT, Manager of Service and Weights and Measures Division, Toledo 1, Ohio.

D. J. BOUDINOT, Industrial Sales Manager, Toledo 1, Ohio.

R. BRADLEY, Toledo 1, Ohio.

MERRELL E. HOLMES, Assistant General Sales Manager, Toledo 1, Ohio.

THURLO JOHNSON, Assistant National Service Manager, Toledo 1, Ohio.

ALBERT E. JONES, Divisional Manager, 223 West Exchange Street, Akron, Ohio.

BYRON D. MILLER, Manager, Steel Industry Relations, 1156 Hanna Building, Cleveland 15, Ohio.

E. C. SMITH, Industrial Division, 213-215 East 27th Street, New York 10, N. Y.

Triner Scale & Mfg. Co.: FRANK A. LANG, Representative, 2714 West Twenty-first Street, Chicago, Illinois.

Troemner, Henry:

EDWARD J. FUREY, General Manager, 911 Arch Street, Philadelphia 7, Pa.

CHARLES F. ROSICA, Sales Manager, 911 Arch Street, Philadelphia 7, Pa.

U. S. Slicing Machine Co., Inc.: MATTHEW D. RIBBLE, Special Representative, Standard Computing Scale Division, La Porte, Ind.

Veeder-Root, Inc.:

J. J. BRANNICK, Sales Manager, Computer Division, 915 Van Buren Street, N. E., Auburn, Ind.

AUSTIN E. MCKEEVER, Sales Manager, Master Meter Duplicator Division, Hartford 2, Conn.

DAVID J. POST, Vice President, Hartford 2, Conn.

Washington Scale & Equipment Co.: AARON YOCHELSON, Partner, 1107 N Jersey Avenue, N. W., Washington, D. C.



ne Pump Co.:

C. F. BATEMAN, Chief Engineer, Salisbury, Md.

W. O. HOWLAND, Engineer, Salisbury, Md.

LOUIS SOLTANOFF, Project Engineer, 302 South Boulevard, Salisbury, Md.

o Corporation: C. H. BENTLEY, President, Webb City, Mo.

low Gov't Std. Scale Works, Inc.: CARL E. EHRENHARDT, Secretary, 25th and  
wthorne Avenue, Terre Haute, Ind.

l, John, Co.:

LOUIS G. CLOSE, Manager, Baltimore District, Bennett Pump Division, 2127  
North Charles Street, Baltimore 18, Md.

WILLIAM M. HOXIE, Service Manager, Bennett Pump Division, Broadway  
and Lethan, Muskegon, Mich.

## STS REPRESENTING ASSOCIATIONS, BUSINESS, AND INDUSTRY, AND RAILROADS

rican Paper Goods Co.: LLOYD W. VIBBERTS, Production Superintendent,  
nsington, Conn.

rican Petroleum Institute: B. H. LORD, JR., Assistant to Director, Division  
Transportation, 1625 K Street, N. W., Washington, D. C.

ciated Tobacco Manufacturers: EDWARD F. RAGLAND, Executive Secretary,  
ite 104-105 Willard Hotel, Washington 4, D. C.

ciation of American Soap & Glycerine Producers, Inc.: ROY W. PEET, Man-  
er, 295 Madison Avenue, New York 17, N. Y.

as & Durbrow, Inc.: ROBERT C. READ, General Manager, 165 John Street,  
w York 38, N. Y.

ntic Refining Co.: EMIL P. GOHN, 260 South Broad Street, Philadelphia, Pa.

more & Ohio Railroad Co.: E. KENT LAWRENCE, General Scale Inspector,  
aintenance of Way Department, Baltimore 1, Md.

adian Peat Producers Association: E. E. CARNCROSS, Box 699, New West-  
nster, B. C., Canada.

mercial Textile Mfg. Co.: ARNOLD S. WHITE, General Manager, 49 K Street.  
W., Washington, D. C.

y Industries Supply Association, Inc.: ROBERT J. HANGER, 1108 Sixteenth  
reet, N. W., Washington 6, D. C.

le Cup Co.: ARTHUR J. NOLAN, Vice President, Easton, Pa.

Standard Oil Co.:

NELSON FRIZ, Construction and Maintenance Assistant, 15 West Fifty-first  
Street, New York 19, N. Y.

L. L. KENNEDY, Superintendent, Construction and Maintenance, 500 North  
Broad Street, Elizabeth 3, N. J.

line Pump Manufacturers Association: G. DENNY MOORE, Managing Director,  
aybar Building, 420 Lexington Avenue, New York 17, N. Y.

eral Ice Cream Corporation:

A. H. BAYER, Vice President and Director of Research and Production,  
101 Nott Terrace at Eastern Avenue, Schenectady, N. Y.

A. C. FISHER, Vice President and Treasurer, 101 Nott Terrace at Eastern  
Avenue, Schenectady 1, N. Y.

G. EMERSON SARTAIN, Producer Relations, Bryant & Chapman Dairy, Divi-  
sion of General Ice Cream Corporation, 255 Homestead Avenue, Hartford.  
Conn.

s Container Manufacturers Institute, Inc.: C. E. WAGNER, Development  
ngineer, 8 West Fortieth Street, New York City 18, N. Y.

cester Fisheries Association: L. J. HART, Secretary, 120 Main Street, Glouces-  
ter, Mass.

t Atlantic & Pacific Tea Co.: R. G. CARPENTER, National Meat Department,  
1 West Wacker Drive, Chicago 6, Ill.

Oil Corporation:

E. C. DICKEY, Atlanta Sales Division, Gulf Building, Atlanta, Ga.

W. K. McCOY, General Superintendent Marketing Equipment, Gulf Building.  
Pittsburgh, Pa.

strial Research Syndicate: C. A. LINDSAY, Director, 1305 Euclid Street, N. W.,  
Washington, D. C.

rnational Association of Ice Cream Manufacturers:

ROBERT H. NORTH, Executive Assistant, 1105 Barr Building, Washington, D. C.

DONALD H. WILLIAMS, Assistant to Executive Secretary, 1105 Barr Building,  
Washington, D. C.

- Lily-Tulip Cup Co.: LEONARD J. INGLIS, Assistant to Vice President, 122 Forty-second Street, New York, N. Y.
- Lorillard, P., Co.: HERBERT R. O'CONOR, JR., 10 Light Street, Baltimore, Md.
- Marvadel Ice Cream Co.: JOHN C. KRUSEN, Manager, 4001 Seven Mile 1 Baltimore 8, Md.
- Maryland-Virginia Milk Producers Association: CECIL F. COLE, Field Representative, 1756 K Street, N. W., Washington, D. C.
- Michigan Peat, Inc.:  
DON ENDRESS, Vice President, Capac, Mich.  
Mrs. E. P. POPPEL, President, 267 Fifth Avenue, New York, N. Y.
- Millers National Federation:  
HERMAN FAKLER, Vice President, National Press Building, Washington,  
JOHN J. MCCrackEN, Assistant to Vice President, National Press Building, Washington, D. C.
- Mock Seed Co.: FRED G. MOCK, 1218 Smallman Street, Pittsburgh, Pa.
- National Association of Dairy Equipment Manufacturers: JOHN MARSH, Executive Secretary, 927 Fifteenth Street, N. W., Washington, D. C.
- National Association of Scale Manufacturers: ARTHUR SANDERS, No. 1 The Circle, Washington, D. C.
- National Fisheries Institute, Inc.: CHARLES E. JACKSON, General Manager, 1614 Twentieth Street, N. W., Washington 9, D. C.
- Paper Cup and Container Institute, Inc.:  
DALE H. ECKERMAN, Executive Director, 1790 Broadway, Room 702, New York 19, N. Y.  
ROBERT W. FOSTER, Assistant Executive Director, 1790 Broadway, New York 19, N. Y.
- Pennsylvania Railroad:  
BYRON R. NELSON, Eastern Region, Pennsylvania Station, 30th Street, Philadelphia, Pa.  
MILLARD A. PINNEY, Engineer of Tests, Test Department, Altoona, Pa.
- Philadelphia Seed Co.: J. B. HERTZFELD, Arch and Front Streets, Philadelphia, Pa.
- Pillsbury Mills, Inc.:  
OTIS W. GALLOWAY, Claim Agent, 608 Pillsbury Building, Minneapolis, Minn.  
BRADSHAW MINTENER, Vice President and General Counsel, 600 Pillsbury Building, Minneapolis, Minn.
- Premier Peat Moss Corp.: MALCOLM T. GRAHAM, Vice President, 535 1 Avenue, New York, N. Y.
- Safeway Stores, Inc.:  
ARNOLD J. ANDERSON, Retail Operations Manager, 1845 Fourth Street, N. E., Washington, D. C.  
EDGAR BALSHAW, Division Manager, 1845 Fourth Street, N. E., Washington, D. C.  
LUKE BEALE, Employee Relations Manager, 1845 Fourth Street, N. E., Washington, D. C.  
FRANK J. SHEEHAN, Manager, Public Relations, Dexter Services, 726 Jackson Place, N. W., Washington 6, D. C.  
JOSEPH W. UPTON, Price Maker, 1845 Fourth Street, N. E., Washington, D. C.  
SAYBOLT, J. W., Business Counsellor on Weights and Measures Laws, Carlyle Avenue, Surfside, Miami Beach, Fla.
- Scale Journal Publishing Co.: MRS. EDITH J. SAYBOLT, 1703 East Eighty-fourth Street, Chicago 17, Ill.
- Shell Oil Co.:  
B. F. CARSON, Division Engineer, Baltimore, Md.  
JOSEPH V. HAZEN, Division Engineer, 37-06 Eighty-second Street, Jackson Heights, N. Y.  
LEONARD E. NOUD, Field Engineer, New York Division, 37-08 Eighty-second Street, Jackson Heights, N. Y.
- Sinclair Refining Co.: KENNETH W. BIRKIN, Manager, Automotive Department, 600 Fifth Avenue, New York, N. Y.
- Socony-Vacuum Oil Co., Inc.: E. L. HOFFMAN, 26 Broadway, New York 4, N. Y.
- Southern Railway System:  
BEN F. GILBERT, Chief Scale Inspector, Room 817 Southern Railway Building, Washington, D. C.  
J. N. TODD, Superintendent of Scales and Work Equipment, Office of Chief Engineer, P. O. Box 1808, Washington 13, D. C.

thern Weighing and Inspection Bureau: ALFRED J. REYNOLDS, General Supervisor in Charge of Weighing and Weights, 511-101 Marietta Street Building, Atlanta, Ga.

Gas Co.: H. W. HOLLAND, Manager of Operations, 135 East Forty-second Street, New York, N. Y.

read Institute, Inc.:

JOHN BELL, Chairman, Legislation Committee, 11 West Forty-second Street, New York 18, N. Y.

J. W. SHAVER, Director, 11 West Forty-second Street, New York 18, N. Y.

DAVID SNYDER, Executive Director, 11 West Forty-second Street, New York 18, N. Y.

king Corporation:

ELLIOT BALESTIER, JR., Assistant to President, 711 Bowen Building, 815 Fifteenth Street, N. W., Washington 5, D. C.

WILLIAM M. SAWERS, 711 Bowen Building, 815 Fifteenth Street, N. W., Washington 5, D. C.

stern Weighing and Inspection Bureau: E. M. CURL, Room 460 Union Station, 17 West Adams Street, Chicago 6, Ill.

### OTHER GUESTS

S. ARBUCKLE, Dairy Department, University of Maryland, College Park, Md.

ARLES BAUER, 328 West Ridge Road, Gary, Indiana.

CK S. CONRAD, Dairy Department, University of Maryland, College Park, Md.

N. F. JOSEPH DONOHUE, President, Board of Commissioners, District of Columbia, District Building, Washington, D. C.

ORGE A. HOWE, 112 Fourth Street, S. E., Washington, D. C.

ROLD A. NEWLANDER, University of Maryland, College Park, Md.

EPH W. NISONGER, Instructor, Dairy Department, University of Maryland, College Park, Md.

COL. ALEX PISCIOTTA, 3348 Gunston Road, Alexandria, Va.

BRY G. SMITH, Wadsworth, Ohio.

W. SMITH, 700 Elm Street, Chevy Chase, Md.





# NATIONAL CONFERENCE ON WEIGHTS AND MEASURES REPORTS

Misc. Pub.	Year	Price	Misc. Pub.	Year	Price
4	1905	OP	74	1926	OP
5	1906	OP	80	1927	OP
6	1907	OP	87	1928	OP
7	1908	OP	101	1929	OP
8	1910	OP	116	1930	OP
9	1911	OP	129	1931	OP
10	1912	OP	156	1935	OP
11	1913	OP	157	1936	OP
12	1914	OP	159	1937	OP
13	1915	OP	161	1938	OP
14	1916	OP	164	1939	OP
41	1919	OP	167	1940	55¢
43	1920	OP	170	1941	35¢
48	1921	OP	186	1946	40¢
51	1922	OP	189	1947	40¢
55	1923	OP	195	1949	35¢
59	1924	OP	199	1950	50¢
70	1925	OP	202	1951	50¢

Where prices are given, the publication may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Remittances should be made by coupons (obtainable from the Superintendent of Documents in sets of 20 for \$1 and good until used), by money order, or check payable to the Superintendent of Documents, Government Printing Office, or by cash; and the remittance should accompany the order. Orders should be sent to the Superintendent of Documents, and not to the National Bureau of Standards. The Publications marked OP are out of print, but may be available for consultation in public libraries in large cities or in the libraries of leading universities and colleges.

