U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

REPORT OF THE THIRTY-THIRD NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

ATTENDED BY REPRESENTATIVES
FROM VARIOUS STATES

SPONSORED BY THE NATIONAL BUREAU OF STANDARDS
WASHINGTON, D. C., SEPTEMBER 22, 23, 24, and 25, 1947

MISCELLANEOUS PUBLICATION M189

U. S. DEPARTMENT OF COMMERCE
CHARLES SAWYER, Secretary

NATIONAL BUREAU OF STANDARDS
E. U. CONDON, Director

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Official photograph of delegates and guests attending the Thirty-Third National Conference on Weights and Measures, assembled on the steps of the Treasury Building, Washington, D. C.

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(Including appointments announced at the Thirty-Third National Conference. The term of office, in years, as determined by lot at the Thirty-Third National Conference, is shown by the figure in parenthesis following each entry. See pages 2–3 and 14–16 of this report.)

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County: Los Angeles ---------- Charles Morris Fuller, Sealer of Weights and Measures, 501 New High Street, Los Angeles.

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	Woodrow W. Wells, Inspector, Department of Weights, Measures, and Markets, 300 Indiana Avenue NW., Washington.

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	Archie T. Smith, Assistant Superintendent, Department of Weights and Measures, 187 West Hanover Street, Trenton.
	Samuel H. Christie, Jr., Senior Inspector, Department of Weights and Measures, 187 West Hanover Street, Trenton.
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Trenton	Francis J. Black, Superintendent of Weights and Measures, 29 West Hanover Street.
Union City	Alfred O. Oslund, Superintendent of Weights and Measures, Municipal Building.
County:	
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	Matthew G. Rice, Inspector, Bureau of Weights and Measures, Department of Agriculture and Markets, 8 Marlette Place, White Plains.
City:	
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	H. L. Lewis, Inspector of Weights and Measures, Division of Markets, Department of Agriculture and Immigration, Palmer.
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- Alex Summers, Coordinator, Arthur, Ill.

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- H. I. Beardsley, Pittsburgh Equitable Meter Division, 400 Lexington Avenue, Pittsburgh 8, Pa.
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- Charles H. Obrock, Sales Engineer, Pittsburgh Equitable Meter Division, 50 Church Street, New York 7, N. Y.

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- Louis G. Close, Division Manager, 2414 North Charles Street, Baltimore, Md.
- W. M. Hoxie, Service Manager, Muskegon, Mich.

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- Harry G. Smith, Sales Manager, 5743 Smithway Street, Los Angeles 22, Calif.
- Wilson Milligan, Division Manager, 37–14 Thirtieth Street, Long Island City 1, N. Y.

Stimpson Scale Co.: Frank M. Doyne, Eastern Sales Manager, 468 Weaver Street, Larchmont, N. Y.

Streeter-Amet Co.:
- Verne C. Kennedy, President, 4101 North Ravenswood Avenue, Chicago 13, Ill.
- J. A. Csupak, Sales Manager, 4101 North Ravenswood Avenue, Chicago 13, Ill.

Thatcher Glass Manufacturing Co.: James Arrandale, Assistant Vice President, Elmira, N. Y.

Tokheim Oil Tank & Pump Co.: William Louthan, Service Manager, 1600 Wabash Avenue, Fort Wayne, Ind.

Toledo Scale Co.:
- S. Q. Bennett, General Manager of Service and Weights and Measures Divisions, Toledo, Ohio.
- V. V. Radionoff, Government Representative, 3713 New Hampshire Avenue, Washington, D. C.
- Walter G. Williams, District Sales Manager, 3713 New Hampshire Avenue, Washington, D. C.

Torsion Balance Co.:
- Park T. Sowden, General Manager, New York, N. Y.
- Carl F. Fritch, Plant Superintendent, 147 Eighth Street, Jersey City, N. J.

Triner Scale and Manufacturing Co.:
- John E. Edgerton, Representative, 1395 National Press Building, Washington, D. C.
- Frank A. Lang, Representative, 2714 West Twenty-first Street, Chicago, Ill.

Troemner, Henry:
- Edward Furey, 911 Arch Street, Philadelphia, Pa.
- Charles F. Rosica, Salesman, 911 Arch Street, Philadelphia, Pa.

U. S. Slicing Machine Co.: M. D. Ribble, Special Representative, La Porte, Ind.

Veeder-Root, Inc.:
- David J. Post, Jr., Vice President, Hartford 2, Conn.
- A. E. McKeever, Sales Representative, 70 Sargeant Street, Hartford, Conn.

GUESTS REPRESENTING ASSOCIATIONS, BUSINESS AND INDUSTRY, AND RAILROADS

American Bottlers of Carbonated Beverages: Loring F. Overman, Assistant to the Secretary, 1128 Sixteenth Street NW., Washington 9, D. C.

American Petroleum Institute: James E. Moss, Director, Division of Transportation, 1625 K Street NW., Washington 6, D. C.

Association of Ice Cream Manufacturers of Pennsylvania, New Jersey, and Delaware: William H. List, Jr., Executive Secretary, Hotel Pennsylvania, New York 1, N. Y.

Baltimore & Ohio Railroad Co.: E. Kent Lawrence, General Scale Inspector, 1380 Central Building, Baltimore 1, Md.

Bethlehem Steel Co.: Harry Marchant, Scale Inspector, Sparrows Point, Md.

Brown Instrument Co.: Douglas M. Considine, Manager of Technical Section, Wayne and Roberts Avenues, Philadelphia 44, Pa.

Carnegie Illinois Steel Corporation: Charles Bauer, Scale Shop Foreman, Sheet and Tin Mill, 328 West Ridge Road, Gary, Ind.

Ex-Cell-O Corporation: W. R. Cassidy, Eastern Division Sales Representative, Pure-Pak Division, 53 Park Place, New York, N. Y.

Frozen Food Foundation, Inc.: George H. Sullivan, Packaging Engineer, 600 West Genesee Street, Syracuse, N. Y.

Frozen Food Institute, Inc.: G. Hodges Bryant, Chairman of the Board, 90 West Broadway, New York, N. Y.

Gasoline Pump Manufacturers Association: G. Denny Moore, Managing Director, 420 Lexington Avenue, New York, N. Y.

Glass Container Manufacturers Institute: Nicholas G. Cameron, 19 East Forty-seventh Street, New York, N. Y.

Gloucester Fisheries Association: Lawrence J. Hart, Secretary, Gloucester, Mass.

Gulf Oil Corporation:
- J. O. Habicht, Unit Head, P & T Department, Philadelphia, Pa.
- W. K. McCoy, Room 2401, Gulf Building, Pittsburgh, Pa.
- Bernard Wagner, Gulf Building, Pittsburgh, Pa.

Industrial Research Syndicate: C. A. Lindsay, Director, 1305 Euclid Street NW., Washington 9, D. C.

International Association of Ice Cream Manufactures:
- Robert C. Hibben, Executive Secretary, 1105 Barr Building, Washington 6, D. C.
- Robert H. North, Executive Assistant, 1105 Barr Building, Washington 6, D. C.

Liquid Tight Paper Container Association: Arthur W. Howe, Jr., Assistant Executive Director, 1532 Lincoln Liberty Building, Philadelphia, Pa.

Massachusetts Fisheries Association: Thomas D. Rice, Executive Secretary, Fish Pier, Boston, Mass.

Mayflower Beverage Co.: Lionel Rossignol, 81 Western Avenue, Waterville, Maine.

Milk Industry Foundation: Charles M. Fisters, General Counsel, 927 Fifteenth Street, Washington 5, D. C.

National Association of Frozen Food Packers:
- C. Courtney Seabrook, President, 1415 K Street NW., Washington, D. C.
- Clifford F. Evers, Technical Director, 1415 K Street NW., Washington, D. C.
- Lawrence S. Martin, Secretary-Treasurer, 1415 K Street NW., Washington, D. C.

National Association of Retail Grocers: Tyre Taylor, Counsel, 712 Jackson Place NW., Washington, D. C.

National Association of Scale Manufacturers:
- L. H. Erickson, President, 469 East Ohio Street, Chicago 11, Ill.
- Arthur Sanders, Secretary, 1129 Vermont Avenue NW., Washington, D. C.

National Fisheries Institute, Inc.:
- Raymond E. Steel, Acting General Manager, Suite 228, Victor Building, 724 Ninth Street NW., Washington 1, D. C.
- Harold Luther, Member, Committee on Weights and Measures, National Fisheries Institute, Inc., c/o General Seafood Corporation, 383 Madison Avenue, New York, N. Y.

National Potato Chip Institute: Harvey F. Noss, Executive Secretary, 1142 Hanna Building, Cleveland, Ohio.

National Scale Men's Association: C. B. Smith, President, 1120 Northern Pacific Railway Co. General Offices, St. Paul, Minn.

National Truck Tank and Trailer Tank Institute: Allan R. Smith, Executive Secretary, 120 South LaSalle Street, Chicago 3, Ill.

Paper Cup and Container Institute, Inc.: Dale H. Eckerman, Executive Director, 1790 Broadway, New York 19, N. Y.

Paper Pail Association: Harvey H. Robbins, Executive Secretary, 111 West Washington Street, Chicago 2, Ill.

Partee Equipment Co.: Paul Partee, President, Spencerville, Ind.

Saybolt, J. W., Business Counsellor, 1701 East Eighty-fourth Street, Chicago 17, Ill.

Scale Journal Publishing Co.: Edith J. Saybolt, Secretary, 1703 East Eighty-fourth Street, Chicago 17, Ill.

Sinclair Refining Co.: K. W. Birkin, Manager, Automotive Department. 630 Fifth Avenue, New York, N. Y.

Southern Railway System:

- J. N. Todd, Superintendent, Scales and Work Equipment, Box 1808, Washington, D. C.
- B. F. Gilbert, Chief Scale Inspector, P. O. Box 921, Charlotte, N. C.

Southern Weighing and Inspection Bureau: A. J. Reynolds, Sr., Supervisor of Weights, 511–101 Marietta Street, Atlanta, Ga.

Standard Oil Co.: L. L. Kennedy, Superintendent, Construction and Maintenance, 500 North Broad Street, Elizabeth, N. J.

Thread Institute, Inc.:

- David Snyder, Executive Director, 11 West Forty-second Street, New York 18, N. Y.
- John Bell, Chairman, Legislation Committee, 11 West Forty-second Street, New York 18, N. Y.

Tissue Association, Inc.:

- Ross A. Fife, Executive Secretary, 122 East Forty-second Street, New York, N. Y.
- Robert Young, Chairman, Facial Tissue Industry Division, 122 East Forty-second Street, New York, N. Y.

Woodruff, F. H., & Sons, Inc.:

- J. H. Bangs, Representative, Milford, Conn.
- Daniel A. Johnson, Representative, 9 Depot Street, Milford, Conn.

MISCELLANEOUS GUESTS

Howe, George A., 112 Fourth Street SE., Washington, D. C.

CONTENTS

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SECOND SESSION—AFTERNOON OF MONDAY, SEPTEMBER 22, 1947

THIRD SESSION—MORNING OF TUESDAY, SEPTEMBER 23, 1947

APPENDIX

REPORT OF THE THIRTY-THIRD NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

SPONSORED BY THE NATIONAL BUREAU OF STANDARDS, AND HELD AT THE WASHINGTON HOTEL, WASHINGTON, D. C., SEPTEMBER 22, 23, 24, AND 25, 1947

FIRST SESSION—MORNING OF MONDAY, SEPTEMBER 22, 1947

(The Conference was called to order at 10:20 a. m. by E. U. Condon, President of the Conference.)

The CHAIRMAN. In my capacity as Chairman of the meeting I will recognize myself to make a few opening remarks about some of our plans. The paper has been mimeographed and copies will be made available to you as in the case of other program papers.

THE OFFICE OF WEIGHTS AND MEASURES OF THE NATIONAL BUREAU OF STANDARDS

By E. U. CONDON, *Director, National Bureau of Standards, and President, National Conference on Weights and Measures*

Last September, when you did me the honor of installing me as president of your Conference, I was still in my freshman year. Now I am a sophomore and, accordingly, will be expected to have some opinions, however immature they may seem to those of real experience in our field.

The first thing I want to do is to welcome you to our Thirty-Third Conference and to express the hope that we may find from it inspiration and guidance for improved performance of our duties and for closer cooperative relationships based on personal acquaintance. During the past year I have been greatly helped by receiving friendly advice and counsel from many of you. For this I am deeply grateful and give you all my most sincere thanks.

The National Conference on Weights and Measures surely cannot be accused of being an overly formal organization. We have no written constitution. We have a plentiful supply of Vice Presidents so that no one of them needs to preside at more than one session. We have a Secretary who really does the work, and a Treasurer who would not be unduly weighted down if he were to carry our treasury in his pockets in silver coin. We have an Executive Committee to whom questions of policy can be referred during the year. We have a Nominations Committee to make sure we have a full slate of officers for these positions. In addition, we have five standing committees for studies on specific topics of importance. These are appointed by the President. Their appointment for next year is the last item of business for this morning's session.

For a time it seemed to me that this was too informal an organization. But when we consider the accomplishments of the past, and when we also consider what a curse a too cumbersome administration can be, it seems to me that we should be very careful not to have more elaborate machinery than necessary. Nevertheless, there are doubtless many ways in which our administrative procedures can be improved. Any member having suggestions in this direction is invited to present them formally or informally to the Executive Committee or to me.

There is one change with regard to our standing committees which I propose to inaugurate this year, and I hope it meets with your favor. There is a natural tendency when a man is doing a good job to continue him in this work indefinitely. Yet this is not fair to him, for committee service can be very exacting and is an extra burden on an otherwise well-filled work day. Moreover, it is important that our work have as broad a base of participation by all the members as possible. On the other hand, continuity of knowledge about the work is also of the utmost importance.

Therefore, I propose that hereafter: (1) A man shall be appointed for an N-year term if the committee in question consists of N men; that is to say, on a five-man committee we shall have five-year terms, and on a seven-man committee we shall have seven-year terms. (2) That a man be not immediately eligible for reappointment to the same committee. (3) That no man be asked to serve on two standing committees at the same time. (4) That hereafter the committees elect their own chairmen as part of the work of organizing themselves at each Conference.

I think this plan has many advantages. We have a great tendency to work—and, in fact, overwork—some of our most diligent and distinguished members. It is really not fair to them. At the same time, when it comes to giving up the services of somebody who has habitually been overworked, this is something which we are very reluctant to do.

A good example of one who is affected by this change is our good friend, Mr. Joseph G. Rogers of New Jersey, who has for many years served very diligently on the Committee on Specifications and Tolerances and who is also Chairman of the Committee on Methods of Sale of Commodities. He has really made something of a record by his vigorous work in the latter field. It seems to me that it is just unfair to work any one man that hard. So instead of asking him to continue in both of these capacities, we are asking him to continue as Chairman of the Committee on Methods of Sale of Commodities, and are giving him a vacation from the other committee. On the other hand, he is such a valuable man that this vacation might not be for more than one year. I have expressly mentioned the case of Mr. Rogers as a very good example of the difficulties one gets into in this kind of problem.

In order to put this plan into effect with a gradualness that will not be too revolutionary I propose: (1) To designate the present chairmen to continue in office as chairmen during the next year, and also to specify that these individuals be designated to serve as members for a full term of N years; a year from now, and in subsequent years, these chairmen may or may not be elected as chairmen by the members of their respective committees. (2) That after I name the full membership of the committees under Item 5 of this morning's program, we then and there draw lots to determine which of the members gets a one-year term, which a two-year term, and so on; in the future the plan will be to make one new appointment to each committee each year, thus providing for rotation of membership.

This plan, it seems to me, has some real advantages in bringing more democracy to our work, and the proposed plan of putting it into effect is gradual enough so that if there is strong opposition to it, we can next year at this time, forget the whole thing and continue under the old system.

At the National Bureau of Standards during the past year, we have been giving a lot of thought to the best way in which we can re-establish our services to weights and measures regulatory officials, so largely upset during the war. Somewhat over a year ago, we renamed our old Weights and Measures Division. It is now called the Metrology Division, which is a high-brow word meaning the same thing, chosen to emphasize the heavy program of scientific work of the highest precision which this division's laboratories are called on to perform. This division is headed by Dr. Wilmer Souder, who is well known to many of you, and who has a place on the Thursday morning session of our Conference program.

At the same time, Mr. Ralph Smith, your Secretary, has done what he could to correlate the relations of the Bureau with State and local weights and measures officials while carrying a heavy burden of administrative duties as Assistant Executive Officer of the Bureau. Now that most of the work of post-war reconversion is completed, we are able to arrange for Mr. Smith to devote full time to the problems of the weights and measures regulatory field. Accordingly we are establishing at once, an Office of Weights and Measures. This will be a unit in the office of the Director. It is rather difficult to state with precision the exact division of duties between Dr. Souder's Division and Mr. Smith's Office. In general, one may say that the Metrology Division is concerned with the laboratory work of precision measurement in the field of mass, length, and capacity, while the Office of Weights and Measures will be concerned with the general service to the weights and measures official which the Bureau of Standards should render. Fortunately, a precise definition is not necessary. While I suppose that most of your correspondence would be with Mr. Smith, we hope you will feel free to write to any of us and we will give you the best service we can.

We hope in the future to participate more fully in the State and regional conferences on weights and measures and thereby to pick up ideas on how our service can be more helpful. Mr. Smith will also supervise a revision of the Bureau's Miscellaneous Publication M20, "Federal and State Laws Relating to Weights and Measures." This valuable book is now badly out of date, since the latest edition (the third) was published 21 years ago. A number of other projects of a similar sort are also planned, such as a casebook or abstract of legal cases, opinions, and precedents in the weights and measures field. It is also hoped to develop a complete file on State and local specifications, tolerances, and regulations, and to arrange for summaries of this material to be made widely available.

Another project that we have in mind of great importance to business men, and especially to weights and measures equipment manufacturers, is the collection of information on weights and measures regulatory work in other countries. We need not only to have full information on units in use in other countries, but also on their organizations for weights and measures administration, and on their laws in this field. This is clearly vital to our expanding foreign commerce. Moreover, we should not be surprised if we get some valuable ideas on how we can do a better job by checking our experience against that of our friends in other countries.

But in my opinion, the most important new service which we contemplate for the National Bureau of Standards is in the establishment of a school offering short courses of training for weights and measures officials of State and local governments. The need for service of this kind has been expressed by several of you, particularly by Mr. J. H. Meek of Virginia. What we have in mind is a real training course with lessons to be studied and supervised laboratory work to be done on topics of real practical interest in weights and measures work.

When one studies this subject, one sees a great range of special topics which would be appropriate for handling in this way. We feel that if, in this smaller field, we can do a job that is proportionately as valuable as has been the police training work offered by the Federal Bureau of Investigation, then we shall have rendered a very important service to weights and measures administration in the United States.

We want to start in a small way and build solidly. I want to ask the Executive Committee of this Conference to take on the job of considering this project and of helping us with specific suggestions.

Initially, our choice of topics and problems has to be very much affected by the space and equipment which can now be devoted to the project. Later, it will be possible to consider the acquisition of special facilities for the school when we shall have gained more experience. With such present limitations in view, Mr. Smith has prepared a suggested outline of a ten-day course of training dealing specifically with the office-testing phase of the work of a State or large city weights and measures office. We have the space and equipment to handle such a proposed course with registration limited to ten students at one time. We could actually carry this out some time next spring. During this Conference we hope to get your comments on the general idea, on the specific way of starting, and on a suitable date for actually starting. I hope we can decide to launch the first of such schools, if the need is really there, and make specific announcement of the date before this Conference closes.

I am going to close my remarks at this time because we have a full program, and your Secretary does not allow me much time. If you pick up the mimeographed copies of this talk, however, you will notice that I have taken advantage of the opportunity there afforded, of "extending my remarks" as they do in Congress. In that place you will see there is given a tentative program for the two-week school on office testing. This is presented for your criticism and comment, and to help you decide whether anything of this general character would be useful in training your staff. In conclusion, I should add that no fee would be charged the student or his office. The cost of running the school would be borne by the National

Bureau of Standards. The expenses of the students in coming here and staying here, of course, cannot be borne by the Bureau.

(The addendum to Dr. Condon's paper, referred to in his closing paragraph, is as follows:)

SUGGESTED PROGRAM FOR A TWO-WEEK TRAINING COURSE IN OFFICE TESTING WORK FOR A WEIGHTS AND MEASURES OFFICE

FIRST DAY

1. Registration.
2. Lecture. Chapter 14 of Handbook H26. Outline of activities of Sections 1, 2, 4, 8, and 9 of Metrology Division.
3. Visit to Standards vault.
4. Visit to laboratories of sections named. Personal introductions. Explain procedures. Discuss records, reports, certificates, marks, and seals.

SECOND DAY

1. Lecture on mass standards (except cast iron 50's and upward). Brief history. Classes of standards. Handling and storage. Tolerances. Adjustments. Meaning and use of corrections and errors.
2. Lecture on laboratory balances. Theory. Construction, care, adjustment, and repair. Direct weighing. Weighing by substitution and transposition. Intercomparison of standards.
3. Discussion period. Students' questions.
4. Laboratory period. Conduct actual tests, individual students making observations, recording data, and computing results. Discussion period.

THIRD DAY

1. Lecture on length standards. Brief history. Rigid end and line standards. Gages. Tapes—geodetic, surveying, commercial. Handling and storage. Tolerances. Corrections and errors.
2. Lecture on testing of length standards. Simple testing apparatus. Magnification and lighting. Micrometer microscope. Hand lenses. Demonstrate testing of short rigid scales, rigid end and line yard standards, and short and long tapes. Tolerances.
3. Discussion and students' questions.
4. Laboratory period. Each student actually tests a series of length standards, recording and computing results. Compare results. Discussion.
5. Revisit Gage Section for demonstration of tests on gage blocks, micrometers, etc.

FOURTH DAY

1. Written quiz on mass standards and balances. 1 hour.
2. Lecture on mass standards—cast iron 50's and upward. Design. Outside coatings. Handling and storage. Constancy. Tolerances. Portable and nonportable balances. Apparatus for handling weights. Adjustment and sealing.
3. Discussion period.
4. Demonstration of test procedures in Scale House.
5. Laboratory period. Each student calibrate some 50's and 1000's. Compare results. Discussion.

FIFTH DAY

1. Discuss and analyze quiz papers on mass standards and balances.
2. One hour written quiz on length standards.
3. Lecture on volumetric standards. Brief history. Volumetric and gravimetric testing methods. Precautions. "To contain" and "To deliver". Bases of NBS reports and certificates. Effects of temperature. Burettes and flasks. Test procedures for capacity measures up to 100 gallons, glass graduates, burettes.
4. Discussion.
5. Laboratory period. Practice in making settings and readings with results checked by instructor. Actual tests on apparatus. Problems and discussion.

SIXTH DAY

1. Discuss and analyze quiz papers on length standards.
2. One hour written quiz on mass standards of large denominations.
3. Tour of laboratories of National Bureau of Standards, other than those visited first day.
4. One hour written quiz on volumetric standards.
5. Discuss quiz papers on mass standards of large denomination.

SEVENTH, EIGHTH, AND NINTH DAYS

1. On seventh day, discuss quiz papers on volumetric standards.
2. Break up class into groups so that each student will spend 1½ days in the mass laboratory, and ½ day each in length and volumetric laboratories. Students to make tests as in their own offices, independently of supervision during work. Results to be verified or checked, errors pointed out, and faulty procedures corrected.

TENTH DAY

1. Review lecture. Important elements of all phases of office testing, covered in course.
2. Discussion and informal quiz as to deatils and relation of material covered to home-office requirements of the students.
3. Commencement exercises. Presentation to each student of copies of relevant National Bureau of Standards publications and of certificates of completion of the course.

ABSTRACTS OF STATE REPORTS [1]

CALIFORNIA

By James E. Brenton, *Chief, State Bureau of Weights and Measures*

Mr. Brenton confined his report to a résumé of amendments to the container act, enacted in 1947, which strengthened the definition of a "container", fixed 68° F or 20° C as the standard temperature for volume determination of liquids (except petroleum products) and prescribed that a quantity declaration be expressed in terms of the largest units contained in the package; certain marking exemptions were included covering cases where the buyer determines the quantity, and relative to some commodities marketed in transparent containers.

CONNECTICUT

By Frank M. Greene, *Deputy State Food and Drug Commissioner*

Mr. Greene reported the transfer of the Division of Weights and Measures from the Department of State Police to the Food and Drug Commission, by action of the 1947 legislature. He announced that no changes of policy or administration were contemplated.

DISTRICT OF COLUMBIA

By J. Thomas Kennedy, *Director, District Department of Weights, Measures, and Markets*

Mr. Kennedy reported the purchase of a new testing truck for large-capacity scales, the addition of two men bringing the total of enforcement officers to 17, and the inspection 125,000 pieces of commercial equipment of which 11,800, including 25 percent of all prescription scales used in the District, were found in faulty condition.

[1] As presented at the Conference, some of these reports were combined with the reports of Associations. For convenience of reference, State reports and association reports are separately grouped herein, and are presented in alphabetical order by States.

He stated that the specifications and tolerances of the District were being kept in conformity with those of the National Conference.

FLORIDA

By Nalls Berryman, *Supervisor, State Division of Weights and Measures*

Mr. Berryman said that notwithstanding serious delays in deliveries of necessary equipment, statewide scale inspection was begun about six months ago; of almost 800 scales tested, more than 30 percent were found to be faulty. A large amount of work had been done on vehicle-tank compartments and wholesale and retail meters, and equipment was being worked out for testing meters handling liquefied petroleum gases. More than 60,000 food packages had been checked for accuracy of content declaration since this program was started in April.

GEORGIA

By S. H. Wilson, *State Oil Chemist*

Mr. Wilson noted the division of weights and measures controls in his State, matters dealing with scales and weighing being under the jurisdiction of the Department of Agriculture, and devices used for measuring petroleum products being under the jurisdiction of the Department of Revenue. Speaking for the Supervisor of Weights and Measures he reported normal activity, no new projects having been undertaken. As to his own field, Mr. Wilson said that liquid-measuring devices were tested every 90 days, and that out of some 54,000 inspections made last year, inaccuracies were found in less than four percent of the cases.

ILLINOIS

By James M. Paddock, *State Superintendent of Standards*

Mr. Paddock listed the following new equipment and personnel made possible by funds appropriated during the past year: One 500-gallon, trailer-mounted test measure and two similar 50-gallon units; two large-capacity scale testing trucks; one panel-body testing truck; twenty-five cars for inspectors; nine additional inspectors. Efforts to obtain an amendment of the pattern-approval provisions of the law having been unsuccessful, Mr. Paddock said that a plan would be worked out to adapt the principles of General Specification No. 1 to the Illinois system, pending a statutory change by the next legislature.

INDIANA

By Rollin E. Meek, *Acting Director, State Division of Weights and Measures*

Mr. Meek reported that, by legislative act, the statutory office of Commissioner of Weights and Measures had been abolished, and a Division of Weights and Measures set up in the State Board of Health. He added that a new Board of Health Building was under construction to be completed in 1948, in which adequate provision would be made for office and laboratory space for the Division of Weights and Measures. Plans were said to be under way for increases in personnel and equipment as soon as necessary funds become available.

KANSAS [2]

A recent law authorized the creation of a weights and measures organization in the Board of Agriculture. As of September 1947, the organization had not yet been manned, but a vehicle scale testing equipment was on order, and delivery was expected sometime after January 1, 1948.

Secretary's Note.—Word was received in November 1947, to the effect that Mr. J. Fred True had been appointed to head the Division of Weights and Measures of the Kansas State Board of Agriculture with the title of "State Sealer."

KENTUCKY

By J. E. Johnston, *Director, State Division of Weights and Measures*

Mr. Johnston noted the inadequacy of statutes and appropriations for his Division, notwithstanding corrective efforts at the last two legislative sessions; he said these efforts would be renewed in 1948. The Division has jurisdiction only over pumps for dispensing petroleum products, and scales in tobacco, mill, and grain warehouses and in stockyards; considerable activity was reported in these fields, with particularly gratifying results in improving the accuracy of pumps in use through replacement and repair of defective equipment. Extension of authority to embrace all commercial weighing and measuring devices, and the procurement of large capacity scale testing equipment, were recommended.

MASSACHUSETTS

By John P. McBride, *State Director of Standards and Necessaries of Life*

Mr. McBride commented upon the general adequacy of statutory authority over commercial devices, and indicated that future legislative programs would be directed to more effective control of methods of sale of commodities. He noted a heavy increase in the sale of wood by hucksters. As indicative of the determination on the part of local officials to improve their equipment, Mr. McBride mentioned the recent acquisition by the Boston city department of a modern large capacity scale testing unit.

MICHIGAN

By George W. Martin, *Sealer of Weights and Measures of Ferndale*

Mr. Martin, reporting for the State, commented upon the failure of the legislative program and the deficiency in the number of weights and measures officers in the State, but said that the record of condemnations showed that the condition of commercial equipment was improving. Livestock scales were said to be something of a current problem.

MINNESOTA

By Erling Hansen, *State Supervisor of Weights and Measures*

Mr. Hansen reported that an increase of revenue, estimated at $50,000 annually, would result from a new law making available for

[2] In the absence of a delegate from Kansas, the Secretary of the Conference presented this report, based upon letters received from Mr. Paul Ijams, the Director of the Control Division, and Mr. Roy Freeland the Assistant Secretary, of the Kansas State Board of Agriculture.

use by the Department the fees collected for special tests; these added funds, he said, would permit increasing the force of inspectors to twenty-six, and should materially increase the frequency of regular tests throughout the State although annual testing, as prescribed by statute, still could not be realized.

NEVADA [3]

By Wayne B. Adams, *State Sealer of Weights and Measures*

Suitable methods and equipment for testing meters dispensing liquefied petroleum gas, use of which is rapidly increasing, was cited as the outstanding current problem of the department. Mention was made of a scale testing unit carrying sixteen 500-pound test weights, the weight-handling equipment being powered by a self-contained gas electric generating unit; three light testing trucks; and two trailer-mounted 50-gallon test measures. It was stated that the specifications, tolerances, and regulations of the National Conference have been adopted, and that the State weights and measures law is similar in most respects to the Model State Law of the Conference.

NEW JERSEY

By Joseph Giuliano, *State Superintendent of Weights and Measures*

Mr. Giuliano discussed a systematic project of under-cover try-out purchasing, recently instituted, and cited ninety-eight prosecutions resulting from two hundred seventeen purchases in three representative cities as proof of the need for such a project; individual shortages ranged in equivalent money value from two to forty cents, and 80 percent of the shortages found were in purchases of meats. The successful results of the regional meetings with local inspectors, and of the technical and legal training classes held at the Department Office, were noted. An ambitious legislative program involving 10 bills was unsuccessful.

NEW YORK

By John J. Leonard, *Supervising Inspector, State Bureau of Weights and Measures*

Mr. Leonard reviewed recent amendments to the laws relating to marketing of milk bottles, sale of fuel wood, sale of lawn dressing and fertilizer, and the marking of packages of flours and meals and of thread. He stated that the trucking of coal into the State continued to be a serious problem, and expressed the opinion that planned short-weight practices were "a well organized racket" which flourished notwithstanding the vigilance of weights and measures and police officers and the imposition of larger fines and jail sentences on convicted offenders.

NORTH CAROLINA

By C. D. Baucom, *State Superintendent of Weights and Measures*

Mr. Baucom mentioned a general rewriting of the basic weights and measures law of the State and the recent amendment of the scale

[3] In the absence of a delegate from Nevada, the Secretary of the Conference presented this report, which had been submitted by mail by Mr. Wayne B. Adams, State Sealer of Weights and Measures.

mechanic act under which bonding is required. He said that appropriations had been increased, permitting a fifty percent increase in personnel, but that his organization had been charged with the enforcement of two new laws, one requiring the inspection of all tobacco-curing installations, and the other fixing strength requirements for concrete building blocks. He noted the satisfactory performance of his hydraulically operated scale-testing truck.

NORTH DAKOTA

By A. J. Jensen, *Chief State Inspector of Weights and Measures*

Mr. Jenson commented upon the general replacement with modern equipment of the old-time small-capacity scales in his State, noting some 900 new installations within the past four years; a force of nine inspectors and three testing trucks make it possible to conduct tests of all scales every fourteen months. Mr. Jensen urged all officials to publicize in their own areas the activities of the National Conference, and to adhere to its recommendations so that weights and measures procedures may be unified throughout the country.

OHIO

By V. D. Campbell, *Deputy State Sealer*

Mr. Campbell reported the enactment of a law eliminating the legal weights per bushel for fruits and vegetables and requiring sales of these commodities to be on the basis of weight or count except when sold in standard containers, by the bunch, or by the producer on his own premises. He spoke of the successful operation of the new vehicle-scale testing equipment, but noted the impossibility of covering the State adequately with only one unit. Large turn-over among county sealers, who are political appointees, places a heavy responsibility on the State in the training of new officials. Procurement of special equipment for testing vehicle tanks and meters is planned.

PENNSYLVANIA

By Joseph F. Blickley, *Director, State Bureau of Standard Weights and Measures*

Mr. Blickley spoke principally of a successful legislative program which resulted in: (1) Strengthening the laws, particularly the solid fuel law, by increasing the penalties for violations; (2) amendment of the marking requirements of the pattern-approval law to permit full acceptance of General Specification No. 1; (3) amendment of the law regulating Babcock testing apparatus to conform to the requirements of other States; (4) enactment of a requirement that fruits and vegetables be sold by weight or count, at wholesale or retail, if the original package be "broken"; and (5) enactment of a requirement for net-content marking on every package of *any* commodity which sells at retail for more than five cents.

RHODE ISLAND

By Edward R. Fisher, *State Sealer of Weights and Measures*

Mr. Fisher reported that within a few weeks a new vehicle scale testing unit would be put into operation, thus supplying a much needed facility. He commented upon the success of the training program for local sealers, under which the State Sealer works in the field with each county or city sealer for a two-week period.

TEXAS

By W. S. Bussey, *Chief, State Division of Weights and Measures*

Mr. Bussey said that the primary activity of the past year had been the rebuilding of the State Division as to personnel and equipment. The legislature was prevailed upon to authorize salary increases for the inspectors and to provide an appropriation of more than $45,000 for equipment. The two existing vehicle scale testing equipments were being replaced, two new equipments were being designed, and additional inspectors had been employed and were being trained.

VERMONT

By George E. Carpenter, *Supervisor, State Division of Weights and Measures*

Mr. Carpenter reported that no major changes had occurred in his Division during the past year as to laws, organization, or facilities. He said that Vermont was largely an agricultural State, and that his organization paid particular attention to milk plants and creameries, where scales are regularly tested four times each year. He noted the necessity for continual vigilance to control "chiseling", and commended consistent programs of investigation and supervision to this end.

VIRGINIA

By R. D. Thompson, *State Supervisor of Weights and Measures*

Mr. Thompson reported some addition of manpower and a considerable increase in the amount of testing carried out. The plan under which State inspectors do the testing in local jurisdictions and the city or county bears the cost was said to be working out very well, particularly in small or sparsely settled communities. The State has acquired a mobile 100-gallon test-measure unit, to be used principally for testing fuel-oil meters, and the city of Richmond has acquired a 200-gallon, trailer-mounted test measure. The State issued during the year a printed booklet containing the Virginia and Federal laws on weights and measures.

WISCONSIN [4]

By George Warner, *State Supervisor of Weights and Measures*

Mr. Warner's report noted a transfer of emphasis in the activities of his Division since the war, from war plants and industry to the producer, packer, distributor, and retail purchaser of commodities. There were mentioned statutory changes relative to milk and cream bottles, Babcock test bottles, and flour packages.

[4] This report was presented to the Conference by Mr. M. W. Jensen, City Sealer of Weights and Measures of Madison, Wis.

ANNOUNCEMENT REGARDING COMMITTEE REPORTS AND PROGRAM PAPERS

The CHAIRMAN. The Secretary wishes to make an announcement at this time.

The SECRETARY. As most of you know an effort was made prior to the convening of this meeting to get into the hands of as many as possible of those who were coming, copies of the reports of the Standing Committees of the Conference. Reports of each of the five committees were mailed to all State offices, to the members of all Standing Committees, to all of the officers of the Conference, to all members of the Conference Executive Committee, and to each person of whom we had advance knowledge that he was planning to attend this meeting.

Additional copies of these committee reports are available, and will be found on the table at the rear of the room. There you will also find the final report of the Committee on Specifications and Tolerances, which was completed only yesterday; this is supplementary to the Tentative Report which was distributed by mail.

From time to time, as the various speakers on the program complete their addresses, copies of their papers will be placed on the table so that you may pick them up for reading and study later on. With one or two exceptions, all such papers will be available; the exceptions are occasioned by failure to receive from the authors copies of their manuscripts.

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE AND REGIONAL ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS [5]

CALIFORNIA ASSOCIATION OF WEIGHTS AND MEASURES OFFICIALS

By CHARLES MORRIS FULLER, *Sealer of Weights and Measures of Los Angeles County, Calif.*

Mr. Fuller reported that the Association had had its most active and successful year, with three area meetings in each of five geographical districts in addition to the annual State meeting. The California Sealers News is published three times a year by the Association, and carries minutes of each area meeting, State regulations, and other material related to the work of the members.

INDIANA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By WILLIAM H. ROBERTS, *Inspector of Weights and Measures of Vigo County, Ind.*

Mr. Roberts said that the regular schedule of a Spring meeting and a Fall meeting each year was being followed, with special emphasis on constructive publicity at all times. A question-and-answer session occupies an important place on the program of each meeting.

[5] As presented at the Conference, some of these reports were combined with the State reports. For convenience of reference, association reports and State reports are separately grouped herein, and are presented in alphabetical order by States.

MASSACHUSETTS WEIGHTS AND MEASURES ASSOCIATION

By James J. Dawson, *State Inspector of Standards*

Mr. Dawson said that the principal function of the Association was to foster constructive weights and measures legislation and to cooperate with the State Division of Standards in obtaining passage of such legislation. An invitation was extended to attend the next meeting of the Association, to be held in historic Cambridge.

MICHIGAN ASSOCIATION OF WEIGHTS AND MEASURES OFFICIALS

By George W. Martin, *Sealer of Weights and Measures of Ferndale, Mich.*

Mr. Martin spoke of the close cooperation existing between the Association and the State Bureau of Foods and Standards, which he attributed in part to the fact that the Association president is chosen from the personnel of the State Bureau. He said that the Association was in its thirty-fourth year, and would hold its next annual meeting in February.

NEW JERSEY WEIGHTS AND MEASURES ASSOCIATION

By Francis J. Black, *Superintendent of Weights and Measures of Trenton, N. J.*

Mr. Black spoke briefly of the annual meeting of the Association only recently concluded, saying that its registration of more than 250 established a record for Association meetings.

NEW YORK WEIGHTS AND MEASURES ASSOCIATION

By Robert Williams, *Sealer of Weights and Measures of Nassau County, N. Y.*

Mr. Williams reported that group meetings are held in various parts of the State for informal discussion of enforcement problems, supplemented by annual meetings of the entire Association. The last general meeting was the fortieth to be held.

NORTHWEST WEIGHTS AND MEASURES ASSOCIATION

By C. I. Hoel, *State Inspector of Weights and Measures of Minnesota*

Mr. Hoel said that the Association currently had a membership of over three hundred, including officials representing eight States and numerous representatives of manufacturers and industry. Annual meetings are held in the Spring, and informal evening meetings are held on a monthly basis except during the summer months.

OHIO SEALERS' ASSOCIATION

By Robert K. Slough, *Sealer of Weights and Measures of Akron, Ohio*

Mr. Slough reported that the Legislative Committee of the Association screened all weights and measures legislative proposals and followed the policy of seeking passage of not more than one or two bills at any session. He said that the Association had plans for publishing books of instruction for sealers, outlining methods of test for specific classes of devices. Regional, "summer," and "annual" meetings are held.

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PENNSYLVANIA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By IRVIN R. SHULTZ, *Inspector of Weights and Measures of York, Pa.*

Mr. Shultz cited the passage in one legislative session of eight bills sponsored by the Association as evidence of the success attending the efforts of the Legislative Committee of the Association. Annual meetings are held, the next to be in Reading in November.

SOUTHERN WEIGHTS AND MEASURES ASSOCIATION

By W. S. BUSSEY, *Chief, Division of Weights and Measures of Texas*

Mr. Bussey spoke of the very successful meeting of the Association held in New Orleans in June 1947, mentioning particularly the favorable local publicity received and the interest which the meeting generated in Louisiana in weights and measures supervision. Annual meetings of the Association are held.

TEXAS WEIGHTS AND MEASURES ASSOCIATION

By W. B. EVANS, *Sealer of Weights and Measures of Houston, Tex.*

Mr. Evans reported that the Association had not resumed full activity since the war, the only recent meeting having been in the form of a two-day "school," held at the office of the State Division in November, 1946. An invitation had been issued, he said, to the Southern Association to meet jointly with the Texas Association in 1948.

VIRGINIA WEIGHTS AND MEASURES ASSOCIATION

By R. D. THOMPSON, *Supervisor of Weights and Measures of Virginia*

Mr. Thompson said that the Education and Publicity Committee of the Association had obtained newspaper publication in various parts of the State of an illustrated feature story on weights and measures. In cooperation with the State Department of Education and the State Division of Markets the Association plans to produce a weights and measures sound film to be shown in public schools and before civic groups.

APPOINTMENT OF COMMITTEES

The CHAIRMAN. Conference committees, as you know, are of two kinds, temporary ones that serve only during a particular meeting, and the standing committees about which I have proposed that some changes be made.[6]

For the Resolutions Committee, to serve for this Conference, it is my privilege to appoint: L. E. Witt, of Milwaukee, Wis., Chairman; Nalls Berryman, of Florida; J. E. Brenton, of California; E. R. Fisher, of Rhode Island; J. C. Mays, of Miami, Fla.; R. W. Searles, of Medina County, Ohio; and I. R. Shultz, of York, Pa.

For the Nominating Committee, to serve for this Conference, I will appoint: V. D. Campbell, of Ohio, Chairman; W. S. Bussey, of Texas; M. C. Griffin, of Hartford County, Conn.; Erling Hansen, of

[6] See pages 2 and 3.

Minnesota; J. T. Kennedy, of the District of Columbia; J. P. McBride, of Massachusetts; and E. F. Usher, of Highland Park, Mich.

Now for the standing committees the proposal is that I shall reappoint these committees, renaming the present Chairmen; then the names of members other than the Chairmen will be drawn by lot to determine which one serves for 1 year, which for 2 years, and so on, it being understood that the present Chairman of each committee will have a term corresponding in years to the number of members on the Committee. After the current year, each committee will elect its own Chairman for the ensuing year.

Accordingly, I announce the following committee members:

For the Committee on Specifications and Tolerances: J. P. McBride, of Massachusetts, Chairman; G. F. Austin, Jr., of Detroit, Mich.; Nalls Berryman, of Florida; C. M. Fuller, of Los Angeles County, Calif.; and R. W. Smith, National Bureau of Standards.

For the Committee on Methods of Sale of Commodities: J. G. Rogers, of New Jersey, Chairman; R. S. Ackerman, of Minneapolis, Minn.; C. D. Baucom, of North Carolina; J. F. Blickley, of Pennsylvania; J. A. Boyle, of Portland, Maine; L. R. Roper, of Seattle, Wash.; and F. J. Young, of Monroe County, N. Y.

For the Committee on Legislation: R. E. Meek, of Indiana, Chairman; C. A. Baker, of New York; J. A. Bernard, of St. Louis, Mo.; J. R. Booth, of Haverhill, Mass.; V. D. Campbell, of Ohio; L. E. Witt, of Milwaukee, Wis.; and F. C. Yarbrough, of Charlotte, N. C.

For the Committee on Weights and Measures Education: W. S. Bussey, of Texas, Chairman; G. E. Carpenter, of Vermont; J. T. Kennedy, of the District of Columbia; J. M. Paddock, of Illinois; R. D. Thompson, of Virginia; E. F. Usher, of Highland Park, Mich.; and Robert Williams, of Nassau County, N. Y.

For the Committee on Trading by Weight: J. H. Meek, of Virginia, Chairman; J. E. Brenton, of California; Erling Hansen, of Minnesota; A. J. Jensen, of North Dakota; and H. K. Thatcher, of Arkansas.

Mr. Smith has arranged some machinery for drawing by lots. I shall let him explain.

Mr. R. W. Smith. For each committee I have an envelope containing slips carrying the names which the presiding officer has just announced as committee members, except that the name of the committee Chairman has been omitted in each case. The slips are so folded that the names cannot be read until the slips are opened up. I shall call for the Chairmen of the committees in alphabetical order of committee names, and for each committee the Chairman will successively draw the slips and announce the names; the first name to be announced will be that of the committee member to serve for 1 year, the second name announced will be that of the member to serve for 2 years, and so on. Will Mr. Rollin Meek, Chairman of the Committee on Legislation, please step forward?

(Mr. Meek drew the slips and announced the names in the following order: V. D. Campbell, F. C. Yarbrough, J. A. Bernard, L. E. Witt, C. A. Baker, J. R. Booth.)

Mr. R. W. Smith. Will Mr. J. G. Rogers, Chairman of the Committee on Methods of Sale of Commodities, please come forward?

(Mr. Rogers being out of the room, the presiding officer volunteered to draw the names and did so in the following order: F. J. Young, J. A. Boyle, J. F. Blickley, R. S. Ackerman, L. R. Roper, C. D. Baucom.)

Mr. R. W. Smith. Will Mr. McBride, Chairman of the Committee on Specifications and Tolerances, please come forward?

(Mr. McBride drew the slips and announced the names in the following order: C. M. Fuller, R. W. Smith, G. F. Austin, Nalls Berryman.)

Mr. R. W. Smith. Will Mr. J. H. Meek, Chairman of the Committee on Trading by Weight, please step forward?

(Mr. Meek drew the slips and announced the names in the following order: A. J. Jensen, J. E. Brenton, H. K. Thatcher, Erling Hansen.)

Mr. R. W. Smith. Will Mr. Bussey, Chairman of the Committee on Weights and Measures Education, please come forward?

(Mr. Bussey drew the slips and announced the names in the following order: R. D. Thompson, J. M. Paddock, Robert Williams, E. F. Usher, J. T. Kennedy, G. E. Carpenter.)

The Chairman. I hope that the new committee plan meets with your favor. I think it is worth a trial, because we do expect working committees, and under the new plan, with a new member each year, no one man will be overworked.

This concludes the business for the morning session.

(At this point, at 12:30 p. m., the Conference recessed for luncheon.)

SECOND SESSION—AFTERNOON OF MONDAY, SEPTEMBER 22, 1947

(The Conference reassembled at 2:10 p. m., Nalls Berryman, Vice President of the Conference, presiding.)

FROZEN FOODS—A SYMPOSIUM

REMARKS OF C. A. BAKER, DIRECTOR, BUREAU OF WEIGHTS AND MEASURES STATE OF NEW YORK

In this discussion of frozen foods in relation to the problems which they create for weights and measures officials, I wish to say, first of all, that I have endeavored through correspondence with many of our State Superintendents and Directors, to obtain as clear a picture as possible of the things which we generally agree should be done for the protection of the consumer.

Many of the problems which face us and for which solutions must ultimately be found are due to the fact that we are dealing with a rapidly growing young giant of an industry, which like most excessively rapid growths, appears to be suffering from "growing pains." Twenty-five or thirty years ago, the automobile industry went through a similar period. Many of us can recall the names of well-known makes of cars which were common in those early days that have now completely disappeared from the market. I believe much the same thing will eventually happen in various classes of frozen foods. In fact, there are ample signs that it is already taking place in some lines.

The great expansion of the frozen-food industry within the past few years has been due largely to the chaotic food situation which resulted from war-time disruption of normal food supplies and packing processes. Many packers attempted to take advantage of this situation without having either adequate facilities or adequate knowledge for processing the products which they placed on the market. Inferior quality was a direct result of such operations, and while it might be argued that weights and measures officials should not be primarily concerned with such matters, nevertheless, products which are poor in quality or improperly packed usually mean excessive shrinkage with corresponding loss in weight or volume, with which we are directly concerned, so there is a definite connection between quality and quantity where enforcement of weights and measures law is involved.

Weights and measures officials apparently agree that all packages of frozen foods should be correctly marked with the net weight of the contents. New York State does not permit the use of any qualifying phrases such as "when packed," "not less than", etc., which means that the weight indication on the package must mean the actual net weight at time of delivery to the consumer. I believe that a majority of our States have similar requirements in this respect; therefore, the frozen-food packers or processors will avoid trouble on interstate shipments if they eliminate the use of such phrases in connection with the weight indication on their products.

In further reference to the maintenance of net weight at time of delivery to the consumer, as indicated on the package, many of our State officials believe that no specific tolerance should be established either by law or regulation; that if tolerances are established, unscrupulous individuals might attempt to take advantage of any tolerance that might be set up in relation to weight deficiencies. I am inclined to the view that specific tolerances should be provided, both in excess and deficiency, as an aid to good enforcement procedure and as a guide and aid to the industry in holding the weight variation on their products within reasonable limits.

In our State, tolerances have been established by regulation on some products, and we have not found that packers attempt to take advantage of them. In fact, they cannot do so for the reason that the regulations also specify that the weight variation "must be as often above as below." This provision applies to all commodities for which definite tolerances have been provided.

It would seem preferable to set up definite and uniform tolerances for specific items after study, experimentation and conferences with the industry rather than to say that reasonable variations shall be permitted, for the term "reasonable" is subject to as many interpretations as there are States in the union or firms engaged in packing frozen foods.

For the purposes of this discussion it is not my intention to enter the field of quality determination for frozen foods, as it is my understanding that this phase of the subject will be thoroughly covered from that standpoint during this Conference.

In New York State, matters pertaining to the quality of food products are under the supervision of our Bureau of Food Control which enforces the provisions of our State law in relation to quality, supplemented by the Federal Food, Drug, and Cosmetic Act in the absence of State statutes which may be applicable.

As weights and measures officers, we are only directly concerned that the net weight of the contents shall be as represented on the package. Whether or not the product contains an undue percentage of liquid, is deficient in solids, or is otherwise inferior in quality, is left to the Bureau of Food Control and our State Food Laboratory, to determine.

I believe this is also true in many other States where agencies other than weights and measures departments or bureaus are charged with the duty of determining quality. When weights and measures officers are responsible for quality as well as quantity determination, it is certainly of prime importance to have definite provisions established for their guidance in these matters.

Apparently, one of the most controversial problems with which we have to deal, is in regard to the marking of a weight indication on individual frozen fish fillets by the packer. The current trade practice, with some notable exceptions, is to pack a number of fillets of approximately the same average weight (usually a pound) in cartons or boxes containing five or ten pounds. These containers may be correctly marked with the net weight of the contents but the individual wrapped fillets are not marked and must be weighed and marked with the correct weight by the retailer if he complies with the law, otherwise one customer may receive a 14-ounce fillet and the next, an 18-ounce package.

Representatives of the frozen fish industry have said that from their point of view, only two solutions of the problem are possible. First, to pack to a predetermined weight (such as one pound) which would be stamped or printed on the individual wrapper or carton. This would necessitate cutting some fillets and adding to others, plus the additional labor item required to weigh such fillet separately. They estimate that this method would increase the cost of the fillet to the consumer by approximately five cents per one pound package.

Their second suggestion, and the one which they prefer because of the cost item involved, is to mark the individual fillet wrapper with the legend "TO BE WEIGHED AT TIME OF SALE." While we might, in the interest of uniform packing procedure and enforcement, accept the latter marking in lieu of a net-weight indication, I am inclined to believe that in order to do so, we would have to write an exception in our law to cover this particular product. In this connection, it should be remembered that whenever such an exception is made, we are inviting similar requests or demands from packers of other commodities, who may feel that they have equally good reasons for asking special consideration for their product.

In the absence of time-study records or other cost factors, it would appear that the industry estimate or statement "that the cost of weighing and marking individual fillets would equal five cents each," is certainly open to question. While the use of a fancy lithographed carton would increase the cost considerably, I see no reason why the present cellulose or parchment wrapper could not be used. The cost of printing a weight indication on these wrappers in addition to the name and address of the packer, would be negligible.

All weights and measures officials are agreed on the desirability of standardization of packages; in fact, the National Conference on Weights and Measures has consistently recommended and indorsed such action in relation to all foods in package form. The Conference has recommended that packages should be put out in 8 ounces, 12 ounces, 16 ounces, 1½ pounds, and multiples of 1 pound, with quantities in small packages of 1, 2, 3, or 4 ounces. This would eliminate packages marked in fractional parts of ounces, which are always a source of confusion to the average consumer.

I would go further, and recommend to the industry that insofar as possible, they should standardize the size of packages (for similar products) in relation to the quantity which they contain. A package may be correctly marked "12 ounces" but by increasing the dimensions very slightly, it may be made to appear the equivalent in size of a 1-pound package. Many consumers buy entirely on the apparent size of the package without reference to the quantity declaration which may be more or less conspicuously placed upon it.

To illustrate, one of our inspectors recently purchased two packages of sliced frozen strawberries packed by different firms. The first, weighing 1 pound, sold for about 54 cents. The second, containing

12 ounces, sold for about 7 cents less. The difference in weight was 25 percent but the difference in cost was only about 13 percent. From general appearances the two packages were very similar.

I am indebted to Director McBride of Massachusetts for the following excerpt from Judicial Instructions to a jury in a Federal Court, in which this statement appeared: "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 on 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 dealers in the article are not deceived. It is the probable inexperience of the customer that you should consider."

In relation to an allowance for loss in weight on frozen food products, it would seem that the industry itself, by experimentation in their own laboratories, could and should determine the normal loss in weight to be expected on various items as a result of the freezing process and storage under proper conditions for the length of time such items would ordinarily be held in retailers' stores.

All items which show a consistent and determinable loss in weight under normal conditions should be overpacked to allow for such loss, in order that the consumer may be assured of receiving full weight at the time of delivery. All packers of food products have to contend with this problem to some degree, regardless of what processing method is used. Most of them honestly and consistently endeavor to maintain accuracy in weights which are delivered to the consumer. The frozen food industry is not alone in having to face these problems. They are neither entirely new, except in degree, nor impossible of solution, although they may appear so to some few packers who have not had experience in food processing by other methods before entering the field of frozen foods.

In direct relation to the enforcement of weights and measures law in regard to frozen foods, I can give no better advice than a quotation from a paper presented at the 34th Conference of the Indiana Association of Inspectors of Weights and Measures, this year, by Mr. T. E. Sullivan, Acting Director of the Food and Drug Division, Indiana State Board of Health. Mr. Sullivan had this to say in his closing remarks:

> In the absence * * * of any definite standards on which to rely, it is necessary for those who are enforcing the Food and Drug Act to use common sense and judgment in determining whether an article is in violation. If a package of frozen food weighs less than the amount stated on the label, it is obviously short weight. If this short weight involves a very small percentage of the total weight, and might have been brought about by normal shrinkage, it would probably be excusable. If the shortage is substantial, action should probably be taken. Similarly if a frozen article consists of an abnormal quantity of water or syrup, it is probably adulterated. On the other hand if the quantity of packing medium seems reasonable for the product packed in it, it is probably all right.

At this point I wish to depart briefly from my prepared paper. Just before I left Albany, I saw this item in a newspaper:

Nine years of research have produced a new method of packaging frozen fillets of cod and haddock into a solid piece. These fillets come in one-pound packages, odorless and moisture-free, and measure three-quarters of an inch thick, eight inches long, and four inches wide. They fit into the ice compartment of the refrigerator.

You can cut them into any size portion and cook without defrosting. The fillets adhere to each other, under a secret process, and remain in one piece through any method of cooking. They flake, however, when eaten.

Edward H. Cooley, President of the company that perfected the process believes this new method of packing frozen fillets will greatly increase the use of fish in the family menu.

I had the opportunity to check-weigh several packages of fillets. I weighed 18 packages in all, six packages of frozen cod, six packages of frozen haddock, six packages of fillet of perch. The greatest variation in any of them was on the fillet of haddock, six fillets being 2 ounces overweight in the six packages. The greatest shortage in any one was one and one-half ounces, and the greatest amount in excess was three-quarters of one ounce. The fillets of perch weighed exactly six pounds, and there was no appreciable variation of any of them when weighed on the modern computing scale. On the total of six fillets of cod, the weight was about 2 ounces in excess.

I think that offers a possible solution to our marking problem. There is no reason why the manufacturer could not place a net weight figure on these fillets.

In closing I wish to express my thanks and appreciation to the members of the industry who have given us their assistance and cooperation in attempting to meet our mutual problems.

REMARKS OF R. A. OSBORNE, FOOD AND DRUG ADMINISTRATION, FEDERAL SECURITY AGENCY

At the 30th National Conference on Weights and Measures, June 6, 1940, W. S. Frisbie of the U. S. Food and Drug Administration discussed general regulations under the Federal Food, Drug, and Cosmetic Act relative to net weight, and Sumner C. Rowe of the Administration presented a paper dealing with the general problems of deceptive containers. At the 32nd National Conference last year, W. A. Queen of the Food and Drug Administration discussed recent regulatory activities of the Administration in the field of short weight and deceptive packaging. It may be timely today to discuss some of our problems with frozen fruits.

The Food and Drug Administration has been giving considerable attention to frozen fruits for the last several years. Our first work on these fruits was with the fruits packed primarily for manufacturing use, particularly for fruit preserves. Later, as the packing of fruit and sugar in containers for household use increased, different types of problems arose. One which is of particular interest to you is the quantity of contents of the individual packages.

We have discussed this matter with a number of weights and measures officials and we are aware that some hold the view that packaged frozen foods should be declared in terms of the drained weight of the solid material as distinguished from any liquid medium in which it may be packed. A careful study, in its context, of section 403 (e) of the Federal Food, Drug, and Cosmetic Act and the regulations thereunder, will reveal that it requires an accurate declaration of the quantity of contents of the food in the package. It is obvious that the quantity of a food in a package of frozen fruit would be the combined quantities of fruit ingredient and any sweetening or packing medium, including the sugar or sugar sirup, that is used in its preparation and that is ordinarily consumed by the purchaser. Thus a quantity of contents declaration that would include only the solid or drained fruit portion of a frozen food packed in such an edible medium would not meet the requirements of this law for goods shipped in interstate commerce.

So far as frozen fruits are concerned, there is, aside from the legal question involved, a practical consideration which we believe would interdict the application of such a requirement regarding the quantity of contents declaration. When fruit is frozen and later thawed, there is always the release of some liquid. This separation of liquid occurs no matter whether sugar or sirup or water is added to the fruit. The relationship of the weight of the drained fruit in the thawed product to the original fruit has been studied by ourselves and others, but so far we have not worked out any precise relationship for all fruits. Work is still continuing on this problem.

It is the general practice to use some sweetening agent with almost all fruits which are to be frozen for household use. In the beginning this was usually dry sugar, but as the result of trials of various sirups, it has been found that in the case of certain fruits the appearance and quality of the thawed product are better where the fruit is covered with sirup before freezing. In all cases with which I am familiar, the sweetened liquid which separates after thawing is a very desirable part of the food and is used by the consumer for food purposes.

Different types of abuses have arisen in connection with the packing of frozen fruits. One in which the Food and Drug Administration is interested is the use of moldy or decomposed fruits. However, this is not primarily a problem with which you are concerned. Another problem has been the misbranding of the packages as to the quantity of contents. We have found at times, e. g., that the statement of quantity of contents has been inaccurate and in some instances this had led to regulatory action under the Federal Food, Drug, and Cosmetic Act. Two such instances are the following:

Two lots of frozen blackberries with sugar, packed in Kentucky and labeled as containing 16 ounces net weight, were found to actually contain from 12.6 ounces to 17.3 ounces and an average of 14.61 ounces net. The lots were seized and it was charged that the shipments were misbranded as defined under section 403 (e) of the Act which states in part "A food shall be deemed to be misbranded . . . if in package form unless it bears a label containing an accurate statement of the quantity of the contents."

A packer in New York State had two lots of strawberries and one lot of raspberries seized for failure to label the packages with the name of the manufacturer, packer, or distributor, with an accurate statement of the quantity of contents, and with the common or usual names of the ingredients as called for under sections 403 (e), (e) (2), and (i) (2) of the Federal Act.

Another type of abuse which has been encountered is the use of excessive amounts of sirup and the use of sirup of very low sugar content. Some have raised the question as to whether the use of insufficient fruits should be called slackfilling or adulteration. It is our view that under the terms of the Federal Food, Drug, and Cosmetic Act, such a frozen fruit containing excessive amounts of sugar sirup, or of a sirup that would result in the addition of excessive quantities of water, can in the absence of a definition and standard of identity, be effectively dealt with only under the adulteration provisions of the Act, primarily that provision which would in effect declare such a product to be adulterated by reason of the substitution of sugar sirup and water for the fruit. A typical example is perhaps in order.

A firm in the State of New York packed an average of 7.35 ounces of whole strawberries with 8.62 ounces of water and sugar in waxed paper containers, size 3¼ by 3¼ by 2¾ inches, or 29 cubic inches. The strawberries were seized and it was charged that the product was adulterated as defined under sections 402 (b) (2) and (4) of the Federal Food, Drug, and Cosmetic Act which states "A food shall be deemed to be adulterated . . . if any substance has been substituted wholly or in part therefor, or if any substance has been added thereto or mixed or packed therewith so as to increase its bulk or weight, or reduce its quality or strength, or make it appear better or of greater value than it is." On thawing, the frozen strawberries were very sloppy. They contained an excessive amount of packing medium. A package of this cubic content could hold in the neighborhood of 12 ounces of whole strawberries.

We have found packages of frozen loganberries, frozen boysenberries, and other fruits to be adulterated in a similar manner and actions were taken under the Federal Food, Drug, and Cosmetic Act.

In those cases in which the combined quantity of fruit and sugar solution are insufficient to fill the container to capacity, it can properly be alleged that the package is slack filled. This question was involved in a seizure action which was taken against a lot of red raspberries packed in the state of Washington; the packages were slack filled as defined under section 403 (d) of the Federal Act, which states in part "A food shall be deemed to be misbranded if the container is so made, formed or filled as to be misleading." The berries were in boxes having dimensions of 5 by 4 by 1¾ inches or 35 cubic inches. The average fill of container was 65 percent when in a frozen condition. The packages contained 9 ounces of berries and 3 ounces of a sugar solution and the declared net weight was 12 ounces. The firm this year packed the same ratio of fruit and packing medium, and the same net weight in boxes 4½ by 3½ by 1¾ inches, or 27.5 cubic inches.

All of the legal actions we have cited have been terminated within the past year.

In considering adulteration of the kind discussed, it will readily be seen that one of the questions that is likely to arise is what is a suitable ratio between fruit and sugar or fruit and sirup. Another is how such a ratio can best be arrived at. Such a ratio might be included as a factor in a definition and standard of identity for a frozen fruit. Without such a standard it is possible to take action only where the quantity of sirup is obviously in excess of the amount needed to properly cover the fruit before freezing.

We have been accumulating data looking toward a hearing on proposals to adopt definitions and standards of identity for various frozen fruits. On this we have made considerable progress. The question of quality standards is much more complex. In quality standards under the Food, Drug, and Cosmetic Act, we have considered it necessary to have some objective methods for determining those factors which enter into quality. This, as you realize, is quite difficult. It is possible that identity standards will be adopted in advance of quality standards for frozen fruits.

In the case of fill of container, the problem of standards is closely connected with identity standards. If identity standards are adopted which provide for a certain ratio between fruit and the sweetening ingredient, then a fill of container standard might simply provide that the food fill a certain percentage of the space in the container. Some elements in the frozen fruit industry, however, would like to follow the precedent set in standards for canned fruits whereby the relationship between fruit and sirup is fixed by the fill of container standard rather than the identity standard. What will be finally done in this respect cannot be predicted accurately at this time, although it would seem, on the basis of present information, that better results in the case of frozen fruits would be obtained by fixing the ratio of fruit and sweetening agent in the identity standards.

As you know, the types of packages used for frozen fruits for household use have changed and are still changing from year to year. Some frozen fruit is actually packed in tin cans. A recent type of package is a container with metal ends and waxed cardboard sides. Considerable amounts of fruit are packed in cups with inset bottoms. These present some problems as to the possibility of deception due to the space beneath the insert. This problem is essentially the same as with other types of foods packed in the same type of container, and need not be discussed as a separate problem of frozen foods.

I have said nothing so far about frozen vegetables. With these products we do not have the problem of added sirups, although there may at times be some excess of wash water left on certain types of vegetables. In general, however, we have not found this to be the case.

There are a number of miscellaneous prepared foods which are frozen and put out in small packages. Each of these usually presents a problem in itself. Take for example the case of a product called "Creamed Salmon," which consists of cooked salmon in a cream sauce with certain condiments. I refer to this particular food since it brings out the problem common to many foods as to whether there is any way under the quantity of contents requirements of controlling the amount of salmon in relation to the amount of sauce or other similar constituent. In our opinion there is not. The food is the mixture of salmon and sauce, and if there is an excess of sauce, it may be alleged, if it can be proven, that sauce has been substituted for salmon. Of course, standards of identity for this type of food would go far in solving the problem, but it seems unlikely that standards under the Food, Drug, and Cosmetic Act can be made for these miscellaneous foods for some years to come. As you well know, there are many problems connected with other frozen foods, particularly the various "frozen dinners" and with so-called seafood cocktails about which I have had nothing to say. My experience has not included work on these products since I have been primarily engaged in work on frozen fruits. This work is still under way and we appreciate the comments and suggestions of other regulatory officials who are concerned with these and with related problems. It will be very helpful to us to have your comments and suggestions regarding abuses existing in packaging of frozen foods and as to what should be done to correct them.

DISCUSSION OF PRECEDING PAPER

Mr. Baucom: Dr. Osborne, you speak about the ratio of the foods to the preservatives; would it not be a reasonably satisfactory arrangement to declare that the preservative shall only occupy a limited amount of space? You also speak of the drying out of a certain amount of moisture. Does the extraction of moisture vary in direct proportion to the moisture content of the food involved?

Mr. Osborne: On your first question I think you are fundamentally correct. The package should be reasonably well filled with the food ingredient and the packing medium should be just such as to cover the food. That would be sound reasoning I think.

Your second question is more difficult to answer. There are a number of factors which seem to affect the drained weight; for example, a food like black raspberries has a rather solid content and is rather well dried fruit; this would drain higher—that is, the percentage of the weight drained on the screen as compared with the weight of the food put in would be higher—than in the case of a fruit like strawberries with low solids content. Strawberries run around 8 percent solids and black raspberries will probably run as high as 18 percent—I do not know the exact figures. There is a relation though. Of course there are other factors, as I said—the factor of maturity, and probably the area of production may have something to do with it. I have not studied this question in just the way you have suggested and I cannot give you a complete answer, but there is a relationship.

REMARKS OF CLIFFORD F. EVERS, TECHNICAL DIRECTOR, NATIONAL ASSOCIATION OF FROZEN FOOD PACKERS

It is an honor and a pleasure to be with you today and to have the opportunity to be one of the speakers on your program.

As an introduction to my subject, I believe a brief history of the frozen food industry will be of interest to you. Even though freezing, as a method for preserving food, probably dates back to the time when man first inhabited cold northern climates, the frozen food industry, as we know of it today, is comparatively recent in origin. In order to state the approximate dates that this industry originated, it is necessary to distinguish between several types of methods and resulting frozen products.

Sharp freezing as a means of freezing preservation came into use on a commercial scale about 1865 with the artificial freezing of fish and poultry. The freezing preservation of meat started about 1880. The cold-packing industry had its beginning about 1905 with the freezing of small fruits for remanufacture for jams, jellies, pies, and ice cream. Commercial quick freezing of vegetables and the freezing of fruits for table use are of much more recent origin, having started about 1929. The freezing of consumer size packaged frozen fish, meat, and poultry also began about the same time. Some precooked foods date back to the early 30's, as frozen crabmeat and lobster meat, both of which had to be cooked as a means of preparation, were on the market at that time. The first volume packs of precooked frozen foods began about 1942.

Unfortunately the industry does not have any reliable statistics on the annual production of packaged frozen fish, meat, poultry, and precooked foods. However, we do know that the total 1946 pack of frozen fruits, berries, and vegetables in retail containers amounted to approximately 379 million pounds. The industry's potential is still very great when one interprets that figure to indicate an annual per capita consumption in this country of less than 3 pounds.

With that much of an introduction to the history and size of the frozen food industry, the rest of my talk will be limited to the subject of weights and measures of packaged frozen foods, in which you have a particular interest.

In accepting your committee's kind offer to be one of the speakers on today's program, my purpose is not to lobby against legislation that your group has in mind for consideration and action, but to better acquaint your group with the methods and problems of the frozen food industry. It seems to me that your group cannot proceed with your contemplated activities without giving full recognition to the nature of the frozen food industry and the products of that industry.

To illustrate the need for your group to fully understand our products and problems, I wish to cite certain recommendations incorporated in the Tentative Report of the Committee on Sale of Commodities. I sincerely hope that my comments will be accepted as constructive criticism. For example one of the items that you have in mind for consideration and action at your present Conference is weight declaration on packages of frozen foods. You state that all frozen foods in package form should bear a quantity declaration, together with the name of the food contained and the name and address of the packer or the agency responsible for the distribution of such packages. Does not existing Federal law require what you believe should be done? Does not failure to comply with this requirement make the product misbranded under Section 403 (e) (2) of the Federal Food, Drug, and Cosmetic Act? As I see it, your proposal would serve no useful purpose, but would merely duplicate existing law.

In reply, you might point out that your main concern is with drained weight. However, in this connection I doubt that you appreciate fully the many difficulties involved in this problem. You state that frozen foods should be sold by avoirdupois net weight based on original drained weight of the commodity. I feel sure that the frozen food industry would not react sympathetically to a proposal of that kind, in view of the fact that other processed foods are not labelled and sold in that manner. In the case of canned peas for example, the label does not declare the weight as so many ounces of drained peas. Moreover, the frozen food industry packs vegetables without any packing medium. True, the product is not bone dry, for during the necessary washing, blanching, and cooling processes the product is in contact with water and therefore some moisture will adhere to the surface. However, to the best of my knowledge, no vegetable is ever packed for freezing without first being subjected to a draining or dewatering process. Therefore frozen vegetables are packed just as dry as is possible under good and normal commercial practice.

In the case of frozen fruits, we have a different situation. Here again the proposals of your committee seem to discriminate against the frozen food industry in that the declared weight on a can of peaches is not so many ounces of drained solid product. As you well know, sugar syrup or some liquid packing medium is absolutely necessary for the proper heat processing of canned fruits, and as you also know, sugar syrup as a packing medium is equally necessary for the proper freezing preservation of most fruits. If you question that statement, I suggest that you freeze and store a few slices of peaches in the ice making compartment of an electric refrigerator. It is doubtful if you would care to eat that product after thawing. Both for technological reasons and in line with consumer requirements, the frozen food industry has long ago established the fact that sugar syrup is a necessary packing medium for many frozen fruits.

As to the drained weight of these products, it can only be said that to date no one has established a positive relationship between drained weights and the quality or quantity of ingoing fruits or methods of processing and freezing. Packers with years of experience in this industry know what they put into a package, that is, ratio of fruit to syrup, but it is impossible to know exactly what amount of solids will drain from that package after thawing. There simply is no consistent and exact relationship between put-in weights and cut-out drained weights. In any event, the industry aims at selling a processed product that is as near to the "prepared for the table" fresh product as can possibly be produced. Perhaps during the war years there have been some instances when through ignorance or otherwise, some people did use a very light density syrup as a packing medium and perhaps more syrup per package than would be considered good industry practice; but consumer acceptance soon puts these people out of business. Quality packers, as a standard procedure, have packing specifications that call for putting as much prepared fruit into the package as the package will hold without crushing or mashing the ingoing product, and only enough syrup is added to fill the voids and cover the product.

In the case of precooked foods the frozen food industry is again put at a disadvantage by your present thinking. A can or glass jar of heat processed prepared meat, such as beef stew, does not carry a label indicating the weight of the solid ingredients in avoirdupois ounces and the quantity of the gravy in terms of liquid measure. Yet that is what you propose for frozen precooked foods.

I sincerely hope that your Committee on Sale of Commodities will give serious thought to the many problems involved and that as legislation is proposed some thought will also be given to the situation from the packers' angle. Perhaps it would help you in formulating legislation to know some of the details of the methods used by packers to insure that their frozen food packages go out to the public containing the proper weight of contents.

Some frozen products, such as peas, lima beans, and cut corn are measured into the package by volume. Even so, some packers weigh every package, and all at least check-weigh their packages. Other frozen vegetables, such as asparagus and spinach, are packaged by hand either directly on a scale or every package is check-weighed after filling. Fruits such as peaches and apricots are usually hand packed

JOHN DOE PACKING CO. Smithtown, Wash.

QUALITY CONTROL REPORT WEIGHT SHEET

Sheet No. ______ PRODUCT ______ Date ______

Declared Weight ______ Code ______

												TOTALS
Time Taken												
Packing Line Number												
No. of Packages Exam.												
OVER-WEIGHT BY	3/4 oz. and over											
	5/8 oz.											
	1/2 oz.											
	3/8 oz.											
	1/4 oz.											
	1/8 oz.											
Number Overweight												
EVEN WEIGHT	0											
Number Evenweight												
UNDER-WEIGHT BY	1/8 oz.											
	1/4 oz.											
	3/8 oz.											
	1/2 oz.											
	5/8 oz.											
	3/4 oz. and over											
Number Underweight												

REMARKS: ______ Signed: ______

FIGURE 1. *Check-weighing record form used by packers of frozen foods.*

although there are some volume filling machines used for sliced peaches. After the fruit is weighed into the package a measured amount or a definite weight of syrup is added to the fruit. Following this, the packages are check-weighed for total net weight. Other fruits, such as sliced strawberries with sugar, are thoroughly mixed before packaging and the mixture is usually volume filled into the package, although some packers weigh in the mixture. In either case, filled packages are check-weighed.

As a part of this paper I submit a type of a weight sheet (see fig. 1) that is similar to the various types being used by many packers. The use of this form gives the packer an excellent résumé of the weights of the frozen packages that he has produced. In practice, a quality control assistant, at frequent intervals, collects at random a number of packages at the end of the filling line. The time of the examination and the packing line that the packages were taken from, are recorded on the form. Each package is then weighed and the weight of each is recorded by the use of a tally mark in the proper space. The results are then summarized for that group of check weighings. The floor lady in charge of the packing crew, the plant superintendent, and the quality control department now have before them a record that immediately flashes a red flag if average weights are poor or if filling weights are uneven. Adjustments can be made at once to correct the situation.

At the close of the day a recap is made of all weight sheets and these data are usually passed on to top management. Having had many occasions to see some of these recap records, it is justifiable to report that underweight readings usually amount to less than 2 percent, whereas overweight readings often run as high as 99.9 percent. To be very specific I can well remember some actual figures on a pea pack which covered packages that were volume filled by a machine. The actual tonnage produced is beyond recall but during the pea-packing season in this one plant over 60,000 packages were check weighed, and of these 90 percent were overweight and only 1.5 percent were underweight. With data like that I believe you will agree that the frozen food industry is not guilty of short weights.

Many of you probably know that the Food and Drug Administration is actively engaged in studying many of the problems that concern you. At some future date, this agency plans to issue standards of identity, quality, and fill of container for various frozen foods. When this is done, Federal law will eliminate the malpractices with which your group now appears to be extremely concerned. In the meantime, I want to assure you that as a practical matter, the industry is very serious in its intentions to pack products of excellent quality for the users of frozen foods.

Packers in the industry are as much, if not more, interested than you or any other governmental group in making certain that purchasers of frozen products receive what they pay for, and are satisfied with the products they buy.

REMARKS OF G. HODGES BRYANT, CHAIRMAN OF THE BOARD, FROZEN FOOD INSTITUTE, INC.

So the members of this Conference may be able to weigh the subject matter of my remarks on standardization for the purpose of accepting or rejecting them, in whole or in part, I ask full audience indulgence while I give a brief outline of the relationship of the Frozen Food Institute to the frozen food industry.

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The Institute, now functioning as an international organization, was created primarily as a non-profit, educational, research body to discover, through academic, laboratory, and practical methods, the essentials of all phases of the frozen food industry, to endeavor to accept all problems of research pertaining to the frozen food field as they arise, and to deal with such problems with the authority of science, logic, and in an open-minded, unbiased, non-prejudiced manner. As the discoveries are made the Institute passes them on, in the form of recommendations, to the trade.

To adhere to the essence of the word Institute—which word Webster defines as "fundamental principles; an established principle, rule or order"—with the least number of mistakes (we are not infallible) the Institute was founded as an academic research group, with a definite requirement of a degree in some profession kindred to frozen foods (engineering, food technology, bio-chemistry, biology, market research, packaging design, etc.) as eligibility for membership. This rule still prevails in the main body known as Frozen Food Institute, Inc.

However, as the Institute grew it was found advisable to broaden its scope through the establishing of an associate membership permitting any firm or individual, operating commercially in any branch of frozen foods, as well as any trade group so desiring, to associate with the Institute and thus gain immediate, first hand, authoritative knowledge to help them in their operations.

This brief outline should aid this audience to see the motivating power behing the acceptance of the invitation given FFI by your Secretary, Mr. R. W. Smith, to have a representative appear on this Conference program.

We have no axes to grind, no policing policies to exploit. FFI is here in the hopes of helping the progression of the frozen food industry through one of its most important phases, namely, standardization of packages and a universal program of a constructive nature concerning weights and measures.

This motive was evidenced at our Annual Convention of this year, held in Boston in April, when for the first time in the frozen food industry a panel was devoted to open discussion between our members and 17 directors of standards from 17 different States.

Many paramount issues on standards were brought out at that April panel. On the following day, a special FFI Standards Committee was appointed to carry on. Today's factual outline is the outline of that special committee's findings to date—we have not fully completed our committee program—as they pertain to weights and measures.

For your further knowledge I name the individuals who comprise that committee: Mrs. Anna De Planter Bowes, Chief, Division of Nutrition, Department of Public Health, Pennsylvania; Dr. Herman W. Dorn, Research Director, Lincoln Laboratories, Inc.; Dr. M. B. Galbreath, Director, New York State Agricultural and Technical Institute; Dr. White-Stevens, Director of Food Purchases, Hospital Bureau of Standards and Supplies, Inc.; J. Gordon Lippincott, J. Gordon Lippincott and Co., Industrial Package Design; Dr. Albert A. Johnson, Founder and First President, New York State Institution of Applied Agriculture; Dr. Paul W. Chapman, Dean, College of Agriculture, University of Georgia; Dr. J. Raymond Adams, Managing Editor, Frosted Food Field; Jacob Fisher, President, Frigidinner, Inc.; Seth L. Kast, President, Frostrite, Inc.; Edwin J. Malkin, President, Malkin Motor Freight Lines; Joseph P. Kalivoda, Sales Research Director, Fruehauf Trailer Co.; George S. Wallace, Sr., President, George S. Wallace and Sons; Nicholas J. Janson, President, Nicholas J. Janson Co.

The most important summary of the past 4 months' intensive work of this committee is one of a very negative nature. To quote from the FFI Committee report dated August 15, 1947:

> Unless the packers and the processors of frozen foods start immediate cooperation in the control of excessive moisture content of their package (both institutional and consumer) they are facing mandatory legislation, such legislation instituted by either Federal or State Directors of Weights and Measures.

Substantiating this summary I cite what might be an indication. On May 13 of this year a conference on packaging standardization was held in New York City under the supervision of the American Standards Association. Such branches of the frozen food insudtry were represented as refrigeration experts, government officials, packaging machinery companies, brokers, research groups including FFI, and other industry divisions. Of the others there was only one packer representative.

The basic reason this FFI committee on standards qualifies their finding with the words "excessive moisture" is because of one step in the freezing process for vegetables and fruits. The step I refer to, relative to fruits and vegetables, is the essential washing, through which the introduction of extra or added non-essential moisture can play a great part.

Our Standards Committee has tested some packages released for sale by unethical processing plants where the nonessential moisture content was greater than the fruit or vegetable content; others where it was a 50/50 finding. We have no findings where the "dollar conscious" member of the industry has sold his overloaded moisture package at any lowered price! Selling crystalized liquid at fruit or vegetable prices means excessive profits. It works a hardship on the consumer's pocketbook as well as harming the ethical packer and distributor. That is why our industry is facing mandatory regulation and legislation.

In the matter of prepared—or pre-cooked—frozen foods, such as chicken à la king, stews, turkey, chicken and steak with gravy, or any item combining solids and liquids, we have a different picture. Although some processors are turning out these products with an overweight of liquid, we of the Institute cannot see how we can regulate these items under the same plan as might be used in the regulation of frozen fruits and vegetables, because of evaporation through precooking. The Institute understands that Bureaus of Standards are legally guided in their administration for frozen foods on two classications, solids and liquids; and now frozen foods introduce a third classification, the combination of solids and liquids in the same package. We also interpret those classifications to refer to net contents at time of consumer purchase, excluding the weight of the containers.

I will, after pointing out some other findings of the FFI Standards Committee, return with the recommendations of the Committee as to suggested regulatory status.

In the opinion of the Institute, at the present time there are too many types and sizes of frozen-food containers. Quoting from our Standards Committee August 15 report:

> Standards of frozen food packaging (that is, the container itself) should be established as to shape and volume and thus eliminate unnecessary package sizes. The packages decided upon should be those meeting consumer acceptance, and should convey to the buyer's eye the difference in quantity of content.

The Committee, in its remarks on this subject, points out the reasons for its findings as follows:

> 1. No packaging standards should be established without considering the design standards of existing or new models of packaging machines.
>
> 2. Packaging standards, when established, should be governed by shape and volume because of the different consistencies and divergent natures of frozen food items. They should convey the difference in quantity at a glance, because of the habit of "puff" packaging.

The Institute, through its research findings, and working as a free agent with all branches of the industry between production and consumer, can only recommend. We do find our commercial associate members cooperative, to a high percentage, through incorporating FFI recommendations into their operative program. However, there is much yet to be done by the industry that it may fall in line with the desires of the Bureaus of Standards.

The FFI's executive board feel the Federal and State Directors of Standards are most willing to aid in a cooperative manner and will not demand any illogical adjustments from our industry. This was proved through the Standards panel at our Boston Convention when 17 State Directors were present.

Quoting again from FFI's Standards Committee report of August 15:

> This Committee recommends the frozen food industry be given the following suggestions:
>
> 1. Frozen foods classified by legal statutes as solids, should be sold by avoirdupois net weight. Labels of such products should indicate the grade and quantity of solids in the package, allowing for shrinkage between processing and consumer sale and for added moisture through crystallization via freezing.
>
> 2. Frozen foods classified by legal statutes as liquids (orange juice, etc.), should be sold by liquid volume. Labels of such products should indicate the content in terms of liquid measurement, allowing for added moisture through crystallization via freezing.
>
> 3. Frozen foods combining solids and liquids in their content (such as turkey or chicken with gravy, lobster a la Newburg, shrimp creole, stews, or any other item with a formula combination of solids and liquids), should be sold with the solid content in excess of the liquid content. Labels of such products should indicate the grade, the avoirdupois net weight as well as the liquid-volume net weight, and recognition should be given to evaporation through precooking. Any such combined classification product with an excess of liquid content, should be considered as an adulterated product by the Health authorities.
>
> 4. A closer alliance between health and weight officers and the industry for the regulation of the sale of frozen food products.
>
> 5. A definite understanding between Standards Directors and the industry as to the information to be placed on labels of frozen food packages. FFI's Committee on Standards recommends that each label bear: Grade declaration, such as A, B, C, run of the field; quantity declaration; name of food content (not label a vegetable stew as beef stew); name and address of the packer and/or distributor; and a break-down of the ingredients in accord with the percentage of each to be found in the package.
>
> 6. That no law be suggested by the Federal or State Directors of Standards that would curtail the use of gravies, juices, or preservatives (such as ascorbic acid, etc.) as long as such added ingredients are part of the processing formula, or any

law containing clauses that do not consider Nature's process of evaporation or crystallization.

7. That the FFI offer its Research and Advisory Committee personnel and findings to work in close liaison with Federal and State Bureaus of Standards, thus working out a mutually acceptable code of ethics by which the frozen food groups may govern their industry.

8. That the FFI offer its personnel to the Federal and State Bureaus of Standards to aid in any educational program with weights and measures officers through which a better understanding of the position of the frozen food industry may be passed on to the weights and measures officials.

FFI recognizes that unless steps are taken on a voluntary basis by the industry, legislation will be established. Consumer protection will mean greater expansion of frozen food sales, and all ethical operators should consider the consumers as their ultimate buyer through whom sound growth of distribution comes.

Gentlemen, on behalf of the academic members and commercial associate members of FFI, I thank you for the time alloted us and I hope we leave with you some practical views.

REMARKS OF RAYMOND E STEEL, ACTING GENERAL MANAGER, NATIONAL FISHERIES INSTITUTE, INC.

National Fisheries Institute is a trade association representing the boat owners, the packers, the plant owners, and the processors of frozen fish and other products. It so happens that frozen fish packaging has been a subject of conversation already. I have here with me a committee which I represent, as well as the Institute. We represent the packers and distributors as well.

The subject of frozen fish packaging became such an important issue that we ran a poll last June after the Legislative Committee of your Conference met in Indianapolis. I was accorded the privilege of appearing at that session and I offered my recommendations at that time for the packaging of frozen fish.

Mr. Baker of New York gave us his views on the subject; I was to be on the other side of the issue, and I hope that is taken in good part, because we offer your Conference everything in the way of cooperation. Our poll indicated that something like 39 States were in favor of putting the words, "To be weighed at time of sale" on the individually wrapped fillet package, if you can call it a package. The ones that are unfavorable, including Mr. Baker's State of New York and one other State, the State of Pennsylvania, have taken a diverse view that I believe is really an interpretative opinion, as far as the law is concerned. We have had some little difference in the matter of Food and Drug interpretation of law, but I believe we are now on all fours. We want to follow up the spirit of this Conference.

I notice that in one place you want to cooperate and have a uniform set of laws, if at all possible, in the United States. I hope that your deliberations involve your taking the majority view, which we have already gotten as a result of our poll, to use the words, "To be weighed at time of sale," and to consider that to be the proper wording for fish fillets.

Let me give you a short résumé of the filleting industry. First of all, I believe it was Clarence Birdseye who developed the modern method of quick freezing. The frozen fish industry was one of the first parts of this large industry. The fish filleting industry is a little bit newer. Of course, you know that a fish fillet is nothing other than the meaty side of a fish, and the size of the fillet depends upon the size of the fish. The housewife in most jurisdictions has become accustomed to buying the fillet; she refers to it as a cod fillet, or a haddock fillet, and so forth.

When the fish is packaged, it is thrown into a five- or ten- pound container, each portion being wrapped in a cellophane wrapper to keep the mass of fish from adhering together and coming out in a conglomerate mass that nobody could put on the retail market.

I want to bring one thing to your attention in discussing packaging methods: This is the one-pound package that Mr. Baker made reference to. There are, to my knowledge, four or five large firms experimenting with the one-pound package of fish. So far it has not met with what we would call consumer acceptance. At the present time, right here in the City of Washington—and I would like to you investigate this—there is a difference in price at retail of anywhere from five to ten cents on one-pound packages of fish fillets, as compared with the fillets as they come from the larger containers of fish fillets in the retail market.

Secretary Krug, it comes to my attention, is giving a press release to be used in tomorrow afternoon's papers, at which time he will publicize the nutritive value and the cheapness of fish fillets. We think it would be a great blow to the industry if this Conference should go on record recommending the one-pound package of fillets, when at the same time the Secretary of the Interior is advertising to the public that fish is a good buy and that the housewife should take advantage of the current prices. You would find a slow-down on the market, because you would find utter confusion in the industry.

The one-pound package of fillets, I might say further, is not a piece of fish in one piece. It may be one fillet and part of another, and it separates when it is thawed out. Thus far, the Institute had been unable to say that that is the better way to merchandise fish; it is in the trial period at the present time. The difference in the cost at the packaging level is between five and eight cents. I wrote the brief which was given to your Legislative Committee, and in that brief I stated the amount as five cents; I have since learned from packers of fish fillets that that price will be, maybe, eight cents and upwards, depending upon the type of fish that is being filleted.

I think it would be wiser for you men who meet with this problem day after day to go into a fish-packing plant and watch the process. You could better determine that way what the added cost would be than you can by my standing here and explaining the operation to you.

I would like to go along with the endorsement of your Legislative Committee on standards of packaging; that is, to the effect that before you men leave Washington you will go on record not to take any action to give your proposed legislation to Congress until further study has been made of the subject. The National Fisheries Institute is interested in increasing the per capita consumption of fish, and we will do everything in our power to increase consumption of consumer packages which will have consumer appeal. We are not in favor of chiseling retailers. We will do everything we can to overcome that situation.

I have one of our committee members present who has worked out a sample package to be weighed at the time of sale which we believe would be adequate protection for everyone. We cannot possibly stop all of the chiselers, even if we had the weight stamped on each package. I would like to show you that sample, and we hope that in the end you will give us some exemption in your deliberations that will take care of our industry.

The CHAIRMAN: The Chair is going to recognize Mr. Bussey of Texas on this same subject.

REMARKS OF W. S. BUSSEY, CHIEF, DIVISION OF WEIGHTS AND MEASURES, STATE OF TEXAS

Mr. President, and Gentlemen of the Conference: I have been asked to report on quite an extensive investigation on the weights of packages of frozen foods and other commodities in Texas. Many of the things which I will mention here as having been encountered down there have already been mentioned by previous speakers.

This investigation that I am reporting on now was conducted in Dallas, Texas. We also have similar results in other parts of the State, but my remarks today are confined to the Dallas investigation.

Approximately 25,000 packages of various frozen foods were checked by the Dallas department since January 1, 1947. Not more than 10 percent of any lot were checked, and in many instances less than one percent of a lot were checked. Practically all of this checking was done at cold storage warehouses, only a small percentage being done at retail establishments.

Approximately 100,000 packages were condemned from sale because of short weights; those were lots represented by the samples which were weighed. Thousands of packages were returned to the packer; some were repacked in Dallas, some were relabeled, and in some instances it was necessary to reweigh entire stocks to segregate the individual packages that were unreasonably short in weight.

Reports on inspections of the products packed by 15 different packers, selected at random from the files, show that nine lots by nine different packers were condemned. These were where the weight variations were too great to permit the sale without repacking. All products condemned were not consistently short in weight; on some the average was overweight. On numerous lots checked, where the average would have been acceptable, as many as 25 percent of the packages were short weight in various amounts from five percent to twenty percent. In other words, the average weight would run close to the amount indicated on the package, but the variations in the individual packages were tremendous.

Shipments in some instances were found to average from six to ten percent short weight, while other shipments, sometimes from the same packer, were found to average overweight by similar amounts. That would indicate that the packer was not intentionally packing his product short-weight. On one shipment of 6,000 packages of strawberries, packages were labeled "two and one-half pounds" but were found to average three and one-quarter pounds, a loss to the packer of approximately $1,500 at current prices.

As a result of discussions with the packers and distributors, and of the observations of the inspectors who made the investigation, it was concluded that the inaccurate weights were caused by: (1) Lack of adequate supervision in the packing; (2) new and inexperienced packers; (3) absence or infrequency of check-weighing; (4) lack of weighing equipment suitable for weighing individual packages; and (5) the piece-work system in some plants.

Unsatisfactory containers are also a factor in the problem. Containers which were not designed or suitable for such use have been used by some packers. Many shortages in products packed with liquid, such as fruits, were found to be brought about by leakage, and the distributor just did not pay much attention to it; he would deliver leaking packages to the retailer in that condition and, of course, part of the product had already been lost. Stocks have been checked where more than five percent were short because of leakage while still in jobbers' stock; in other words, packages arrived at the jobber's warehouse in good condition, but while they were there in storage they had been damaged and part of the product had leaked out. Shortages from this cause often run as high as 25 percent on the individual package. Also, improper handling by retailers results in leakage and loss of labels on many containers.

The method of sale and labeling is a major problem on many frozen foods where individual units are of variable weights. As you heard a few moments ago, there is the question of dehydration during the freezing process, which it is argued is the cause for many shortages. New difficulties have been encountered in establishing actual tare and net weights on many types of packages, that is, the difficulty that the seller runs into when he is trying to establish the true weight of the container being used. There is the responsibility on the part of the official of enforcing net-weight sales on such items as rapid-frozen fish, fish fillets, whole wrapped chickens, and individually wrapped steaks, chops, roasts, and so forth. Another problem is the complete loss of labels on some products.

The following suggestions have been made for improvements, not solely by the Weights and Measures Department, but by all concerned who have been contacted during this investigation. First, an educational program on the part of associations representing the frozen food industry directed to packers of frozen foods; that has already been mentioned at some length here today. Second, such programs should include information on proper packing and check-weighing procedures, and on suitable containers for the various types of products. Third, strict and uniform enforcement by all weights and measures officials throughout the United States.

REMARKS OF TYRE TAYLOR, COUNSEL, NATIONAL ASSOCIATION OF RETAIL GROCERS

I wish to say, with particular reference to the statement made by the speaker who preceded the last speaker, that while the retailers can perhaps fully understand why the packers would like to bring about some sort of arrangement whereby the retailers will have to weigh all packaged frozen foods at the time of sale, nevertheless, I do not think, although our association has not had the time yet to take an official position on this, that that proposal will be met with a receptive attitude on the part of the retailers. For that reason, we certainly hope that this body here, in weighing the matter, will explore all angles of this proposal, including the attitude and position of the retailers themselves and the positions that they would be placed in should such a proposal be embodied in the law.

I do not think that I am overreaching myself when I say that the retailers of the country will resist that with all the power at their command before the State legislatures, before the Congress, and in their own stores.

It is a matter of some puzzlement to me, why in the case of a new industry, or a relatively new industry, like the frozen food industry, where presumably the objective of an association is to bring about a wider acceptance on the part of consumers of the products of its members, we should nevertheless find this association coming here with a proposal certainly resulting in putting the retailers into a position where they would not push frozen food packaged items in their own stores.

REMARKS OF J. L. HART, SECRETARY, GLOUCESTER FISHERIES ASSOCIATION

I live with fish most of the time. Gloucester is only a small community of 25,000 people, but we are one of the largest fish producing ports in the country. Last year we handled 218,000,000 pounds of fresh fish. We are basically a fish-processing port, in that 90 percent of the fish which is landed is filleted and frozen.

I think that you gentlemen who are sincerely trying to do a real job in protecting the consumers against any misrepresentation in packages of frozen foods should know just what the problems of the fishing industry are. The species of fish landed in largest amount at Gloucester is red fish, or "rose fish" as it is generally called. There were landed in Gloucester last year 130,000,000 pounds of red fish, which produced about 35,000,000 pounds of filleted fish. The yield was about 25 percent of the catch. This is a relatively small type of fish, and from six to twelve or fifteen individual fillets are required to make one pound. Our markets are principally through the Middle East.

Let me run hurriedly through the process so that you gentlemen can get an understanding of our problem. In filleting fish the fish is normally packed in 10-pound cartons. The fish will be filleted, the fish fillets will then be inspected, a 10-pound carton will be weighed, and a tolerance of three or four ounces will be allowed, depending upon the moisture of the fillets as the boxes are passed along. The girls in the packing line know what will approximate a pound of fillets. A girl will take a piece of cellophane paper, put the fillets in the paper and wrap them up. In a 10-pound carton there may be nine, ten, or eleven individually-wrapped packages. When a carton is complete, including the three or four ounces of tolerance, it is marked as a 10-pound package of fillets.

Those 10-pound packages are then taken to an outside freezer, and later when we get an order for, say, 5,000 pounds of rose-fish fillets, we will take out 500 of those 10-pound cartons.

I submit that if we have to weigh those wrapped packages of fillets, the unit cost will be increased by more than the five cents which Mr.

Steel mentioned. In my opinion the one-pound carton is physically impossible. There is no uniformity in the fillets. Suppose, in the case of the one-pound packages, an over weight of one ounce were allowed. In the 35,000,000-pound catch which was packed last year, one ounce over weight in each package would mean about two and a quarter million pounds loss, which at the processor's price of 20 cents would be about $500,000 in that one item alone. A haddock fillet weighs about a pound and an eighth or a pound and a quarter. If you want to get a one-pound carton, are you going to cut off the eighth of a pound or the quarter of a pound? And if you cut it off, what are you going to do with it?

Coming back to red fish, if we had to mark the weight on each package, one package might weigh 15 ounces, another package one pound, and a third package one pound and one ounce, and it would mean that we would have fully as many girls marking those packages as there are girls putting them up. Then we should have to have somebody else adding up the weights of the individual packages to get the proper weight for the 10-pound cartons. When the fish got to the freezer he would not take the dealer's total weight mark but would have to make his own additions and there would be another set of adding machines to weigh the cartons before they enter the freezer. If somebody were to call me and ask for 5,000 pounds of red-fish fillets, then I would have to get out my adding machines and add my ounces and half ounces in order to make my 5,000 pounds. If I fail to do that, I am going to lose my shirt.

That is the problem we are faced with in our particular industry. We want to cooperate and we want to do everything possible. But it seems to us that the only possible way to work this out will be to put an insert slip in the wrapped package, or to print on the cellophane wrapper, "To be weighed at time of purchase."

When you go into a fish market and buy a whole fish you buy it by the pound. If you buy fresh fish fillets, you buy them by the pound. There is no reason why legislation could not be enacted—and it would work no hardship on the retailers—to require the actual weighing of any species of fish when it is bought by the consumer.

Reference has been made to fish as a protein food. We know that fish is a good protein food, but fish will sell only if it is priced under other protein foods. If you are going to add five, six, or seven cents to the price of fillets to get them to the consumer, it is wrong. True, some companies are putting up one-pound packages of fillets, but that is premium fish, and represents only a very small portion of the total output; neither we nor any other fish firm can get along on a premium pack basis. The business must be on a mass production basis if fish ports like Gloucester are to prosper.

This is a very serious thing to us. We want to cooperate, but we do not see how we are going to do it if you are going to recommend either a definite one-pound or two-pound package or require the marking on each package. I am sincere in that, Mr. Chairman, and I really hope that some serious thought will be given to it because Gloucester is in the same position as other fish ports in New England and it is in the same position as every other area in this country which engages in fish processing.

REMARKS OF GEORGE H. SULLIVAN, PACKAGING ENGINEER, FROZEN FOOD FOUNDATION, INC.

The Frozen Food Foundation represents a group of 15-odd retailers in the United States and Canada. I want to emphasize a couple of very important points that Mr. Evers touched upon. The main one is that frozen foods must compete with other foods being sold in retail outlets. A woman goes in to buy some peas, for example. She has the choice of buying fresh peas, canned peas, or frozen peas. If she buys eight pounds of fresh peas, she finds, after preparing them, that she ends up with three pounds. If she buys a 20-ounce can of canned peas, the chances are she is going to wind up by using 14 ounces of that 20 ounces; the rest will be liquid that is thrown away. If she buys frozen peas, the chances are she will use very close to the twelve-ounces that is put in the package.

With fruit it is a different situation. Both canned and frozen fruits are sold, as Mr. Evers pointed out, with syrup on them. But the main point that I want to bring out is this: Frozen products, canned products, and fresh products all have to compete on the same market. It would certainly be inadvisable to regulate one type, such as the frozen product, and not the others. It is bad enough as it is today to sell frozen peas in 12-ounce packages in competition with canned peas in 20-ounce cans, where you only get fourteen. Certainly, if we are going to consider standardization, I think that is something that should be considered as a long-term proposition, and not as applying to one type of food and not another. If you are going to standardize frozen foods, certainly you should standardize canned foods. You should certainly use drained weight on canned foods if you are going to do it on frozen foods.

The second point is that, compared with standardizing the contents at twelve ounces, for example, for all vegetables, we feel that it is much more important to standardize the size of the package, because of the way the package has to be handled in storage and distribution; the package is much more important because it has to fit into high cost storage and retail selling space and space in the home. You will agree with me that it is impossible to standardize both the size and the weight, because the densities of the products packed are different. Cauliflower takes up more space per twelve ounces than do peas. So, we do have to make a choice between weight or size. If you make the choice of the weight, then you are going to end up with so many different sized packages that it will be impractical for the frozen food packers to put them up.

There are a lot of complex problems to be met and those problems should certainly be solved before we try to set up regulations in the industry.

REMARKS OF THOMAS D. RICE, EXECUTIVE SECRETARY, MASSACHUSETTS FISHERIES ASSOCIATION

I admire the patience of this group in sitting through two or three hours of discussion of weights and measures problems. I have seen very few people leave the hall.

I have noticed that your group has compiled an Act, which they would like to have enacted as a Federal law, in relation to the marking and weighing of packages, particularly as it applies to frozen foods. I would like to have a committee of your group spend about a week in Boston, to see at first hand the operations followed in processing fillets. The cost and the ramifications of the process of filleting of fish are such that to legislate in favor of an individually wrapped fillet would practically put the industry out of business.

Mr. Baker told you of a concern that today is offering a one-pound package of fillets to the consumer. It apparently can be kept in the refrigerator, and if it is not to be used up for dinner one night, a piece may be cut off from that master package and used in the preparation of a meal. Actually, gentlemen, that package costs 35 cents a pound at the wholesale level, and the maker of it intends that it should be marketed for 50 cents a pound. Contrast that price with the present price of 22 to 23 cents a pound for the same type of fillet frozen in the ordinary way and marketed in the ordinary way. How long, gentlemen, do you think the average housewife is going to step up to one counter and get a one-pound package of frozen fish for 50 cents when three feet away she can get what she wants for 22 cents?

REMARKS OF HAROLD LUTHER, MEMBER, COMMITTEE ON WEIGHTS AND MEASURES, NATIONAL FISHERIES INSTITUTE

The problem that we have with the weights and measures officials is the marking of weights on fillets that are merely wrapped in cellophane or parchment. Now, that is not a package in itself. I would like to quote from Food and Drug Trade correspondence, as I believe they call it, dated April 25, 1940. As far as I know the Food and Drug opinion has not been changed. Somebody wrote in asking if fish wrapped in cellophane should have the net weight marked on it, and the answer was that while they were inclined to regard frozen fish wrapped in cellophane wrappers as food in package form, it is not necessary to insist upon the statement of the net weight of each individually wrapped piece where there is a variation between pieces, provided the individual fish when sold to the ultimate purchaser is weighed and sold by weight.

It may sound to you that we are taking a negative point of view, when, in fact, it is the other way. The first time this came up, I talked to one of your own weights and measures officials in one of the States, and he said that he realized what our problem was on individual marking of each wrap of fillet, but that it was his function to protect the consumers. I then asked him what he thought we might be able to do and he suggested the legend, "To be weighed at time of sale." So actually what we are doing is accepting a recommendation of one of your own members, and it is this man's recommendation to the effect that we put on, "To be weighed at time of sale" that we are axious to go through with.

The Chairman. Are there any more comments? Since there is no further comment, we shall pass on to the report of the Conference Committee on Methods of Sale of Commodities.

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON METHODS OF SALE OF COMMODITIES, PRESENTED BY JOSPEH G. ROGERS, CHAIRMAN, AND DISCUSSION THEREON

Much of the discussion here this afternoon is related to items in this report; probably we will have lost no time because all of these items will not have to be discussed again. In the case of the remarks of Dr. Bryant, coincidentally or not, many of his recommendations seemed to relate closely to what we have in this report. I would like to ask Dr. Bryant a friendly question as to whether he happened to have a copy of this report before he made his talk. Is Dr. Bryant in the room?

(These was no response.)

This is necessarily a tentative report of your Committee on Methods of Sale of Commodities. Its main purpose is to place before the delegates to the National Conference on Weights and Measures at this time, items of fundamental importance for treatment. As the work of this Committee progresses it will endeavor to deal with all essential commodities in our commercial structure. The pros and cons of argument in relation to certain items included in this report have not been exhausted. The committee membership has wide geographical distribution that makes interim meetings of our group quite prohibitive. Correspondence, too, is an unwieldy procedure that does not lend itself to full satisfaction in reaching proper conclusions. This committee work is extracurricular in relation to the everyday business affairs of our membership, and the factor of time we may give to it is, of course, important. We endeavor to deal with the various subjects coming under our consideration from the standpoint of logic and with an open mind. We are not infallible, but we treat with matters as we see them, based to a large extent on practical experiences and their results.

Owing to misunderstandings that have been evidenced it is deemed advisable to clarify just what the purposes and functions of this committee are:

(a) It was created primarily to decide upon, for recommendation to the National Conference on Weights and Measures, the best methods of sale for essentials in our commodity structure, and to promote uniform adoption of such methods in the several State jurisdictions.

(b) It is not a function of this committee to draft legislation or regulations to cover the items included in its recommendations. This is the point that we mainly desire to clear up.

(c) Certain recommendations of the committee from time to time may touch upon other than the quantity phase where this has close relationship to other factors that affect weights and measures issues, but this will only be in cases where it is thought that the economic welfare of the consumer will benefit by dual treatment. It would appear in fact that under its title the committee is not restricted in its scope and it may, to good purpose at times, well devote itself to questions of betterments in general trade practices from all angles. However, as the work of the National Conference group is predominately related to quantity matters, and as the weights and measures field alone is a broad one, priority will and should be given to the phase with which we are most closely associated, with reservations, of course, for deviations when and if they are deemed necessary and should be given special attention.

In the years that this committee has been functioning we have, up to now, dealt with 177 essential commodities. The committee now presents the following items for the consideration and action of the 1947 National Conference. [Reading:]

1. FROZEN FOODS: Should be sold by avoirdupois net weight based on original drained weight of the commodity. Quantity declarations on packages should conform with the quantity of determinable solids in the package.

This recommendation is presently confined to such foods in the classification of solids, which present the outstanding problem in the prevailing situation.

Foods strictly of liquid classification offer no apparent difficulty and should be sold by volume representations in terms of liquid measurement. Ice cream, while sold by liquid volume, we believe cannot be construed as falling entirely within this classification as there is not as yet, to our knowledge, any legal decision as to whether it is a liquid or a solid. The incorporation of solids in ice cream is one of the factors that makes this issue highly controversial.

All frozen foods in package form should bear a quantity declaration expressed in ink or other indelible substance in a plain and conspicuous manner on the container or on a label or tag affixed or attached thereto, in terms of avoirdupois net weight, together with the name of the food contained and the name and address of the packer or of the agency responsible for the distribution of such packages. The net content weight shall be determined at processed temperature before freezing and be exclusive of all gravy, juice, or preservative, or moisture in excess of the quantity which adheres to the solids in a package due to molecular attraction under atmospheric pressure, and may be referred to or designated as net drained weight. Provided, however, that this shall not prohibit the incorporation for sale of gravy, juice, or preservative, under the conditions specified, with the named food, and provided further, that the net quantity of such elements is expressed in terms of liquid measure on the same container, label, or tag.

NOTE:—In the processing of frozen foods washing is, of course, essential. This recommendation, therefore, takes into consideration the reasonable moisture residue after proper drainage. It is, however, aimed against the introduction of extra or added moisture to increase weight. Moisture so added should be treated as adulteration and herein we find an apparent undivorcable relationship between quantity and quality. There are prevailing laws against such adulteration mainly enforceable by health and food officers. The regulation of sale of frozen foods would, therefore, seem to be an issue that should be jointly entered into by the quantity and quality regulating authorities to set up the proper control.

Prepared frozen foods, such as turkey or chicken with gravy, beefstew, lambstew, or other items wherein there is a combination of solids and liquids, present a difficult problem for treatment. Very questionable conditions exist in such items now on the market. It is the opinion of the committee that the solids in such packages should predominate. This does not presently prevail, as the liquids usually far exceed the solid elements in packages of this character.

Excessive moisture is the elemental factor that should and must be brought under control in the frozen food industry, and unless the processors and packers lend their full cooperation toward this they are simply "asking for" legislation that will force the issue.

Mr. Rogers. It has been customary to act on these recommendations as they are presented, although some of them can be disposed of in groups. How shall we proceed, Mr. Chairman?

(It was moved and seconded that the committee recommendation on Item 1, Frozen Foods, be adopted.)

Mr. Rowe (Federal Food and Drug Administration). Under the Federal Food, Drug, and Cosmetic Act, the quantity of food in package form must be declared; as we see it, it would be necessary to declare the entire amount of food in the package rather than simply the drained weight of the food. I think we all have in mind the objective of trying to stop the addition of water to frozen foods; but we feel that this should be done by means of standards.

In the case of a package of frozen fruit, we feel that the total weight of the frozen food and the syrup should be declared. However, in the case of fish, where there is a glaze, we feel that the weight of the fish should be declared and not the water. But to repeat, where the packing medium really consists of food, we believe that the total contents should be declared.

I notice that the report of the Committee refers to some such statement as "drained net weight". We in the Food and Drug Administration feel that "drained net weight" is ambiguous and perhaps confusing. Therefore we feel that, in general, the "net weight" should be referred to the total food in the package, that is, liquid and solids, exclusive of the wrappers. The term "net weight" then refers to the total food in the package, and the term "drained weight" is restricted to the weight of the solids in the package. For example, in the case of green olives in brine, we suggested a declaration of the drained weight and the industry has conformed to that. Olives in brine are now declared as "drained weight in ounces" or as "drained weight of olives in ounces," the brine not being considered to be food. But a declaration of drained weight in the case of a package in which the liquid portion of the contents is actually food—a syrup would be an example of this—would not be in conformity with the Federal Act.

Mr. Rogers. I think that just what the gentleman is proposing is what we are trying to overcome; I am assuming that he thinks that any consumable element in the package, whether liquid or solid, should be included in the net weight of the contents as marked. We had a case where a manufacturer took a few blackberries, made up a sugar syrup, poured it over the blackberries, froze it, weighed it, and sold it, marking the entire weight of the contents on the container with the statement "extra moisture incorporated." The customer paid for this when he was expecting to get a fair package of frozen blackberries. We took the matter up with the industry and were told that they could not do a thing with the manufacturer.

As I understand it, we can now include any consumable element when declaring net weight of contents. That abuse is the very thing we want to overcome. We contend that it is entirely reasonable to require that the drained weight be declared. If they want to incorporate syrups or gravies or other liquids, they can determine the liquid content and declare that.

Mr. Queen (Federal Food and Drug Administration). Mr. Rogers' statement indicates that he does not have an entirely clear understanding of our position with respect to the type of packing medium in frozen or other processed foods which may be considered as a part of the food in the package and therefore included in the declaration of the quantity of contents. Certainly no responsible member of the Food and Drug Administration has made the statement that a packing medium can be so considered and treated as a food, regardless of its composition or character. It is needless for me to say that no one outside of the Administration is authorized to speak for it on such matters. As Dr. Osborn has pointed out, we have considered as foods only those packing media that are customarily consumed, as distinguished from those that can conceivably be consumed.

Our position in this regard is one of long standing, having been expressed quite a number of years ago in public announcements under the Food and Drugs Act of 1906.

I should like to make clear our agreement with the views expressed here that the matter of regulating the proper proportion of solids and liquid in frozen foods is an important one. We believe that the problem, however, will require a more practicable approach than that provided by a simple net content declaration in terms of liquid and solid proportions of the food in the container, if it is to be satisfactorily solved. We question whether the machiney ordinarily provided by weights and measures laws is adequate to deal with this important problem. We believe that the inclusion of an excess of the packing medium in a food, whether it be water, a mixture of water and sugar, or other liquid ingredient, involves the more fundamental question of food adulteration, resulting from the substitution of another product for the one the consumer expects to receive. Such substitution, in whole or in part, we consider to be adulteration and, we believe, more readily amenable to the adulteration provisions of food and drug laws. It must be apparent that the simple requirement that the proportion of liquid packing medium and the solid material in a food package be stated on the label would not prevent or remedy such adulteration. On the other hand, the implied permissiveness of such a requirement might complicate enforcement of provisions dealing with adulteration of such products.

In our opinion the fundamental consideration is whether the food in the package is the food the purchaser expects to get and that which the packer professes to put into it, and whether the quantity of contents is accurately and informatively declared on the label.

Mr. Witt. I should like to go along with the Food and Drug Administration, but I should like to tell the Conference about the experience we had 5 years ago in the sale of packaged pickled herring. At that time the wholesale price of onions was about 10 percent of that of herring. One man conceived the idea of underselling his competitors by packing more onions in his package; of course, it was all edible food. The State of Wisconsin then did what Mr. Rogers' Committee is trying to have us do, by promulgating a regulation which required him to supplement his interstate label by a statement to the effect, "Net Weight of Fish____Ounces." Some packages contained as much onions as they did herring. So I should like to go along with Mr. Rogers' recommendation even in the face of these comments of the Food and Drug Administration.

Mr. J. T. Kennedy. I think we are dealing with a new industry, the members of which do not seem to agree among themselves. I think they need a housecleaning, but I think we should give them an opportunity to clean their own house; if they do not clean it, then let us clean it for them.

In the period of a year the Food and Drug Administration might find some answer to our problem. Personally, I agree with them that it is a question of adulteration. I think we should give the frozen food industry at least a year to do the housecleaning, and so I should like to see this laid over 1 year even though the people of the country are not being fully protected. I believe we can gain more by that method of operation. I offer that as a substitute for the motion before the Conference.

The CHAIRMAN. Is that acceptable to you, Mr. Rogers?

Mr. ROGERS. I will accept that.

(The Chairman then called for a vote on the original motion to adopt the Committee recommendation on Item 1, Frozen Foods; being in doubt on the voice vote, the Chairman called for a rising vote, which resulted in the motion being agreed to.)

The CHAIRMAN. Mr. Rogers, please proceed with the report.

Mr. ROGERS (reading):

2. DRIED FRUITS: Should be sold by net weight. When in package form the quantity declaration should be in terms of net weight only and no qualifying term or statement, such as percentage of added moisture, should be officially recognized.

NOTE.—Packers of dried fruits now incorporate moisture to preserve freshness. There is consumer acceptance and preference for such fruits so processed, mainly because of the shorter time necessary for table preparation. Moist dried fruits take little time to soak prior to cooking as compared with the completely dehydrated kinds. However, the fact remains that the added moisture is included in the net weight and becomes a factor that adds to weight losses through quick evaporation of the moisture content. Those pursuing the wetting practice apparently make no allowance for this by compensating with an additional amount of fruit to equal the percentage of moisture incorporated. To cite an actual example: A certain packer of prunes produced a package with a declared net weight of 2 pounds. When reweighed in stores the actual net weight was found to be only 1 pound 11⅜ ounces through a run of packages, and this was reasonably fresh stock. This packer included the statement "3% added moisture" in the container markings, probably to justify the weight loss that he knew would take place. It should be kept in mind that the consumer paid for the added moisture at the price of the fruit.

Your committee is, therefore, of the opinion that moisture added to dried fruits should not be included in the quantity declarations and that statements of moisture percentage should not be recognized in justification for weight losses through evaporation.

(Item 2, Dried Fruits, was duly adopted.)

Mr. ROGERS. A program item on Liquefied Petroleum Gases is scheduled for tomorrow. However, these are the Committee's ideas. [Reading:]

3. LIQUEFIED GASES (Butane, Propane, etc.) for household use: Should be metered and sold by cubic feet.

NOTE.—The several prevailing weight methods employed in the sale of these gases do not give the consumer adequate protection against deception and fraud.

The character of household usage would seem to place these gases in the category of public utility gases, and their treatment in relation to dispensing or delivery can, and justifiably should, be the same.

These gases boil at very low temperatures and readily lend themselves to the cubic foot basis of measurement.

This recommendation is confined to household service as this presents the most troublesome problem. For motor-vehicle consumption, developments are such as to make metering by liquid volume feasible without detriment to the consumer, and such method is now employed. Beyond this the committee presently makes no representations for other usages to which these gases may be subjected, as further study is needed of what these usages may be and the problems connected with them, which may make it impractical to apply other than a weight method of sale. Where the weight method is used, it is a fundamental necessity from the standpoint of proper quantity declaration that the tare weight of the containers employed be conspicuously and plainly stenciled or otherwise plainly marked in a reasonably permanent manner on each container unit.

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The Chairman. If no one objects to a particular Committee recommendation we shall go right on and then vote on a group of recommendations at one time. However, when the reading of a recommendation is completed, if any one objects they should make it known and then we shall vote on that one separately.

Mr. Roper. Since there should be a paper on this subject later on, it may be advisable for us to hear this before taking action on this proposal. In the State of Washington a lot of propane is sold through liquid meters; if it were to be metered as a gas all these meters in use will have to be discarded and replaced by other meters. The same situation probably exists in other jurisdictions as well.

The Chairman. That is something to be considered, but I believe that we should vote on this recommendation of the Committee at this time.

(Item 3, Liquefied Gases, was duly adopted.)

Mr. Rogers. In presenting Item 4, Thread, I may say that we had an opportunity last night of meeting with members of the industry on this subject; on some points we agreed with the proposals of the industry and on others we did not agree. We now recommend the following. [Reading:]

4. THREAD: Should be sold by linear measurement or by net weight, with an allowable tolerance not exceeding 3 percent.

The term "thread" shall be construed to mean sewing, basting, mending, darning, crochet, tatting, hand-knitting, or embroidery thread, made of cotton, flax, silk, rayon, nylon, or any other material except wool.

All spools, tubes, cones, bobbins, balls or skeins of thread should have the length in yards or the net weight in avoirdupois pounds and/or ounces, together with the name and address or symbol or registered trade mark or other positive identification of the manufacturer declared upon a conspicuous part of each such unit, by means of a label or stamp, or a tag affixed thereto.

When the net weight of thread put up on any container as specified is less than two avoirdupois ounces the sale and quantity declaration by linear measurement should be mandatory.

NOTE.—Woolen yarns are not included in this recommendation. This committee dealt with them as a subject in its report to the 1946 Conference. Sale by net weight for such yarns was recommended at that time. Linear measurement was not recommended because of the highly potential factor of stretch in wool.

This 3 percent tolerance is a moot question, because of the existing laws in about five State jurisdictions where they have treated this matter, and where they allow a 5 percent tolerance. We still have an open mind on it, but we believe that we are being sufficiently liberal and that the thread industry can in all probability meet a 3 percent tolerance. However, the Thread Institute wants to take this proposal back to the industry and find out whether there can be a general acceptance of it. The Conference could adopt it tentatively at least, with final action deferred until next year, but I think we should put the industry on notice that unless they can prove to us that they cannot meet a 3 percent tolerance we will let it stand.

The provision for marking in terms of "avoirdupois pounds and/or ounces" was inserted at the suggestion of the industry. On some spools a manufacturer may not be able to put his name, but he will be able to show his trade mark or symbol which will have been registered with the Institute, and we can learn from the Institute or from someone in the industry what these marks will mean.

Mr. Baucom. I would like to offer an amendment to the Committee's recommendation. I think very few of us allow any tolerance by statute, and in here we would be setting up a compulsory tolerance. In my State, we set a tolerance, the difference between perfection and execution, and there is a range in which the inspector can use his own discretion.

I propose striking out the words, "not exceeding 3 percent" and inserting in lieu thereof the words "the algebraic sum of the errors of ten measurements selected at random shall not exceed 1 percent, and no individual measurement shall exceed 5 percent." That will prevent any unscrupulous person from attempting to take any tolerance whatsoever because he cannot possibly anticipate which ten packages an inspector may measure. He will have to stay just as close as he can. The inspector can use his discretion, but he cannot go beyond 5 percent of any individual package.

The Chairman. Does anyone second Mr. Baucom's motion?

(There being no response, the Chariman declared that the motion failed.)

Mr. Bell (The Thread Institute). I would like to make our position clear, because the industry that is represented by the Thread Institute is a very large and widely spread industry. There are 115 manufacturers with plants located in 19 different States. In 1946, the estimated value of the thread products of this group was no less than $150,000,000.

The Thread Institute succeeded an association known as the Cotton Thread Association which was formed in 1916 principally to correct abuses in the marking of thread, not so much on the spools of thread used in the household, because they are accurately measured and properly marked, but spools used in the industrial trades, principally in the city of New York where there hundreds of garment manufacturers. It was in that latter group that unscrupulous dealers in thread began to give short measure and use inadequately marked spools, a situation which was eventually cleared up by the law passed by New York State in 1918; of about eight violators apprehended, some were fined and one was fined and actually sent to prison.

At the present time the Thread Institute has the same objects as the original association.

In February of this year, the New York State law was amended to include any synthetic material, such as nylon and rayon. We felt that the provisions of this law should be extended to other States, and we talked with Mr. Baker at Albany. He suggested that we should get in touch with your organization. That we did during the summer, and it was not until a week ago that we had official advice that this subject was to appear before this Conference. The members of the industry have not had an opportunity to consider a change in the tolerance or the fixing of the tolerance at 3 percent.

I, and the Secretary of our Institute, Mr. David Snyder, have done the best we could since arriving here in Washington yesterday afternoon. We met with the Committee last night and offered a few suggestions. But I feel that in fairness to this large membership of ours, located in 19 States, in four of which they have a 5 percent tolerance, the entire industry should have an opportunity to consider the provisions of this recommendation of your Committee.

I want to assure you that we have cooperated to the best of our ability in this brief time, but if you could afford us a year, as recommended by Mr. Rogers, in which our industry could have the opportunity of considering the terms for the reduction in this tolerance, we would be able to present a thoroughly considered case.

We would like to go further. We would like to cooperate with your Legislation Committee and draw up what we regard as a model thread marking law. That really was our object when we talked the matter over with Mr Baker. It is still our object.

We know that thread is of importance to every home, and to every factory. The thread industry is spreading rapidly to the West Coast. The fixing of new regulations would be timely, but I hope that some member who has the right to offer a motion will make the motion, more or less as advocated by Mr. Rogers, that this recommendation be left in suspension until a year hence so as to give the industry an opportunity to give the matter the serious and earnest consideration that it deserves.

Mr. Rogers. I believe that I indicated to Mr. Bell at our meeting that the Committee would be willing to give the industry the year that they have asked for, to decide whether or not to support the Committee recommendation; perhaps in the meantime they can show us sufficient reason for changing it. But we did want to obtain at least the tentative adoption of the 3 percent tolerance.

(It was moved and seconded that Item 4, Thread, be tentatively adopted, the question was taken, and the motion was agreed to.)

Mr. Rogers (reading):

5. OILS: Should be sold by liquid measurement based on the U. S. Standard gallon of 231 cubic inches and its binary submultiples. When put up for sale in sealed containers the net quantity of contents should be marked, such declaration to be based on marketing temperature of 15.5° C, 60° F.

NOTE.—Industries dealing in oils, package by weight in relation to volume, using the established and accepted temperatures given in this recommendation. The coefficients of expansion in oils apparently make this necessary when they are canned or bottled, and conversions at the stated temperature are employed to serve the purpose of satisfactory marketing.

(Item 5, Oils, was duly adopted.)

Mr. Rogers. Relative to the next item, considerable interest has been displayed in this subject, and the Committee thought that it should present something which might act as a guide. We do not attempt to draft legislation for you, but we want to help all we can. [Reading:]

6. LIQUID FUELS: Should be sold by metered measurement in quantities exceeding 50 gallons but not exceeding 3,000 gallons.

The term "liquid fuels" shall be deemed to mean and to include fuel in liquid form, which can or may be used for heating purposes; provided, however, that oils shall not be included if they possess a flash point of 105° F or lower, as determined by the Tagliabue closed cup tester, or a Saybolt Universal Viscosity at 100° F higher than 55 seconds.

Tickets of delivery should be provided and given to purchasers upon the completion of deliveries, such tickets to have distinctly and indelibly expressed thereon the date, the name and address of the seller, the name and address of the purchaser, the number of gallons sold or delivered, the grade of liquid fuel, and the signature of the person making such sale or delivery or his agent. Delivery tickets should preferably be processed by means of ticket printing devices attached to and coordinated with the meters used in the delivery of liquid fuels within the classification of the term as defined.

NOTE.—The range of quantities within which metering is recommended is in consideraton of conditions wherein this method of delivery is either not feasible, such as in sales of small quantities as in range oil, or where it is undesirable, such as in matters of contract where users of quantities exceeding 3,000 gallons on delivery prefer to purchase by tank or compartment lots.

This recommedation does not include gasoline or other liquid fuels of low flash point. Nor is it applicable to oils that do not readily lend themselves to metering, such as bunker C and others that require preheating for the purpose of delivery.

(Item 6, Liquid Fuels, was duly adopted.)

Mr. Rogers (reading):

7. FACIAL TISSUES: Your committee now proposes the following amendments to former recommendations in relation to this subject. This is an item on which action of the Conference was deferred last year.

(a) That facial tissues packaged for resale through retail outlets should have a unit count based on 100 and multiples thereof. Where the number of units in a package is less than 100 there shall be no limitations on unit count.

NOTE.—The industry opposes regulation of the number of sheets in a package, claiming it would work a hardship on both the industry and the consumer without any compensating gain.

It is difficult to agree on either premise as the economic benefits of standardization, to which this relates, have been quite well proven. It should speed up production, lower production costs, lessen production problems and result in savings to the ultimate consumer.

The recommendation applies to what may be termed the "family-size" package. In exempting small packages with sheet counts less than 100 units, the Committee feels it has given due consideration to the most controversial phase of former proposals wherein the industry does have a problem in connection with the production of packages on which there are established and stabilized prices for unit packages at retail, such as those selling for five or ten cents. This situation apparently does not exist in the larger packages where prices fluctuate and odd-cent values are common.

(b) Amend sheet size tolerance to read 0.25 inch in either or both dimensions of sheet, instead of confining this to one dimension only.

NOTE.—It has been determined that under actual manufacturing conditions the essential softness of sheets makes it impossible always to trim them as exactly as required by the original recommendations of this Committee and it is now felt that the indicated change is justifiable in fairness to the industry.

(c) The Committee recommends the following provisions against the slack filling of containers:

(1) The inner size of the cartons not to exceed by more than 3/8 inch in either length or width, the length or width, respectively, of the sheets as folded for packaging.

(2) The inner height of boxes or cartons not to exceed the height of the contents by more than 0.5 inch at 70° to 75° F temperature and 50 percent relative humidity for packages not exceeding 200 usable units. Where packages exceed 200 usable units an additional 1/16 inch in height for each 100 such units shall be allowed.

(d) A former recommendation of the committee relative to the folding of sheets is withdrawn.

NOTE.—It has been determined that different mills have different types of folding equipment which cannot be standardized and that in view of the committee recommendations covering "slack fill" the proposal in relation to folding requirements would appear to be unnecessary.

In relation to paragraph (a) of this item, the industry claims that what we propose is not entirely feasible, and suggests that a subcommittee of our Committee visit some of the plants and find out what the production problems are before definitely recommending packaging in multiples of 100 units. Perhaps you will wish to act separately on paragraph (a); if you think it should go under further study, the Committee will be agreeable.

(It was moved and seconded that paragraph (a) of Item 7, Facial Tissues, be tentatively adopted, the question was taken, and the motion was agreed to.)

Mr. Rogers. I think paragraph (b) of Item 7 is fair. There is a trimming problem in the factories. The machines are not always the same.

As to paragraph (c) of Item 7, the industry claims that the more tissues there are in a package, the more swelling there is as a result of high relative humidities, and the Committee recognized this factor. The values specified in subparagraph (c) (2) may be considered arbitrary, and we realize that some investigation may be needed to determine exactly what these values should be. The industry suggested that we allow ¼ inch for each 100 units, which would amount to a clearance of 1¼ inches in a box of 500 units; we feel that that amount is too much. So the Committee reduced the figure to what it was felt was adequate to avoid rupture of a package due to swelling of the contents. I suggest that this subparagraph be adopted tentatively only, until we learn whether or not its requirements can be met; the manufacturers are not sure and we are not sure either. The industry is willing to do it, and will make studies between now and the next Conference to determine if it can be done.

(It was moved and seconded that paragraph (b), subparagraph (c) (1), and paragraph (d) of Item 7, Facial Tissues, be adopted, and that subparagraph (c) (2) of the same Item be tentatively adopted; the question was taken and the motion was agreed to.)

(It was moved and seconded that, because of the lateness of the hour, consideration of the Report of the Committee on Methods of Sale of Commodities be discontinued at this point, to be resumed at the succeeding session of the Conference; the question was taken and the motion was agreed to.)

The Secretary. I have been asked to make two announcements.

The Committee on Resolutions will meet in Room 320 of this hotel at 8 p. m. on Wednesday, September 24, and members of the Conference are invited and requested to submit to Mr. Witt, the Committee Chairman, or to any member of the Committee, before Wednesday evening, any resolutions or suggestions for resolutions which they may wish to have considered by the Committee.

The Nominating Committee will meet in Room 320 of this hotel at 3:30 p. m. on Tuesday, September 23. The Committee Chairman, Mr. Campbell, wishes me to say that if any member of the Conference desires to make any suggestions in relation to nominations for officers of this body, the Committee will receive them for this purpose between 3:30 and 4:30 o'clock.

(At this point, at 5:15 p. m., the Conference adjourned, to reconvene at 10 a. m. Tuesday, September 23, 1947.)

THIRD SESSION—MORNING OF TUESDAY, SEPTEMBER 23, 1947

(The Conference reconvened at 10:10 a. m., J. F. Blickley, Vice President of the Conference, presiding.)

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON METHODS OF SALE OF COMMODITIES, PRESENTED BY JOSEPH G. ROGERS, CHAIRMAN, AND DISCUSSION THEREON—CONTINUED

Mr. McBride. Yesterday it was voted to adopt Item 1, Frozen Foods, of the Committee's recommendations. I believe there was some confusion, and that many of us who voted in the affirmative were of the opinion that we were voting on the subsequent motion offered by Mr. Kennedy, which was to lay this matter on the table until next year. We feel that in view of the fact that the Conference has accorded to other industries an opportunity, before final action is taken, to study the Committee's recommendations, since it was our intention to do so in the case of the frozen food industry, and since there was lack of understanding on our part as to what motion was prevailing at the time, I think it is fair that we ask for a reconsideration of that action, so that whatever we do, if we do get reconsideration, we will have clarity on it and the members will not leave here with confusion in their minds.

I move, therefore, that the Conference reconsider its action yesterday in relation to Item 1 of the Committee report.

Mr. Witt. I second the motion.

Mr. Rogers. I did not think it was a confused issue but possibly it might have been. But the Committee had in mind, in view of the fact that this subject had been treated at the 1946 Conference, that we had served notice on the food industry at that time that action would be taken this year.

If it is the consensus that the food industry should have more time, of course the Committee is not going to be opposed, but I think we all are agreed that something definite must be done in this situation. The quicker we can focus attention on it and get some action, the better off we will be. Do you have in mind that we can tentatively adopt it as we did in the case of other industries where we had a controversial question and let it lie over for a year?

Mr. McBride. That is the purpose. We had some able speakers here yesterday on the general subject of frozen foods and we learned from those speakers that a good deal of this problem is still in the development stage. Even Dr. Osborne is not yet of a mind as to what shall be done in relation to standards of identity, and by our vote of yesterday we are going beyond what their experience justifies. We have taken a final conclusive action in anticipation, and yet I feel that we do not fully know or comprehend the whole problem, and that this final action we have taken does not reflect, perhaps, what we would want to do if we had more complete information on the subject.

(The question was taken and the motion to reconsider was agreed to.)

Mr. McBride. I now move that the Conference tentatively adopt the recommendation as offered by the Committee on Item 1, Frozen Foods.

Mr. Kennedy. I second the motion.

(The question was taken and the motion to adopt tentatively Item 1, Frozen Foods, was agreed to.)

The Chairman. We will now proceed with Item 8 of the report of the Committee on Methods of Sale of Commodities.

Mr. Rogers (reading):

8. GARDEN SEEDS: Should be sold by avoirdupois net weight. Quantity should be marked when in package form.

NOTE.—A possible justifiable exception to this may be found in the sale of such seeds by a unit dip method at a specific single unit price to offset the prevailing racket in packaged seeds retailing at ten cents. Under a method or system of this kind the elements employed should have sufficient safeguards to render them satisfactory for commercial acceptance.

A number of States are permitting a system of this character to be used in their jurisdictions.

Now, we are not proposing any official recognition of the dip method. However, what has developed is that the people will get better treatment by the dip method than they will at the present time in buying seeds in packaged form, because there is a terrific racket in this seed business; you get a nice envelope with a nice picture on it, but nothing in it. States that have permitted use of the dip method do not necessarily approve the method; it is just a stopgap and something that may cure the racket.

Mr. Kalechman. This method will clash with the method we have in the State of Connecticut. Grass seed is being marketed in package form containing less than one-half ounce. Any package containing less than half an ounce does not have to be marked.

Mr. Rogers. This dip method shows up those smaller packages that are under half an ounce, where you are given very little for your money. You still would not have to mark anything under the half ounce.

Mr. Kalechman. I do not think it would be practical to weigh amounts of a quarter of an ounce or one-thirty-second of an ounce. You would be all day weighing.

Mr. Rogers. The whole trouble would be in getting the equipment sufficiently refined to weigh those very small packages you are talking about, but it could be done. That is the reason we subscribe to this weight method. As a matter of fact it is F. H. Woodruff & Sons, Inc., of your State that has this dip system. I think they have representatives here in this room now; perhaps they will explain the system.

Mr. Johnson (F. H. Woodruff & Sons, Inc.). I shall endeavor to give some clarification of this system which may be up for unofficial consideration. The method is simply a device through which the average hardware merchant or retailer can sell bulk seeds at a price of 10 cents per package. The method of selling them is a dip unit method. In the past most merchants were unwilling to handle bulk seeds because of the time element in selling them by weight. If the method of selling them by weight were used, it would mean that they would have to juggle back and forth, pour in and pour out, and the time consumed was not really worth it to them, so they have gone into the packaged means of selling seeds.

We can put into their hands this dip system which allows them to buy the seeds in bulk, paying a greatly reduced price, naturally, and sell them to the public at the accepted price of 10 cents a package, and allow the consumer to get between three and five times as many seeds for his ten-cent piece as he could get the other way. It is one method of doing away with the middleman and the profit in between. We have this system in use in a number of States in the country at the present time. We are at all times willing to discuss and demonstrate the dip method with any of the enforcing officers of the various States. In many instances, particularly when the States have the half-ounce law, we are theoretically breaking the law, but the fact that we do give the public so much more for their money has, I think, justified our use of it.

I shall be glad to answer any questions that you may have, with the permission of the Chairman.

A Delegate. Does not the unit of measurement vary with the seed?

Mr. Johnson. It does. We have color identification stickers for the seed jars; ten-cent stickers may be red, blue, green, yellow, or black. We also have dips with a red, blue, green, yellow, or black handle. You use the handle which corresponds to the color for the seed being sold, and you are absolutely assured of getting complete straight-away handling right through, with no danger of mixing up on it at all. All seeds bulk differently; that is taken into consideration in the price factor.

A Delegate. I notice in a lot of stores most of these seeds are put up in packages. I have never seen any place where they are put up by the man that sells over the counter. Do you know the percentage of what is prepackaged in the factory and what is packaged by the seed dealer?

Mr. Johnson. I would not want to give any percentage because I do not know. I think you will find that the prepackaged seed would be far in excess of the amount of seed sold in bulk over the counter.

Mr. R. E. Meek. I think it is most unfortunate that we should have a discussion about this method of sale of garden seeds. I think it is unfortunately true that the method is in violation of most of our laws, and if we give any approval to this method I do not see how we can reject other methods whereby they use the dip or measure seeds. I feel that this Conference should go on record recommending the sale of garden seeds by weight, and that no other recommendations should be considered.

The Chairman. There is nothing in the recommendation, I should say, to the affect that this dip method be adopted. It is just an explanation in the notes of a system that is in effect. Is that not correct, Mr. Rogers?

Mr. Rogers. That is true.

Mr. R. E. Meek. That is true. That is the reason I think it is unfortunate that the discussion came up, because there are other methods in the sale of garden seeds besides the method used by this company, and although we may look with full favor on this method, I do not know how we can permit others to use theirs and at the same time not use this method.

The CHAIRMAN. The recommendation is that garden seeds should be sold by avoirdupois net weight and the quantity should be marked when in package form. That is the recommendation of the Committee. The footnote to that is just an explanation of the systems that are in effect. If States have laws that would forbid that system, naturally they could not put that system into effect. Other States may have laws such that they are permitted to adopt that system. Then it is up to them to adopt it or not adopt it. Does that explain it?

Mr. R. E. MEEK. I said I was in agreement with the recommendation, but I think it is unfortunate that any consideration is given to this method, either by the Conference or by individual States.

Mr. ROGERS. I think for our own broad general knowledge, that as many things as we know that have happened in the commercial field should be brought to our attention, and that is the purpose here. Some of the States have not been brought into contact with this method; you have and we have. If we find that things have merit, we do not hesitate to say they have merit, but we are still strictly sticking to the principle of sale by weight in the proposal.

(Item 8, Garden Seeds, was duly adopted.)

The CHAIRMAN. Items 9 to 25, inclusive, are not controversial items. The recommendations here are the practices in effect today, so we should have no trouble in going through these quickly. Mr. Rogers will read them item by item, and at the conclusion of No. 25, I will entertain a motion for the adoption of Items 9 to 25, inclusive.

Mr. ROGERS (reading):

9. GRASS SEED: Should be sold by net weight, and when in package form should be so marked.

NOTE.—Some packers are using gross weight declarations on packages.

10. ANTI-FREEZE LIQUIDS: Should be sold by liquid measure.

11. POLISHES (liquid): Should be sold by liquid measure.

12. POLISHES (solid powder or paste): Should be sold by net weight.

13. STATIONERY (general): Items coming under the generally accepted term of "Stationery" such as Pens, Pencils, Pencil lead fillers, Paper clips, Erasers, Wire staples (except continuous wire for stapling), Labels, Tags, Seals, etc., should be sold by numerical count.

14. INKS: Should be sold by liquid measure.

15. SOAP (liquid): Should be sold by liquid measure.

16. SOAP (in cakes or bars): Should be sold by net weight.

NOTE.—The soap industry during the war was able to get exemption from weight requirements for bar soap, which concession it is understood was granted because of the moisture content in such soap. This concession appears to have been inconsistent when considered in relation to other industrials packaging essentials with high moisture content on a weight basis.

17. SOAP POWDERS AND FLAKES: Should be sold by net weight.

18. CLEANSING FLUIDS: Should be sold by liquid measure.

19. DETERGENTS (liquid): Should be sold by liquid measure.

20. DETERGENTS (solid or powder): Should be sold by net weight.

21. INSECTICIDES (liquid): Should be sold by liquid measure.

22. INSECTICIDES (solid or powder): Should be sold by net weight.

NOTE.—Items 10 to 22 when sold in package form should have the net quantity of contents declared by plain and conspicuous markings in terms of avoidupois net weight, liquid measure, or numerical count according to the classification in which they properly belong.

Where any package subject to weight stipulations contains any article other than the represented commodity itself, the quantity declaration shall be exclusive of such article.

We included that last provision because in some packages, such as soap powder for example, a towel or a wash cloth or some other item may be included. We want the package declaration to apply only to the essential commodity contained in the package. I think that is sound reasoning. [Reading:]

23. NUTS (except cocoanuts): Should be sold by avoirdupois net weight and when in package form should be marked accordingly.

24. QUANTITY MARKINGS FOR PACKAGED COMMODITIES: Should in all cases be applied to the outside wrappers of packages.

NOTE.—This can be invoked as consistent with the purpose of net weight container laws. It principally has application to gift-wrapped packages in which most failures occur in this respect. This was especially troublesome during the war years, and there can be recurrences due to misunderstandings by packers or merchants who sometimes decide for themselves that if the inner container bears a quantity declaration it is sufficient.

That applies where the package is prewrapped and the customer does not know what is inside. The inside box may have proper markings on it, but that does not serve the purpose for the person who buys the package already wrapped. [Reading:]

25. SECOND-HAND CONTAINERS FOR FRUITS AND VEGETABLES: When second-hand containers are used for packing and shipping fruits and vegetables, all names, addresses or symbols of previous packers or shippers should be removed before sale or re-use.

The provision may not sound important but it is very important. These packages are frequently reclaimed and used over and over again, and certainly the name of the previous user should be obliterated. The purpose here is to put packers on notice as to what they are expected to do.

(Items 9 to 25, inclusive, were duly adopted. The subjects of these items were Grass Seed; anti-Freeze Liquids; Polishes (liquid); Polishes (solid, powder, or paste); Stationery (general); Inks; Soap (liquid); Soap (in cakes or bars); Soap Powders and Flakes; Cleansing Fluids; Detergents (liquid); Detergents (solid or powder); Nuts (except cocoanuts); and Quantity Markings of Packaged Commodities.)

Mr. ROGERS (reading):

26. GENERAL RECOMMENDATIONS:

Packaged Commodities: The committee recommends revised thought on marking requirements especially in relation to foods that are packaged with high moisture content and others which, for economic reasons in packaging, can and probably should be exempted from net quantity markings at their source. This especially refers to such items as meats, cheese of certain types, fish, dried fruits with added moisture, and other commodities wherein it is most difficult, if not impossible, to control variables in the commodity itself or in the factor of shrinkage.

Developments in the processing of certain packaged foods would appear to make it advisable to require weighing at time of sale for many items of essential commodities. This can readily be accomplished by having the tare weight appear on the container, together with a prominent legend or statement that the package is to be weighed at time of sale to the consumer.

The work of weights and measures officers would certainly be lessened and the entailed problem of shrinkage loss eliminated or minimized by such procedure.

When net weight container laws were first established the field of packaged foods was of very limited scope. The evolutionary trend, however, has been such that we are now living in what may be termed "The Package Age," with virtually every known food essential being put up in containers of one kind or other. With this expansion it was only natural that complications would develop—and they have. It would, therefore, seem that we should attune ourselves to the changed conditions. Weights and measures enforcement work was never intended to be a bottleneck towards progress. Laws that served their purposes well at the beginning of this packaging era do not in many instances serve the same purpose now. Before this era began and essential foods were sold from bulk, the buyer did not stand the shrinkage loss. He paid for the exact quantity he received, weighed for him at the time of sale.

Our efforts to have the packaging industries incorporate excess quantities in food packages to compensate for shrinkage have mainly been unavailing, and while we endeavor to treat the quantity conditions of packages on their individual merits in each case, the so many factors that enter into proper and successful determinations influence the feeling that we should turn to a simplified method for such commodities that create problems beyond the human equation to solve.

Let us for the moment turn to some examples: Certain meat products are being processed in the very container that is passed along to the consumer. Certain items of fish are variable in sizes and weights. Certain types of cheese do not lend themselves at all to quantity declarations when processed and packaged. While it is true that all of these could be marked in some way, this would entail the individual weighing and marking of each unit package and it simply means that the labor costs of such operations would be passed along to the already overburdened consumer. We can well be sure that the packaging source will not assume it. What we propose here may appear as a radical departure from our accustomed usage of net weight marking requirements, but serious reflection we believe should influence the advisability of at least exhaustnig all the possibilities and treating troublesome commodity problems in the package field accordingly.

Date Stamping of Packages: Your committee recommends that the packaging industries generally should apply the practice of date stamping containers of packaged commodities and especially those subject to losses through evaporation of moisture content.

NOTE.—This would be an aid both to industry itself and to weights and measures officers in the settlement of controversial questions or complaints. It would be a factor for consideration in relation to packages that have remained in a merchant's stock for an unreasonable length of time, and would relieve packers of short weight odiums in many such cases.

Your committee in signing out this report under a tentative status does so with the right of individual or collective reservations by reason of which such changes may be made as deemed justified or advisable as the result of any subsequent presentations or proposals from those affected by or interested in what this committee now offers.

(Signed) J. G. Rogers, *Chairman*,
R. S. Ackerman,
C. D. Baucom,
J. G. Blickley,
J. A. Boyle,
L. R. Roper,
F. J. Young,
Committee on Methods of Sale of Commodities.

Mr. Rogers. That completes the report. This change in the system of marking packages appears to be radical, but if you analyze it, it is not so much so. There are commodities in our commercial structure today that could very readily go over to a weight-at-time-of-sale method. It is a very difficult thing to control. For instance, we are getting complaints all the time from receivers of meat from the packers, wanting to know why they have to stand shrinkage losses. We have often thought that the principle of weight at destination was certainly very much the better, because it represents the old condition under which all of us bought things when we went to any store; we bought it and it was weighed for us right then.

So this is simply for your consideration, and offered as a general recommendation that thought be given to it. You can take any final action and pick out today all the commodities in the commercial structure to which the principle might be applied.

Gentlemen, I am respectfully submitting this report of our Committee, and I want to thank you for the reception you have given it. I want to thank the Committee who worked with me. I hope we have accomplished something.

The Chairman. Being a member on the Committee on Methods of Sale of Commodities, I objected to Item 26. The main reason for my objection was that I do not think it is practical. I have made a personal survey of packages of this type. The intention of the industry is good but it is not carried out by the clerk behind the counter. Moreover, Pennsylvania law will not permit it; our Department of Justice has rendered an opinion that under Pennsylvania law, we cannot permit the sale of any packaged goods that are not marked as to net content.

Many other States can go along with this recommendation, which is submitted to you for your approval to carry out when you got back to your respective States or not to carry out. That is your particular individual problem in your State. However, it is the function of the Committee to make recommendations, and this recommendation is now before you to either accept or reject, and if there are no further discussions on the Item, I will entertain a motion for its adoption or rejection as you see fit.

(Item 26, General Recommendations, was duly adopted.)

The Chairman. We still have some unfinished business from yesterday's program. Mr. C. L. Richard, of the Livestock Branch of the United States Department of Agriculture, has asked for a few minutes.

REMARKS OF C. L. RICHARD, SUPERVISOR OF SCALES AND WEIGHING, LIVESTOCK BRANCH, UNITED STATES DEPARTMENT OF AGRICULTURE

Mr. Chairman and Gentlemen of the Conference: I sought this opportunity to address you today because I wish to discuss briefly a phase of your functions which is of particular interest to my organization. I wish also to solicit and encourage your cooperation with us in establishing and maintaining proper standards of weighing accuracy at livestock and live poultry markets which we supervise.

A Federal statute known as the Packers and Stockyards Act makes the Livestock Branch of the Department responsible for supervision over weighing facilities and weighing practices at some 200 livestock markets and 19 live poultry markets. Our regulations include a requirement that scales at these markets shall be tested periodically. I should like to make it clear that we do not provide the testing service or maintain test equipment. We simply require that tests be made by competent agencies, that they follow a definite prescribed procedure and that the test results be recorded in detail on special forms which we provide. When practicable, one of our field representatives is present during the tests.

In some instances these tests are made by railroads, scale manufacturers, or independent testing agencies. In others they are conducted by the State or city departments which you gentlemen administer. Some of you have occasionally expressed the opinion that our test procedure requirements are too severe, our test record forms too involved, and our tolerances too strict, but I think that these criticisms have been ventured without full realization of the special circumstances surrounding the use of these scales. Thus, for example, livestock has a higher dollar value per pound than any other commodity commonly weighed for sale or purchase on large-capacity scales; live animals do not comprise a dormant platform load but are generally in motion during the weighing operation; load drafts on a representative scale may range from a 70-pound calf to a lot of steers weighing 25,000 pounds. It is for these reasons that our requirements are special as regards test procedure, tolerances, and records of test results, and it is for these reasons that we desire you to cooperate by so conducting and recording the tests that we shall have complete and comprehensive knowledge of the scales' performance. You will be interested to know that the high standards of accuracy we have set for livestock scales, as represented by our special tolerances, are not too difficult to maintain; last year, in some 85 percent of the tests made at supervised livestock markets, the scales were found to be accurate within those tolerances.

With respect to testing of live poultry scales I am happy to inform you that generally we are receiving the active cooperation of the city sealers. There are one or two exceptions where city inspectors seem to regard a single application of one 50-pound weight an adequate test of a 500-pound-capacity poultry scale. In such cases, of course, we do not accept this as proper testing practice and must require the scale owner to engage some more competent testing agency, a situation which certainly reflects discredit upon the city sealer's office.

We plan to undertake shortly, under authority granted to the Secretary of Agriculture, investigation and tests of livestock scales used by packers to weigh slaughter livestock for purchase. In this program we shall seek your assistance and cooperation too. It is our plan to supply you with lists of the scales in your separate jurisdictions, request that you include them in your regular test schedules and supply us with copies of your reports on test results. Our field representatives will be instructed to cooperate with you and to witness tests whenever practicable. I may remind you, in this connection, that livestock and live poultry scales used at public markets in your jurisdiction, whether or not they come under the supervision of the Department of Agriculture, merit your special attention for they directly concern the interests of producers and others in your communities and they are of sufficient economic importance to justify regular and comprehensive tests.

That is the extent of my message to you. I wish to convey to you the official thanks of my Department for the cooperative service you are rendering and I trust that we may have your continued assistance in our efforts to properly control weighing at public livestock and poultry markets.

ADOPTION OF TEST METHODS BY THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

By R. D. Thompson, *Supervisor, Weights and Measures Division, Commonwealth of Virginia*

When our good friend Ralph Smith wrote us asking for suggestions for this meeting, I felt that the least I could do would be to "shell out" at least one suggestion. Hence, I proposed the topic which you now see assigned to me. I should have smelled a rat, but one only learns these things by experience. Having proposed the subject, I could not well refuse to discuss it when requested to do so.

My suggestion is that the National Conference form a Committee on Methods of Testing Weighing and Measuring Devices, and that methods be proposed by the Committee to the Conference for adoption or rejection in a manner similar to that followed by the present Specifications and Tolerances Committee and the Committee on Methods of Sale of Commodities. I believe that in certain instances the Conference has gone on record as adopting methods of test developed and recommended by the Bureau of Standards; specifically I refer to methods for testing fabric-measuring devices and taximeters.

Such methods as were adopted by the Conference could, in turn, be adopted by the States and should lead to a much higher degree of uniformity in testing and inspectional procedures throughout the country. It should be understood, of course, that the adoption and use of these methods by the States would be entirely optional.

At the present time it is well known that methods of test on the various devices vary excessively. Vehicle-tank calibration, for instance, in New York may be done in an entirely different manner from the method used in Virginia or Florida. It is my understanding that a committee of the American Petroleum Institute is now working with the Specifications and Tolerances Committee of the Conference toward developing a uniform method of vehicle-tank calibration.

The new weights and measures official is at a loss to find out the best method of testing many devices, without doing a great deal of research work. Such methods as were adopted by the Conference could eventually be incorporated in a handbook, which would be an invaluable aid to both weights and measures officials and inspectors and to scale and pump mechanics. The usefulness of such a handbook would, however, depend on its being expressed in language which could be readily understood by the average layman.

We must face the fact that while much of weights and measures work is of technical nature, most of the inspecting and testing is performed by men who are not technically trained. The use of appropriate pictures and illustrations throughout the book would add immensely to its value. No reflection whatsoever is intended on the very excellent Handbook H37, entitled "Testing Weighing Equipment" by R. W. Smith, which was published in 1945. This pretty thoroughly covers the testing of scales. However, we are still pretty much left without an authoritative source on many tests which we must conduct, such as calibrating vehicle tanks, test measures, test weights, and pretty much the whole field on measuring devices.

It is stated in the introduction to Handbook H37 that the Bureau eventually intends to publish a companion book to this publication to cover the testing of measuring devices. According to my information it may be some years before this book can be published, and in the interim I believe that a capable committee working with the Bureau could perform a real service in the field of weights and measures.

I find in studying over old reports of this Conference that almost everything I think of relating to weights and measures has been discussed at one time or another. It may be this proposal has been up for discussion before and dropped for some good reason. However, I would like to have the reaction of the group to this suggestion and some action taken upon it.

The SECRETARY. I have been asked by Mr. Kennedy of the District of Columbia to make the following announcement:

> At about 2 p. m. today in my office, Room 3117 Municipal Center, 300 Indiana Avenue, there will be a demonstration of the compensated spring scale for our department. Our new men have never seen this demonstration, and if there is anyone at the Conference who would like to view it, not having previously seen it, he is cordially invited to come to my office.

VEHICLE TANKS—A SYMPOSIUM

REMARKS OF JAMES E. MOSS, DIRECTOR, DIVISION OF TRANSPORTATION, AMERICAN PETROLEUM INSTITUTE

A year has passed since I appeared before you on behalf of the Committee for Uniform Calibration of Vehicle Tanks, the Joint Committee on Tank Truck Shipping Practices and the Central Committee on Automotive Transportation—all of the American Petroleum Institute—to present the reasons for our interest in the development of a uniform procedure for vehicle tank calibration.

At that time, I pointed out that the dislocations in the transportation of petroleum brought about by the war had resulted in a four-fold increase in the work performed by tank trucks in our industry, that the nature of this war work had, in addition, substantially broadened our experience both as shippers and carriers and that an important result of these war experiences had been the conviction on our part that a uniform procedure for the calibration of vehicle tanks was desirable. I stated at your last National Conference that "it was our feeling that implicit in this problem was a testing procedure recommended by an authoritative body as standard" and that I understood the National Conference had recognized specific procedures for the testing of certain types of measuring devices in the past.

I stated further: "We seek no relaxation in existing standards. On the contrary, we subscribe to a forthright consideration of the problem by authorities in this field. We believe that those authorities are the weights and measures officials of the country. We shall continue to cooperate with them toward a final solution."

We now wish to report to you the progress we have made during the past year.

Our Committee for Uniform Calibration of Vehicle Tanks first sought to inform themselves with respect to all papers relating to this subject which had in the past been published in the National Conference Proceedings. Accordingly, we requested Mr. R. W. Smith to furnish us with the references to these papers which we then photostated in sufficient numbers for our committee members. With the thought that a list of these valuable contributions to vehicle tank calibration may provide a convenient bibliography for others interested in the same subject, the list of the papers sent to our committee members follows:

PAPERS ON THE EQUIPMENT AND PROCEDURE FOR THE CALIBRATION OF VEHICLE TANKS APPEARING IN THE PROCEEDINGS OF NATIONAL CONFERENCES ON WEIGHTS AND MEASURES OF THE NATIONAL BUREAU OF STANDARDS

(Note on References: First No.=Conference Proceedings, Second No. =page)

(a) 1924 (17–94) Method Used in the Calibration of Vehicle Tanks in the City of Detroit, Michigan—George F. Austin.
(b) 1926 (19–57) The Measurement of Petroleum Products—Charles M. Fuller.
(c) 1930 (23–108) Testing Vehicle-Tank Meters—Francis Meredith.
(d) 1930 (23–112) Calibrating Vehicle-Tank Compartments by Liquid Meters—H. N. Davis.
(e) 1930 (23–115) Calibrating Vehicle Tanks by Large-Capacity Measures—S. T. Griffith.
(f) 1931 (24–41) Equipment for Testing Large-Capacity Meters for Petroleum Products—Charles M. Fuller.
(g) 1936 (26–104) Chicago Ordinance in Relation to Vehicle-Tank Meters and the Enforcement Thereof—James O'Keefe.
(h) 1936 (26–106) Air Elimination for Vehicle-Tank Meters—C. D. Baucom.
(i) 1936 (26–110) Portable Testing Equipments for Large-Capacity Meters and Vehicle-Tank Compartments—Walter G. White.
(j) 1936 (26–113) Same title as above—John R. Booth.
(k) 1938 (28–17) Demonstration of Fuel-Oil Meter-Testing Equipment of the City of New York—Alex Pisciotta.
(l) 1940 (30–71) Weights and Measures Regulation—Charles M. Fuller.
(m) 1941 (31–31) Testing Liquefied Petroleum Gas Meter Systems by the Gravimetric Method—Charles M. Fuller.
(n) 1941 (31–25) Air Elimination for Large-Capacity Meters—C. P. Griffith.
(o) 1941 (31–33) Vehicle-Tank Piping Design—Charles H. Engelhard.

The second concern of our Committee was to call on as many weights and measures officials in the States as they could conveniently reach in order to inform themselves on the experience and views of these authorities. This program included visits with 21 State officials located in 20 States. This schedule of visits is now nearly completed and our committee members have been impressed with the uniform courtesy and consideration they have received and the helpful suggestions which have been made by these State officials. On behalf of our Committee, I take this opportunity to thank all of those who have so generously assisted us.

You will be interested in the impressions we have received as the result of these visits and studies. They are two: First, the problem of producing a uniform procedure for the calibration of vehicle tanks is far more involved than we had anticipated; and, second, these complications are of such a nature that they probably cannot be resolved at this time by any single procedure or method.

These conclusions have convinced us that at this time the most effective contribution we can make on this subject should be of a general nature and that it should first be published in tentative form. We believe for example that several methods for vehicle tank calibration should be referred to and that the initial publication, at least, should be more of the nature of a useful manual on this subject.

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Our specific reasons for this approach to the problem are:

(a) We believe that an additional step should be inserted in the program to provide for a period of time during which we will be able to bring to the attention of all of those in our industry concerned with vehicle-tank measurement a practical working summary of the best methods already devised by authorities for the use of vehicle tanks and vehicle meters for purposes of liquid measurement. Briefly, we feel that some excellent work has already been done by your members on this subject. We do not believe that our people are familiar with it. We therefore conclude that this work should first be summarized and presented to them.

(b) We believe that the involved nature of this problem clearly indicates that, following the publication of a tentative description of methods for vehicle-tank measurement, there should be allowed ample time for trial of such methods and, above all, for the accumulation of comments and suggestions with respect to the individual procedures recommended.

(c) Finally, we believe that the importance of the subject is far too great to expose any part of the program to failure as the result of undue haste or impractical theories. We are certain that this deliberate approach will have both your approval and support.

We have, accordingly, developed the following outline of sections which we hope to complete in detail in sufficient time to submit, first to your Committee on Specifications and Tolerances, and finally to the Thirty-Fourth National Conference on Weights and Measures.

The outline we are at present working on is as follows:

Foreword.

Sec. 1—A brief history of the transportation of petroleum by tank truck (with illustrations).

Sec. 2—A discussion of the need for and problems of vehicle-tank measurement, especially from the viewpoint of the industry.

Sec. 3—The history of the specifications, tolerances, and regulations for vehicle-tank measurement as adopted by the National Conference on Weights and Measures.

Sec. 4—Vehicle Tank Measurement—specifications, tolerances, and regulations as adopted by the National Conference on Weights and Measures with notes on the practical utilization thereof by the industry.

Sec. 5—Vehicle Tank Calibration—an outline of currently accepted methods.

Sec. 6—Tank Vehicle Meter Calibration.

Appendix—Useful tables—gravity tables, etc.

In our opinion, a publication of the kind described above will be useful to the industry and will be interesting and of value to weights and measures officials. It will not recommend any single method of vehicle tank calibration but will pave the way for a standard procedure in the future if this seems desirable.

I repeat that, in the preparation of this publication, we must depend on your assistance and it must have your final approval. Our first concern is that it shall contain nothing inconsistent with the specifications, tolerances, and regulations for vehicle tanks adopted by this National Conference. Our second concern is that we may be able to secure your approval of a few specific and representative procedures for the calibration of vehicle tanks which may be set forth in detail in this publication.

One year from now we hope to be able to submit for your approval a tentative draft of this manual.

REMARKS OF ARCHIE T. SMITH, ASSISTANT STATE SUPERINTENDENT, DEPARTMENT OF WEIGHTS AND MEASURES, STATE OF NEW JERSEY

Before the advent of meters facilitating the delivery from tank trucks of the various products normally carried by the gasoline and oil industries, the weights and measures fraternity throughout the Nation had to pay very little attention to piping hook-ups other than to ascertain no liquid was trapped in the compartments or lines when the truck was supposed to be empty. All things being equal, our main concern was to apprehend the user of the false five-gallon measure, including those measures which were dented and not a few of which were badly dented deliberately.

When meters first began to appear on tank trucks some years ago, some weights and measures officials started to sit up and take notice, so to speak, but not too much notice at first. No department had suitable equipment to handle this innovation and the dealer who owned a meter was just way up to date. Then as the installation of meters began to spread, various departments started to procure suitable calibrating equipment and dig in to find out what it was all about. This of course took time. Complaints of short measure became more prevalent. We were all more or less new in this field of endeavor and had to learn the hard way. Many meters were tested many times and found correct, but still the short measure complaints rolled in and in many cases were directed against the same equipment which we had recently checked. I say "we" advisedly, taking it for granted all jurisdictions were up against the same problems.

Logically, then, if a given tank truck was supposed to be delivering short measure and we were certain the meter was correct there must be a joker somewhere in the piping hook-up. Investigation proved this to be a fact and the odium cast upon the meter was removed. It was not as easy as that sounds, however.

I was assigned to this type of work in 1939 and instructed to be on the lookout for "by-passes". I knew that pumps had by-passes to relieve the pressure when the nozzle was shut off, but didn't know about by-passes in the pipe lines. A comprehensive study had to be made of this situation. It meant rolling under each truck to trace every pipe line from its source, opening the numerous valves one at a time and in various combinations, and running tests to find out what happened in each instance. It was not long before the term by-pass meant more than just relieving pump pressure. As each one was discovered it was ordered removed and the lines plugged or capped as the case might be. Many hook-ups were uncovered whereby fraud could be perpetrated. Some were simple, while others were quite complicated, as I shall point out later by means of slides.

The coal dealers soon began to feel the pinch of the oil business and many of them jumped into the heating-oil game. Most of them knew little or nothing about the oil business to start with, but all seemed to have the phobia that the customer's storage tank must be pumped out about every so often to eliminate sludge and water.

I gleaned this information after questioning many tank truck owners as to why they ordered by-pass lines installed in their equipment. The answer invariably was, "I didn't; I simply ordered a tank truck piped so it would deliver the product and also be able to pump out storage tanks. My drivers operate the units. I don't know one valve from another". This was true in many instances. However, it did not take some of the drivers long to learn how to cheat the customer, pocket the proceeds from the sale of the stolen oil, and still show the boss correct figures.

It works the other way too, as witness the case where I was called in to check a meter which was supposed to be delivering 1,000 gallons for each 800 gallons shown on the meter, which would mean a 20 percent error in the meter. Investigation developed the fact that the regular driver was off sick and the new man had cracked the wrong valve and was by-passing 200 gallons of oil around the meter for every 800 gallons which went through the meter. Incidentally, the meter was found to be correct and the owner removed the by-passes then and there by breaking two lines.

Now, where do we go from here, you may ask. The path leads directly to the door of the Tank Truck Manufacturer; the big ones as well as the little fellows. I often wonder where they got their ideas for some of the hook-ups I have come across. Possibly some persons with a bent for making a big dollar submitted specifications for tank trucks which would lend themselves in that direction. Then again, they may have been designed for the dual purpose of delivery and suction work as I have outlined above, having no ulterior motive in mind. However, the fact remains that tank truck manufacturers do build equipment with certain lines and valves which readily lend themselves to the perpetration of fraud by those who are so inclined.

One oil dealer purchased a new tank truck to add to his fleet of three. Permission was granted for this dealer to make a delivery before the meter was calibrated. The truck was loaded and sent out with one of his experienced operators. After nearly two hours of experimenting the driver returned, having been unable to find the correct combination of valves to unload the oil through the meter. It developed that there were several tank truck salesmen after this dealer's business and their sales talk seemed to center on the number of valves each could furnish for a given sum. The order was given to the man with the most valves, resulting in the above confusion.

My inspection of this truck the next morning took considerable time. There was a maze of pipe lines and valves, including by-passes and several valves which had no essential duty whatever. They were just extra valves. The truck was condemned and returned to the manufacturer for removal of by-pass lines and unnecessary valves.

The deeper I delved into the pipe line situation, the more interesting it became. I started making rough sketches of the various types of hook-ups, and in May 1941, made three drawings: One, of the simplest legitimate hookup; one, of the simplest set of by-pass lines; and one, of the most complicated hook-up. A clever operator could make this latter hook-up do everything but talk. About a year or so later I came into possession of a set of blue prints made by one of the largest tank truck manufacturers in the country. Among these prints were some identical with my drawings as well as others with "Rube Goldberg" characteristics.

Believing the elimination of the vicious "by-pass" could be speeded up, our Department had these three drawings mimeographed and copies sent to every weights and measures official in the State of New Jersey. How much this helped I do not know, but I can say that trucks equipped with by-pass lines are a rarity in New Jersey today, and as each new one shows up it is quickly eliminated.

During the recent war an entirely different hook-up came into being on United States Army Air Force gasoline tank trucks. As some of these will no doubt get into civilian service through surplus equipment channels I shall attempt to explain briefly what we are up against.

To begin with, there is no gravity outlet, in fact, no outlet what ever on the underside of the tank truck as we know tank trucks in civilian enterprise.

A large housing at the rear of the truck contains an independent gasoline motor connected by gear shift to two pumps, one on either side. They can be operated independently or together as desired. Then there is a conventional meter and hose reel for each pump. The pipe lines run from the pumps upward to near the top of the shell, then through the shell and on to a point about midway of each compartment where they drop to within an inch or two of the bottom.

This suction hook-up was designed to prevent water from being introduced into the gas tank of any plane. Furthering this safety measure a segregator was installed on the underside of each compartment directly under the end of each pipe line. This consists of a chamber containing a valve and float. Water in a compartment would find its way into the segregator at the bottom and before the danger point was reached the float which would sink in gasoline would be raised to a point where a valve would close the end of the suction pipe preventing further use until the water had been bled from the segregator.

The Army requested the calibration of the compartments of these trucks. They had to be calibrated with water, of course, but they would not operate with water. The segregator took care of that. Making a long story short, each pump on the so-called 2,000-gallon units, (which, incidentally, fell far short of their rated capacities) had a 2-inch plug in the top and each truck was equipped with a suction inlet used to pump gas out of planes. A suction line was coupled to this inlet and a delivery line coupled into the top of the pump. The suction line was then introduced into a compartment through the dome. The delivery line being connected into the pump ahead of the meter prevented any water damage to that element.

The 4,000-gallon units presented a real problem as there were no openings in the pumps for a delivery line. However, this problem was solved by spotting a 2,000-gallon unit alongside the bigger tank truck and utilizing the motor, suction, and delivery lines of the smaller job.

When this method was advanced the Army decided to find out how other States had handled this work. We lost three days, all of which were spent in long distance Army phone calls around the country to no avail. Only one weights and measures official was located who had completed several of these jobs. I talked with him on the phone

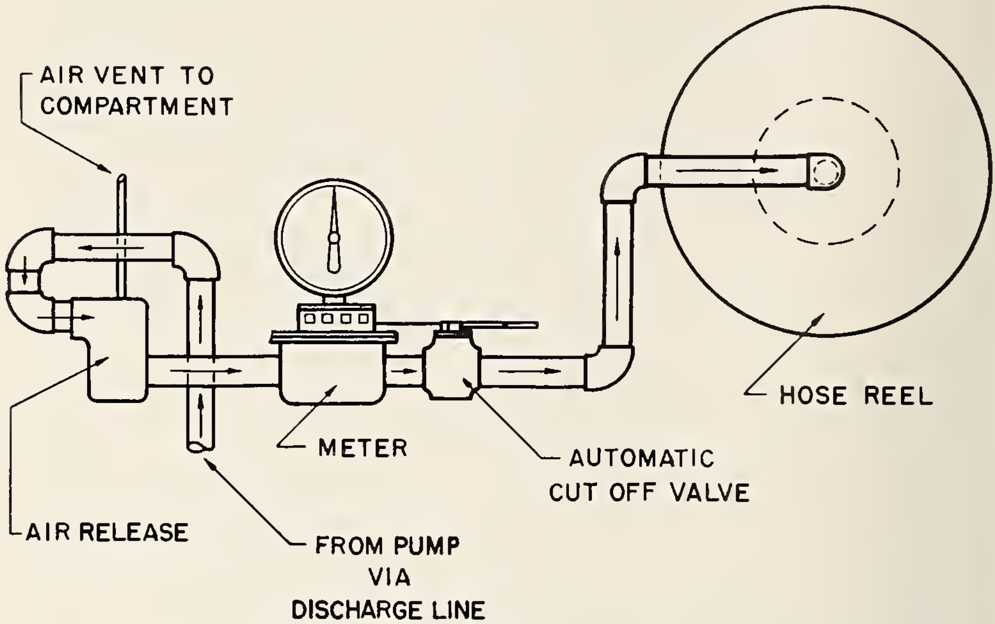

Figure 2. *A simple piping diagram for vehicle tanks.*

Arrows show direction of liquid flow.

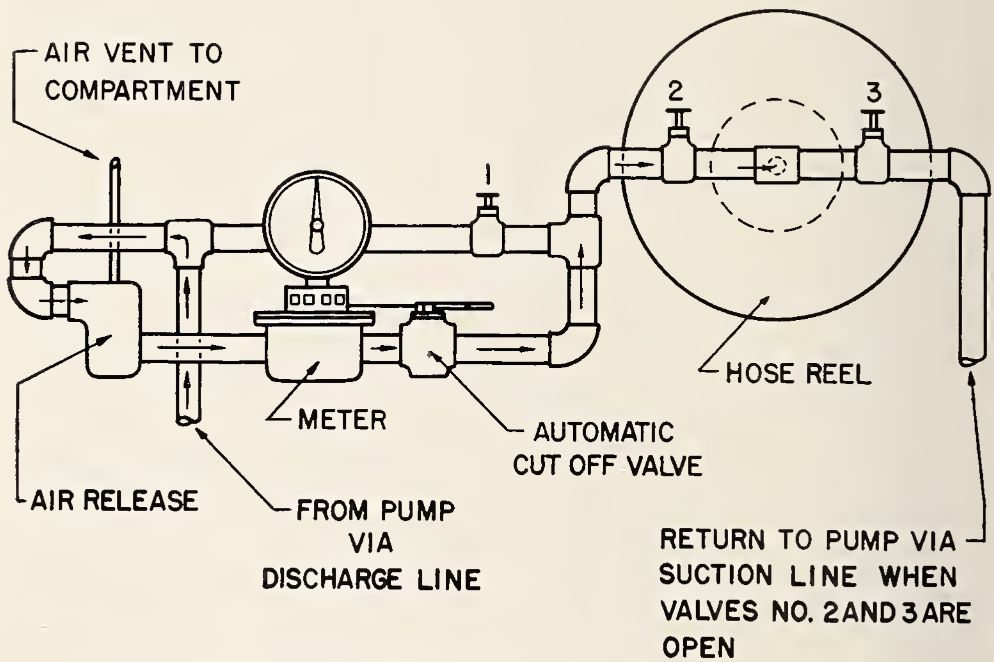

Figure 3. *A common "by-pass" piping diagram for vehicle tanks.*

Arrows show direction of liquid flow for a normal delivery with valve 2 open and valves 1 and 3 closed. Hose reel can be by-passed and meter registration will occur if valves 2 and 3 are open and valve 1 is closed. Meter can be by-passed and delivery made through hose if valves 1 and 2 are open and valve 3 is closed.

and by dint of much questioning on my part learned that he had calibrated these trucks with his standard 5-gallon test measure; that the capacities of each compartment were marked on the respective domes; that he had run 5 gallons of gasoline through each meter and certified to the accuracy of the capacity as noted on each dome. Incidentally the rate of flow as we found it was about 50 gallons per minute. Of course this method was given no consideration whatsoever and we were authorized to proceed with the work. Once started we received cooperation from all.

In closing I would like to point out that a few dealers have had occasion to use the by-pass lines for suction purposes. Those who have, are for the most part sorry they did it. The truck compartments had to be flushed out and meters had to be repaired. Storage tank clean-out work should be handled by independent equipment.

It is on this premise that I strongly advocate that a national code be drawn up regulating and standardizing tank truck hook-ups and recommend that each State enforce it.

(At this point Mr. Smith illustrated by means of slides, and described certain pipe-line hook-ups. See figures 2, 3, and 4.)

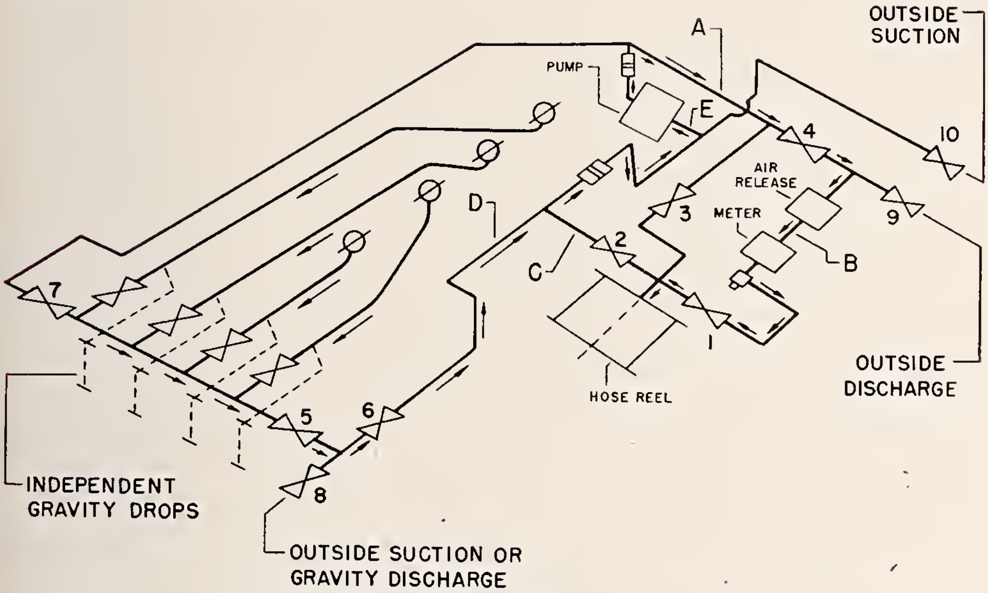

FIGURE 4. *An involved "by-pass" piping diagram used on some vehicle tanks.*

Arrows show direction of liquid flow for a normal delivery with valves 1, 4, 5, and 6 open and valves 2, 3, and 7 closed.

Liquid will register on the meter and partially by-pass the hose reel, passing through lines A, B, C, D, and E, if valves 1, 4, 5, and 6 are open, valve 2 is partially open, and valves 3 and 7 are closed.

Liquid will register on the meter and completely by-pass the hose reel if valves 1, 2, 4, 5, and 6 are open and valves 3 and 7 are closed.

Liquid will by-pass the meter and be delivered through the hose reel if valves 3, 5, and 6 are open and valves 1, 2, 4, and 7 are closed; partial by-passing of the meter will occur if valves 1, 3, 4, 5, and 6 are open and valves 2 and 7 are closed.

For outside suction through valve 10 to compartments, valves 7 and 10 are opened and valves 2, 3, 4, and 6 are closed.

For rear outside suction through valve 8 to compartments, valves 6, 7, and 8 are opened and valves 2, 3, 4, 5, and 10 are closed.

For nonmetered pump discharge through valve 9, valves 4, 5, 6, and 9 are opened and valves 1, 2, 3, 7, and 10 are closed.

For outside suction through valve 10 and discharge through valve 9, valves 4, 9, and 10 are opened and valves 1, 2, 3, 6, and 7 are closed.

For gravity discharge through meter and hose reel, valves 1, 4, and 7 are opened and valves 2, 3, and 6 are closed.

REMARKS OF ALLAN R. SMITH, EXECUTIVE SECRETARY, NATIONAL TRUCK TANK AND TRAILER TANK INSTITUTE

To the best of my knowledge, this is the first time that vehicle tank manufacturers, through their trade association, have been invited to take part in the discussions of the problems facing the officials charged with enforcement of weights and measures regulations. Needless to say, the National Truck Tank and Trailer Tank Institute, comprising the large majority of the manufacturers in the whole tank industry, welcomes the opportunity.

While not at a loss for words, for one could speak volumes on the subject, I nevertheless feel somewhat like the freshman Senator, newly elected to Congress, who comes to this teeming capital of the world, full of vim, vinegar, and fire, and yet is expected by protocol to observe, listen, and say nothing.

Regardless of protocol, however, there are some points about vehicle tank calibration from the tank manufacturer's viewpoint that should be of interest to weights and measures officials and I shall presume to bring out a few of these as I go along.

First, it is the wholehearted desire of all vehicle tank manufacturers to cooperate fully with the State and city officials, and at the same time with the oil companies, who are our customers. Over the years, many improvements in vehicle tank construction have taken place; some as a result of improved engineering on the part of the manufacturer; some as a result of demands by the oil companies for greater efficiency; and some as a result of improved regulations by public officials such as this group; and all with the end in mind that the general consuming public after all is the one who must be satisfied.

For example, heads of tanks are now manufactured so there is no longer danger of movement of any kind—they either have such a deep dish that they cannot breathe, or they are stiffened to a point that guarantees constancy of compartment capacity. Complete drainage is another point that manufacturers consider important and all have this in mind when tanks are designed and built.

Primarily, however, improvements in tank engineering and construction so far as the problems of weights and measures are concerned, rest with the operators of the equipment and the State and city officials who are in charge of this for the public welfare.

Tank manufacturers as a whole do not, I believe, feel that tanks they manufacture are measuring devices. On the contrary, vehicle tanks at the time of manufacture are considered only as containers, and it is not until they are calibrated and sealed as to capacity, after delivery to the user, that they may properly be considered a measuring device. There are good reasons for this viewpoint.

In most instances, particularly with the larger manufacturers, the vehicle tank is manufactured at one locality but delivered and used in any one of 48 States, or any one of hundreds of cities. It would be impractical for these tanks to be calibrated at the tank factory, particularly when the sealer at the point of delivery would require a recheck of the calibration before placing the unit into local usage.

Engineering of tank construction of course contemplates that the finished tank or compartment will be approximately of the size intended, and manufacturers hit the mark with surprising accuracy—usually within a few gallons of the desired total plus an expansion leeway. But this is about as far as the tank builder can go unless he enters into the tank calibration business. Thus far at least, most tank manufacturers feel that calibration is a matter to be handled by the oil company and the local sealer, with the tank considered only as a container up to the time it is calibrated and sealed.

We are happy that so much progress in standard methods of calibration and measuring has been accomplished, as evidenced by Handbook H29. We understand that more and more States and cities are adopting these standards, and this is good because standardization of practices is healthful to any industry and particularly in this case, where uniform practices can mean so much.

Without getting into details, it might be well to mention a few points about Handbook H29 specifications that have been brought to our attention by various tank manufacturers. These points perhaps are ones that the oil companies and the sealers already are considering, but they do present manufacturing problems where perhaps we can be of assistance.

Paragraph 5 of the specifications provides that a fill or inspection opening shall in no case be less than 7⅝ inches in diameter. In the farm trade particularly, where vehicle tanks have from four to six compartments with double bulkheads and a total capacity of 600, 800, or 1,000 gallons, with individual compartments often of 50 or 100 gallons capacity, for many years manufacturers have used a 6-inch fill cap, and in some cases even a 4- or 5-inch fill cap, and tens of thousands of these truck tanks are now in use and are continuing to be built. In considering the minimum size, it might be well to bear in mind that the smaller compartments on these truck tanks very often will not permit more than a 6-inch fill opening, especially when an expansion dome containing the handle mechanism is included. An 8-inch fill cap with expansion dome would be wider than the compartment width in many cases.

It has been suggested also that paragraph 5 be clarified as to the use and description of an adjustable indicator. In some areas, sealers apparently are insisting that an angle iron be welded to the tank and they refuse to pass tanks where the marker is a screw-threaded piece with sealing wire through a drilled hole to which the sealer's tag is attached. The permanent welded marker presents a real difficulty in that welding facilities are not always available at the point of inspection and sealing. From the manufacturer's viewpoint, the sealed screw-threaded piece appears adequate.

Another point is whether tanks should be calibrated with wet or dry lines. The majority of oil companies, we believe, prefer wet-line calibration, while the sealers, we believe, favor dry-line calibration.

From the tank manufacturer's viewpoint, wet-line calibration is preferred—not alone because larger size pipe lines permit a greater payload for our customers—but because it is not always possible to insure leak-proof emergency valves. A slight particle of dirt or foreign matter could hold the valve seat open and permit a small trickle from the compartment into the dry line. With a spring-closing type of valve, it is difficult to avoid this problem. It may sound strange for us to admit that there is a possibility of an emergency valve leaking slightly, but in defense we wish to point out that the primary purpose of an emergency valve is to prevent dumping a whole load of gasoline on a public highway in the event an accident rips off a pipe line. It is not so serious if only a very small amount escapes.

In commenting on the foregoing points, I have endeavored to confine the remarks to just a few problems that directly bear on manufacture of tanks. I realize there are numerous other points from the users' and sealers' viewpoints that need discussion and clarification. The oil companies and the sealers are at work on these, so there is only one further comment I should like to make.

I do not believe sealers have the same type of enforcement problem in the oil industry as may exist in other industries, such as in the corner grocery or butcher shop, where a thumb or a couple of fingers on a scale can reap an ill-gotten harvest for their owner, especially in these days of fancy prices.

The overwhelming majority of oil companies are reputable concerns, jealous of their standing in their community, and very conscious of customer good-will. I believe that the last thing any of them would want would be to have even the slightest whisper leveled at them of any irregularity in the way of inaccurate deliveries.

As already indicated in their committee report to you, the oil companies are striving to cooperate with you so that all may do a good job, and I wish to add that the vehicle tank manufacturers, individually, and collectively through their association, stand ready to lend their assistance whenever and wherever it may be needed.

In closing, I have a confession to make. When I circulated Handbook H29 Vehicle Tank Specifications to our manufacturers, I was surprised that a good many apparently had never heard of it. That may be my fault as association secretary; it may be their fault as individuals for not keeping abreast of what is going on; or it may be your fault in not publicizing it more fully. I'll take the blame this time, but I should like to ask that your organization keep us posted, not only on the regulations you agree upon nationally as a group, but also on the regulations that you adopt in the area under your direct jurisdiction. And as the regulations in the various States and cities become more uniform across the country, I am sure that the best interest of the public will be served.

REMARKS OF GEORGE E. CARPENTER, SUPERVISOR, DIVISION OF WEIGHTS AND MEASURES, STATE OF VERMONT

It has been a pleasure to me to listen to the preceding speakers on this symposium and to hear what they have had to say. For the benefit of the last speaker, I should like to say that it is quite evident that he has not met a great many of the truck drivers whom good oil dealers and distributors have to employ to go out and deliver their products to the consuming public.

Last April our Secretary canvassed our membership by letter for suggestions as to items we would like on the agenda for this Conference. Being much concerned over the situation in our State I suggested "vehicle tanks," as this subject appeared to need some constructive action as far as Vermont was concerned. This resulted in my being selected to secure the information that I desired and present it here for all to consider.

I should like to say right here that what is everybody's business is nobody's business at times. If you and I go out on the street and we see a building bursting into flames, we immediately make it our business by ringing the alarm, and that is the situation from which most of my paper evolves. My understanding of the worthwhileness of a conference of this nature is that it may serve as a clearing house for our problems and at the same time make for a more uniform and efficient procedure in the over-all picture of the enforcement of weights and measures laws and regulations throughout the Nation.

Accepting the task, I sent questionnaires to 49 jurisdictions with 12 questions asked, any one of which could be answered by "yes" or "no." The first 10 pertain to the handling of petroleum products, and Number 10 was really the $64 question. It is believed that all will be interested in the results of this canvas which includes replies from 43 of the 49 jurisdictions solicited. The ten original questions with the results are as follows:

1. Does your State require calibration of all tank vehicles transporting inflammable liquids?	Yes	24	No	19
2. Do you have centrally located calibration stations?	Yes	13	No	30
3. Do you use portable calibration units?	Yes	28	No	15
4. Is there any charge for calibration? If so, how much?	Yes	10	No	33
	From $.50 to $10.00 per M gallons.			
5. Do you have authority to regulate piping and valves on these vehicles?	Yes	28	No	15
6. Do you adjust meters if found out of tolerance?	Yes	21	No	22
7. Does your State require all petroleum products to be delivered through meters?	Yes	3	No	40
8. Are invoices required to accompany delivery?	Yes	21	No	22
9. Are printed meter attachments approved?	Yes	24	No	19
10. Do you have authority to prohibit the common use of a tank vehicle from hauling gasoline and other petroleum products at the same time?	Yes	9	No	34

Questions eleven and twelve had to do with the problem of metering of so called "bottled gas." Several States are recognizing the fact that this problem is soon to be with us, but none had any legislation on the subject when our questions were answered. Some had legislation pending.

Now may we return to the all important question No. 10, "Do you have authority to prohibit the common use of a tank vehicle from hauling gasoline and other petroleum products at the same time?" Nine jurisdictions answered this question Yes while 34 answered No. To me this looks serious for it means that the lives and property of many thousands of people in these 34 jurisdictions are threatened by the human element involved in the delivery of kerosene and fuel oil in these areas. Is it any wonder that newspapers are constantly printing stories of explosions of oil stoves and oil burners with resultant loss of life and property? It is true that familiarity breeds contempt and the carelessness of many people who handle gasoline without doubt contributes to the mounting number of explosions and fires to say nothing of the loss of life which sometimes occurs.

Seriously, there are 34 States where reasonable protection of life and property calls for action on the part of weights and measures officials or some other State agency. We suggest that weights and measures officials initiate action because it is our inspectors calibrating tanks and meters who first discover the carelessness and indifference of certain distributors. Some oil companies who have some splendid regulations for the protection of their customers and employees, are known to leave the question of whether pipe lines are properly cleared to the judgment of the truck driver, and many of these people are like the Irish hod carrier who had been told to take 12 bricks each time he went up the ladder. He shortly used up his supply so there were only 11 bricks left so he calls to the mason on the staging to throw 1 down to him. I have seen a four-compartment tank truck loaded with Hi-test gasoline, regular gasoline, fuel oil, and kerosene going out to make deliveries. I would not buy fuel oil or keresene from that dealer at any price and in my opinion that sort of procedure must be stopped. In Vermont we found that our State Fire Marshall had the necessary law authorizing him to regulate, and it was simply a question of his issuing a regulation prohibiting mixed loads and than enforcing the regulation. Further than this there are dealers who switch from hauling gasoline to fuel oil or kerosene. The driver is supposed to drain all lines and make sure that all gasoline is out of same before loading. Some one should be required to check on this. In this connection our State Fire Marshall is cooperating by issuing a regulation requiring a recorded check on draining operations whenever a vehicle is transferred from gasoline service to kerosene or fuel-oil service.

One State official replied to my question in the negative and then went on to say that in 40 years as a regulatory official he had noted hundreds of instances where contaminated kerosene had caused explosions and fires with the resultant death and destruction of property.

In any event these conditions offer an opportunity for a considerable number of us to perform a real service to our public.

One other question that should be elaborated upon to some extent is No. 6, "Do you adjust meters if they are found out of tolerance?" Yes 21, No 22. I know it is against the principle of weights and measures officials everywhere and for all times to be repairmen, but about half of us admit that we do the practical common-sense thing when face to face with a meter that is out of tolerance; it has an adjustment provided by the manufacturer, the truck is needed to deliver fuel to people who are suffering from the cold, and in many instances is the only means of delivery for miles around. We adjust it if we can, and seal, rather than to condemn. This practice provides a saving to the owner and the State, and a service to the general public.

In one instance, one of our inspectors came to a truck where the man had been ordered to shift from gasoline to kerosene. The outlets in those compartments were at the rear. The driver had set his truck so that the front end was the higher and he figured that he was draining his tank. The inspector asked him to come up on top and look down in. He had a gallon to a gallon and a half of gasoline in each compartment due to the pitch of his truck. He thought he had drained everything out and he was going to be loaded with fuel oil and go out and make delivery.

I want to take this opportunity to thank all of you people for your cooperation in furnishing the information requested and I hope that some one may benefit from same.

METHODS OF SALE OF ICE CREAM

By J. THOMAS KENNEDY, *Director, Department of Weights, Measures, and Markets, District of Columbia.*

Back in June, Mr. Ralph Smith addressed me a letter stating that somebody had requested further discussion on ice cream. Knowing that the District of Columbia went into this matter last year, he asked me to tell you what we did and what the result was, and he further said that we would have a discussion.

The Commissioners of the District of Columbia, the governing body of the City of Washington, appointed as a committee of three to investigate this subject, a member of the Weights and Measures Department, a member of the Corporation Counsel's Office, and a member of the Health Department. This committee held several conferences, the first of which was with a group of ice cream men representing about 80 percent of the industry locally. This branch of the industry was 100 percent against the sale of ice cream by weight. The next hearing which was held was a public one and those interested in this subject were invited to express their views. This particular hearing was not well attended nor were the retailers well represented.

Under the direction of the Commissioners, a public hearing was then held for the citizens of the city likewise to express their views. A large number of associations were represented at this meeting, together with representatives of the ice-cream industry, which was still practically 100 percent against the sale of ice cream by weight—only one company had gone on record as favoring such a change. Toward the end of the hearing, the ice cream representatives requested that the report be held open in order that they could give their side of the story to the individual citizens and civic associations. The request was granted. The ice-cream industry appeared at practically all citizens' and civic meetings held during the month of March, and upon invitation from the civic groups the Department of Weights and Measures was represented at twelve of such meetings. Being a government employee subject to certain rules and regulations, it was not possible for the representative of the Department of Weights, Measures, and Markets to seek approval of that Department's recommendation, nor was it possible for that representative to enter into any debate with the industry.

The Department of Weights and Measures felt that the proper way in which to sell ice cream was by weight, such sales permitting the consumer to receive what he orders and what he pays for. It also permits a retailer to sell honest measure, for it is practically impossible for a retailer to hand-pack a quart of ice cream into a 32-ounce liquid measure and have 32 ounces of ice cream in the box; all voids are not possible of elimination in hand-packing, thereby creating short measure. Selling by weight permits a retailer to sell practically all of the article that he buys; in other words, if he buys ice cream by the pound, he can sell practically all that he buys. This is not true when selling ice cream by liquid measure for it is only possible—and that only in cases where care is taken—to dispense 13 to 15 quarts out of a 20-quart can. All of these facts were laid before the meetings of citizens and civic groups which were attended by the Weights and Measures Department.

The manufacturers in their arguments maintained that the sale of ice cream by weight would in the end materially increase the cost to the consumer, this increase being brought about by the increased costs of operations, such as delayed deliveries, installation of new accounting procedures, reduction in the number of dealers that could be served each day, and the fact that retailers would be required to hire additional help to dispense such ice cream. The manufacturers brought in many technical reasons why they were against the sale of ice cream by weight, such as butterfat content, the lightest ingredient, being reduced in quantity and heavy sweetening increased, thereby increasing the weight of the cream but at the same time reducing the food value. It was also brought out by the manufacturers that the frozen custard industry—counter ice-cream manufacturers—would be so slowed up in dispensing custard that it would cause them to lose business and probably throw many of them into bankruptcy.

The net result of all these hearings resulted in about a fifty-fifty poll of associations—50 percent for and 50 percent against sale by weight.

The committee appointed by the Commissioners realized that to modify the law, it would be necessary to go before the Congress of the United States, and that without the backing of the citizens such action would not be justified. Therefore the committee recommended to the Commissioners that ice cream be continued to be sold by liquid measure rather than by weight, as public opinion was not sufficiently strong at that time to justify such action by Congress.

DISCUSSION OF FOREGOING PAPER

Mr. Rogers. Ice cream is a live issue. I think our main concern has been how to control the retailer. That is the reason for the public complaint. The public naturally wants full volume for what it spends. We had the greatest number of complaints during the war years when there was a restriction on manufacture. The volume was not there, but the fellows did get some stocks and they were stretching them.

It is an admitted fact that the industry has consistently opposed weight legislation. To be fair with both sides, we wanted to go into this subject rather deeply and we have done so with the industry. They are still opposed to sale by weight for a number of technical reasons that Mr. Kennedy has so ably presented.

But the industry itself has become alive to the fact that the situation is not clean, and it knows that among the retail dealers there is a great propensity toward gypping; so they offered to work out with us a method whereby we could lay on the desk of any judge the proper evidence, a method which they thought would suppress the gypping that is going on by the retail dealer and possibly relieve a lot of the pressure on us. Recently they presented to us for consideration or for adoption a container of special construction, with dimensions 13 by 15 by 18 inches. It is a container with an aluminum case, and a lining of balsa wood approximately an inch or an inch and a half thick for purposes of insulation. The idea was that if a weights and measures officer could utilize a utensil of that kind in picking up evidence, it could be made to stand up in court. Our trouble has always been that because of the characteristics of ice cream, one cannot make determinations which the judge will accept; he wants to see visible evidence. Placing visible evidence before him is a very difficult thing, because of the need for something to preserve that evidence.

Just before coming down to the Conference, we assigned a man to the field with this insulated container to see whether it had any merit. It will not hold any great number of samples,—possibly about 4 quarts—because there must be incorporated sufficient dry ice to preserve the evidence; the question was just how long we could preserve the evidence, and whether this would be sufficiently long to get our case into court.

We find that it can be done. On a run of 30 hours we found that up to 26 hours the evidence was preserved. In other words, we could go into a store and pick up a package of ice cream, cut it open and see if there was any tangible evidence of short measurement, and immediately fold it up again, seal it, and put it in the dry ice again and take it into court. We have not had any court action on it yet.

This experiment was simply to find out if this thing was effective, and we believe it will be effective. It is something for you fellows to consider. We are going to try it out now to see whether we can make it stick in court. We think it can.

There was one deficiency in the container itself. The judges want all kinds of safeguards set up because they bend over backward to give the defense the benefit of the doubt, so we had to provide a sealing lug on the box so there will be no opportunity at all of opening that box from the time we seal it until it gets into court.

The ice cream industry will cooperate with us. They will make it possible for us to go to any ice cream manufacturing plant with a box of evidence, and place it in their storage. They are just as anxious as we are to suppress the man who is giving short measurement.

Incidentally, we found out another interesting thing. In going into the records of costs to find out what the spread was between the wholesale price and the retail price, we found one instance in which ice cream sold wholesale for 49.5 cents per quart and dealers were selling it at from 80 cents to 90 cents a quart. So you can see that the dealer can realize something between 20 and 30 percent profit even when there is a shrinkage loss. There is no really logical excuse for the retailer to give short measurement, because we do believe the industry is giving the retailer a chance for a sufficient mark-up for the purpose of profit.

Mr. North (International Association of Ice Cream Manufacturers). Mr. Chairman and members of the Conference, we have a wealth of material here documenting our stand in opposition to the sale of ice cream by avoirdupois weight, but out of consideration for the members of this Conference, and realizing the time limitation, we are just going to highlight some of the facts we would like to leave with you people.

While the stand of the International Association of Ice Cream Manufacturers and the entire industry for which it speaks, is well known to most of the members of this Conference, we appreciate the opportunity to appear at this open forum and again register our reasonable opposition to the suggestion that the method of sale of ice cream be changed from volumetric measurement to avoirdupois measurement. This statement is submitted in behalf of our 875 company members operating over 1,900 plants in the 48 States and the District of Columbia. These members are manufacturing over 80 percent of all the ice cream sold at wholesale and over 75 percent of all the ice cream manufactured in the United States.

In making this appearance, we are assuming that your objectives are:

1. To recommend uniform regulations for the sale of a particular product which will adequately protect those who sell and those who buy. In other words, as a quasi-official organization you are recommending to the legislatures, and in some instances to the Congress, procedures which are designed to aid and protect the ultimate consumer and, at the same time, to aid and protect business. We could take no other position for, as public officials, you represent all of us.

2. Our second assumption, since you are men dealing with business constantly, is founded on the belief that whatever procedures you recommend must, of necessity, be practicable and workable. You would not penalize business by creating new methods of handling which multiply costs without giving commensurate advantages, and you would not penalize the consumer by devising procedures which offer no more protection than some practical statutes already in effect and which only increase the cost to the consumer of the product he wants to buy.

There is one statement made by Mr. Kennedy which I would like to refute. We do maintain that ice cream can be dipped and packed and that the consumer can be given adequate weight. At an expenditure of thousands upon thousands of dollars by the International Association of Ice Cream Manufacturers through its affiliate Ice Cream Merchandising Institute, we have gone to a lot of pains, and have done a lot of research work, to develop proper dipping and packing procedures. And now I am pleased to announce that we are holding open house and a new school for training ice-cream merchandisers under the various plans which will in turn go back to the dealers and properly educate the fountain personnel. This is one of the best equipped and most skillfully staffed schools that any industry can boast of, and we will be glad to see any of you people who may wish to see this school on the tenth floor of the Barr Building.

Before stating any of the general propositions that we hold to be reliable in opposition to selling by weight, I should like to make some very pointed observations after reading your tentative report which was presented to us previous to this meeting. In considering the sale of frozen foods, you recommend that foods strictly of liquid classification offer no apparent difficulty and should be sold by volume representations in terms of liquid measurement. You further state, and we quote:

> Ice cream, while sold by liquid volume, we believe cannot be construed as falling entirely within this classification as there is not as yet, to our knowledge, any legal decision as to whether it is a liquid or a solid.

We contend that ice cream is a liquid. The ingredients, with the exception of the sweetener, and sometimes the sweeteners, are all liquid. When put together in the form of mix, they are liquid. When the ice cream is drawn from the freezer, it is a liquid. No one would consider whipped cream a solid. It is only during storage in the hardening room and before ingestion that it assumes a transitory semisolid form.

You further state, and we quote:

The incorporation of solids in ice cream is one of the factors that makes this issue highly controversial.

We maintain that the solids, and we are speaking particularly of the milk solids, are in soluble form and a liquid. The fat solids in the dairy products in the mix are emulsions, and certainly they, too, are considered by chemists as being a liquid. The only time solids are not either soluble or emulsified occurs when pieces of fruits, confection, or nuts are incorporated into the formula. This will offer no difficulty because it occurs, as a matter of statistics, in a small percentage of our products.

Secondly, your standards for frozen foods where solids are predominant, call for drainage and ask that the weight be based on the original drained weight of the solids. This, obviously, we could not do in ice cream.

We further submit that the Federal Food and Drug Administration, which certainly has quasi-judicial power, states that ice cream shall be stated in liquid measure, the customary measure called for by consumers themselves, conceding that ice cream shall be treated as a liquid. This appears in the present Federal regulations, Section 404.

We, therefore, submit that consistency in dealing with frozen foods and in determining classification requires that ice cream be considered as a liquid.

Our general opposition to the proposal to sell ice cream by weight can be reduced to four categories:

1. It does not meet the test of practicability.
2. It would unfairly restrain the ice cream industry in its competitive markets.
3. It would not best serve public interests.
4. It would be impossible of effective and impartial enforcement.

Following Mr. Rogers' statement, I should also like to say that the members of our Association have been constantly trying to improve the standards of the industry. We are as vitally concerned about protecting consumers as you are.

The action of our Board of Directors in adopting a resolution calling for a double standard in the statutes should be convincing evidence of our cooperative attitude. We suggest and will support legislation in any State or political subdivision which would control overrun by making it mandatory that the minimum weight of ice cream be 4.5 pounds per gallon. That should certainly offer sufficient protection to any dealer and the consumer. As a second part of this standard, we would work for the adoption of a statutory provision to assure proper food value in ice cream by making it mandatory to have a minimum of 1.6 pounds of food solids in each gallon. Certainly, these statutes are capable of impartial enforcement. This is adequate protection for the consumer.

This, gentlemen, is the official position of the International. It is a position that has the support of most of the State Departments of

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Agriculture. It is a position which will assure that the job you want done will be done. We might add, also, the job we wish to have done, for from an ethical standpoint we abhor any practice which does not give the consumer both the quality and the quantity of our product that we feel it deserves; this is, of course, in addition to the requirement for contents declaration by the Food and Drug Administration.

We think it is very significant that in 1927, and again in 1936, your group, after an extensive discussion by the committee on the procedure in sales of commodities, showed by vote their disinclination to suggest that ice cream be sold by weight; that last year without specific discussion and in an omnibus resolution, this group voted to encourage efforts to obtain weight legislation. We submit that the arguments and the circumstances in this discussion have not changed.

In closing, I want to tell you that the International Association, acting as spokesman for the ice-cream industry, does much to encourage the production of quality ice creams, promotes research, and conducts educational campaigns on the nutritional value of ice cream as food. We also encourage ethical practices by our members throughout the industry. If we felt that selling by weight was feasible, that it was a progressive measure, we would be the first, not the last, to encourage the inauguration of such sales procedure.

The subject has been seriously considered and completely discussed for over two decades, and the open-minded leaders of this industry have been unable to reach the conclusion that selling by weight would be a workable trade practice and have found the disadvantages so preponderantly overweighing whatever slight advantage might be gained, that it could not successfully be undertaken by the members of the industry.

Mr. Kalechman. Mr. North, is it a matter of fact that the better grade of ice cream is lighter in weight than the poorer grades of ice cream?

Mr. North. It is a matter of fact. Some of the ingredients in ice cream which are most expensive and rich are light in weight.

Mr. Kalechman. Is it not a matter of fact that most of your manufacturers of the better ice creams are opposing this method of selling by weight only for the reason that the poorer ice cream manufacturer can undersell them.

Mr. North. The answer to that is emphatically "No." As a matter of fact, weight has nothing to do with the quality, and I might urge upon you to consider the fact that the Federal Food and Drug Administration will probably next year set minimum standards of identity, and, as a matter of fact, most of the States have them.

Mr. Kalechman. That is the reason they do not want to sell by weight. If you compare the poorer ice cream and the French ice cream, you will find a difference in weight.

Mr. North. Surely. But let me point out that the majority of our members are producing all types of ice cream and they are as much opposed to selling by weight as any other group.

Mr. Kalechman. I think that you people want to sell by volume now until the Federal Food and Drug Administration has provided for the making of uniform ice cream.

Mr. North. The Federal Food and Drug Act requires that we sell by volume at the moment.

Mr. KALECHMAN. You just made a statement that your Association has endeavored to have adopted a standard of identity.

Mr. NORTH. That has nothing to do with the volume at the moment.

METER TYPE GASOLINE PUMPS

By C. P. GRIFFITH, *Vice President in Charge of Engineering, Bowser, Inc.*[7]

I will endeavor to explain the construction of the Meter Type Gasoline Pump and also demonstrate the functioning of some parts of this equipment.

Let me say at the start that all present day meter type gasoline pumps are very much alike in principle. All manufacturers have component parts, such as meter, air eliminator, pump, motor, computer, discharge sights, etc., which when they are assembled together serve one purpose only—and that is the correct measurement of gasoline.

Let us use this diagram in order to examine the operating principles of a gasoline pump. If we have a clear understanding of this diagram we can apply the same principles to all makes and easily understand how each one operates.

We begin at the bottom of the system with a foot valve submerged in a tank full of gasoline. Instead of a foot valve, an angle check valve may be used at the top of the tank. It makes no difference because this valve has no relation at all to the accurate measurement of a gasoline pump. That may seem strange to anyone who has been accustomed to consider a foot valve, or an angle check valve, as a part of the measuring function.

Ever since 1932, when all gasoline pumps were required to have air eliminators, a foot valve or an angle check valve has had no bearing whatsoever on measurement. A modern gasoline pump must measure accurately with or without either of these valves. In a modern pumping system these valves serve only one function—keeping the line primed to prevent the delay that would occur if the pump had to reprime the line each time before serving a customer.

The gasoline pumping system consists of an electric motor and a pumping unit hooked together, usually by a V-belt. As we close this switch we energize the motor and start the pump. Positive displacement pumps are always used for this purpose. When they start operating, they must pump liquid. It is obvious that if we close this switch before we are ready to serve gasoline, the pumping unit will operate but will not be able to pump any gasoline. Therefore, we must provide relief for the pumping unit before we open the nozzle and again when we suddenly close it.

It is customary in all pumping systems to provide this relief by using a by-pass valve at this point. A by-pass valve is a check valve with a spring load to hold it on its seat. The pumping unit must pump against the spring load in order to relieve itself, and if you will follow the arrow in the diagram you will note that the relief from the by-pass valve goes back into the suction side of the pumping unit. When the pumping unit starts to operate against a closed system, such as we have before the nozzle is opened, it gets its relief by forcing

[7] Mr. Griffith supplemented his paper by a demonstration with a retail dispensing unit specially fitted with gages to show conditions prevailing in different parts of the system nnder different operating conditions.

the gasoline against the spring and back into the suction side of the pumping unit. This provides a circulation of gasoline which is called "by-pass action." The setting of the spring on this by-pass valve determines the pressure which we will have available. Most manufacturers set their by-pass valves 4 or 5 pounds higher than the pressure required to energize or operate the entire system. As a result it is easier, when we open the nozzle to serve a customer, for the pumping unit to force gasoline through the system than it is to hold the spring open. As soon as we close the nozzle, which eliminates relief at that point for the gasoline, the pumping unit then opens the by-pass valve and the liquid circulates in by-pass action until we shut off the motor.

The liquid pumped from the underground tank may contain air or vapor. Perhaps there is a small leak in the line which introduces air into the suction side of the pumping unit. Any air or vapor that may be entrapped in the liquid must be removed, so the air separating chamber is the first place to which the pumping unit delivers the liquid. The principle of air separation is quite simple. If we poured liquid rapidly into this 5-gallon bucket, the liquid would foam. In order to get the air and vapor out of it, we could let it settle for a few seconds. The heavy, pure liquid would remain in the bottom of the bucket while the air or vapor would rise to the surface. Gravity takes care of that. We use the same principle in the air separator which is built into every gasoline pump. The only difference is that we do not take a definite quantity and allow it to settle and then use it. In an air separator, settling is a continuous process and this is the way it is done.

You will note that the discharge pipe from the pumping unit is an ordinary piece of pipe—1-inch diameter is customary. The pipe on the discharge side of the air separator unit is the same size and leads into the meter. However, the area or cross-section of this air separating chamber through which the gasoline passes is very much larger than the cross-section of either of the pipes. We will assume that the liquid is entering this air separator chamber at a velocity of 12 gallons per minute—the average speed of a gasoline pump. As the liquid enters the large cross-sectional area of the air separating chamber, the velocity is greatly reduced or retarded. When it goes out the other end of the air separator, it picks up its original velocity. It is during the period of retarded velocity, which we might consider as a momentary coming to rest, that we use the same principle of air separation that we would find in this 5-gallon bucket. In other words, the air-bearing liquid will always be at the top of the chamber and the heavy, air-free liquid which we want to use will always be at the bottom. If we were to suddenly freeze the contents of an air eliminator we would find an infinite number of layers of liquid varying in density from pure liquid on the bottom to pure vapor at the top. Our problem is solved merely by discharging to the meter from the botton of the air eliminator where we are always assured of air-free liquid.

Now, what do we do with the air-bearing portion of the liquid or the vapor that accumulates? You will note that at the top of an air separator chamber we have a small orifice through which we constantly drive off the upper layers of liquid that may contain air or vapor. In early pump practice we used to pipe this back to an underground tank where the liquid was salvaged and the air and vapor went out through the vent. That was an expensive practice and required the laying of a return line for every pump installation; we decided instead to put a small tank right in the pump housing, such as you see here. This sump, or small tank, receives a constant flow of liquid, air, and vapor from the upper part of the separating chamber whenever the pumping unit is in operation. The liquid settles in the sump chamber and the air and vapor go out through the vent. When a sufficient quantity of liquid accumulates the float valve raises and allows it to go back through this pipe into the suction side of the pump. With this arrangement the liquid is salvaged in the pump rather than in the underground tank.

Note particularly that this sump-chamber valve can let air into the suction side of the pump if the valve is not seating. The vent is open to the atmosphere and if this float valve were to remain in an open position for any reason, it would be far easier for the pumping unit to draw air from the atmosphere than it would be to raise liquid from the underground tank. A good mechanic will always check the operation of the float valve when the pumping unit fails to deliver liquid, because air introduced at this point could be the entire cause of difficulty.

We can assume that the gasoline leaving this air separator chamber is free of air and vapor. Next it goes into the meter. Meters in gasoline pumps are all of the displacement type. The movement of each piston through a defined stroke—pushing ahead of it a definite quantity of liquid—causes the series of displacements which are responsible for the term, "displacement meter."

I would like to have you think about the meter in a gasoline pump in a new light. Actually a meter is a hydraulic motor which drives a clock mechanism.

The movement of the meter mechanism is caused solely by pressure of the liquid coming into it. One revolution or cycle of the meter represents a definite amount of liquid.

The chart shows a drive shaft coming out of the top of the meter, which is coupled directly to the computer. The computer indicates the amount of liquid delivered in gallons and tenths of gallons, also its money value in dollars and cents. The computer also records, for the use of the operator, continuous records of gallons and money.

The meter is the most important of the several component parts of these units. The meters in use today have now been on the market for many years; they have been modified slightly, as experience has indicated the necessity for such modifications, so that today the modern meter type gasoline pump has definitely proved to be far superior to the other types of measuring pumps formerly used for this purpose.

The gasoline leaves the meter free from air and vapor and next goes through a combination check and pressure outlet valve, or what some manufacturers choose to call a pressure regulating valve.

The location and construction of this part of this device is not the same on all pumps, but we all accomplish the same purpose—in that we have to keep this part of the system under pressure, and also guard against excessive pressures.

The functioning of this valve is not very clear to many people, and I am going to take some time to explain its purpose, because it is one of the most important parts of a system when it comes to keeping discharge sights full at all times, which is necessary for accurate performance. You will note from the diagram that we have a hose and nozzle on one end of an inverted U-tube with a sight glass at the top of that tube. The other leg goes down this pipe. Now let's disregard for a minute this pressure regulating valve. The lower leg of the U-tube on the left end is submerged in the liquid in the air separator. Thus we have an inverted U-tube completely filled with liquid, closed on one end by the hose nozzle, and closed on the other end by a liquid seal. This would never empty if we handled water. In the handling of gasoline we have to take into consideration the characteristics of the liquid and the purpose for which the system operates. Gasoline is not a stable liquid. If we subject gasoline to a vacuum, to a subatmospheric pressure, or to higher temperatures, we vaporize the lighter ends of the gasoline which are more volatile and which are necessary for easy starting of an automobile. We must remember that every time a molecule of gasoline turns into vapor it increases in volume 14 times. Now with this in mind let's examine again this inverted U-tube that we have in gasoline pump construction. Gasoline is contained between the end of this nozzle and the end of the leg that is submerged in the air separator. Let us suppose it is a warm day. At atmospheric pressure part of the gasoline would begin to vaporize and since the sight glass is at the highest point of the system, the vapor bubbles would find their way into the sight glass and would give the appearance of a void or leak-back. In reality it is a collection of vapor that has been created in the gasoline. Every molecule of vapor has to push 13 molecules of gasoline out of its way so we would have a condition like this: The vapor couldn't push the gasoline out of the end of the hose because it is closed off by this nozzle. There is only one place it could find relief and that would be through this left leg of the tube and back into the sump chamber and eventually out through this vent. The first customer who came in after that vaporizing condition occurred would be short measured inasmuch as the vapor condition would be on the discharge side of the meter. Gasoline pump engineers, in order to overcome the possibility of short measurement due to vaporization, take advantage of the fact that the same gasoline which would vaporize at atmospheric pressure, or at a slightly higher temperature, can be held under pressure without any vaporization occurring even with a temperature rise. They put a check valve in the system near this point. The purpose of this valve is to trap gasoline between the valve and the end of the hose so that it is always under pressure. This prevents vaporization. It is obvious that if we trap gasoline in a confined space, and the temperature rises abnormally, it would be possible for us to build up a tremendous pressure due to the expansion of the gasoline. In fact, it would be great enough to burst the hose or the sight glass.

In order to guard against these excessive pressures all manufacturers provide some type of pressure relief valve, which allows for returning a very minute amount of liquid back to the air eliminator. It will be obvious from this that we are dependent upon the correct functioning of valves to keep discharge sights full at all times.

This diagram applies to every make of gasoline pump. As you compare a pump with this diagram you may find that the pressure regulating valve is on the inlet side of the meter rather than the discharge side. It may even be built in as a part of the air separator chamber body. In most pumps this sump chamber is usually combined with the air separator body into one casting. These are matters of engineering choice. If you understand the principles of this diagram, you will understand the operation of any make of pump.

Now we shall consider a gasoline pump and tank connected for actual operation. This is an ordinary gasoline pump without housing or trimmings. Several gages have been placed on this pump so you can see what happens under varying conditions. This large gage on the left is a vacuum gage graduated in inches of mercury. This large vacuum gage on the right is connected in parallel with it but the readings are translated into equivalent feet of lift. Equivalent feet of lift is important to us as pump mechanics because it provides an easy way to determine if we are lifting gasoline higher than it is practical to lift it. The smaller gage above the vacuum gages is a pressure gage connected to the discharge side of the system. By that gage we can note the by-pass pressure and the operating pressure.

I would now like to demonstrate this gasoline pump.

This is a standard piece of equipment modified slightly for this demonstration so you can see what is taking place. It is mounted on a combination base and storage tank. The liquid being used is a dry cleaning solvent, having a distillation range of approximately 190° to 415° F. You will see that it is considerably more stable than gasoline but it serves our purpose very nicely and we avoid the fire hazard that would be present if we attempted to use gasoline.

We have added two pressure gages; one shows inlet pressures to the meter and the second one shows hose inlet pressures. We also have two vacuum gages; the one on the left reads in inches of mercury and the one on the right has been equipped with a special dial face reading in feet of lift.

The float chamber which is normally used with this pump is a separate cavity in the air eliminator, but for this demonstration it is incapacitated and we have constructed another float chamber having a glass cylinder so that we may observe what takes place.

The first demonstration is a normal installation with gasoline drawn through a normal suction line with a normal angle check valve at the top of the suction line. A sight glass has been placed in this suction line so you can see the movement of liquid on the suction side and observe the degree of vaporization that takes place.

The pumping unit is now operating and you will note that the flow is approximately 16.4 gallons per minute. By actual stop watch it is 16.4 gallons per minute. Observe the pressure gage. Before I opened this nozzle we had a by-pass pressure of 22 pounds per square inch. That means that we had that much pressure available to run this hydraulic motor, or meter, as you call it. As soon as I opened the hose nozzle the pressure gage dropped back and shows that we have an operating pressure in this system of 16 pounds per square inch. That is necessary to overcome the resistance of the meter, to drive the clock, to overcome the resistance of the hose, the piping, and the valves. Note also that this pressure gage in the top of the hose has dropped down to about 9 pounds. The difference between these two pressure gages is what we call "pressure drop" across a meter. In other words, we are losing 7 pounds of our pressure to operate the system. The gasoline flowing through this system is going out at a normal rate of flow into a customer's tank.

Note particularly the reading of the vacuum gages at this point. The vacuum gage on the left shows 2 inches of mercury. The one on the right gives us our equivalent feet of lift and that is one that interests us most in a gasoline pump installation. It shows here, for instance, that we have an equivalent of 3 feet of lift. That may sound strange to one who isn't acquainted with the term "equivalent feet of lift." We have only about 1½ feet of actual lift but due to the fact that we have created friction in the line by putting in elbows and valves, we have raised the equivalent work of this pumping unit to that of 3-foot direct lift. In a gasoline pump installation we always refer to "equivalent feet of lift," and when we say that gasoline cannot be lifted over 14 feet without excessive vaporization, we are referring to 14 feet of equivalent lift. I can give you a good rule to follow in figuring equivalent feet of lift. With 1½-inch pipe at 12 gallons per minute, every four elbows are the equivalent of 1 foot of lift. Every 50 feet of pipe is the equivalent of 1 foot of lift. Every poppet in a check valve is the equivalent of 1 foot of lift. When we add all of those equivalent feet of lift to the actual diameter of an underground tank, plus the 3 feet of dirt under which it is buried, plus the height of driveway to the pumping unit, we have the actual equivalent feet to which we are subjecting that gasoline as we pump it. Large underground tanks are 7 or 8 feet in diameter. Add 3 feet for the dirt above the tank, 2 feet for the height of the pumping unit above the ground level, and we have practically the limit to which gasoline can be pumped before using any elbows or valves. The remedy when we have a large tank is to use larger pipe. Two-inch pipe, for instance, has negligible friction in its elbows or in the length of pipe at 12 gallons per minute.

With this normal installation in mind at approximately 16 gallons per minute, we shall next consider an underground condition that is very prevalent in certain sections of the country. A number of years ago, before we had air separators, the measurement of a gasoline pump was dependent entirely upon the satisfactory operation of a check valve or foot valve. It was found, however, that the vibration of trucks and other traffic often allowed gasoline to leak past the valve. To counteract this, some valve manufacturers made what is known as a "spring-loaded check valve." The spring load on a check valve was designed to prevent leakage caused by vibration. Unfortunately many of those valves were heavily loaded with a string. There are several hundred thousand of them in underground tanks today. An oil company mechanic, who is installing a gasoline pump for a new account, very seldom inquires about the condition of the foot valve or check valve in the underground tank. He merely hooks up the above-ground part, which is the gasoline pump, and goes merrily on his way.

Let us see what happens to a gasoline pump when we put it on that kind of installation. I'll throw this same pump over to this other suction line, which is identical in every respect, except that the valve poppet is held down by a spring. Now look at the pressure gage and the vacuum gage. With the spring loaded valve in the line, the vacuum has increased considerably, the equivalent of 12 extra feet of lift. Our capacity has dropped about 2 gallons per minute and operating pressures are down from what they were before.

This is about a maximum suction lift that is practical to handle and more lift than we like to handle. If we had this much suction lift and were handling gasoline, the loss in capacity would be considerably more than we have with this liquid.

If you will observe the sight glass in the suction line you will see that with this restricted suction we are pulling this liquid apart. The bubbles you see are gas bubbles; no air whatever is being introduced into the system. When you see a condition like this in the suction line you naturally question the accuracy of delivery.

We will now measure 5 gallons. The results are very satisfactory. This accuracy is possible because of the air eliminator.

We will next demonstrate that the indicated delivery is accurate with these devices when the source of supply is exhausted, a condition that rather frequently occurs. We will also demonstrate that after replenishing the source of supply the first delivery is accurate without any kind of priming operation.

This accuracy is possible only because of the efficient operation of the air eliminator.

This demonstration shows the most important service rendered by the air eliminator.

With the pump running along normally, we will now introduce air into the pump suction line. Pressures immediately drop and the meter comes to a stop, and it will be noted that we have a continuous discharge of air out through the air eliminator vent.

I have heard weights and measures inspectors talk about finding these air eliminator vents plugged. I don't know why anyone would do this. It may be that the pump has some defective parts in the float chamber and instead of servicing the unit as they should they simply plug the vent. In any event, it completely destroys the effectiveness of the air eliminator. I will now plug this vent by simply holding my thumb over it. It will be observed that the meter runs, measuring and indicating the delivery of air instead of gasoline. This demonstrates that we have no air eliminator if the vent is plugged, and such pumps must be serviced for accurate operation.

There is one further demonstration that I would like to make. We have already said something about the functioning of an air eliminator in the event we have a leak in the suction line. If such a leak was as large as ⅛-inch diameter we would introduce enough air to stop the pump entirely.

I will now install a pipe cap with a $\frac{1}{16}$-inch diameter hole drilled through it, open the valve and draw air into the unit through this $\frac{1}{16}$-inch hole. After circulating 20 or 25 gallons we then draw a 5-gallon quantity into a test measure and find that we are accurate within 2 cubic inches, which is very satisfactory operation.

We have now used up all the time allotted for this demonstration. I think we have shown that the modern meter type gasoline pump gives a very creditable performance, even when installed under unfavorable operating conditions.

THE DISTRIBUTION OF LIQUEFIED PETROLEUM GASES

By L. L. Kennedy, *Superintendent of Construction and Maintenance, Standard Oil Company of New Jersey*

I am going to preface my remarks by saying that this business we are going to talk about can be a much greater headache to you people than these frozen fishes I heard about all day yesterday, or this ice cream that you have just been talking about. After what I say now, you may wish to reconsider your recommendations. One was approved yesterday, I believe, and I am afraid that it is going to become a very controversial issue if you allow it to stand as it is. However, you can draw your own conclusions from what I have to say, and govern yourselves accordingly.

This paper will be presented in three sections. First, we will explain briefly just what L.P.G. is. Secondly, we will show the growth in the use of L.P.G. Thirdly, we will present the methods of handling and the equipments used in distribution—with which you people as Sealers will probably become completely familiar as time goes on.

Before going into details it must be admitted that practically all of the material to be presented has been lifted verbatim from reports and publications which are available to each of you, and it might be well right here to give credit. First, to the "Handbook Propane Butane Gas" which is in print and is really the Bible of the industry; "Butane-Propane News," a magazine for the industry; then, the house organ "Flow Line" which carried an excellent paper by your Mr. C. M. Fuller, Sealer in Los Angeles. Incidentally, we have some interesting pamphlets entitled "Liquified Petroleum Gas—Its Properties and Characteristics"—not enough for all, so please don't swamp me.

This product, if it is not properly handled, is dynamite. It is not like anything else that you have run into. It is a dangerous, hazardous product, and you must handle it with care and give it a lot of respect.

Now to business—what is L. P. G.? The initials L. P. G., which are used generally in industry as you know, stand for Liquefied Petroleum Gas. Various combinations of hydrocarbons go to make up the several commercial types, such as butane, propane, isobutane, and butane-propane mixtures. These products are secured from actively producing oil and gas wells, and recently this main source of supply is being supplemented through the use of modern refinery processes. In its liquid state, L. P. G. is similar to gasoline in that it can be handled and transported, stored and measured in exactly the same manner, with one big exception—L. P. G. must be handled under pressure. Whether L. P. G. is in the liquid or vapor phase depends on three things: Pressure, temperature, and volume. It is not thought necessary to dwell too long here on the physical or chemical characteristics of L. P. G. If any of you good people are interested in any particular problem of handling L. P. G., Mr. Smith will be happy to arrange a session for us say some afternoon or night. Suffice it to say that L. P. G. is a comparatively new source of energy, heat, and power, and will take some study to properly recognize it and properly control it from all angles.

We in the industry consider that L. P. G. is as new as cooking oil once was. We are worried over the fact that possibly this business, like the heating oil business, is going to become a tremendous industry. The industry must grow because it is a highly lucrative business; sad to relate, lots of people have seen the possibility of making some fast money and have gone into the business of handling L. P. G.

[SECRETARY'S NOTE.—Beginning at this point in his paper Mr. Kennedy displayed a number of lantern slides. Unfortunately copies of these slides are not available for reproduction herein.]

In this, the second part of the paper, we will show the growth of the L. P. G. industry. From the slide you can easily visualize the tremendous and rapid growth of the use of this product, which is utilized for so many varied purposes, such as: Cooking, heating water, refrigeration, food processing, metal treating, fuel for internal combustion engines of all types, stationary and mobile. It is also used as "make up" for manufactured gas, and its use in the chemical field is now being greatly extended. This business will continue to grow as these new uses and applications entering the field will call for still more production, better distribution and handling, and simple but complete methods of control.

This brings us to the third and last section, that is, methods of handling and equipment used. We will take it for granted that our product has been "manufactured" and is now in storage in a pressure container, normally a tank of anywhere from 5 to 10 thousand gallons on up. Regularly constituted methods of transportation consist of pipe line, tank car, tank truck, in cylinders of various sizes, and lately via specially constructed barges and tankers. All of these units, remember, are so constructed as to withstand the pressure created by the presence of L. P. G. in liquid form. As all of this equipment is "special" we have a few slides which will permit you to see some of it. This view shows a simple bulk storage installation. This shows a special high-pressure tank car; note the different type dome in which are the special features required for handling L. P. G. Here are some different types of tank trucks used for bulk handling. We cannot show you pictures of barges and tankers as these types are actually not in general use yet; in fact, the first and only tanker capable of L. P. G. transportation has recently been converted. This slide shows several different types of cylinders used in the trade, but by far the 100-pound cylinder is in widest use. Next is the 100-pound cylinder in which you will be particularly interested, as we believe you will have more to do with these cylinders than with other sizes. This view shows a typical method of filling these cylinders; all of this is done in the liquid phase, similar to gasoline. Here is a normal two-cylinder installation and here a single cylinder installation; a hood covers the controls on both types of installations normally to protect the control mechanisms from the weather. Most of this type installation is outside of any building or structure and so is exposed to the elements.

In the east we do not have any amount of L. P. G. sold for over-the-road automotive use. On the west coast, however, there is a growing demand. In the last slide we reproduce an illustration from a paper by Mr. Fuller showing how he is coping with this particular phase of handling L. P. G.

As mentioned before, there are a lot of angles to the selling of L. P. G. which are of a highly technical nature and we can discuss them if you care to at a special get-together with those interested.

LARGE-CAPACITY METER INSTALLATIONS

By Harry G. Smith, *Sales Manager, Smith Meter Co.*

It is my privilege to discuss a subject that would have received attention before now had your Conference been meeting during the war years. Over the past 5 to 7 years the petroleum industry has experienced a trend toward larger capacity facilities at truck loading terminals. Many factors have contributed to this development, larger vehicle tanks, the elimination of small plants and their combination with larger central terminals, and the construction of product pipe lines with large capacity distribution terminals as integrated units. Truck loading speeds of 400 gallons per minute are not uncommon and many installations are being planned for even greater loading speeds.

This presents a problem to the weights and measures man who may be called on to calibrate these large-capacity units. Very few departments are equipped with calibration equipment of sufficient size to properly handle these tests. It is this problem of meter calibration that I would like to discuss today.

The subject of meter testing has received official attention from both the American Petroleum Institute and the American Society of Mechanical Engineers. A joint committee of these two organizations, after 4 years of study, has published a code on the installation, proving, and operation of positive displacement meters. This code is wide in scope and covers many meter uses not of interest to weights and measures authorities. It does, however, contain one specification arrived at after much discussion, that is of particular interest to this group. Paragraph 2018 states that the volume of the prover tank be not less than the volume delivered in 1 minute through the meter, and further recommends that a capacity be provided equal to one and one-half to two times the rated capacity of the meter being proved. Thus, a 400-gallons-per-minute meter should be tested in a prover tank having a minimum size of 400 gallons. It is extremely difficult to prove a large-capacity meter in a tank of inadequate size.

I have illustrated slides with which I will trace this development and will show some of the equipment now being used at the larger terminals.

Figure 5 illustrates a truck-loading installation that is typical of hundreds of plants with which you are all familiar. An installation of this type presents few problems in meter calibration in that the average maximum delivery speeds would approximate 150 gallons per minute. Plants of this capacity will continue to be used where they meet economic needs.

Figure 6 illustrates a 100-gallon portable tank, typical of the prover tanks used by both meter companies and weights and measures men. It is entirely adequate for meter equipment illustrated in figure 5 but is too small for the larger plants now being built.

Figure 7 well illustrates the trend in modern plant construction. Large-capacity meters are mounted under the working floor. Printing-type counters and set-stop counters for automatic loading are extended above the floor. With equipment of this type, a predetermined quantity of liquid is delivered to the truck and two or more products may be loaded simultaneously.

We show in figure 8 how these meters are calibrated. The prover tank shown here is owned by the terminal operator. Semiportable, it can be moved to any truck loading position and a test delivery made that duplicates in every way the actual delivery to the truck tank. The capacity of the tank is 500 gallons, the meters operate at less than 350 gallons per minute, and accurate testing is possible.

Figure 9 shows another terminal test procedure. Here deliveries are made to trucks at rates of 400 gallons per minute. A 400-gallon prover tank is shown receiving a test delivery in the same manner as the delivery would be made to a truck tank.

At the modern terminal shown in figure 10 the owner has installed a 500-gallon permanent prover tank that is available for test runs at any time. The flow of any meter can be diverted to the prover tank and an immediate test made to prove the accuracy of the meter. A permanent prover has an advantage in the event the accuracy of a delivery is questioned, for immediate test runs can be made to prove the accuracy of the meter.

Figure 11 shows a permanently installed closed-type prover at a pipe-line terminal which is used for calibration of the meters on the loading rack in the background. Interconnecting piping will divert the flow of any meter to the proving tank. You will note that here again ample capacity has been provided in the prover tank. Of further interest, here are the two meters shown in the foreground. Since the State gasoline tax to be paid by this terminal is determined by the total readings of each loading-rack meter, it is necessary that the volume of fluid used in testing be deducted. The two meters in the foreground record the discharge from the prover tank, one meter registering the taxable product discharged, and the other the non-taxable products such as fuel and diesel oils. The reading of the discharge meter on taxable products is deducted from the reading of the delivery meters in computing the tax.

I have been asked to comment on a new development of the meter manufacturers that permits the placing of the ticket printing device in the office at a remote point from the meter installation. (See fig. 12.) This system is finding wide acceptance, as it limits the duties of the truck loader and places all accounting functions in the office. Weights and measures officials have inquired as to the accuracy of these devices. Examinations of the various systems offered indicates that under no circumstances can a buyer be charged with more product than he receives. Any attempt to interfere with the system operation will in most cases result in no registration whatever.

Several weights and measures departments such as Massachusetts, Connecticut, and Los Angeles have constructed large test units that are adequate for testing meters of any size now in service. I do not have pictures of these units to show you, but I believe photographs have appeared in weights and measures publications. I would caution that in the absence of test equipment of adequate size, tests should not be made in small equipment unsuited to this work. The rule that the test draft must equal one minute's operation of the meter at normal speed is worth following. Instances are known where carefully calibrated truck compartments are used as prover tanks. This expedient, while more desirable than the use of prover

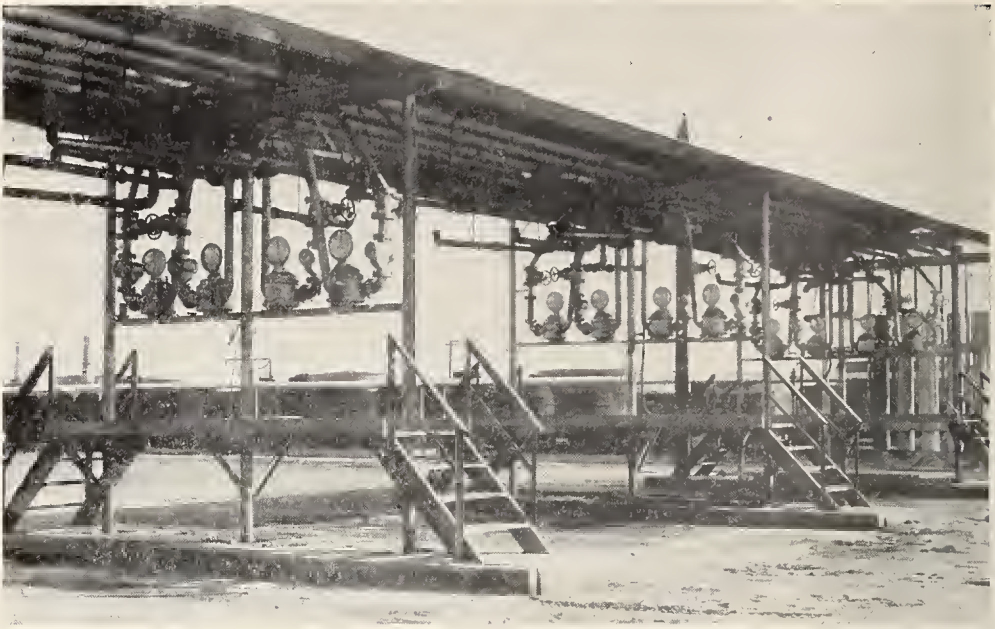

FIGURE 5. *Pump-operated bulk-plant equipped with twelve vertical-dial meters handling a variety of petroleum products.*

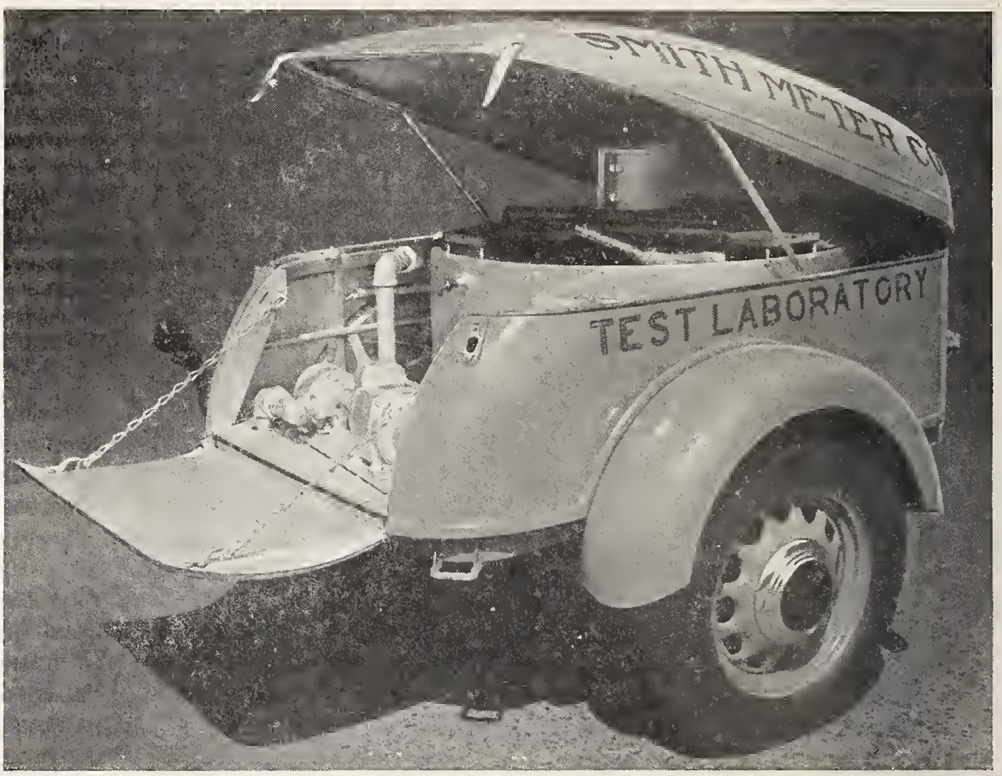

FIGURE 6. *Portable test laboratory equipped for recalibration and accuracy tests in customers' plants.*

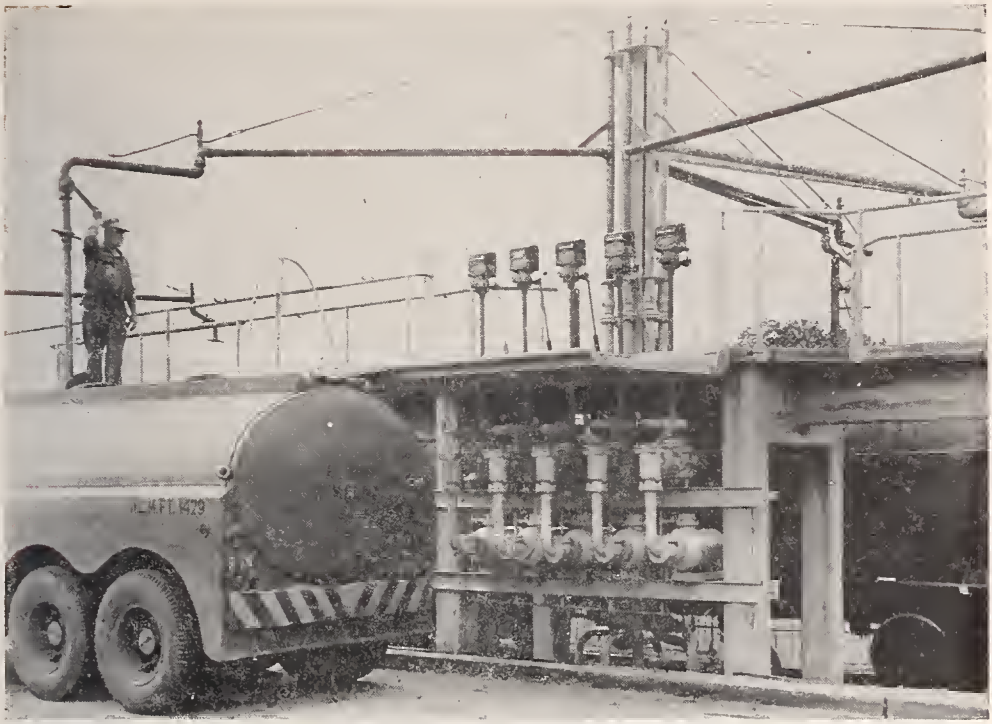

FIGURE 7. *Modern bulk-plant installation.*

Meters are mounted under the working floor. Printing-type counters and set-stop counters for automatic loading are extended above the working floor.

FIGURE 8. *Semiportable prover tank, capacity, 500 gallons.*

This type of prover tank is used by the terminal operator, and can be moved to any truck-loading position.

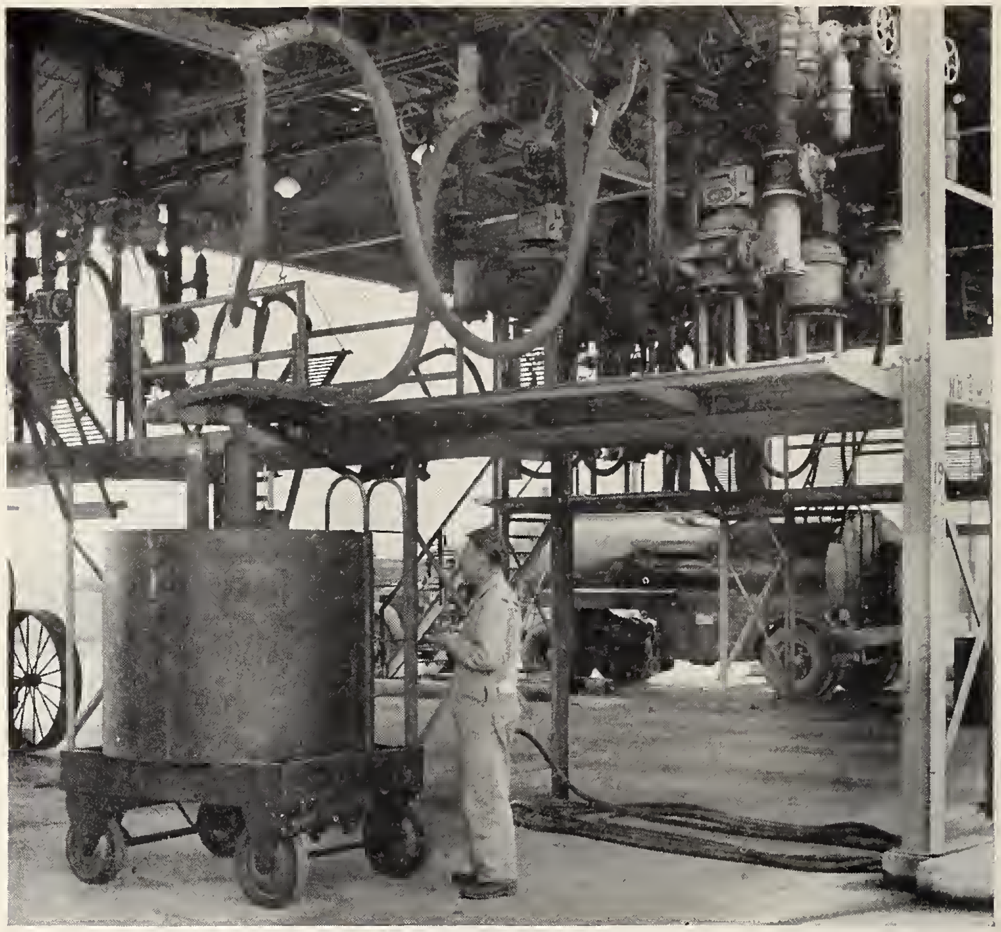

FIGURE 9. *400-gallon prover tank receiving a test delivery.*

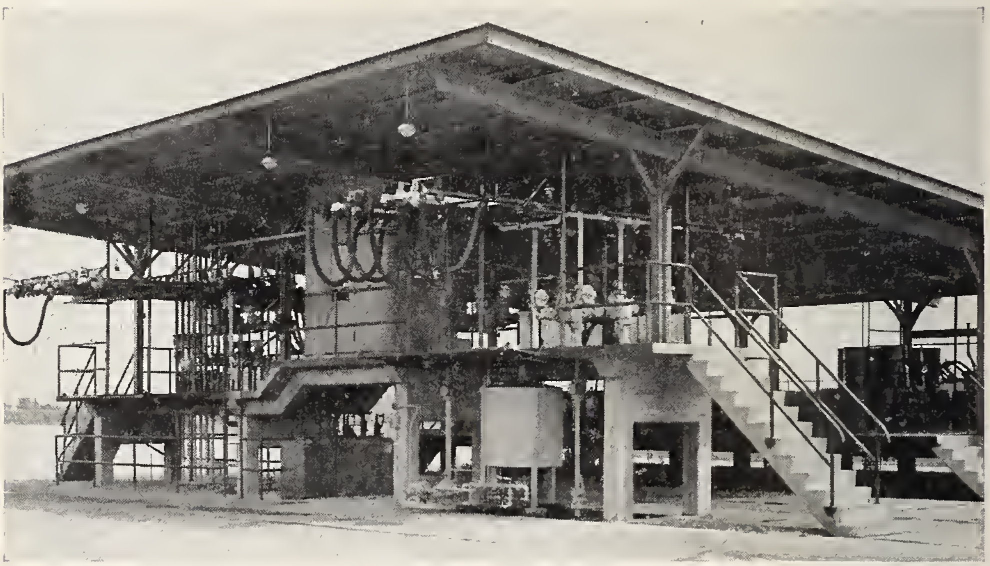

FIGURE 10. *Permanently installed 500-gallon prover tank.*

The flow from any meter can be diverted to the prover tank for an immediate test on the accuracy of the meter.

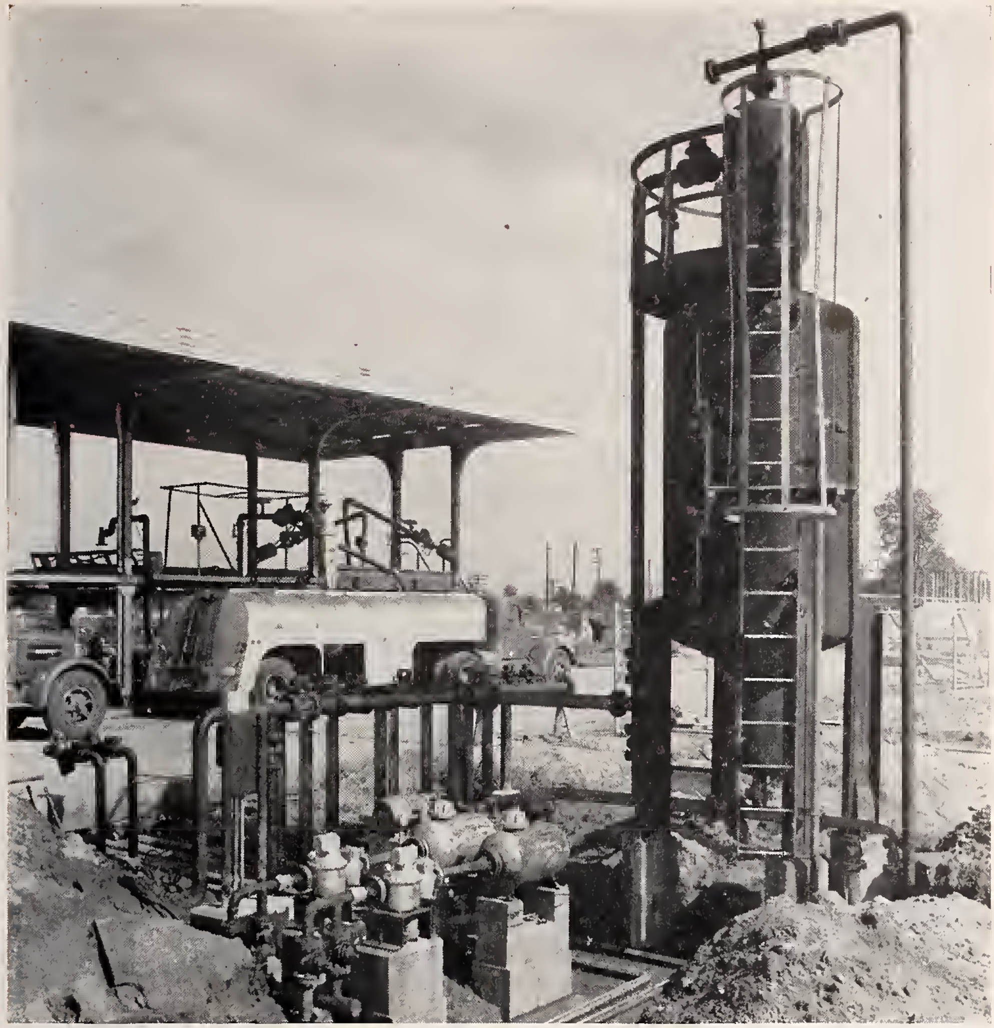

Figure 11. *Permanently installed closed-type prover tank at a pipe-line terminal.*

Interconnecting piping will divert the flow from any meter on the loading rack (shown in the background) to the prover tank.

tanks of inadequate size, does present some hazards. The compartment should be as large as possible to minimize the possible error in reading the liquid level at the compartment marker. Tests have been made by first making a delivery to the truck compartment, and then making a series of withdrawals to small calibrated containers.

I have emphasized this problem of the size of test equipment because it is the outstanding hazard in testing large-capacity meters. In general these installations will be found well engineered. The design of many installations is such that air entrainment is minimized to the point where air elimination equipment is not provided. This attention to engineering design simplifies the problems of the weights and measures man and makes the actual proving of the meter a routine test for quantity delivery.

I wish to thank the officers of this Conference for the opportunity to

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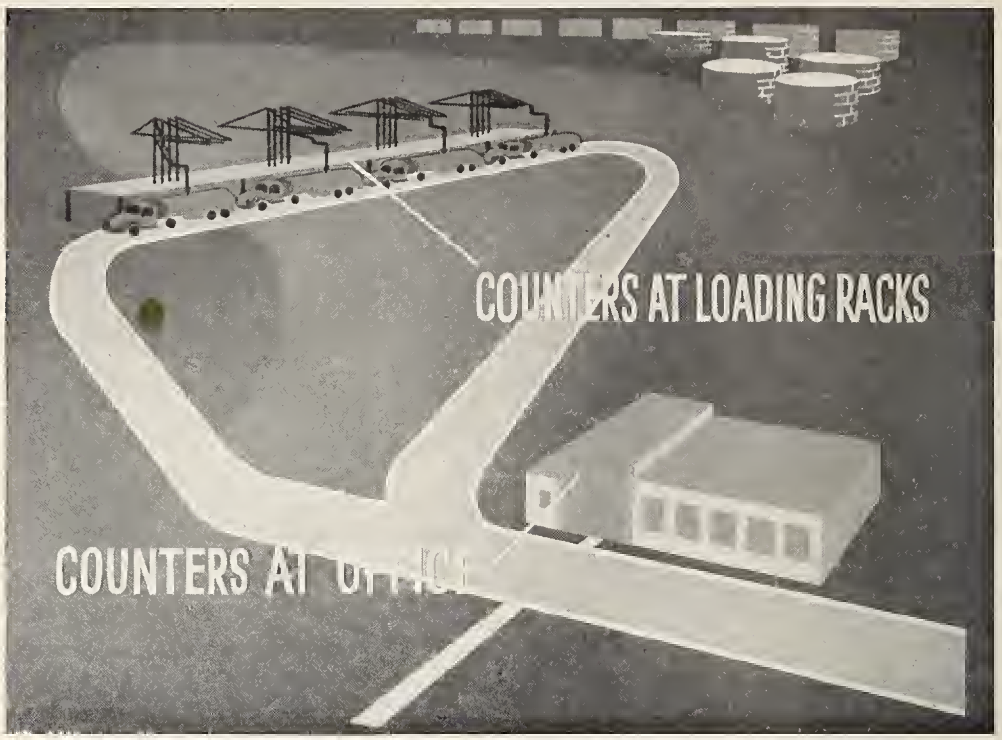

FIGURE 12. *Diagrammatic sketch of remote-indicating meter installation.*

discuss this problem and to request your cooperation in the adequate testing of these units. You will find the meter manufacturers ready and willing to extend their assistance in any manner that will be of help to you.

The CHAIRMAN. This evening at 9:00 o'clock an informal party will be held in the Hall of Nations of the Hotel Washington, to which all delegates and guests and their ladies are cordially invited. There will be refreshments and dancing until 12.00-midnight.

The photographer advises that he can take a much better picture out of doors than he can in this room. It is proposed that the group cross the street to the steps of the Treasury Building where a good picture can be obtained.

(At this point, at 1:45 p. m., the Conference adjourned, to meet at 10 a. m., Wednesday, September 24, 1947.)

FOURTH SESSION—MORNING OF WEDNESDAY, SEPTEMBER 24, 1947

(The Conference reassembled at 10:15 a. m., J. A. Boyle, Vice President of the Conference, presiding.)

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY JOHN P. McBRIDE, CHAIRMAN, AND DISCUSSION THEREON

Mr. McBride. You should have two papers, the tentative report and the final report of the Committee. The final report does not eliminate the tentative report, the final report being supplementary to the tentative report. [Reading:]

The Committee desires to report to the National Conference on Weights and Measures its consideration of and its conclusions with respect to, certain matters as follows:

1. *Tolerances for Liquid-Measuring Devices.*—The propriety of reducing the maintenance tolerances for retail devices to a straight 1 cubic inch per indicated gallon of delivery, and the acceptance tolerances to a straight ½ cubic inch per indicated gallon of delivery, was investigated. While it appeared practicable to make such a reduction on meter devices of modern design, the Committee is mindful of the large number of devices of older types which are still in service, and believes that the smaller tolerances could not be met on such devices. The Committee does not consider it appropriate to set up a tolerance distinction in the National Conference code between meter units and units of other design. Upon the assumption that devices of the older types should not be eliminated so long as they continue to perform within present tolerances, the Committee concludes, therefore, that no change should be recommended at this time in the tolerances for retail liquid-measuring devices.

The propriety of a 50 percent reduction in the tolerances for wholesale liquid-measuring devices has been considered. The cooperation of an industry committee was solicited in gathering data on this subject; the report of this industry committee is not yet available but receipt of this report is anticpated in time for the Committee to reach conclusions at its sessions immediately preceding the 33rd National Conference.

Since the issuance of our tentative report we have sat in with the industry Committee. You will recall that we have been pointing toward a closer tolerance for wholesale devices. There are several States which do operate under a more restrictive tolerance for wholesale devices than the code now provides, and it is our aim to have uniformity.

Yesterday you heard Mr. H. G. Smith describe some of the conditions that have been found and you also heard from Mr. Archie Smith about a situation involving inadequacy of testing equipment for wholesale devices. I think that probably we should make an honest confession to ourselves and say that we are not adequately equipped to effect tests to determine accuracy of performance according to the requirements we have already set up.

The Committee therefore concludes in relation to the proposed 50 percent reduction in the tolerance for wholesale devices that the present tolerance should stand until such time as we are able to bring ourselves into a better position with respect to adequacy of testing equipment. [Reading:]

2. *Set-Back Interlock on Liquid-Measuring Devices.*—The Committee finds that although licenses are freely granted to manufacture under the basic patents contolling the interlock, these patents are still valid and are held as a monopoly. Conforming to the established policy of the National Conference to make no mandatory requirements which can be met only by the use of a device controlled by patents monopolistically held, the Committee concludes that it would be improper at this time to add a specification requirement for the set-back interlock.

3. *Uncompensated Spring Scales.*—Further study has been given to the matter of tolerances for uncompensated spring scales and to the prohibition of the use of uncompensated spring scales in the sale of foodstuffs; on both of these subjects the Committee made recommendations in 1946, but the 32nd National Conference deferred action. The Committee has now received assurance that that segment of the scale industry which manufactures uncompensated spring scales is actively working to develop a product of improved quality and performance, and that results in the form of samples of production models, or of scales actually in production, will be achieved by the end of September, 1947. If this expectation is realized, the Committee feels that it will be only fair to allow a reasonable opportunity for trials of the new designs under actual service conditions, and accordingly concludes that action by the Conference on the 1946 recommendations cited above be deferred to the time of the 34th Conference.

The Committee has now sat in with that segment of the scale industry that makes the uncompensated spring scales, and they have shown us some concrete evidence of their desire to improve conditions in this type of scale. This is another phase on which we have been seeking to make improvement for some time. The evidence that the uncompensated spring scale manufacturers have shown to us is a two-revolution, 10-pound dial, and this is to be the common scale manufactured by the industry catering to the so-called "huckster" trade. Briefly, this 10-pound dial offers wider spacing between graduations, and the value of that is that errors can be more readily disclosed, and the manufacturer can more easily check his product and cull out some of the bad product that has been getting by the factory inspector and reaching the field. Also, the spring used in that scale will give better performance by reason of the lesser load applied when the capacity of the scale is limited to 20 pounds.

The Committee feels, therefore, that the industry has showed us what they promised to show us, and that they are ready to go into production on these new designs. There are still in stock with some of the manufacturers a small number of the older 20-pound dials. We have made no recommendation as to whether these should be used up or whether they should be disposed of. In one instance, a manufacturer has cleared the decks and he is standardizing on a 10-pound dial; he will have no other scale for the huckster trade except the two-revolution, 10-pound dial. I rather think the other members of the industry will go along with that.

In order that we may move along as quickly as possible, but in no sense with the idea of trying to force action, it will be the practice for me to move that the Committee report be accepted. That does not mean that we are trying to force anything on you, but it is just so that business will proceed as rapidly as possible.

With respect to the three recommendations which I have presented, I move on behalf of the Committee that the Conference accept these reports as offered.

(The three Committee recommendations were duly adopted.)

Mr. McBride (reading):

The Committee recommends to the National Conference the adoption of the additions and amendments to the specifications, tolerances, and regulations for commercial weighing and measuring devices which are set forth below.

(Signed) J. P. McBride, *Chairman*,
G. F. Austin, Jr.,
C. M. Fuller,
J. G. Rogers
R. W. Smith
Committee on Specifications and Tolerances

As the Committee recommendations are read, explanatory comments will be interpolated from time to time. [Reading:]

SECTION ON SINGLE-SERVICE MEASURE-CONTAINERS

In Specification 1, following the words "¼ pint", add the following:

(1 gill, 4 fluid ounces)

to make the specification read as follows:

1. CAPACITY.—Measure-containers shall not be subdivided and shall be of one of the following capacities only: 1 gallon, ½ gallon, 1 quart, 1 pint, ½ pint, and ¼ pint (1 gill, 4 fluid ounces), standard liquid measure.

The single-service measure-container is a device which has only recently come under specifications and tolerances. For some time it has been customary in the use of this small-sized container to declare its capacity sometimes in terms of the pint, sometimes in terms of the gill, and sometimes in terms of fluid ounces. To save the industry the burden of changing over certain of their marking equipment, we recommend that it be permitted to express the capacity of that small container either as "¼ pint," as "one gill," or as "4 fluid ounces."

Mr. Baucom. Does that fit in with the standards adopted by the Congress where the usual marking is "¼ pint"? Technically, of course, it is all the same, but we do want to be consistent. We do not want to adopt something that might be construed as conflicting with the Federal standards.

Mr. McBride. It is not consistent with our set-up for liquid capacity measures. But for this special purpose, and particularly in view of the fact that this type of container has very recently come under our regulations and that manufacturers have been going along with us and now have a set-up under which the capacities are sometimes indicated in terms of fluid ounces and sometimes in terms of the gill, it seems fair to let them work that out and not immediately require that they come to one designation, "¼ pint."

Mr. J. T. Kennedy. I think we made a mistake last year by putting "¼ pint" in there; that is not breaking down in accordance with the standard measurement of the United States. The "gill" is the standard unit. I think we should specify "gill." Then if you are going to allow "¼ pint" and "4 fluid ounces," these should be the ones to be shown after the standard term.

(The amendment to Specification 1, as proposed by the Committee, was duly adopted.)

SECTION ON LIQUID-MEASURING DEVICES

Mr. McBride (reading):

Amend the third paragraph of Specification 6 by deleting the words,

not exceeding 2½ inches in size, the value of the minimum rate shall not exceed 20 gallons per minute. On meters larger than 2½ inches in size the value of the minimum rate should be governed by the character of use of the meter.

and substituting therefor the words,

the value of the minimum rate shall not exceed 20 percent of the manufacturer's marked maximum discharge rate.

so that beginning with the second proviso of the paragraph, this will read,

And provided further, That in the case of retail devices the value of the minimum rate shall not exceed 7 gallons per minute, and in the case of wholesale devices the value of the minimum rate shall not exceed 20 percent of the manufacturer's marked maximum discharge rate.

We have had the minimum of 20 gallons per minute on meters not exceeding 2½ inches in size, but we have never set up any specific figure for meters larger than 2½ inches in size. We have had that matter under study for some time and we have reached the conclusion expressed in the Committee recommendation.

(The amendment to Specification 6, as proposed by the Committee, was duly adopted.)

Mr. McBride. In the Tentative Report of the Committee it was proposed that there be adopted a new Specification, to be numbered 24, reading as follows:

24. DISCHARGE HOSE.—The discharge hose of any liquid-measuring device shall be in one continuous length, that is, two or more lengths of hose shall not be coupled together to form the discharge line.

It now develops that this would be an unwise procedure, because some units are now properly designed with a coupling in the hose line adjacent to the housing and with a considerable length of hose within the housing. Under the proposed Specification, when it becomes necessary to replace a worn length of hose, it would be necessary to replace the entire hose line, including the unworn portion within the housing, a procedure which certainly is not economical. On behalf of the Committee, therefore, I wish to withdraw the proposal for the adoption of this new Specification.

(The recommendation of the Committee was agreed to, and the new Specification was not adopted.)

Mr. McBride (reading):

Amend the "Note" following Specification 53 to read as follows:

Note.—It is recommended that the capacity of the standard measure used for the testing of a wholesale meter be equal to at least the amount delivered in one minute by the meter at its maximum rate of delivery.

The old "Note" read as follows:

Note.—In general, it is recommended that in the case of wholesale devices having high discharge rates the size of the regular testing draft should be increased to 100 or even several hundred gallons. The greater the discharge rate the more desirable it is to increase the size of the testing drafts.

We now recommend something more specific than that. It might be more desirable for the capacity of the test measure to be equal to one and one-half or two times the one-minute delivery of a meter, but what the Committee is recommending is believed to be the minimum which should be realized and is a step in the right direction.

(The amendment to the "Note" following Specification 53, as proposed by the Committee, was duly adopted.)

Mr. McBride (reading):

Add a new Regulation to be numbered 8 and to read as follows:

8. LENGTH OF DISCHARGE HOSE.—The length of the discharge hose on any retail liquid-measuring device shall not exceed 15 feet, measured from the outside of the housing to the inlet end of the discharge nozzle, unless it can be demonstrated that a hose of greater length is essential to permit deliveries to be made to receiving vehicles or vessels. Unnecessarily remote location of a liquid-measuring device shall not be accepted as justification for an abnormally long discharge hose.

The reason for that regulation is that in some instances it has been shown that unnecessarily long hoses have been employed on retail gasoline liquid measuring devices. With an unusually long hose, difficulty is created in the purchaser's possible inability to read the indicating element of the dispensing device. We also well recognize that there are installations where a length of hose longer than 15 feet may be necessary, as is frequently the case on rivers and lakes and coastal places, many vessels being served gasoline from a wharf or pier; in such a case, we do not recommend this limitation. There may be other cases where it would not be practical to have a hose only 15 feet long, so we have put in the language which would allow departure from the 15-foot limitation, relying on the judgment of the official as to the expediency of permitting a departure from the 15-foot requirement.

The Committee recognizes that this is not the strongest type of regulation, but in view of the varying field conditions it is the best language that we can bring out on the subject. We do definitely say in the closing sentence that "unnecessarily remote location of a liquid measuring device shall not be accepted as justification for an abnormally long discharge hose." We mean by that that the operator shall not create a condition of impossibility. It must be a condition of impossibility that arises by the purchaser's inabiilty to present to the inspector a device that conforms to the basic 15-foot requirement.

(New Regulation 8, as proposed by the Committee, was duly adopted.)

SECTION ON VEHICLE TANKS

Mr. McBride (reading):

Add at the end of Specification 17, "Constancy of Delivery", a proviso, as follows:

Provided, however, That the minimum operating rate for testing purposes on meters larger than 2 inches in size shall not be less than 20 percent of the manufacturer's maximum discharge rate as marked on the meter.

We now have a 20-gallon-per-minute minimum for meters on vehicle tanks, but experience has shown that for meters larger than 2 inches in size the better way to set a minimum rate is to do it percentage-wise.

(The new proviso at the end of Specification 17, as proposed by the Committee, was duly adopted.)

SECTION ON SCALES

Mr. McBride (reading):

Amend General Definition A–2s(2) by adding at the beginning of the definition the words, "For purposes of the application of the requirements for SR, tolerances, and minimum graduations," to make the definition read as follows:

A–2s(2). LIVESTOCK SCALE.—For purposes of the application of the requirements for SR, tolerances, and minimum graduations, a livestock scale is a scale having a capacity of 6,000 pounds or more and used primarily for the weighing of livestock on the hoof.

The reason for the suggested change in the definition is that apparently the previous language led to confusion, and some of the officials thought that it was a restrictive definition. By the addition of the proposed language we make it clear that the purpose of this definition is to apply to the livestock scale of 6,000 pounds or more certain requirements for SR, tolerances, and minimum graduations already set up elsewhere in the code.

(The amendment to General Definition A–2s(2), as proposed by the Committee, was duly adopted.)

Mr. McBride (reading):

Adopt finally, to become effective January 1, 1949, the amendment tentatively adopted by the 32nd National Conference to Specification B–2b(2), to make the specification read as follows:

B–2b(2). LEVEL-INDICATING DEVICE.—*Any scale which is portable and which is designed for use upon a counter or table, and any person-weigher, whose weight indications are changed by an amount greater than one-half the tolerance allowed, when set in any position on a surface making an angle of 5 percent or approximately 3 degrees with the horizontal, shall be equipped with a device which will indicate when the scale is level, and in no case shall any pendulum operating the scale be considered a leveling device; the indications of the level-indicating device shall be readily observable without the necessity of disassembly of any scale parts requiring the use of a tool or device outside of and separate from the scale. The scale shall be rebalanced at zero each time its position is altered during the test contemplated by this paragraph.*

Note.—The requirement relative to visibility of the level-indicating device shall become effective on January 1, 1949.

This matter was studied at the last Conference and tentatively adopted; we now propose final adoption. The "Note" is new, and provides for the customary period for adjustment by the manufacturers to the new requirement.

(The amendment of Specification B–2b(2), as proposed by the Committee, was duly adopted.)

Mr. McBride. You will recall that in 1946 there was adopted an amendment to Specification B–2d, to be effective January 1, 1948, making the Specification read as follows:

B–2d. DEVICE FOR ADJUSTING BALANCE OR LEVEL.—*All mechanical devices for adjusting the balance condition or the level of scales except cream-test scales and prescription scales, shall be of such construction that they are operable or accessible only by the use of some tool or device which is outside of and entirely separate from the device in question, such as a screw driver, wrench, etc., but not an adjusting pin.*

Previously the Specification applied only to small-capacity scales; the 1946 amendment brought in large-capacity scales. The Tentative Report of the Committee this year made the following proposal:

Delete the amendment to Specification B–2d which was adopted by the 32nd National Conference to be effective January 1, 1948; restore the original retroactive language of Specification B–2d; and add at the end of the restored language a new nonretroactive requirement, to be effective January 1, 1949, to make the specification read as follows:

B–2d. DEVICE FOR ADJUSTING BALANCE OR LEVEL.—All mechanical devices for adjusting the balance condition or the level of person weighers and of small-capacity scales except cream-test scales and prescription scales, shall be of such construction that they are operable or accessible only by the use of some tool or device which is outside of and entirely separate from the device in question, such as a screw driver, wrench, etc., but not an adjusting pin. *The balance ball or equivalent device of a vehicle scale or of a scale used for weighing livestock on the hoof shall not be rotatable and shall be actuated by a self-contained, manually-operable screw unless the balancing device is motor controlled or is otherwise automatic in operation or is enclosed in a cabinet.*

NOTE.—The final sentence of this specification shall become effective on January 1, 1949.

The advance distribution of the Tentative Report resulted in considerable discussion on the foregoing proposal and further investigations were made by the Committee. As a result we now recommend as follows: [Reading:]

With respect to the Tentative Report of the Committee, amend the final sentence of the proposed specification B–2d, under the heading "Scales", to read as follows:

The balance ball or equivalent device of a large-capacity scale shall not be rotatable and shall be actuated by a self-contained screw unless the balancing device is motor controlled or is otherwise automatic in operation or is enclosed in a cabinet.

Delete the "Note" following the proposed specification.

The purpose in mind when the amendment was made last year was to overcome the facility for fraud that is sometimes present with the balance ball that rotates on a fixed screw. The change now proposed says in effect that a large-capacity scale balance ball or equivalent device shall not be rotatable and shall be actuated by a self-contained screw, thus permitting the operation of the balance ball by a screw driver or other device outside of the scale—which is the requirement we have for small-capacity scales—and permitting also the advancement or retarding of the balance ball by a purely manual operation. Exceptions are made from the requirement in the case of a motor-controlled balancing device or a device which is automatic in operation or which is enclosed in a cabinet. The reason for those exceptions is that in those several instances, the balance ball is not readily at hand.

If the final recommendation of the Committee is adopted the "Note" in the Tentative Report should be deleted.

(The amendment to Specification B–2d, as proposed by the Committee, was duly adopted.)[8]

Mr. McBRIDE (reading):

Add at the end of specification B–2t (1), the following:

Adequate provision shall be made for access to the pit of a vehicle or livestock scale, for purposes of inspection and maintenance.

[8] The amended form of this Specification is as follows:

B–2d. DEVICE FOR ADJUSTING BALANCE OR LEVEL.—All mechanical devices for adjusting the balance condition or the level of person weighers and of small-capacity scales except cream-test scales and prescription scales, shall be of such construction that they are operable or accessible only by the use of some tool or device which is outside of and entirely separate from the device in question, such as a screw driver, wrench, etc., but not an adjusting pin. *The balance ball or equivalent device of a large-capacity scale shall not be rotatable and shall be actuated by a self-contained screw unless the balancing device is motor controlled or is otherwise automatic in operation or is enclosed in a cabinet.*

The reason for that requirement is that it has been shown that in some instances on large-capacity scales, particularly where the deck is not wood but is concrete or some other continuous substance, no facility is provided for the inspector to get into the scale pit. Therefore, the Committee recommends that we require that such provision be made.

(The amendment to Specification B–2t (1), as proposed by the Committee, was duly adopted.)

Mr. McBride (reading):

Amend Specification C–2b by changing the word "riveted" to "affixed", and adding at the end a new proviso, to make the specification read as follows:

C–2b. READING FACE.—The reading face of a straight-face spring scale shall be firmly affixed to the frame at not less than three points: *Provided, however*, That this requirement shall not be construed to prohibit a scale properly equipped with a well designed balancing means dependent for its operation upon limited, mechanically-controlled movement of the reading face with respect to the frame.

There are adequate means other than riveting for firmly affixing, so we recommend the first change. The reason for the proviso is that on straight-face spring scales provision of proper balancing means has always presented a problem.

We require that there be means for zero-load-balance adjustment on every scale. There is a means for such adjustment of straight-face spring scales which can be construed to be well designed but which operates by mechanically-controlled movement of the reading face; we feel that it should not be eliminated.

Mr. Baucom. Mr. Chairman, I would like to know whether the purpose of this proviso—and it may be a good one; I am not questioning that—is to permit adjustment by moving the dial up and down, in lieu of making a spring-support adjustment as we previously have required. We might be fixing it so that somebody could move that with a screw driver after we put the seal on it, and therefore aid in the perpetration of fraud.

Mr. McBride. On the ordinary straight-face spring scale there is no satisfactory means of adjustment. There has been developed a method of adjustment which does necessitate a limited movement of the face relative to the frame. That seems to be the only practicable way of doing it, because we require that the indicator on a straight-face spring scale shall be firmly attached to the spring.

Mr. Baucom. Would you want to seal those screws in place? If we have slots in the reading face of a straight-face scale to permit adjustments for zero balance, would it be desirable or advisable or necessary to seal those screws so that they can not be loosened up after the inspector has put his seal of approval on the scale? I think the idea is a good one and many times these spring scales could be continued in service if we could just get them on a zero starting point. But I also want to be in a position where we can control it; otherwise we might have to prosecute some unscrupulous man who attempts to use it for fraudulent purposes.

Mr. McBride. The proposal would permit only "limited" movement of the reading face, and this only when it is mechanically controlled. The situation would be similar to that on all other types of scales. If you seal the adjusting means, then you defeat adjustment.

As I said before, in specification B–2c, we make a general requirement that there be means for zero-load adjustment on all scales; what we propose is a practicable method for meeting this requirement in the case of straight-face spring scales.

(The amendment to Specification C–2b, as proposed by the Committee, was duly adopted.)

Mr. McBride (reading):

Delete from Regulation K–1b the words "and livestock" in the title and the words "or a livestock scale" in the text, to make the regulation read as follows:

K–1b. MINIMUM ON VEHICLE SCALES.—A vehicle scale shall not be used for weighing loads of less than 1,000 pounds.

We formerly provided that a livestock scale be not used for weighing loads of less than 1,000 pounds. That requirement was inserted some years ago at the request of the Packers and Stockyards Division of the U. S. Department of Agriculture, because it offered to them a sustaining arm in getting proper scales for weighing single animals. Now, however, that Department is no longer interested in the requirement, probably because they have accomplished their ends, and we now see no further purpose in retaining that restriction.

(The amendment to Regulation K–1b, as proposed by the Committee, was duly adopted.)

Mr. McBride (reading):

Add to the text of Regulation K–4 the words, "shall be so positioned that it is firmly and securely supported and", and add to the title the words "Supports and", to make the regulation read as follows:

K–4. SUPPORTS AND LEVEL CONDITION.—A scale which is portable and which is being used on a counter or table or on the floor shall be so positioned that it is firmly and securely supported, and the scale shall be maintained in level.

(The amendment to Regulation K–4, as proposed by the Committee, was duly adopted.)

Mr. McBride (reading):

Add a new Regulation to be numbered K–12 and to read as follows:

K–12. STOCK RACKS.—A scale used for the weighing of livestock on the hoof shall be equipped with a suitable stock rack, that is, an enclosure, fitted with gates as required, within which livestock may be held on the scale platform during a weighing operation. The rack shall be securely mounted on the scale platform, and adequate clearances shall be maintained around the outside of the rack.

While it may be that in many cases livestock scales are not equipped as recommended, we are now saying in specific language that a scale used in weighing livestock on the hoof shall be equipped with an enclosure and that this shall be securely mounted on the scale platform.

(New Regulation K–12, as proposed by the Committee, was duly adopted.)

Mr. McBride. That covers all the matters in our report. We have in mind some further study in relation to lubricating-oil meters. That is a new type of metering that is coming in, and we are going to study that; we would appreciate any experiences that you want to report to the Committee in that relation during the coming year. We also have in mind something in relation to vehicle-tank compartments and piping, and I think a good start was made in that direction by the symposium yesterday.

ANNOUNCEMENTS

The CHAIRMAN. The Secretary wishes to make several announcements at this time.

The SECRETARY. At this point on our program there was scheduled a paper by Mr. M. J. J. Harrison, Supervisor of Scales and Weighing, Pennsylvania Railroad, on the subject "Multiple Draft Weighing." It is with real regret that I have to announce that at this moment Mr. Harrison is tightly swathed in bandages and is confined to his home. I learned this through a letter which I received last evening which stated that on last Saturday Mark had a very bad fall and that although no bones were fractured, his injuries will incapacitate him for some time. I am sure that all his friends in this body, and that includes almost all of you, will join me in wishing that he has a very speedy recovery and that there are no complications. I know that Mr. Harrison regrets tremendously that he cannot be here; he said in his note to me that this would be the first time in 18 National Conferences that he had missed a meeting.

I have been asked to make an announcement on behalf of equipment manufacturers who are present at this meeting to the effect that this evening between 8:30 and 12:00, an informal party will be held in the Washington Room of this hotel. This party is being given by the manufacturers as a courtesy to those attending this meeting and all are cordially invited to attend.

I wish to make another announcement which is important to all of you. We would like very much to have everyone present at the Conference duly registered. We are not so much interested in the registration fee, but we do want to know who is here, and this is important to you people because the registration list is used to distribute material which results from the meeting, including a copy of the printed report of the proceedings which will ultimately be issued. Please, therefore, if you are not registered, whether you are a guest or an active member, arrange to register before the meeting is concluded. Also, please pass on this word to others who may not be in the room at the moment so that the registrations may be complete.

Mr. Archie Smith of New Jersey tells me that he has received requests from a number of people for copies of the piping diagrams which he used in connection with his paper on vehicle tanks. He wishes me to say that persons desiring mimeographed copies of these diagrams may obtain them by addressing him at his office in Trenton.

Mr. J. T. Kennedy has informed me that during the course of the morning the Canadian Embassy telephoned him to learn the National Conference action on frozen foods; satisfaction with the action taken was expressed.

A large supply of the reports of our standing committees was provided for distribution at this meeting, supplementing the wide mail distribution in advance of the meeting. It appears that now this stock is essentially exhausted. Persons desiring additional copies of any of these reports may obtain them by addressing me; I shall have additional copies run off in sufficient number to meet all requests.

Mr. BUSSEY. I move that the Conference join Mr. Smith in his expression to Mark Harrison. If it is in order, and Mark's paper is available, could it be presented in the proceedings?

The SECRETARY. It would be except for the fact that Mr. Harrison proposed to speak extemporaneously, using slides and other illustrative material. There is no manuscript available. I regret that as much as you do.

(The motion was seconded, the question was taken, and Mr. Bussey's motion was agreed to.)

ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

By C. B. SMITH, *President, National Scale Men's Association*

Article I, Section 2 of the Constitution and By-Laws of the National Scale Men's Association clearly defines the purpose and aims of the National Scale Men's Association and reads as follows:

The objects of the Association are:

A—To secure the cooperation of all concerned in matters of scale design, scale construction and installation, and scale maintenance and weighing.

B—To bring about discussion of everything pertaining to scales and weighing, the prime object being to bring about by education, an improvement in scale construction, in methods of maintenance, and in weighing problems.

The membership is classed as Active, Associate, Senior, and Honorary. The qualifications of the four classifications are as follows: An "Active" member is one who is actively engaged in the manufacture, repair, or installation of scales, or engaged in the designing of scales, or proficient in the science and theory of scales and scale construction. An "Associate" member is one who is actively engaged in the scale business or in the weighing of any commodity, but not qualified for active membership. A "Senior" member is one who has a dues-paying record of 10 years or more, and who by the condition of his employment is retired from active duty, and who has been elected to Senior Membership. An "Honorary" member is one who has won the gratitude of the Association by particular interest shown in the Association.

The National Scale Men's Association is composed of 10 divisions located throughout the United States. These divisions are as follows: Calumet Division, at Gary, Ind.; Central Division, at Chicago, Ill.; Great Lakes Division, at Toledo, Ohio; Hoosier Division, at Indianapolis, Ind.; Midwest Division, at Kansas City, Mo.; Northwest Division, at Minneapolis and St. Paul, Minn.; Texas Division, at Houston, Tex.; Southern Division, at Birmingham, Ala.; Northern California Division, at San Francisco, Calif.; and Southern California Division, at Los Angeles, Calif.

Of the total of 404 paid-up members of the National Scale Men's Association, 317 are members of one of these Divisions. The remaining 87 are not members of any Division because either their residence or place of business is so located as to make it impractical for them to belong to any Division. A Division may be formed by the written application of 10 or more persons, all of whom are or will become members of the National Scale Men's Association. No member can, however, be a member of more than one Division. Each Division is required to elect a set of officers consisting of a Chairman and Secretary-Treasurer, and must meet at least twice a year and maintain a minimum paid-up membership of not less than 10 members. Divisions are also required to submit to the Executive Committee of the

National Scale Men's Association not later than October 15 of the year preceding the next annual convention, subject and outline of a talk to be given at the next annual convention by a member of that Division. The Executive Committee will screen the material submitted and select subjects of interest to be given at the next annual convention. This greatly simplifies the work of arranging a program and instills interest in the various Divisions.

The National Scale Men's Association has always been active in drawing up and approving specifications for various types of scales. Its members have been active on the Yards and Terminals Committee of the American Railway Engineering Association for many years. At the present time the National Scale Men's Association has a standing committee on The Metric System, of which Mr. J. E. Woodland is Chairman, and which has been active for the last 2 years. The committee was carried over into 1947 and the committee gave its report at the last annual convention at Kansas City; the report was accepted by vote and the committee continued for further study. The C. A. Briggs Committee on Education of which Mr. Rollin E. Meek, Vice President of the National Scale Men's Association, is a member, was appointed at the last annual convention at Kansas City and has been functioning since that time; the report of this committee will be given at the next annual convention and the committee so far has touched on many varied and interesting phases.

The National Scale Men's Association at its annual conventions strives to bring speakers from the various industries and groups closely associated with the problems of its members. At the last annual convention at Kansas City, Mr. R. W. Smith, Secretary of the National Conference on Weights and Measures, talked on the aspect of regulating scale men by licensing or bonding, viewed from the angle of a weights and measures official. Good scale men have always been scarce, and with the demand from the railroads, mines, steel mills, oil companies, packing houses, milling industries, and other large industries employing the cream of the scale profession, it is not hard to see why the cry for licensing or bonding has been the result of need for better service.

Why is it that the larger industries get the better class of scale men? In one highly industrialized area the rate in commercial scale shops is \$1.43 an hour while in industries in the same area the rate is \$1.68½ an hour. In addition to a larger take-home pay envelope, the men employed in industrial plants have the advantages of vacation pay, protection against occupational hazards, and the advantages of security in employment, promotion, and retirement that go with an organized labor contract.

Other examples of the type of subject of talks given are "Surface Treatment of Scale Parts" and "Weighing of Aircraft." The weighing of aircraft during the war was quite a problem as aircraft were taking off and landing on air strips in many far remote parts of the world. It was necessary to weigh aircraft as a matter of safety, to see that the gross weight did not exceed the lifting power of the aircraft, and that the fore and aft centers of gravity fell between rather narrow limits. The need for development of weighing equipment that could be transported to the plane rather than bringing the plane to the weighing equipment was of utmost importance. The result of this development was a kit that fitted in an ordinary suitcase weighing 50 pounds and having a weighing capacity of 150,000 pounds, which has since been developed to have a capacity of 300,000 pounds, graduated in 10-pound divisions.

Many of the members of the National Scale Men's Association are members of this Conference, and in many respects the interests of both bodies coincide, although the final objects of the two are different. Your Conference is most vitally interested in the direct performance and results obtained from weighing machinery, while the National Scale Men's Association is interested in the design, specifications, and practices of weighing to insure accurate weights.

SOME ASPECTS OF INDUSTRIAL WEIGHING*

By Douglas M. Considine, *Chemical Engineer, Brown Instrument Co.*

The role which scales play in protecting purchasers of merchandise and certain public services is generally understood and accepted with high regard. In fact, it is difficult to imagine how business and commerce could even limp along without scales that can be trusted. This role of scales as public protectors, however, is but a part of the great contribution which scales render to man's progress and everyday living. One function, often overlooked by those who are not directly concerned with industrial operations, is the use of scales and weighing devices as manufacturing and processing tools. It is to a consideration of this latter function of scales that this paper is devoted.

Aside from receiving, shipping, inventorying, and packaging, where do scales fit into the industrial plant? Scales are widely used to proportion ingredients to a process, exemplified by their wide use in the glass, rubber, alloy steel, and chemical industries. Too much or too little sand, soda ash, or cullet in a batch of glass will spoil the product just as effectively as too much or too little baking powder will ruin milady's cake. Scales are frequently used to check or test a product in its intermediate or final stages of production, as exemplified by the continuous weighing of rubber tire tread as it emerges from the extruder, or measurement of the tension or compression in a finished spring. Scales are used for accounting purposes, wherein the basic material charges to a department or the production of a department or worker are measured directly in terms of weight or by count through weighing. These are but a few of the hundreds of ways scales are used industrially. If time would permit, hundreds of specific examples in dozens of industries could be cited. Of course only a few instances can be covered in this space.

The basic principles employed in industrial scales are much the same as those employed in the more conventional scales used in daily business and commerce. It is the application of these principles that distinguishes industrial weighing equipment from other types. In designing industrial scales and what I believe are aptly termed "interlocked weight control systems," the scale manufacturer has drawn heavily from the field of electrical and electronic engineering. The scale manufacturer also has applied some of the principles used by instrument engineers in other fields.

*A number of illustrations, not reproduced here, were used by Mr. Considine in the presentation of his paper.

Before discussing some of the specific items of equipment, or what might be termed "gadgets" which have been added to scales to render them more useful industrially, I believe it would be well to consider for a moment where weight as a process variable fits into the general field of instrumentation and automatic control.

A process variable may be defined as a quantity or condition which, if not controlled, adversely affects the results obtained from an industrial process. Temperature, for example, is one of the major process variables. There are thousands of processes which require the maintenance of accurate temperatures to obtain the desired results. The refining of petroleum, the vulcanizing of tires, the canning of foods are but a few examples of processes which will fail partially or completely if temperature is not properly controlled. Some other major process variables include pressure, the rate of flow of fluids, the speed of machinery and equipment, the moisture content of materials, and the pH, or acidity, of process solutions. There is a host of others.

One of these other process variables, too infrequently considered in this light, is weight. To many processes, the proper control of weight is just as important, and often more important, than the other process variables just mentioned. It is evident, then, that even though many scale engineers and instrumentation engineers do not recognize the fact, their fields of activity have much in common. As an instrumentation engineer, I have gained much from a study of industrial weighing applications—and I am confident that scale engineers would benefit likewise from a study of instrumentation methods. The gap between weight and the other process variables is presently too wide. To narrow this gap, which would result in greater processing efficiencies, the scale engineer must broaden his concepts and accept the fact that weight is one of the major process variables and is amenable to many of the automatic control methods used to control temperature, pressure, and the like. And, on the other hand, the instrumentation engineer must broaden his concepts to include weight in his thinking.

The conventional dial scale is the heart of many modern interlocked weight control systems. By merely adding one of two electrical devices to a scale of this type, its flexibility and utility can be increased manyfold. One of these devices is the mercury magnetic contact, illustrated here. This contact comprises a small vacuum tube in which is contained a drop of mercury and a flexible wire, the end of which contacts the mercury when in a closed position. On the flexible wire is mounted a magnet armature, which draws the wire out of the mercury when subjected to magnetic attraction, causing the electrical contact to be broken. The contact tube is mounted on an adjustable bracket located at the lower section of the dial housing diametrically opposite the zero position on the dial and very close to the plane of dial indicator travel. A small permanent magnet is attached to the scale indicator by a small arm and when the indicator is in the zero position, the magnet attracts the armature on the flexible wire in the vacuum tube, causing contact to be broken.

In operation, with no load on the scale, a poise on the beam is set to the desired weight, whereupon the dial indicator revolves in a clockwise direction from the zero graduation and comes to rest at a position on the dial equivalent to the poise setting. The load is then applied to the scale whereupon the indicator revolves back toward zero in a counterclockwise direction and cutoff takes place when the indicator reaches the zero graduation.

Where feeding rates to the scale are quite rapid and where there is little time to accumulate material on the scale, a double cut-off is employed. This arrangement simply consists of one contact mounted in the zero position and a second contact mounted several dial graduations away from zero. In this manner, the zero contact causes final cut-off of the feed, but the other contact causes a dribble feed, thus eliminating the chance of overweight in the batch.

The second of these electrical devices which can be added to the conventional dial scale is the photoelectric cut-off. In the arrangement illustrated here, an interceptor is incorporated on the scale head so that the light-sensitive portion directly faces a section of the dial. When the interceptor passes between this section and the photoelectric cell, an electrical contact is made or broken, as required by the process. Dribble feed is accomplished by incorporating a slit in the interceptor so that two contacts are made by the photoelectric cell, the dribble contact being made a few graduations before the zero position is reached. The position of the interceptor is adjusted by means of a center knob, accessible from outside the scale dial.

The scale illustrated here incorporates two photoelectric cells and two interceptors so that both the feeding of the scale as well as the discharging operation can be automatically controlled.

It is important to note that both of the cut-offs described enable the scale to actually weigh material out of the hopper, insuring delivery of the correct amount of material to the process. This arrangement is to be contrasted with equipment in which the material is accurately weighed into the hopper, but where the discharge of material from the hopper is not a weighing operation. Thus, complete delivery of the weighed material to the process may not always take place. Without the provision for weighing material out of the hopper as well as into the hopper, there is always the possibility of a pocket of material being weighed time after time, causing each batch to be short by that amount.

The two contacts just described are the means by which a dial scale can be incorporated into an automatic weight control system. The system is not complete, however, without the addition of several external components.

One important component is the electric vibratory feeder. A feeder of this type incorporates a trough or deck, on which material flows to or from the scale, which is vibrated by means of a pulsating electromagnet. These feeders literally nudge the material along by means of vibrations which vary from 1,800 per minute with an amplitude of ⅛ inch to 7,200 vibrations per minute with an amplitude of $\frac{1}{32}$ inch. An outstanding advantage of these feeders is the clean, precise cut-off which can be obtained and which greatly reduces the possibility of over or underfeeding a batch.

Shown here are two feeders of this type used in connection with a suspension hopper scale. The upper feeder is used to charge the

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scale hopper, while the lower feeder is used to discharge the hopper. This particular equipment is installed in a large glass plant.

Electrical timers, switches, relays, counters, signal lights, and push buttons are also integral parts of modern weight control systems. The dials for setting the timers, push buttons for initiating control, the signal lights, relays, and timers are usually incorporated in a master control panel, often located a hundred or more feet from the scales themselves. Shown here is a weight control panel installed in a large plant making alloy steels. Often these centralized control panels are located in the same room with other types of instruments and controls, including pyrometers, flow meters, pressure gages, and the like. In many cases, the scales and auxiliary equipment are maintained by the same men who maintain other types of instruments. Remote installation of the electrical components of the weight control system is advantageous in that these more delicate components of the system are not subjected to fumes and dusts often encountered in the batching room proper.

To illustrate how weighing of several materials to a process is precisely and automatically coordinated, I shall briefly describe a system used in batching rubber.

The system illustrated here comprises: Two platform dial scales, each with a capacity of 500 pounds, for weighing rubber; five bench dial scales, each with a capacity of 25 pounds, for weighing pigments; and one suspension hopper dial scale, with a capacity of 50 pounds, for weighing lampblack.

Weighing rubber on the platform scales is one of the few manual operations required by the system. Pigments are fed to the scales by electric vibratory feeders. There are three conveyors interlocked in the system, namely, two rubber conveyors, each of which serves a Banbury mixer in which the batch is made up, and one reversing pigment conveyor, which serves both Banbury mixers. Each pigment chute empties into a vibrating feeder, which insures a steady, positive feed to each scale. Each chute is equipped with a bin level indicator, a vibrator to insure constant flow, and a bin check valve to prevent flushing of materials.

Once the scales are adjusted for a series of batches, operation of the system proceeds thusly:

First, rubber is placed on the scale according to compounding pointers until the total desired weight is satisfied and indicated by a tolerance signal light. The rubber conveyor now will start when the Banbury operator depresses the proper push button on the control panel, providing the mixer has previously been discharged, the discharge gate is closed, and the mixer ram is in proper location. The starting of the conveyor is electrically interlocked with these latter factors. There is a control panel at each of the two mixers.

The operator then depresses a push button which initiates operation of the pigment weighing. The pigment conveyor will start, providing all pigment scales have received the proper loads for which they have been set. The direction in which the conveyor moves is dependent upon the control station from which the starting impulse is received. At the end of a given interval, as determined by another timer, the pigment conveyor stops. Charging of the lampblack is accomplished similarly.

After each pigment scale is discharged, it is automatically refilled, ready for the next batch; that is, unless the automatic counter locks out the system after a given number of batches have been prepared. The counter is set at the start of each series of batches and allows the scales to refill a definite number of times, but prevents the making of more batches than are required for a given formula.

Automatic weight control systems are not confined, of course, to dial type scales. One interesting and rather widely used arrangement involves the beam scale with electrically driven poise. In operation, the hopper is filled with material and the sale is balanced by manually adjusting the poise. A rate control dial is set at the desired rate of feed and a small synchronous motor, which drives the poise, is started. This motor retracts a poise on the beam by means of a revolving worm geared to the poise. Retraction of the poise gives the beam a tendency to tip up. This tipping action of the beam causes the end of the beam to make a mechanical or electrical contact which controls a mechanical or electrical vibratory feeder to remove material at the rate required to keep the scale in balance. Feeders of the vibrating deck or trough type are used for solid materials. A scale of this type, however, is also available for weigh-feeding liquids.

Blending of ethyl fluid into gasoline is now being done continuously with the aid of an automatically operated loss-in-weight scale of the type just described. Tetraethyl fluid is usually proportioned to motor gasoline in amounts ranging from 0.5 to 1.5 cubic centimeters per gallon. The high accuracy of the blending system is illustrated by the fact that the tetraethyl load content of the blended product varies from plus or minus 0.01 cubic centimeter at a minimum to a maximum of 0.06 cubic centimeter. In this installation, the required ethyl fluid is continuously blended with gasoline at an adjustable rate from 700 to 1,200 gallons per minute. Essentially, the blending system comprises:

A horizontal ethyl fluid storage tank of 8,500-gallon capacity, mounted on a 60-ton built-in type scale.

A venturi meter and electrical flow transmitter for measuring the rate of gasoline flow volumetrically and transmitting the flow measurement electrically to a mechanism for retracting the poise on the Ethyl fluid scale.

An air control system attached to the free end of the scale balance beam in such a way as to control the amount of air pressure exerted on the diaphragm of a control valve in the ethyl fluid feed line and hence the rate of fluid evacuation from the tank.

And a system of safety devices and audible alarm signals. These are mounted on an instrument panel and go into operation in case of pump or air pressure failure.

The continuous weighing of products while they are on the move is another large contribution of scale engineering to industrial processing. These devices operate quite similarly to conveyor type scales in that they involve two idler rollers and one live roller which is connected to the scale mechanism. These devices serve to continuously indicate to an operator how much a product, such as tire tread, coated fabric, or paper board, is deviating from the desired weight per lineal dimension. In some cases, alarm signals are incorporated to warn the operator visually or audibly when tolerances are being exceeded. It is quite possible that these devices will one day be interlocked with the processing equipment involved to automatically effect changes in process conditions to bring the material back to standard when tolerances are exceeded.

In closing, it is interesting to note how progress in the measurement and control of weight as a process variable has paralleled progress in the measurement and control of temperature, pressure, flow, and other variables. Early pyrometers for temperature measurement were manually balanced, requiring the attention and skill of an operator to manipulate dials until the galvanometer reached a stable, balanced position. Then a reading was taken. How similar this is to the average beam scale which requires like manipulations. The pyrometer was improved—first by mechanical means and in recent years by electronic means—so that the instrument became direct reading. How similar this development is to the development of the automatic dial scale. The pyrometer was further improved to include a means to automatically record temperatures. While still not practiced extensively, scales are available today, of course, which provide continuous weight records. The pyrometer was still further improved to include electrical contacts or pneumatic mechanisms which served to automatically operate control valves or dampers to change process conditions in accordance with the measured variable. How similar these improvements are to the mercury magnetic and photoelectric cutoffs described earlier in this paper. This striking parallel of events only serves to emphasize the need for a freer exchange of know-how between scale engineers and instrument engineers.

VEHICLE SCALES—TESTING EQUIPMENT AND PROCEDURES [9]

By James M. Paddock, *Superintendent of Standards, State of Illinois*

Mr. President, members of the National Conference and guests, I trust that I may not be considered a bit presumptuous in appearing before so many able and experienced weights and measures officials, assembled here from so many parts of the country. Last year, I attended my first National Conference on Weights and Measures and even though I am new in weights and measures work, in comparison to many weights and measures officials, I can fully appreciate the importance of testing vehicle scales and our present inability to do this work with our limited equipment.

With corn and wheat at almost $2.50 a bushel and other farm commodities at a correspondingly high level, it can readily be seen that an inaccurate scale would soon cost someone a great deal of money. In Illinois, we have far more scales weighing these commodities than we can possibly test regularly and more scales are being installed all the time.

The food packing industry is undergoing a general change that is naturally affecting the use of the vehicle scale. The growing of truck

[9] This paper was presented to the Conference by G. A. Ritchey, Administrative Assistant, Division of Standards, State of Illinois.

produce for canneries is quite general throughout the State of Illinois and various shipping points have been established where large scales have been installed to handle the volume of traffic. It is imperative that these scales be tested for accuracy at a particular time. During the past few years, the trucking interests hauling farm produce through various devices brought themselves under very close observation of shippers. As a result, they urgently request periodic inspection of their scales. For example, when the tomatoes are ready for canning, we receive many requests for inspection of scales over which tomatoes are to be weighed. During the sweet corn canning season, we receive many requests for weighing this commodity, etc. Then too, we have the numerous coal mine scales, lumber yard scales, etc.

It has been our opinion for a long time that we should increase our testing equipment for vehicle and other large capacity scales. Naturally, during the war, this was impossible and as most State officials realize the process of securing an appropriation for expensive equipment is a long and tedious operation. During the last session of the legislature, however, we were successful in securing an appropriation that will enable us to purchase two additional large scale testing units. We also secured in our appropriation enough funds to hire four more men.

In contacting several State officials, most of the replies advised that the same condition, shortage of equipment, existed in their jurisdiction. Therefore, the primary problem, as I see it, is not the testing equipment and procedure, but securing funds from the legislature to purchase this badly needed equipment. As various means of securing these funds are employed in the different jurisdictions, I do not believe that I could add anything that would help this situation. We must, however, continuously strive to impress the people and members of the legislature with the importance of our work. In our opinion, three test units must be employed in the very near future to efficiently and properly handle the work entailed in the heavy-duty scale installations throughout the State, used by our commercial and industrial enterprises.

I am indeed sorry to say that our present equipment consists of one large vehicle-scale testing unit. This is a 5-ton Diamond T truck and carries ten 1,000-pound weights, which are loaded and unloaded by a Gar Wood winch, which is operated by an auxiliary motor, located inside the van body. The weights are distributed on the scale by use of a rubber-tired dolly. Two tons of 50-pound weights are carried as extra weight to test smaller-capacity scales.

In a great many cases where small wagon and livestock scales are to be tested, we can assign two of our district inspectors, each carrying 500 pounds of 50-pound weights, to make the test.

For our new large-scale testing units, we have been favorably impressed with the truck exhibited by Mr. Baucom at the Southern Association meeting. We have received estimates on the cost of the equipment and expect to place our order immediately, unless we are convinced that something better is available.

The unit is a Scale Testing Corbett truck, especially designed, of the six-wheel, two-wheel-drive type with a trailing axle. Continental motors will be used. Room is provided for eighteen 1-000-pound weights to be arranged in six rows of three. The weights are loaded and unloaded three at a time by means of hydraulic equipment, operating on two parallel roller chains. This equipment is powered by a high-pressure pump, driven from a power take-off on the transmission. The power take-off is engaged from the cab and is left running from the time the driver is ready to unload the weights until the weights are reloaded. All other operations are controlled from the ground at the rear of the truck. Only two controls are used: The first is a selector control which has detents to hold it in any of three positions, one position for raising or lowering, one for traversing the weights to or from their position in the body, and the third a neutral; the other control is equipped with springs to return it to neutral when the operator releases it. This same control governs the speed of the engine and consequently the speed of the movement; in the normal vertical position the engine idles, but as the control is depressed the speed increases. It is impossible to increase the speed of lowering faster than a preset safe speed. The hydraulic system incorporates safety devices making it impossible for the weights to be dropped by wrong manipulation of the controls or even by the failure of the pump or any of the tubing.

A hand truck for moving the individual weights is included. This can be loaded on top of the weights by the hydraulic power and locked in place for safe transportation.

The truck will be enclosed, and will consist of a stationary panel on the right hand or nonoperating side, and a panel on the operating side hinged to the beam at the top to open horizontally with props to form a canopy. The rear will be enclosed with a removable heavy canvas curtain, which will enclose the open part at the bottom of the extended canopy, as well as the back.

We have ordered a Panel Body Truck, which we will equip with sufficient weights to test livestock scales and scales of not too great a capacity. This will enable us to handle requests for inspection of livestock scales and various scales of this type, without disturbing our large-capacity testing units. After this unit is put into operation, if we find that we need another unit of this type, we will endeavor to have two in service, at all times.

In regard to procedure in testing scales, I feel that there are two ways of testing large scales. One of these is the theoretical or proper method to use, when conditions are ideal, and the other is the method to use to secure the best practical use of the very limited equipment. I will not go into the theoretical procedure as many pamphlets have been issued explaining this method, and in digesting the replies from the various other officials, I have found that, as in Illinois, most States must, of necessity, take some short-cuts in order to use the equipment to best advantage.

In Illinois, our first step in testing the scale is to obtain a zero-load balance. Then the SR is taken. Next we test each corner of the scale with weights, when possible equal to one-fourth of the capacity of the scale. The SR is noted after each weighing. Then the ten thousand pounds of weight are evenly distributed over the scale. The weights are then removed from the scale and the truck is weighed empty. Then the truck is reloaded and again weighed to give a strain-load test. Automatic-indicating devices are tested in the same manner. All test observations are recorded on a test record form, carried by the inspector. A copy is left with the scale operator, one forwarded to the office, and one retained by the inspector. All essential data about the scale are recorded, its make, type, capacity, etc.

We consider our present unit inadequate, as it carries 10,000 pounds of weights and the weight of the truck is 18,000 pounds. To properly test a scale the known weight should exceed the weight of the truck.

When new equipment is secured carrying more known weight, we are planning on using "end tests". I realize that there has no doubt been much discussion, from time to time, regarding "end testing" versus "corner testing" for motor-truck scales. In my opinion, "corner testing" is proper procedure for the smaller sizes of platform scales, but I do not believe that "corner testing" is justified for the weights and measures official on the larger capacity scales, and as I have explained before, our present procedure of "corner testing" is due to an inadequate amount of weight. "End testing" requires less time, and it is important to make as many tests in a day as possible, due to the increasing number of requests; and also the inspector should so conduct his test as not to tie up the scale for an undue length of time. As the weights and measures inspector does not make repairs or adjustments, an "end test" with an adequate load will develop all essential information needed.

In some States the equipment is used almost exclusively on requests for inspection, while in others, no attempt is made to take care of requests as the truck is given an itinerary and does not deviate from it. In Illinois, we hold our requests until an appreciable number is received from the same locality. The truck is then routed to take care of these requests and also test all other scales in the vicinity.

In closing, I would like to say that I believe with the purchase of new equipment during the coming year and additional personnel, Illinois will not have to apologize for inadequate heavy-duty scale testing equipment at the Conference next year.

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON WEIGHTS AND MEASURES EDUCATION, PRESENTED BY W. S. BUSSEY, CHAIRMAN [10]

We wish it were possible for your Committee on Weights and Measures Education to report to you, at this time, a year of outstanding progress and achievements. However, this is impossible. Yet, your Committee is more firmly convinced than ever that "Education" is the most important subject facing weights and measures officials today.

Your Committee, as such, must confess that it has done very little during the past 12 months. We are happy, however, that recent reports made to the Committee, by weights and measures officials from various parts of the United States, reveal that considerable individual and departmental activity has been going on in the educational field. This, coupled with what your Committee members have done individually and collectively, represents an appreciable amount of educational work.

When your Committee reported to you in 1946, it consisted of only

[10] To conserve the time of the Conference, this Report was shortened in oral presentation; the complete text is here presented.

three members, the other members having resigned when they entered fields of endeavor outside of weights and measures administration. The three Committeemen last year were Robert Williams, of Nassau County, New York; A. J. Jensen, of North Dakota; and W. P. Reed of Georgia. The personnel of the Committee was completed with the appointment by Dr. Condon, President of the Conference, of Erling Hansen, of Minnesota; E. F. Usher, of Highland Park, Mich.; L. E. Witt, of Milwaukee, Wis.; and W. S. Bussey, of Texas. Later in the year, the press of other matters prompted W. P. Reed to offer his resignation, at which time, R. D. Thompson, of Virginia was appointed to fill the vacancy.

In the Committee report last year, it was recommended that each member of the Conference read and study again the reports that the Committee made in 1940 and 1941, respectively. We sincerely hope that you have done this. If not, we might remind you that it still is not too late. We feel that many useful and helpful suggestions are contained in the first two reports made by this Committee.

The reports recently received by your Committee, from weights and measures officials throughout the nation, were from 24 States and the District of Columbia. In some instances reports were received from several officials within the same State. These reports list ten principal means of spreading weights and measures information, seven of which were for the primary purpose of educating the public and three for educating weights and measures officials. The seven means employed in educating the public, listed in the order of their prominence, are as follows:

(1) In practically all States, the "public press" was made use of as an educational medium. It is clearly evident that newspaper articles are the most common means of disseminating weights and measures knowledge, and these are awarded "first place."

(2) Probably the "second" most widely used medium is that of "personal appearance addresses," made before grade school, high school, and college groups, civic organizations, women's clubs, etc. One outstanding example was found in Los Angeles County, California. Mr. Charles M. Fuller will tell this Conference, later during this session, about his experiences in spreading the gospel of "Properly Financing a Weights and Measures Organization" through numerous appearances before different interested groups in his county.

(3) The "third" most widely used facility is "radio." Numerous State, county, and city jurisdictions have made use of this excellent means of informing the public on weights and measures matters. One State in particular has a rather unique set-up in the radio field, that being the State of Wisconsin, which owns its own radio station to which the Weights and Measures Division of the State Department of Agriculture has access at frequent intervals.

(4) The "fourth" most frequently used means is "exhibits at county fairs and similar exhibitions." Several jurisdictions took advantage of the opportunity to prepare educational exhibits and have a weights and measures officer in charge at all times, to answer questions, hand out literature, etc. In the State of Vermont, questionnaires were passed out to ascertain what the buying habits of the public really were. Fifty-four percent of the people answering the

questions indicated that they take no special interest in what they are getting for their money or whether or not they are being cheated. About 50 percent claimed that they did take the trouble to look at the scale, while only about 40 percent said that they attempted to do something about it if the scale was found out of balance. We would not be surprised if a portion of this 40 percent were not bragging a little. In the opinion of your Committee, this seeming lack of interest on the part of the public is certainly a deplorable condition.

(5) We rank in "fifth" place the "publication of annual and biennial reports, departmental bulletins, and pamphlets, containing weights and measures laws, regulations, and other useful information." Several of the departmental reports and bulletins mailed to your Committee are quite elaborate and carry much useful information concerning the activities of the weights and measures department, together with numerous pictures demonstrating some of the services rendered. Such publications no doubt serve a very useful and worthwhile purpose.

(6) Another educational means which has been made use of quite frequently and which we rank "sixth" is the "attendance of weights and measures officials at trade association meetings and their participation in the programs at these gatherings." Some of the trade organizations which have been prominently mentioned are dairy, grain, bakery, grocer, solid fuel dealers, and other similar associations. Much progress has been reported through better understanding and closer working arrangements with these organizations.

(7) Much work has been reported by departments sponsoring legislation and endeavoring to "educate State representatives and senators" on the importance of weights and measures administration and the functions of weights and measures enforcement organizations. The amount of work done in this field would probably make it rank in "seventh place."

The seven fields of weights and measures education already mentioned deal primarily with the education of the "general public," as heretofore stated. The next three activities deal principally with the "education of weights and measures officials" themselves and those associated very closely with weights and measures administration.

In "first place" we rank "Weights and Measures Conferences and Schools of Instruction for Inspectors and Mechanics." We find that possibly all but about two or three of the State Weights and Measures Associations have resumed their annual conferences and schools since the close of the war. Those associations which have not yet held meetings since the war plan to do so in 1948. It is the custom of most State Associations to hold annual "General Conferences." Some of these organizations, however, also conduct annual "Schools of Instruction for Weights and Measures Officers and Scale and Pump Mechanics." Outstanding in this latter field has been the Virginia Association, which was probably the originator of the "school idea." Indiana holds a fall meeting which is strictly educational, while Ohio, Texas, and other State Associations devote all, or a portion, of their program to special training and instructions for sealers. The Southern Weights and Measures Association devoted a portion of its annual program in New Orleans to special training for inspectors. Without a doubt, more has been accomplished through State, regional, and national conferences, and schools of instruction, insofar as educating weights and measures officials themselves is concerned, than by any other means.

Next we rank the publication of "Weights and Measures News Letters" by some Departments and State Associations. No doubt the outstanding piece of work in this field has been performed by the State of Indiana. The Indiana News Letter has been published month after month, without exception. It has not only served to keep the weights and measures officials and other interested persons residing in the Hoosier State well informed on weights and measures matters; but it has also been very beneficial to those of us in other jurisdictions who have been favored with copies of this splendid publication. California, Michigan, Ohio, and Texas have issued News Letters or similar publications with less frequency than the Indiana letter. The Southern Weights and Measures Association has also joined the ranks of organizations issuing News Letters and three such letters have been issued by that organization up to this time. It is the opinion of your Committee that these News Letters, or Bulletins, issued by various Departments and sealer organizations, help a lot to keep weights and measures officials throughout the country better informed and to keep their work more uniform and in closer harmony. We certainly recommend the continuance of such letters, and also we recommend to each State or organization issuing such letters, that they broaden their mailing lists as much as possible.

We would rank "third" the holding of "district meetings for inspectors," from time to time, throughout the year, to keep them better informed on problems of the day. The State of Kentucky reported the appointment of a "Special Field Supervisor" whose duty it was to contact various district inspectors for instructional purposes.

These are ten principal channels of education made use of during the past year. They have been listed "according to the frequency of use" and not according to their "merits or potentialities." You can easily see that considerable work has been done, but there is plenty of room for expansion.

We have told you, in a very general way, about some of the educational activities of weights and measures officials during the year just past. Now let us look into the future and talk for a moment about what we can and should do during the months to come.

Your Committee has consistently emphasized the importance of "more and better education for weights and measures officials themselves." It is our firm belief that weights and measures officers form the entire foundation for all weights and measures educational activity. It is also our firm conviction that we have fallen far short in our responsibility to provide the necessary means, leadership, and encouragement for the proper and necessary education of these important public officials.

In industry, much time, effort, and money are spent upon advertising, salesmanship, publicity, and public relations. These are vitally important matters to "commerce and industry." They should be just as important to "necessary governmental agencies." These three things are all very closely related to "education." Honest advertising is nothing short of an "educational campaign" to enlighten the public, or certain groups of individuals, as to the value, the merit, the convenience, the necessity, or the desirability of some product, service, or protection.

The good salesman must be an "educator," in a sense. He must be able to educate his prospective customer on the virtues and advantages of his product. He must be able to show him and convince him that it is an outstanding value.

"Publicity" is merely the use of the press, radio, or other means to educate the public regarding certain individuals, services, projects, or products, while "public relations" is very similar and is employed extensively in industry and government as a means of educating the general public by furnishing authoritative information on matters with which they should be vitally concerned, but probably with which they are not very well acquainted.

Advertising, salesmanship, publicity, and public relations all rightfully come under the heading of "education" and should be employed extensively in the weights and measures field. It is certain that the general public, including our higher public officials, has never been sold upon the true value and importance of efficient weights and measures administration. If this job of selling, or educating, as you might choose to describe it, is ever accomplished, it must be done by weights and measures officials. If we are to put this job over, we must be good salesmen. In order to be good salesmen, we must know our product ourselves and must educate others as to its virtues and values. We must employ advertising, salesmanship, publicity, and public relations in making this sale.

Your Committee has learned that the status of weights and measures education in this country is very little different from what it is in some of the other countries of the world. A current issue of "The Monthly Review," the journal of the Incorporated Society of Inspectors of Weights and Measures of Great Britain, carries a very interesting paper under the title "Public Relations and the Inspector." This article was written by Mr. J. H. Sowden Hall, a weights and measures officer in England. His paper indicates that the situation in Great Britain is almost parallel with that in the United States. He talks of a great need for education of weights and measures officers themselves, as well as that of the general public. Every weights and measures officer in this country should read Mr. Hall's paper. If enough of you are interested, your Committee will try to make it available to you.

Getting back to the question "What can we do to provide better education for weights and measures officers?" your Committee has a few definite suggestions and recommendations. One suggestion is that more of our States appoint Educational Committees to work with and assist your National Committee. Such committees have been authorized by the Indiana, Michigan, Virginia, New York, Texas, and Southern Weights and Measures Associations. Possibly other State Associations have authorized the appointment of similar committees without our knowledge. We do not know of any particular activity, since the war, on the part of these State committees, but we do hope that more such committees will be appointed and that they all become very active in this field.

We recommend that more State and regional weights and measures associations be organized and that more Conferences and Schools of Instruction be sponsored.

We believe that the field of visual education should be added to our list of activities. R. D. Thompson of Virginia, a member of this Committee, has been making a study of the possibilities in this field and has been in touch with the Virginia Department of Education regarding the possibilities of producing one or more weights and measures educational films. Mr. Thompson's research in this field is not complete; in fact, it has not progressed far enough for the Committee to make definite recommendations at this time. We do believe that it has great possibilities, and we solicit the cooperation of everyone interested in helping to work something out that will be definitely worthwhile.

Your Committee feels that weights and measures administration in this country has not kept abreast with the times when its importance to commerce and industry, as well as to the individual consumer, is taken into consideration. We have watched other governmental services improve in efficiency and broaden their scope, while we have, more or less, been at a standstill.

Why have these other governmental agencies increased in knowledge, in efficiency, and in public favor? There must be a reason. We know that our law enforcement agencies, such as State Police, County Sheriffs, Constables, and City Police, have increased their efficiency at least twofold during the past 10 years or so. At the same time they were increasing their efficiency they were also increasing their popularity with the people. How has this been brought about? It is the opinion of your Committee that the greatest contributing factor to this vast improvement in our law enforcement agencies has been brought about through the schools sponsored and conducted under the supervision of the Federal Bureau of Investigation. We do not believe that there is any doubt about this.

The Federal Bureau of Investigation, with the cooperation of certain educational institutions and State and city police departments, has selected specially suited officers to take specialized training. These men have been schooled in various phases of law enforcement. Many of them have been specially trained as Police School Instructors, that they might return to their respective jurisdictions and conduct local Law Enforcement Training Schools.

It is the opinion of your Committee, and we so recommend, that this Conference go on record as requesting the National Bureau of Standards to give thought and consideration to the possibility of establishing and sponsoring a technical training school for weights and measures officials. It is our thought that in the beginning the students for such school should be selected from men desiring to make weights and measures administration their career and who have teaching ability, so that they could go back to their own and adjoining States and help conduct similar schools of instruction, where local officers could attend. Your Committee does not propose to recommend a curriculum for such a school at this time. However, we do feel that the course should include practical training, including work on actual weighing and measuring devices.

A weights and measures officer without the proper and necessary knowledge and training is often embarrassed when he finds it necessary to take a case into court. We believe that this situation oftens keeps an inspector from performing his duties in a more efficient manner. A good defense lawyer, in a weights and measures case, usually starts working on the State's expert to disclose just how much basic knowledge he possesses on the working tools of his profession. Your Committee feels that a school such as we have recommended, properly conducted and followed up with similar local schools, would close this gap, where such gap exists. This recommendation has been discussed with representatives of the Bureau of Standards. They are not averse to the suggestion and the Committee feels that we would receive their whole-hearted cooperation and support.

In closing, we wish to thank each and every person who has cooperated with the Committee during the year. Especially do we want to thank all of those officials who sent us reports on the educational activities in their jurisdictions. They revealed many interesting facts which time and space will not permit us to include in this report.

(Signed) W. S. Bussey, *Chairman*,
Erling Hansen,
A. J. Jensen,
R. D. Thompson,
E. F. Usher,
Robert Williams,
L. E. Witt,
Committee on Weights and Measures Education.

(The Report of the Committee on Weights and Measures Education was duly adopted.)

(At this point, at 12:25 p. m., the Conference recessed for luncheon.)

FIFTH SESSION—AFTERNOON OF WEDNESDAY, SEPTEMBER 24, 1947

(The Conference reassembled at 2:10 p. m., C. C. Morgan, Vice President of the Conference, presiding.)

THE REGULATION OF REPAIRMEN

By Ralph W. Smith, *Secretary, National Conference on Weights and Measures*

A year ago, during the Thirty-second National Conference, it was suggested to me that a system of control over the men and agencies engaged in the business of repairing commercial weighing and measuring devices for hire, based on bonding rather than licensing, offered possibilities of a solution to the problem about which many had complained for years but about which no one seemed inclined to do very much. It was suggested further that weights and measures officials had an interest in the solution of this problem, a problem which was of direct concern to those in the repair business and of secondary concern to those in the business of manufacturing weighing and measuring devices.

The more I considered these suggestions the more probable it appeared that a suitable bonding system of control would effectively do one thing which a licensing system alone would not do, namely, provide financial protection for the equipment owner who paid for a good repair job, but failed to get it, and for the one whose equipment was damaged by an incompetent mechanic in the course of unsuccessful efforts to make repairs; accomplishment of this objective has long been a desideratum among weights and measures officers. Furthermore it appeared probable that from such a system there should also flow the corollary advantages, of importance to the general success of weights and measures supervision, of the automatic elimination of incompetent and unscrupulous mechanics and the elevation to a higher level of the whole business of repairing weighing and measuring devices.

Feeling as I did it required not too much persuasion to prevail upon me to accept a place on the program of the 1947 meeting of the National Scale Men's Association held in Kansas City, to present my views. The paper which I presented was prepared after consultation with numerous persons having varied interests in the general problem; many constructive suggestions were received from these sources, for all of which I wish at this time to make grateful acknowledgment. It quickly became apparent that to be of maximum assistance I should be in a position to offer for study a suggested bill designed as the legal basis for the system of regulation being proposed; such a bill was worked out, again with the valuable assistance of others than myself, and was incorporated in the paper as an appendix. Copies of the completed paper were supplied by me to State weights and measures offices just prior to the Kansas City meeting. As material falling within the scope of its interest, the suggested bill was made available to the National Conference Committee on Legislation.

The paper was presented as the concluding item of the morning session of the NSMA meeting on May 1, 1947; there was no discussion. At the afternoon executive session on that day there was presented and adopted a report by an Association committee on the qualification of repairmen; this report was to the effect that (1) neither licensing nor bonding provides a solution, (2) adequate enforcement of existing laws by weights and measures departments is all that is needed, (3) bonding will not give the desired protection, (4) multiple bonding will be required, and (5) responsible companies will be burdened by having to pay bonding fees. Following the adoption of this report there ensued a discussion lasting for perhaps an hour, in the course of which several suggestions were made and debated for formalizing an expression of the Association attitude toward licensing and bonding of repairmen and agencies; these included a motion (later withdrawn) to endorse the principle of bonding, a motion to oppose both licensing and bonding, and a substitute motion that it was the sense of the meeting that the whole subject required more study. Majority sentiment, particularly on the part of the representatives of equipment manufacturers, appeared to be opposed to the endorsement of any system of regulation, but the final Association action was the tabling of both pending motions.

In my paper I announced the intention of presenting my ideas on the bonding of repairmen and repair agencies to the National Conference. In view of the unfavorable reception accorded these ideas by a representative group of the persons proposed to be regulated, and of the reaction of the Committee on Legislation of this Conference to the proposed model bill as expressed in the Committee report already in your hands, I shall refrain at this time from any elaboration of the abuses needing correction or of the ways in which the proposed State legislation might be expected to correct these abuses. However, I do propose that, in the absence of objection from this Conference, there be included as an Appendix to the printed report of this meeting, the full text of the paper delivered before the National Scale Men's Association, to make this a matter of record for whatever value it may have in possible future discussions on the regulation of equipment repairmen and repair agencies.[11]

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON LEGISLATION, PRESENTED BY ROLLIN E. MEEK, CHAIRMAN [12]

Your Committee on Legislation has had under consideration, during the past year, proposed Federal Standard Food Package Legislation and a proposed model bill calling for the bonding of repair agencies and those engaged in making repairs on weighing and measuring devices. The two proposals will be discussed in the order named and separate recommendations made for your consideration.

[11] See page 179.

[12] To conserve the time of the Conference, this report was shortened in oral presentation; the complete text is here presented.

FEDERAL STANDARD FOOD PACKAGE LEGISLATION

For more than a decade, the subject of food package standardization has been an extremely live one with weights and measures officials throughout the country. Their interest in it and their firm belief that standardization is a desirable objective in weights and measures supervision has resulted in the subject being discussed and action taken during numerous meetings of the National Conference on Weights and Measures.

Since the history surrounding proposed food package standardization is a matter of record and may be studied in the various reports of Conference meetings, your Committee is of the opinion that little good can be accomplished by taking the time necessary to review it as a part of this report. It should suffice to point out that the Committee on Legislation again became interested in the subject as a result of action taken during the Conference held last year. At that time, the Conference approved the recommendation of the Special National Conference Committee on Conference Standard Food Package Bill which was that the matter of food package standardization be referred to the Conference Committee on Legislation.

The Committee on Legislation, hoping to benefit from the efforts and experiences of former Committees, began with H. R. 6784, the Federal Standard Food Package Bill introduced, at the instigation of the National Conference, into the Second Session of the 77th Congress, March 13, 1942, by Congressman Somers of New York. This Bill, unlike former proposals designed to bring about food package standardization, was never accorded a hearing. This may partially explain why the Committee began its labors under the impression that the major objection to the bill came from groups vitally concerned with the packaging and marketing of fresh fruits and vegetables.

In redrafting H. R. 6784, the Committee specifically eliminated fresh fruits and vegetables from its requirements and made various minor clarifying changes. The text of the new bill is as follows:

A BILL

To prohibit the movement in interstate commerce of packages of food not of the standard units of weight or measure herein prescribed, and for other purposes.

Be it inacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the Federal Standard Food Package Act.

Sec. 2. For the purposes of this Act—

(a) The term "Territory" means any Territory or possession of the United States, including the District of Columbia and excluding the Canal Zone.

(b) The term "interstate commerce" means (1) commerce between any State or Territory and any place outside thereof, and (2) commerce within the District of Columbia or within any Territory not organized with a legislative body.

(c) The term "Administrator" means the Administrator of the Federal Security Agency.

(d) The term "person" includes individual, partnership, corporation, and association.

(e) The term "food" means articles used for food or drink for man except maltous, vinous, and spirituous liquors and fresh fruits and vegetables.

(f) The term "dry and solid food" means food commercially marketed in the dry or solid state.

(g) The term "liquid food" means food commercially marketed in the liquid state.

(h) The term "canned food" means food sealed in containers and processed by heat to prevent spoilage.

(i) The term "package" means any closed container of food and the contents thereof which comprise the unit for sale or delivery commonly known as the "retail package" and commonly offered for sale to the ultimate consumer in retail outlets; the term is not to be construed to include packages commonly comprising the wholesale unit of sale, notwithstanding that such packages may at times be purchased by ultimate consumers and by hotels, restaurants, and the like.

Sec. 3. The following standard units are hereby established for packages, the specified quantities being the net contents of the packages filled insofar as possible without impairment of quality:

(a) For dry and solid foods, except canned foods: One ounce, two ounces, four ounces, eight ounces, twelve ounces, one pound, one and one-half pounds, and multiples of one pound, avoirdupois weight: Provided, however, That whenever the Administrator finds, after investigation, that with respect to a particular dry or solid food comprising relatively large individual items or pieces, the interests of consumers will more adequately be served by standardization upon the basis of count than upon the basis of weight, he shall, by regulation, publish this finding and fix the number of said items or pieces which shall constitute the standard units for packages of such food.

(b) For liquid foods and for canned foods: One ounce, two ounces, four ounces, eight ounces, twelve ounces, one pint, one and one-half pints, one quart, three pints, two quarts, three quarts, one gallon, and multiples of one gallon, United States liquid measure.

(c) For foods, except canned foods, which are essentially or preponderantly solid at sixty-eight degrees Fahrenheit: Packages as specified in subsection (a) of this section.

(d) For foods which are essentially or preponderantly liquid or viscous at sixty-eight degrees Fahrenheit: Packages as specified in subsection (b) of this section.

(e) For foods, except canned foods, which are semisolid: Packages as specified in either subsection (a) or subsection (b) of this section in accordance with general consumer usage.

Sec. 4. The following acts and the causing thereof are hereby prohibited:

(a) The introduction or delivery for introduction into interstate commerce, the receipt in interstate commerce and the delivery or proffered delivery thereof for pay or otherwise, and the packing, proffering for sale, or selling in any Territory of food in packages which are not of the standard units as defined in section 3 of this Act, except as follows:

(1) Ice creams and other frozen desserts may be packaged as specified in either section 3 (a) or section 3 (b).

(2) Carbonated beverages may be packaged in units of six ounces, United States liquid measure.

(3) The provisions of this section shall not apply to packages of dry, solid, semisolid, and viscous food containing amounts of less than one ounce avoirdupois weight or to packages of liquid food containing amounts of less than one ounce, United States liquid measure.

(4) Small packages of particular dry or solid foods containing not more than six pieces or units whenever compliance with the provisions of this section is impracticable may be exempted by regulation.

(b) The refusal to permit access to or copying of any records as required by section 9.

(c) The refusal to permit entry or inspection as authorized by section 10 or to extend necessary facilities for inspection as required by section 10.

(d) The giving of a guaranty or undertaking referred to in section 12 which guaranty or undertaking is false, except by a person who relied upon a guaranty or undertaking to the same effect signed by, and containing the name and address of, the person residing in the United States from whom he received in good faith the packages of food.

Sec. 5. Nothing in this Act shall be construed as exempting any packages of food from all applicable provisions of the Federal Food, Drug, and Cosmetic Act.

Sec. 6. Whenever the Administrator finds, after investigation and opportunity for hearing, that with respect to particular packages of food it is needful, for the promotion of honesty and fair dealing in the interest of consumers—

(a) To limit the packaging of particular dry or solid foods, when in packages of more than one pound, to certain multiples of the pound, he shall prescribe, by regulation, standard pound multiples for packages of such foods; when standard pound multiples have been so prescribed, packages of the food in question shall be held to comply with this Act only when of the prescribed pound multiples.

(b) To establish exemptions, with respect to particular foods, from the provisions of section 3 of this Act, he shall, by regulation, prescribe such exemptions.

(c) To require on any package of food a declaration of the count and/or of the size and/or of the weight of the individual items or pieces of food contained therein, he shall, by regulation, prescribe such a declaration; when any such declaration has been so prescribed, packages of the food in question shall be held to comply with this Act only when they bear such declarations.

Sec. 7. The Administrator shall promulgate regulations for the efficient enforcement of this Act.

Sec. 8. The Administrator is authorized to conduct examinations and investigations for the purposes of this Act through officers and employees of the Federal Security Agency or through any weights-and-measures or food officer or employee of any State, Territory, or political subdivision thereof, duly commissioned by the Administrator as an officer of the Federal Security Agency.

Sec. 9. For the purpose of enforcing the provisions of this Act, carriers engaged in interstate commerce, and persons receiving packages of food in interstate commerce or holding such packages so received, shall, upon the request of an officer or employee duly designated by the Administrator, permit such officer or employee, at reasonable times, to have access to and to copy all records showing the movement in interstate commerce of any package of food, or the holding thereof during or after such movement, and the quantity, shipper, and consignee thereof; and it shall be unlawful for any such carrier or person to fail to permit such access to and copying of any such record so requested when such request is accompanied by a statement in writing specifying the nature or kind of package of food to which such request relates: Provided, That evidence obtained under this section shall not be used in a criminal prosecution of the person from whom obtained: Provided further, That carriers shall not be subject to the other provisions of this Act by reason of their receipt, carriage, holding, or delivery of packages of food in the usual course of business as carriers.

Sec. 10. For purposes of enforcement of this Act, officers or employees duly designated by the Administrator are authorized (1) to enter, at reasonable times, any factory, warehouse, or establishment in which packages of food are manufactured, packaged, packed, or held, for introduction into interstate commerce or are held after such introduction, or to enter any vehicle being used to transport or hold such articles of food in interstate commerce; and (2) to inspect, at reasonable times, such factory, warehouse, establishment, or vehicle and all pertinent equipment, finished and unfinished materials, containers, and labeling therein. The owner, operator, or custodian of such factory, warehouse, establishment, or vehicle shall extend any necessary facilities for such inspection.

Sec. 11. (a) The Secretary of the Treasury shall deliver to the Administrator, upon his request, samples of packages of food which are being imported or offered for import into the United States, giving notice thereof to the owner or consignee, who may appear before the Administrator and have the right to introduce testimony. If it appears from the examination of such samples or otherwise that such packages of food are in violation of the provisions of this Act, then such packages of food shall be refused admission.

(b) The Secretary of the Treasury shall refuse delivery to the consignee and shall cause the destruction of any such package of food refused admission, unless such package of food is exported by the consignee within three months from the date of notice of such refusal, under such regulations as the Secretary of the Treasury may prescribe: Provided, That the Secretary of the Treasury may deliver to the consignee any such package of food pending examination and decision in the matter on execution of a bond as liquidated damages for the amount of the full invoice value thereof together with the duty thereon and on refusing for any cause to return such package of food to the custody of the Secretary of the Treasury when demanded for the purpose of excluding it from the country, such consignee shall forfeit the full amount of the bond as liquidated damages.

Sec. 12. (a) Any person who violates any of the provisions of this Act shall be guilty of a misdemeanor and shall on conviction thereof be subject to imprisonment for not more than one year, or a fine of not more than $500.00, or both such imprisonment and fine; but if the violation is committed after a conviction of such person under this section has become final, such person shall be subject to imprisonment for not more than two years, or a fine of not more than $5,000, or both such imprisonment and fine.

(b) No person shall be subject to the penalties of subsection (a) of this section, (1) for having received in interstate commerce any package of food and delivered it or proffered delivery of it, if such delivery or proffer was made in good faith, unless he refuses to furnish on request of the Administrator the name and address of the person from whom he purchased or received such package of food and copies of all documents pertaining to the delivery of the package of food to him; or (2) for having violated section 4 (a) if he establishes a guaranty or undertaking signed by, and containing the name and address of, the person residing in the United States from whom he received in good faith the package of food, to the effect that such package of food is not a package of food which may not, under the provisions of this Act, be introduced into interstate commerce.

Sec. 13. (a) Any package of food that is not of a standard unit as defined in section 3 of this Act, when introduced into or while in interstate commerce, shall be liable to be proceeded against while in interstate commerce, or any time thereafter, on libel of information and condemned in any district court of the United States within the jurisdiction of which the package of food is found.

(b) The package of food shall be liable to seizure by process pursuant to the libel, and the procedure in cases under this section shall conform, as nearly as may be, to the procedure in admiralty; except that on demand of either party any issue of fact joined in any such case shall be tried by jury. When libel for condemnation proceedings under this section, involving the same claimant and the same issues, are pending in two or more jurisdictions, such pending proceedings, upon application of the claimant seasonably made to the court of one such jurisdiction, shall be consolidated for trial by order of such court, and tried in (1) any district selected by the claimant where one of such proceedings is pending; or (2) a district agreed upon by stipulation between the parties. If no order for consolidation is so made within a reasonable time, the claimant may apply to the court of one such jurisdiction and such court (after giving the United States attorney for such district reasonable notice and opportunity to be heard) shall by order, unless good cause to the contrary is shown, specify a district of reasonable proximity to the claimant's principal place of buiness, in which all such pending proceedings shall be consolidated for trial and tried. Such order of consolidation shall not apply so as to require the removal of any case the date for trial of which has been fixed. The court granting such order shall give prompt notification thereof to the other courts having jurisdiction of the cases covered thereby.

(c) The court at any time after seizure up to a reasonable time before trial shall by order allow any party to a condemnation proceeding, his attorney or agent, to obtain a representative sample of the package of food seized.

(d) Any package of food condemned under this section shall, after entry of the decree, be disposed of by destruction or sale as the court may, in accordance with the provisions of this section, direct and the proceeds thereof, if sold, less the legal costs and charges, shall be paid into the Treasury of the United States; but such package of food shall not be sold under such decree contrary to the provisions of this Act or the laws of the jurisdiction in which sold: Provided, That after entry of the decree and upon the payment of the costs of such proceedings and the execution of a good and sufficient bond conditioned that such package of food shall not be sold or disposed of contrary to the provisions of this Act or the laws of any State or Territory in which sold, the court may by order direct that such package of food be delivered to the owner thereof to be destroyed or brought into compliance with the provisions of this Act under the supervision of an officer or employee duly designated by the Administrator, and the expenses of such supervision shall be paid by the person obtaining release of the package of food under bond.

(e) When a decree of condemnation is entered against the package of food, court costs and fees, the storage and other proper expenses, shall be awarded against the person, if any, intervening as claimant of the package of food.

(f) In the case of removal for trial of any case as provided by subsection (a) or (b)—

(1) The clerk of the court from which removal is made shall promptly transmit to the court in which the case is to be tried all records in the case necessary in order that such court may exercise jurisdiction.

(2) The court to which such case was removed shall have the powers and be subject to the duties, for purposes of such case, which the court from which removal was made would have had, or to which such court would have been subject, if such case had not been removed.

Sec. 14. Before any violation of this Act is reported by the Administrator to any United States attorney for institution of a criminal proceeding, the person against whom such proceeding is contemplated shall be given appropriate notice and an opportunity to present his views, either orally or in writing, with regard to such contemplated proceedings.

Sec. 15. Nothing in this Act shall be construed as requiring the Administrator to report for prosecution, or for the institution of libel, minor violations of this Act whenever he believes that the public interest will be adequately served by a suitable written notice or warning.

Sec. 16. All such proceedings for the enforcement of this Act shall be by and in the name of the United States. Notwithstanding the provisions of section 876 of the Revised Statutes, subpenas for witnesses who are required to attend a court of the United States, in any district, may run into any other district in any such proceedings.

Sec. 17. If any provision of this Act is declared unconstitutional, or the applicability thereof to any person or circumstances is held invalid, the constitutionality of the remainder of the Act and the applicability thereof to other persons and circumstances shall not be affected thereby.

Sec. 18. This Act shall take effect twelve months after the 1st day of January next succeeding its enactment: Provided, That if, upon investigation, the Administrator finds that with respect to particular packages of food compliance with the provisions of the Act cannot reasonably be accomplished by the time of the effective date of the Act, he shall promulgate a regulation postponing the effective date with respect to such packages of food for such reasonable period as in his best judgement may be necessary in the circumstances, and may similarly further postpone such effective date, and such regulations may be promulgated and shall take effect upon the date of promulgation: Provided further, That the provisions of section 8 shall become effective on the enactment of this Act, and thereafter the Administrator is authorized to promulgate regulations which shall become effective on or after the effective date of this Act as the Administrator shall direct.

The bill was mimeographed, and copies, together with a letter calling attention to a public hearing, was sent to several hundred manufacturers, processors, food distributors, consumer groups, etc. The hearing, held in the Indiana State Board of Health Building in Indianapolis on June 17, was attended by Rollin E. Meek and Joseph F. Blickley as members of the Committee on Legislation and approximately thirty representatives of industry.

The Committee was of the opinion that the holding of a public hearing on the Bill would be of great benefit to it and the Conference as it would give all interested groups—both favorable and unfavorable—an opportunity to express their views. The Committee retains that opinion regardless of the fact that the hearing disclosed little or no support for the bill. Through the efforts of Committee members and representatives of industry most of the arguments, both for and against the bill, were thoroughly explored.

Each person attending the hearing was given an opprtunity to express his views and, before the meeting adjourned, all were invited to file briefs covering their positions with respect to the bill. Copies of these briefs, together with copies of letters and telegrams received from many unable to attend the hearing, were provided each member of the Committee on Legislation and the Secretary of this Conference for further study and as a matter of record. Without exception, the positions taken by all representatives of industry who have made their position known, is either in opposition to the bill or requesting exemption from its provisions as they relate to their particular industry.

Your Committee is of the opinion that some of the minor objections raised to the bill might be taken care of by amendments. However, the unanimity of the opposition and the debatable objections raised, would seem to make it inadvisable to press for the enactment of Federal Standard Food Package legislation, particularly at this time. The objections most strongly urged against the bill may be summarized as follows:

1. The tremendous cost to industry, which cost would ultimately be passed on to the consumer, to change its food packaging machines so that various food items could be packed according to the standards proposed.

2. Industry is geared for the manufacture of the sizes which are now being produced. Standardization, as proposed, would interfere with all-out production, encourage inflation, and would retard the foreign relief program.

3. Various ready-to-eat breakfast foods, biscuits, crackers, etc., are being packaged in containers standardized by shape and volume rather than by weight. This permits the use of the same packaging materials, packaging machinery, and plants to package a variety of products. This would not be the case, due to the different densities and nonuniform weights of the foods mentioned, if required to be packed on a standard-weight basis.

4. The impossibility of canning fruits, vegetables, meat products, sea foods, etc., having different specific gravities, on a net-content liquid-capacity basis without creating a multiplicity of slightly different can sizes or violating slack-fill provisions of existing law.

5. Food package standardization would endanger such practices as packaging food items on the basis of servings; as ingredients for making certain amounts of finished products of approved quality and palatability; to sell for the "majic" five and ten cent prices; and in containers which often have some definite value to the purchaser.

The foregoing are cited as major objections which were raised to the proposed legislation during the June 17 hearing, but the Committee felt that these should not be accepted as "closing the door" against any future efforts to bring about food package standardization. However, these objections were considered to be sufficiently important to make highly questionable any insistance on the part of the Conference for the enactment, at this time, of legislation based on the proposed bill.

Your Committee takes the position that much good has been accomplished by the efforts of the National Conference on Weights and Measures to bring about the enactment of Federal standard food package legislation. Representatives of industry, consumer groups, and others have appeared on our Conference programs. We have sat with these representatives in committee meetings and, at every opportunity, have debated the subject from our respective viewpoints. This, undoubtedly, has brought about a better understanding on the part of industry as to the abuses we hoped to correct. Likewise, the Conference should now have a better understanding of many of the difficulties which would confront industry if the proposed legislation were enacted.

Industry has gone on record as favoring the elimination of unnecessary package sizes by voluntary agreement and to limit packaging to those sizes which have met with substantial consumer acceptance. In the absence of legislation bearing on food package standardization, we trust that the position taken by industry will result in fewer package sizes and easily discernable differences in those used, particularly in the packaging of the same product.

RECOMMENDATIONS ON PROPOSED FEDERAL STANDARD FOOD PACKAGE BILL

The Committee recommends that the proposed food package standardization bill be left in the hands of the Committee on Legislation for further study and that no action be taken to bring about its introduction into the Congress until greater public support is obtained and it can be redrafted in such a manner that it will prove to be more acceptable to industry than it is in its present form. In the meantime, the Conference should encourage and be of every assistance possible to those industries wishing to have standardization legislation enacted for their particular products, as has been the case—on a State level—with such foods as flour, milk, bread, eggs, etc.

BONDING OF REPAIR AGENCIES, ETC.

As a result of considerable agitation on the part of weights and measures officials and scalemen for legislation either licensing or bonding repair agencies and those engaged in making repairs on weighing and measuring devices, your Committee was asked to give consideration to a proposed model bill to be known as the "Weights and Measures Repairman Act of 19____." The proposed bill was drafted by Ralph W. Smith, Secretary of the Conference, and was presented, together with a paper on the subject, to the 28th National Scale Men's Convention at its meeting held in Kansas City, Missouri, last Spring.

While several States have enacted legislation of this type, based on either licensing or bonding principle, this is the first time the Conference has, so far as the Committee has been able to determine, been asked to consider a specific bill. The fact that several speakers have addressed the Conference on the subject, the fact that a number of State weights and measures officials are known to favor the early enactment of such legislation, and the interest shown by the National Scale Men's Association, were major factors in bringing about Mr. Smith's decision to draft a bill for the consideration of all interested parties. The text of the proposed bill is as follows:

A PROPOSED MODEL BILL

to be known as the

"Weights and Measures Repairman Act of 19__"

A bill, To provide financial protection for the owners of weighing and measuring devices upon which repairs are undertaken by commercial repairman and repair agencies, by requiring the bonding of such repairmen and repair agencies, and for other related purposes.

Section 1. This Act may be cited as the "Weights and Measures Repairman Act of 19__", and shall be administered and enforced by the State Superintendent of Weights and Measures. The State Superintendent of Weights and Measures shall issue from time to time reasonable regulations for the administration and enforcement of this Act.

Section 2. No person shall engage in the repair, for hire, of commercial weighing or measuring devices unless such person is bonded, on a form prescribed by the Superintendent of Weights and Measures, as a "repairman" or a "repair agency" as provided by this Act. This section shall be construed to require bonding (1) as a "repairman" in the case of any person who, as an individual and not as an employee of a repair agency, undertakes the repair of any commercial weighing or measuring device not owned or operated by himself, when any charge is made or to be made for such repair, and (2) as a "repair agency" in the case of any firm which, through its employees, undertakes the repair of any commercial weighing or measuring device not owned or operated by it, when any charge is made or to be made for such repair.

Section 3. The bonds required by section 2 of this Act shall be surety bonds, issued by companies licensed to do business in this State. The bond for a repairman shall be in the sum of $2,000 and the bond for a repair agency shall be in the sum of $5,000. All bonds shall be conditioned (1) upon compliance with the provisions of this Act, and (2) upon such repairs as are defined in section 2 of this Act being so made that, upon the first test of a repaired device by a State or local weights and measures officer of this State at any time within 30 days after completion of the repairs, the repaired device will meet all applicable requirements of the specifications and tolerances for commercial weighing and measuring devices and of the laws relating to such devices which are in effect in this State at the time the repairs are undertaken.

Section 4. Executed bonds required by section 2 of this Act shall be approved by the State Attorney General and shall then be filed with the State Superintendent of Weights and Measures. Any bond given in compliance with this Act may be canceled by the surety by giving 30 days notice to the State Superintendent of Weights and Measures by registered mail.

Section 5. Any person failing to repair a commercial weighing or measuring device so that it meets the requirements specified in section 3 of this Act when tested as prescribed therein, having undertaken for hire so to do, shall promptly make such further repairs as may be needed to accomplish this result, or shall cancel the repair charges and refund any part of the repair charges which have already been collected, and, in addition, shall reimburse the owner of the device for any damage to the device which may have been caused by such person in the course of his efforts to repair the device. Written certification by the weights and measures official making the test, to the effect that a device fails to meet the applicable requirements of the law and of the specifications and tolerances for commercial weighing and measuring devices, shall be prima facie evidence of this fact.

Section 6. If any person bonded under this Act fails to make proper refund, payment, and/or reimbursement to the owner of a commercial weighing or measuring device as required by section 5 of this Act, within 30 days following abandonment of efforts to repair a device, the owner of the device shall be entitled to recover from the offender's surety the full amount of such refund, payment, and/or reimbursement, together with the full amount of any legal costs, including attorney fees, necessarily incurred in effecting such recovery: Provided, however, That the aggregate liability of the surety to all owners shall in no event exceed the sum of said bond.

Section 7. The State Superintendent of Weights and Measures shall publish, from time to time, for the information of owners of weighing and measuring devices, lists of individuals and firms who are bonded under the provisions of this Act, and shall issue for the use of each such bonded individual and firm, credentials setting forth the fact that such individual or firm is bonded under this Act.

Section 8. Any person who, by himself or by his servant or agent, or as the servant or agent of another, shall violate any provision of this Act shall be guilty of a misdemeanor, and shall be punished by a fine of not less than $25 or more than $200, or by imprisonment for not more than 3 months, or by both such fine and imprisonment, upon a first conviction in any court of competent jurisdiction; and upon a second or subsequent conviction in any court of competent jurisdiction, he shall be punished by a fine of not less than $50 or more than $500, or by imprisonment in the county jail for not more than 1 year, or by both such fine and imprisonment.

Section 9. As used in this Act:

(a) The word "person" shall be construed to include individuals, partnerships, corporations, companies, societies, and associations.

(b) The word "firm" shall be construed to include partnerships, corporations, companies, societies, and associations.

(c) The term "repair agency" shall be construed to mean a firm which employ-one or more individuals to repair, for hire, commercial weighing or measuring devices owned or operated by others.

(d) The words "commercial weighing and (or) measuring device" shall be construed to include all weights, measures, and weighing or measuring devices commercially used or employed in proving the size, quantity, extent, area, or measurement of quantities, things, produce, or articles for distribution or consumption, purchased or offered or submitted for sale, hire, or award, or in computing any charge for services rendered on the basis of weight or measure, or in determining weight or measure when a charge is made for such determination.

(e) The word "repair" shall be construed to import servicing of any kind, including reconditioning, repairing, replacement and modification of parts, and adjustment for accuracy.

SUPPLEMENT

A suggested form of bond to be used under the foregoing bill.

KNOW ALL MEN BY THESE PRESENTS, That we, ____________________ as Principal, and ____________________ as Surety, are held and firmly bound unto the Superintendent of Weights and Measures of the State of ______________ in the penal sum of ____________________ ($____________) Dollars, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed and dated this ____________________ day of ____________ 19___.

The condition of this bond is such that whereas the above bounden Principal has been duly designated as a

____
(Insert Repair Man or Repair Agency)

by the Superintendent of Weights and Measures, and as such is authorized to repair for hire commercial weighing or measuring devices.

NOW, THEREFORE, if the said principal shall comply with all provisions of the law relating to such work, and shall make repairs on such weighing or measuring devices so they shall, if tested within thirty (30) days after completion of such repairs, meet all the requirements of specifications and tolerances for commercial weighing and measuring devices required by law in this State at the time such repairs are undertaken, then this obligation to be void, otherwise to remain in full force and effect.

The Surety on this bond may cancel its liability as to future repairs undertaken by the Principal on thirty (30) days notice to the State Superintendent of Weights and Measures, such notice to be sent by registered mail.

The Surety's liability for any one or more acts of the Principal shall not exceed in the aggregate the penal sum of this bond.

____

____
Principal

____

____
Surety

The discussion which followed the presentation of Mr. Smith's paper during the Convention of the National Scale Men's Association clearly demonstrated that the great majority of scalemen are now opposed to the general enactment, by the States, of legislation either licensing or bonding repairmen of weighing and measuring equipment. Much of the opposition seems to be based on two premises: (1) many States do not have weights and measures departments sufficiently adequate to administer a law of this kind, and (2) uncertainty as to whether the States enacting such laws would enter into reciprocal agreements whereby repairmen operating in two or more States would not have to be licensed or bonded in all such States.

Furthermore, a division of opinion exists in the Committee on Legislation as to whether legislation based on the licensing or bonding principle would be the more desirable. Strong arguments have been advanced for and against both principles, and this lack of agreement between proponents of such legislation and the general hostility of those intended to be governed by it, would seem to make it inadvisable for the Conference to approve a model bill at this time.

The Committee regrets this lack of positive action because, as previously stated in this report, a number of States have already enacted legislation of this type and others are known to favor it. There is an unquestionable advantage in crystallizing sentiment in favor of a particular bill, the Conference approving it, and recommending it to the different States for enactment. Continued delay is certain to result in the passage of many non-uniform laws—the very thing the Conference has long sought to avoid.

RECOMMENDATIONS ON PROPOSED MODEL BILL BONDING REPAIR AGENCIES, ETC.:

The Committee recommends that no action be taken on the proposed model bill to be known as the "Weights and Measures Repairman Act of 19___" but that it be included in the records of this Conference as the basis for further study. It is further recommended that the National Conference on Weights and Measures maintain interest in this subject and, in cooperation with the National Scale Men's Association, explore every possibility which may lead to the drafting of a model bill this Conference can, unhesitatingly, endorse.

Respectfully submitted.

(Signed) Rollin E. Meek, *Chairman*,
Joseph F. Blickley,
V. D. Campbell,
R. M. Johnson,
Louis E. Witt,
Committee on Legislation.

(The report of the Committee on Legislation was duly adopted.)

REGULATORY RESPONSIBILITIES OF THE FRUIT AND VEGETABLE BRANCH, UNITED STATES DEPARTMENT OF AGRICULTURE

By T. C. Curry, *Chief, Regulatory Division, Fruit and Vegetable Branch, U. S. Department of Agriculture*

It would be foolhardy to stand before you today and, in the time allotted me, attempt to describe all the varied responsibilities of the Regulatory Division of the Fruit and Vegetable Branch of the Production and Marketing Administration. So, I'm going to touch the high spots and run rather hastily through a description of our responsibilities in connection with the enforcement of Federal laws relating to the marketing of produce in interstate or foreign commerce.

These laws include the Standard Container Acts of 1916 and 1928, the Produce Agency Act, the Perishable Agricultural Commodities Act, and the Export Apple and Pear Act. In considering these laws, I am going to discuss the activities carried on under them by the Department which may be related to the work of weights and measures officials of the States.

Oldest of these laws is the Standard Container Act of 1916, followed by a similar act in 1928. These fix the standard size of baskets, including hampers, used for fresh fruits and vegetables. The 1916 law applies to berry baskets and other containers for small fruits, berries, and vegetables; to till baskets; and to Climax baskets. The 1928 law applies specifically to hampers, round stave baskets, and splint, or market, baskets. The law regulates both the shape and the size of the containers through provisions which require submission of specifications for approval, and approval is authorized only if the containers are of proper standard size and if they are not deceptive in appearance.

In administering these two laws, the Regulatory Division has tried to develop, and I think has succeeded in developing, a large measure of uniformity in the specifications and general appearance of the several standard sizes. This uniformity has made possible the development of dimensional methods of testing, which give more consistent results than the volumetric tests and which may be made at the factory or wherever baskets may be found.

The two Standard Container Acts have still the same defects and inconsistencies that have been noted in other years. Chief of these, in my own opinion, is their failure to cover other types of containers used for fruits and vegetables, such as cartons, crates, boxes, and sacks. The Department, I know, feels that the principle of standardization should extend to all types of containers used for fresh fruits and vegetables. The need for such standardization will tend to increase as postwar developments, especially in pre-packaging and air transport, begin to infringe on old methods and as competition increases within the fresh fruit industry, and between the fresh fruit industry and the processed and frozen segments. Unfortunately, there does not appear at the present time to be a well-defined movement to attain a wider application of standardization in this field.

Now, let's look at two other regulatory laws—the Proudce Agency Act, and the Perishable Agricultural Commodities Act.

The relatively prosperous 1920's attracted a great many newcomers to the fresh fruit and vegetable industry. Some of these people had very little business experience, and some of them had little regard for ordinary business ethics. The nature of fresh fruit and vegetable distribution, with the long distance from farm to market and the perishability of the commodities involved, made possible all sorts of "chiseling" on the part of some unscrupulous operators.

Trade leaders tried cooperative measures to bring these bad actors into line, but none of the measures attempted was successful. As a result, with the approval and assistance of the industry, the Produce Agency Act was passed in 1927. Then in 1930, again with the approval and assistance of the industry, the Perishable Agricultural Commodities Act became a Federal law. Since the passage of this last-mentioned Act, principal use of the Produce Agency Act (which is a criminal statute relating only to consignment transactions in perishable farm products) has been for handling complaints involving merchandise—such as dairy and poultry products, floricultural products, shelled nuts, and Christmas trees and greens raised for commercial purposes—not covered by the Perishable Agricultural Commodities Act.

Actually, the Perishable Agricultural Commodities Act is the Government's answer to the clamor of the trade for protection against unfair practices in the marketing of perishable agricultural commodities in interstate or foreign commerce. Just as an aside, I might mention that the first Federal law along this line was an emergency measure known as the Food Control Act, approved August 10, 1917, which was brought about by World War I conditions.

The fresh fruit and vegetable industry has come a long way since the Perishable Agricultural Commodities Act became law in 1930. Consumption of fresh fruits and vegetables has increased from 62 billion pounds in 1930 to a little over 81 billion pounds in 1946. Contributing to this has been an increasing awareness on the part of the consuming public that the human body needs protective foods; a higher consumer income level; an upward trend in population; an increased volume of production; and year-round production and marketing.

The greater portion of the work carried on by the Regulatory Division relates to the enforcement of the Perishable Agricultural Commodities Act, and we like to think that this Act, by facilitating transactions among distributors, has played some part in the marked upswing in fruit and vegetable consumption.

Under the Act, commission merchants, dealers, and brokers transacting interstate or foreign commerce business must be licensed. During the first year the Act was in existence, 15,160 licenses were issued, and about 110,000 have been issued since the law's enactment. As of June 30, 1947, there were 23,632 licenses in effect. A fee of $10 per annum is charged for each license, so that the Regulatory Division is more than self-supporting. All money collected is turned over to the United States Treasury, and each year the amount received exceeds by $35,000 to $40,000 the expenditures of our offices located in Washington, New York City, Chicago, Los Angeles, and Winter Haven, Florida, for administration of the laws I have mentioned.

The Perishable Agricultural Commodities Act prohibits certain unfair practices in the marketing of fresh fruits and vegetables and is designed to afford remedy to the injured person—buyer, seller, commission merchant, or broker—through the filing of a reparation complaint charging violation of any provision of the Act by anyone who comes within its scope. Services of the Regulatory Division are for the benefit of any injured person wishing to make use of them, and there is no charge for such services.

Among violations, complaints covered include rejection without reasonable cause, by a buyer; failure, without reasonable cause, of a seller to make delivery or failure to make good delivery; failure truly and correctly to account and make full payment; the making of false or misleading statements for a fraudulent purpose; misbranding; fraudulent representation; and failure to perform some specification or duty.

The Act also requires records of transactions to be made by the dealer, commission merchant, and broker. These must be preserved for two years and be available for inspection by designated Department of Agriculture investigators.

Disciplinary proceedings, which usually have for their purpose the suspension or revocation of the offender's license, may be initiated by the Regulatory Division when facts indicate violations of the Act which would warrant such action.

Initial reparation complaints are filed informally. They are also first handled informally, with the Division immediately communicating with the party against whom the complaint has been filed and trying to effect a friendly adjustment of the misunderstanding or controversy. This is ordinarily done by mail, but in urgent cases where highly perishable produce is involved complaints may be handled by telegraph or telephone. The Department of Agriculture has installed a direct line to the Division's Washington office to enable the trade to place station-to-station calls. The number is Republic 4118.

We are called upon in the course of a year to handle more than 2,000 complaints. At least 90 percent of them we handle to a conclusion informally. Failing in all efforts to effect informal settlement, formal complaint is accepted and submitted to the Office of the Solicitor for whatever action may be appropriate. If the formal decision, rendered by the Secretary of Agriculture, awards reparation, the offender's license is automatically suspended—unless he makes payment within the time specified in the order or appeals to the U. S. District Court. The suspension is in effect until the award is paid and during the period of suspension it is a violation of the law for the offender to continue to receive, ship, buy, or sell fresh or frozen fruit or vegetables in interstate or foreign commerce.

In the handling of complaints filed under the Act, it is necessary for the Division to review and interpret the terms of contracts for the purchase and sale of fruits and vegetables. Many complaints of short weight are filed—and I will remind you that misbranding a package as to weight is, of itself, ground for action against the offender. But in making decisions on such complaints, it is necessary to try to calculate normal shrinkage, giving consideration to such factors as the length of time the produce has been in transit, the carrier's protective service used, the time of year, etc. The Division, over the years it has been administering the Act, has built up quite a file of precedents along these lines. For instance, it has pretty well been established that up to 2 percent shrinkage in old potatoes may be considered normal, while in new stock the shrinkage may run as high as 5 percent.

Another law I must note before concluding is the Export Apple and Pear Act, passed by Congress in 1933. Under this law, it is unlawful to ship apples and pears moving in foreign commerce without a certificate issued under authority of the Secretary of Agriculture showing that the fruit is of a Federal or State grade which meets the minimum of quality established by the Secretary for shipment in export.

Realizing that your time is somewhat limited and that you have many pressing problems confronting you, I have touched only lightly on the responsibilities of the Regulatory Division. But I'm sure you all know that further information you may wish at any time is yours for the asking. My associations with you people have been very pleasant, and I am very happy to have had the opportunity of meeting with you today. I hope you will continue to feel free in the future, as you have in the past, to call on us at any time we can be of service to you.

FERDINAND RUDOLPH HASSLER, 1770–1843

By Ferdinand Rudolph Hassler, M. D., M. P. H., *Director, Bureau of Laboratories, Department of Health, State of Oklahoma*

It is not the intent or purpose of this paper to outline the complete history of our system of weights and measures, or to give a detailed biography of Ferdinand Rudolph Hassler, the first Superintendent. Obviously this would be quite long and time consuming. However, I do believe that certain facts concerning the early history of its establishment and a brief résumé of the work of Hassler will be of interest to the members of this Conference.

I think it can be safely stated that the Department of Weights and Measures was the first scientific division or bureau established by our Government. This was brought about through the great foresight and scientific interest of Thomas Jefferson, who probably possessed more general interest and scientific knowledge than any of our early Government officials. He foresaw the need for standards of weights and measures, and recommended the adoption of the metric system in the United States as the official system. Out of this beginning has grown our National Bureau of Standards and our present system of weights and measures.

As you all know, with the possible exception of our monetary system, this adoption of the metric system was never made. I believe I am correct in saying that our present system of weights is based upon the standard kilogram while the standard of measure is the standard meter.

Although a National Standard of Weights and Measures was considered and discussed for several years, it was not until November of 1830 that President Andrew Jackson established the Department of Weights and Measures in the United States and appointed its first superintendent. Ferdinand Rudolph Hassler, a Swiss Scientist and Mathematician, was the man appointed to fill this important position.

No historical sketch of our system of weights and measures could be written without giving a brief biography of Hassler. It is apparent that he was considered, both at home and abroad, one of the leading scientists of his time. He was held in high esteem by his fellow scientists in America, Europe, and England.

The writer has in his possession a collection of the original letters and reports of this first Superintendent of Weights and Measures, which includes letters bearing the signatures of Thomas Jefferson, President Monroe, and other early Government officials. One of the original standard kilogram weights that was made in England about 1812 or 1815 is also in the possession of the author.

That Hassler's worth has not gone unnoted by previous Government officials is shown in a letter written by John Vaughan to Thomas Jefferson, December 20, 1806.[13]

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[13] Dr. Florian Cajari, "The Chequered Career of Ferdinand Rudolph Hassler," page 41, Christopher Publishing House, Boston, Mass. (1929).

Philad. 20. Dec. 1806.

Thomas Jefferson
President of the U S

Dear Sir

The important object of an universal Standard of Weight and Measure has long occupied your thoughts; you will therefore learn with pleasure that I have lately become possessed by purchase from M^r Hassler—one of the French Standard Toise-Metre,-Kylogram & the English Troy Standard—Which may serve as standards of Comparison, whenever the subject is taken up in this country. The enclosed memoir of Mr Hassler explains more fully their authenticity & exactness. For these I gave 150 $ In addition to these I have purchased from him for 50 $ the different acct^s of the Measurement of degrees in different parts of the World, upon which these standards have been formed. I have purchased them for our Society, whenever their funds will admit their taking of them: conceiving it highly proper that the Country should be possessed of them, & that they cannot be so properly placed as in the hands of the Society. [American Philosophical Society of Philadelphia].

Hassler was born in the town of Aarau in the German part of Switzerland on October 7, 1770. His father, a man of considerable wealth and influence, had held several public positions in his native land. This fortunate position of the father enabled the son to secure one of the best scientific educations available at that time. He attended the University of Bern for seven years, where he was the favorite student and special friend of Tralles, in Bern, the Astronomer Lalande, the Chemist Lavoisier, and others. He began the collection of a scientific and cultural library and, at the time of his departure for America, this library included five thousand volumes, many of which were quite rare and expensive. Three thousand volumes were brought to America where they were later sold, piecemeal, to the Library of the Military Academy at West Point, the Congressional Library, the Library of Union College, the American Philosophical Society, and a few private purchasers.

At the age of sixteen, he was appointed or elected to an important Government position in his home Canton, in Switzerland (he states through no effort of his own). He was not content for he had a thirst for knowledge. After completion of his studies at the University, Tralles and Hassler made an official survey of Switzerland for the Swiss Government. In this survey they used new ways and methods, the most interesting of which was the triangulation system for large land survey. This system was later used for the Coast Survey in the United States.

When revolution and turmoil developed in Switzerland and France, Hassler chartered the ship "Liberty" (350 tons) for Philadelphia and sailed down the Rhine for America on the 15th of May, 1805. He brought with him 120 Swiss emigrants and their families. In addition, his diary relates, were his wife, four children, and ninety-six trunks, boxes, and bales.

He did not come to America to apply his scientific knowledge, but rather to follow agriculture and to establish a Swiss Colony in one of the Southern States. Together with two others, a Land Company had been formed and funds collected to purchase land for the Colony in the New World. On landing in Philadelphia he found that the agent for the Company had dissipated the funds and the colonizing project was abandoned. It is recorded that he made every effort to establish his countrymen and fellow emigrants in this country and to reimburse their financial losses from his own private funds and funds provided by his father.

Hassler contacted the leading scientific men of this country and was elected a member of the American Philosophical Society in Philadelphia. He was appointed Professor of Mathematics at the U. S. Military Academy at West Point and served there two years. He then took a similar position at Union College in New York.

When Congress provided funds for the establishment of the Coast and Geodetic Survey, Hassler was chosen from among many applicants to be the first Superintendent. Forty thousand dollars (a considerable sum at that time) was appropriated for the purchasing of instruments and other supplies needed for the Survey. His salary was $5,000.00 a year. He was sent to Europe to purchase and superintend the construction of the precision instruments that were to be used. He was held in England during the war of 1812 but, at its end, returned to this country with the "finest set of instruments available in America or Europe." In this collection were standard weights and measures and instruments for two astronomical observatories.

In 1818, by an Act of Congress and through political chicanery, the Coast Survey was turned over to the Army and Navy. Although Hassler was forced out at that time, later, in the same year, he was appointed by President Monroe to represent the United States in the settlement of the boundary between the United States and Canada and to establish the 45th parallel of latitude.

As was previously mentioned, the office of Superintendent of Weights and Measures was established and Hassler was appointed for this post by President Andrew Jackson on November 2, 1830. His salary was $3,000.00 a year. We have seen that he was particularly well qualified for this position and one of his first acts was to check the weights and measures used in the various U. S. Custom Houses.

In an early report he states that there was wide variance in the weights and measures used in the various U. S. Custom Houses. Naturally he set about to relieve this situation. One of the first difficulties was to locate a suitable metalsmith with the ability to make these weights and measures of copper and brass. Such an artisan was finally located and the project was completed. Difficulty was experienced in securing a sufficient amount of zinc. To solve this problem, a small smelter was set up back of his office in Washington; a small foundry was also located there. Each Custom House was provided with a set of standard weights and measures and sets were sent to all of the leading countries of the world and to each of the States of the United States. In his papers he discussed the construction of an elaborate and sensitive balance, the type of which had not been previously available.

Contained in one or more of the ninety-six bales and boxes brought to America was a standard meter made in Paris in 1799 by the Committee of Weights and Measures, a standard kilogram, a standard Troy pound, and an iron toise made by Cavinet of Paris. Hassler and Tralles made two exact copies of toises of Lalande and those were also brought to this country. The Troy Pound used in the U. S. Mint had been checked against Hassler's Standard Troy Pound and found to be accurate. Hassler's processes of weights made it desirable to ascertain accurately the limit of expansion of water and mercury under varying temperatures. He undertook elaborate experiments on this subject which were quite in advance of determinations previously made. He determined 39.83° F to be the maximum density and suggested that water at its maximum density be taken as a unit for researchers on specific gravity. (The mean of results obtained by later investigation found the temperature at 39.24, which was .59 of a degree F lower than Hassler's figure.) He called in standards of weights and measures from foreign countries and compared them to our own, pointing out that such comparison was necessary because most of the foreign standards had been recently revised so that the Cambists used by the Custom Houses were antiquated. As he said, "The differences existing at the various seaports were ruinous to the honest merchant."

A complete set of weights and measures were ordered by Congress to be delivered to the Governor of each state in the Union "to the end that uniform standards of weights and measures may be established throughout the Union."

Though Hassler was 60 years of age at the time of his appointment as Superintendent of Weights and Measures, it is plain to see that he entered his new work with energy and thoroughness which impressed the higher Government officials. He remained in charge of this work for thirteen years until his death. When in 1832 the Coast Survey was reestablished he added to the above work the superintendency of the Coast Survey.

The present Bureau of Standards was established in 1901 on the foundations of the original office of weights and measures first organized by Hassler.

"The best judges of work done by a scientific man are his compeers." We quote from S. W. Stratton, until 1923 Director of the Bureau of Standards: "I consider that he was not only the first and foremost man in the scientific world of our country at that time, but one of the leading, if not the leading, metrologists of his day. I doubt if there were more than half a dozen people in the world at that time who possessed the scientific knowledge and the deftness of the artisan necessary to undertake this work. He knew where to find the instruments; he knew where to find the artisans to construct the standards and apparatus that were necessary in the survey and in the weights and measures work . . . it is remarkable that when he came to this country he brought with him one of the best standards of length of the day, upon which he later based the coast survey work, not expecting, so far as I can learn, to have any connection with the scientific work of his adopted country."

Thus we see in this very brief résumé, the life and work of Hassler, the founding of our systems of weights and measures, and the founding of the Coast and Geodetic Survey are inseparable. True then, as now, petty jealousy, chicanery, and selfish interests were to be seen in public office. The law makers could not see the need for appropriation of public funds for scientific projects, the complaint being always that such projects took too long and cost too much.

In his book "The Chequered Career of Ferdinand Rudolph Hassler," Dr. Florian Cajori, Professor of the History of Mathematics in the University of California, so aptly stated in his introduction:

A man of great practical ability as a scientist, but of scant practical ability in the art of easy and comfortable living, a man highly trained in mathematics, yet a mere child in every-day economics, a man lacking the training of the ordinary politician, yet able by his earnestness and sincerity to influence public opinion, a true scientist ambitious for the higher standards of scientific achievement and never willing to surrender them to the pressing demands of temporary expediency—such a man was Ferdinand Rudolph Hassler. This rugged figure commands a conspicuous position in the early history of science in America, as the organizer and first superintendent of the first great scientific bureau of the United States in Washington, D. C.

(Following the delivery of his paper, Dr. Hassler displayed some historical weights, some original Hassler letters, and some interesting photographs.)

TRANSPARENT CONTAINERS FOR PREPACKAGED MERCHANDISE

By Edmund F. Usher, *Sealer of Weights and Measures, Highland Park, Mich.*

The idea of using transparent containers in packaging is far from being anything new when one considers how long the use of celluloid, glass, mica (isinglass), and even cellophane, have been employed. Mesh bags used in the packing of potatoes, citrus fruits, etc., might be included in the list of transparent containers.

The trend toward prepackaging of merchandise has been evolutionary for a number of years. Most of us can remember the cracker-barrel era when almost everything was sold from bulk. In those days such more or less perishable items as pickles, milk, cookies, crackers, sugar, dried beans, and many others, must have been the topic of discussion for future prepackaging. Today, when prepackaging is spoken of, one invariably thinks of highly perishable commodities as fresh fruits, vegetables, poultry, and meats. Containers for this particular type of merchandise are taken for granted to be of the transparent film variety.

Before going ahead with a brief discussion of the modern trend toward prepackaging, it may be well to mention some of the methods of deception in older types of transparent containers. While transparent containers are used for many commodities, we will confine our consideration generally to food products.

Those of us in regulatory work should be interested in some of the factors which might cause deception in containers. These factors have been presented before, and most of us are well acquainted with them. A review of them as memory refreshers will do us no harm, however, because of the ever-present possibility of their recurrence.

Glass Bottles and Jars

1. Thick glass
2. Deep panels
3. Excessive height
4. Deeply indented bottoms
5. Irregular and odd shapes
6. Raised covers

The elements of sham and optical illusion are still present, and even some glass manufacturers have tried to encourage the sale of their

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products by advertising these very facts. It is reported that in a catalogue of one manufacturer of beer mugs, steins, and glasses, as well as whisky glasses, the fact of larger appearances because of taller designs, heavy sham bottoms, etc., was the principal selling point stressed.

Many transparent containers, wrappers, or windows in other containers are colored or tinted to enhance the appearance of a product without serving to mislead or deceive the public; but in many instances they do give a misleading impression regarding the quality and character of the product contained therein. Use of tomato cartons with red or pink transparent windows which impart to green tomatoes a color of ripeness was found to be a practice in the past. This same method has been used on packages of noodles, where by the use of tinted transparent wrappers, "plain" noodles have the appearance of "egg" noodles.

Several years ago, as a result of appropriate action by the Meat Inspection Division of the Bureau of Animal Industry, U. S. Department of Agriculture, the practice of using transparent wrappers for bacon which were striped with red so as to impart the "streak of lean" and "streak of fat" appearance, and also the use of red-starred transparent sausage wrappers, which gave the sausage the appearance of containing greater amounts of red lean meat was discontinued.

All of the foregoing factors in deception would misbrand the product under the Federal Food, Drug, and Cosmetic Act. Those in attendance at the National Conference a few years ago were invited to visit the offices and laboratories of the Food and Drug Administration here in Washington, where an exhibit of deceptive containers was on display.

Now, let us look for a while at the modern trend in prepackaging of fresh fruits, vegetables, poultry, and meats which have customarily been sold in bulk form. Last October there was held in Sacramento, California, the 27th Annual Conference of the National Association of Marketing Officials whose general theme was "New Marketing History in the Making." A large part of their program was devoted to the subject of future prepackaging. Many exceptionally interesting features came from these meetings, some of which I shall relate from the report of that conference.

California has been called the pioneer State in the prepackaging of fresh fruits and vegetables, because on a tonnage basis the largest crops of perishable products are grown there. This fact necessitates the employment of the best and most modern methods possible to get their merchandise to distant markets.

Prepackaging now is done in the field, in the warehouse, and in the grocery store. There is a division of opinion as to where it should be done most advantageously, but all seem to agree that within the next few years it will advance greatly. Many problems are expected to be encountered in the working out of all the details. There must be advanced improvements in refrigerated rail and air freight transportation. The product must be delivered to market in 100 percent salable condition. Even merchandise a little "off-grade" will destroy the resale value.

From the standpoint of the growers, the purpose is to reduce the cost of distribution from the farm to consumer. This reduction has not yet been accomplished because of the newness of the attempt to prepackage fresh produce. However, there are organizations of engineers and college experiment stations in cooperation with large merchandisers who will leave no stone unturned until the problems of harvesting, transporting, and merchandising have been solved. The authorities of the State of Florida have established a committee to study thoroughly the subject of consumer packaging. It is recognized that prepackaging operations of fresh produce must be fully competitive with the freezer and canner.

There are many forces which seem to be pushing us into a more advanced prepackaging stage. What prepackaging of fresh fruits and produce means to consumer and distributor reveals some of these forces.

Prepackaging means to the consumer

1. Less waste.
2. More uniform condition regardless of shopping hours.
3. Assured cleanliness and sanitation.
4. Time saved in shopping.
5. Time saved in preparation.
6. Economy of family-sized packages.
7. Assurance of "brand name" quality.

Prepackaging means to the distributor
(retailer, wholesaler, or grower-shipper)

1. Less waste.
2. Better inventory control.
3. Reduced transportation costs and icing through removal of culls prior to shipment.
4. Opportunity to establish "brand names."
5. Longer period of salability.
6. Better deliverv condition of merchandise.
7. Reduction of loss through spoilage.
8. Increased sales because of visibility of products.

There may be many other factors involved, but the foregoing summary will suffice to show that a fundamental need exists for prepackaging, despite all the technical difficulties yet to be worked out. The trends and wants of the consumer are irresistible forces which must be satisfied.

Among some of the problems encountered in prepackaging of fresh produce, poultry, and meats is the fact that a wide variety of packages is required to meet the complexities of these products. From various publications and laboratory studies, it appears that peaches should be packaged in a ventilized container, while sweet corn, which also has a high respiration rate, tolerates low concentrations of oxygen in a sealed package without damage to the corn. These two products require different materials for proper packaging.

One of the unusual characteristics of some modern plastic films is their ability when tensilized to a thin membrane, to hold the moisture in, while allowing the gas (CO_2) to go through the thin walls with just enough retained to slow down the metabolism of the wrapped fruit or produce. This seeming phenomenon is highly essential for prolonged preservation of perishable produce.

There has been a new machine developed for the wrapping of citrus fruits, such as oranges. This machine covers the individual orange with a transparent, heat-sealed, skin-tight film at a rate of more than 500 oranges per minute.

Differences also exist between fresh meat and luncheon meats. Fresh meat requires a film of good moisture-proofness and special composition that does not discolor the fresh cut surface. Luncheon meats are not so particular as to surface, but need wrappers of intermediate moisture-proofness so that the surface will not mold or slime.

The principal packaging materials will be transparent films having various combinations of functional properties such as moisture-proofness, liquid waterproofness and heat-sealability. Films have been developed which are adaptive to the packaging of a wide variety of vegetables, such as celery, asparagus, broccoli, lettuce, cauliflower, spinach, tomatoes, corn on the cob, etc; and of citrus fruits, frozen foods, meats, cheese, coffee, liquid products such as pickles in brine, mayonnaise, fruits frozen in sirup, etc.

There are many companies engaged in the production of transparent films as packaging materials, among which are: Bakelite Corporation, Celanese Corporation, Dow Chemical Company, Du Pont, Goodyear, Monsanto Chemical Company, and Tennessee Eastman Products. These concerns are constantly endeavoring through exhaustive research programs to meet the future prepackaging needs.

Some of the results of research studies as published in bulletins issued by the Ohio Equipment Station reveal interesting facts: Of almost 500 consumers interviewed, 13.7 percent prefer the conventional bulk display, and 86.3 percent prefer the packaged, refrigerated, self-service. The reasons for preference also far exceed the objections as shown in another survey.

The tabulated results as revealed by cash registers are, without dispute, considered to be the most important of all surveys. The comparisons were for dollar sales volume for the third quarter in 1946, as compared with the same period in 1945, between two groups of stores: First, ten stores displaying refrigerated, prepackaged merchandise, and, second, ten conventional-type stores with the loose, bulk displays of fruits and vegetables. As to the ten stores having prepackaging and refrigeration now, only two were so equipped in the comparative period in 1945. So generally, with these two exceptions, the combined figures show the consumer attitude toward bulk displays compared with the packaging program. In the third quarter of 1946, with all ten stores selling prepackaged goods, the weekly sales average of produce showed an increase of 48.88 percent. The ten conventional type super-markets which neither in 1945 nor in 1946 have sold prepackaged goods, also showed an increase in 1946 in fruit and produce sales of 27.75 percent.

Facts and figures such as the foregoing ones, even though not at all conclusive, are most certainly indicative of the trend in the field of prepackaging. Even with all of the complexities and problems involved, it does not seem probable that two masters will be served indefinitely—modern streamline merchandising on one side of the store and the cracker-barrel era on the other.

The questions may well be asked: How will the modern way of merchandising of fresh fruits and vegetables, poultry, and meats affect the weights and measures official? And are there any special problems or abuses occurring now or expected to occur as a result of the use of transparent containers?

It will necessitate the examination of these packages for the appearance of the correct information as required by law, such as name and address of packer, and net weight or numerical count of commodity, and the reweighing of more packaged goods than ever before to determine if the stated net contents be true. In some States, the requirement of the name of the product is necessary. This demand would seem superfluous in most cases, unless there may be the possibility of mistaking the identity of the product contained, such as plums and nectarines, huckleberries and currants, strawberries and raspberries, etc.

One abuse now employed is the marking of information on transparent containers with crayon, which marking is illegible. This practice usually occurs when the packaging is done in the store. The transparent materials seem to lend themselves more readily to printing, rather than to writing with crayons.

The one fact of less shrinkage of package contents caused by moisture evaporation, when packed properly, is of most vital concern to everyone in weights and measures enforcement, as well as to the packer. We have all said, at least to ourselves, that if only a container could be developed to prevent loss of moisture, many of our headaches would be ended. With the amazing discoveries being made in packaging material, this dream appears nearer to realization than ever before.

The use of transparent materials in prepackaging will tend to discourage the practice of slack-filling.

In general it may be assumed that fewer problems or abuses are to be anticipated by weights and measures officials in the future with transparent packaging than have been experienced already with containers of other materials.

FINANCING A WEIGHTS AND MEASURES ORGANIZATION

By Charles Morris Fuller, *Sealer of Weights and Measures, Los Angeles County, Calif.*

If the title of this talk should lead you to anticipate a lengthy compilation of figures and statistics, let me hasten to assure you that such is not the case. There is no magic formula for securing adequate financial support for a weights and measures organization.

There are, however, certain procedures within the reach of everyone, which will positively achieve the desired result. This, then, will be an illustrated review of those practical methods which have been used with marked success.

Two fundamental principles should govern the work of every public official. First—do a good job. Second, and equally important—let the people know what is being done for their benefit.

You can be the most conscientious, hard-working sealer of weights and measures in the country. You can pound away at your job of testing scales and pumps, early and late, until you are sure that every piece of equipment is correct. You can go home every night, worn out with the day's exertions.

But—if you have not done something to interest the people in this work which you are doing for their protection; to make them realize that it pays real dividends, saving many times its cost; to show them how to help protect themselves by following a few commonsense rules in making their purchases—then you have not fulfilled your obligations as a sealer and public official.

We are fortunate to be engaged in a branch of governmental service that is popular. It protects the people in their daily life, and by "people" I mean not only the purchasing public but also the legitimate dealers and producers. An honest balance is maintained between buyer and seller. They are ready to cooperate because they have a mutual interest in our work. And cooperation is the most important factor in the enforcement of any law.

Ways and means of publicizing what is accomplished, present a ready challenge to the imagination. Exhibits are valuable because they speak for themselves. For example, take this display which was set up at a county fair. (Figure 13, Nos. 1 and 2.) Attention was attracted by a large pyramid of condemned scales which appeared to be on fire. This effect was obtained by constructing a framework covered with bright red cloth, on the outside of which the scales were fastened. Long red streamers at the top, kept in motion by an electric fan, and a powerful light inside the pyramid, completed the illusion. Pillars of person weigher scales and gasoline pumps, linked together with chains of straight-face spring scales, enclosed the space. In the showcase and on the counters were examples of false containers and condemned scales, as well as some of our test weights and standards. Colored posters and enlarged photographs completed the display. The place was constantly thronged with interested spectators, and an attendant was kept busy answering their questions. Many of them commented that they never before had realized the value and extent of this work.

Exhibits do not have to be elaborate to get results. Empty store windows often are available in prominent locations. Panels can be used on which to mount displays. (Figure 13, Nos. 5 and 6.) Those illustrated are about 5 feet wide by 6 feet long. (Large colored posters are used to attract attention, and demonstrate some commonsense rules to follow in buying. The other posters and photographs tell the story about your department and what it is doing.)

Set up a permanent exhibit in your office. (Figure 13, No. 4.) Have pictures made of this and mounted on a large card, with descriptive matter calling attention to the various items and announcing the fact that visitors are welcome. You will be surprised how many people will call, talk things over, and become enthusiastic boosters.

Take advantage of every opportunity to make good contacts. During the war, many of us were active on salvage committees. Every scrap of material was needed for the war effort. Every bit of space on freight cars and trucks was needed for essential transportation. And at the very time while these efforts were being made in every community, there was a tremendous waste in both materials and transportation due to the use of containers (many of them shipped from coast to coast) that were much too large for the commodity contained.

A collection of these containers was assembled. Photographs were made and forwarded to the War Production Board for whatever action could be taken. (Figure 13, No. 3.) Committees of business men comprising the managers of chain drug stores, dime stores, food

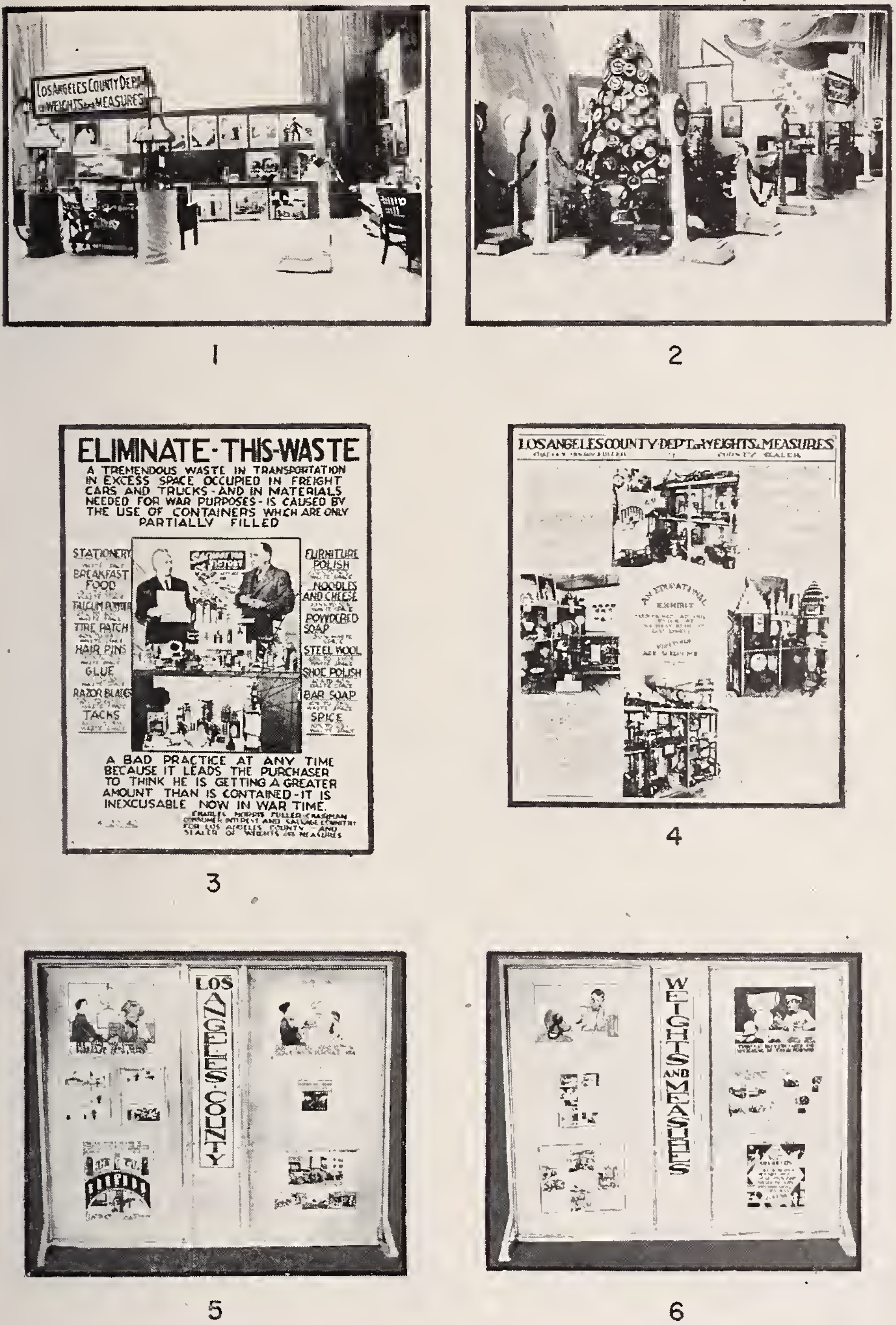
LOS ANGELES COUNTY DEPT. OF WEIGHTS AND MEASURES
1
2
ELIMINATE-THIS-WASTE
A TREMENDOUS WASTE IN TRANSPORTATION IN EXCESS SPACE OCCUPIED IN FREIGHT CARS AND TRUCKS - AND IN MATERIALS NEEDED FOR WAR PURPOSES - IS CAUSED BY THE USE OF CONTAINERS WHICH ARE ONLY PARTIALLY FILLED
STATIONERY
BREAKFAST FOOD
TIRE PATCH
HAIR PINS
GLUE
TACKS
FURNITURE POLISH
NOODLES AND CHEESE
POWDERED SOAP
STEEL WOOL
SHOE POLISH
BAR SOAP
SPICE
A BAD PRACTICE AT ANY TIME BECAUSE IT LEADS THE PURCHASER TO THINK HE IS GETTING A GREATER AMOUNT THAN IS CONTAINED - IT IS INEXCUSABLE NOW IN WAR TIME.
3
LOS ANGELES COUNTY DEPT. OF WEIGHTS & MEASURES
EXHIBIT
4
LOS ANGELES COUNTY
5
WEIGHTS AND MEASURES
6

FIGURE 13.

markets, and others who handled these items were invited to look over the display. They agreed that it was a bad practice which they would do their share to discourage when placing orders with manufacturers. Much good was accomplished. Much more remains to be done. But it also served the purpose of getting a large number of prominent businessmen better acquainted with their Department of Weights and Measures and its functions.

Do not overlook the spectacular. The public enjoys a good show. Most of us accumulate quantities of condemned weighing and measuring devices which are destroyed and the iron and brass auctioned to junk dealers. Make a field day of breaking up the old scales and measures. Invite the county or municipal authorities to participate. The daily papers and news reels are always ready to give this kind of action good publicity. (Figure 14, Nos. 1 and 2.)

Before the war and the urgent need for saving every bit of metal, a maritime touch was added by loading the "legion of the condemned" on a barge and dumping them in the ocean. (Figure 14, Nos. 3, 4, and 5.) The Consumers Guide used one of these pictures on its cover in 1938, and another in a later issue containing an article on Consumer Exhibits. We would not be so reckless with our scrap metal today, but at that time, on the opposite side of the pier where we loaded our barge, freighters were loading all the scrap obtainable for shipment to Japan and we did not care to add to that amount. Furthermore, we wanted to do something to arouse the interest of the people, to make them weights and measures conscious—and it did. (Figure 14, No. 6.)

Annual reports and pamphlets should be made attractive. Use a cover design that arouses interest by depicting some phase of the work. (Figure 15, Nos. 1 and 2.) Make good reading by writing up the story of your activities as though it were being prepared for a magazine article.

A few pages with sketches—these can be made on mimeograph stencils—help a lot. (Figure 15, No. 3.) Of course, there must be pages of statistics; but these are much more likely to be given attention after the reader understands what it is all about.

The daily papers undoubtedly present the most effective means of reaching the greatest number of people. Do not expect them, however, to wax enthusiastic about running a statement of dry facts. They demand something with plenty of "human interest." Tell them about some unusual case or circumstance. Then, along with that, they will be willing to print some additional facts about your work.

Get acquainted with one of their feature writers and invite him over to see what is going on. (Your office exhibit, with the history of some of the condemned articles, will come in handy at this time.) The result is very likely to be a headline story with illustrations, that is immensely worthwhile. An interesting poster can be made with newspaper headings and pictures. (Figure 15, No. 4.)

Newspaper cartoons are effective in influencing the public mind. Cartoons such as these (figure 15, Nos. 5 and 6) played their part when a standard weight bread law was being first considered in the State of California.

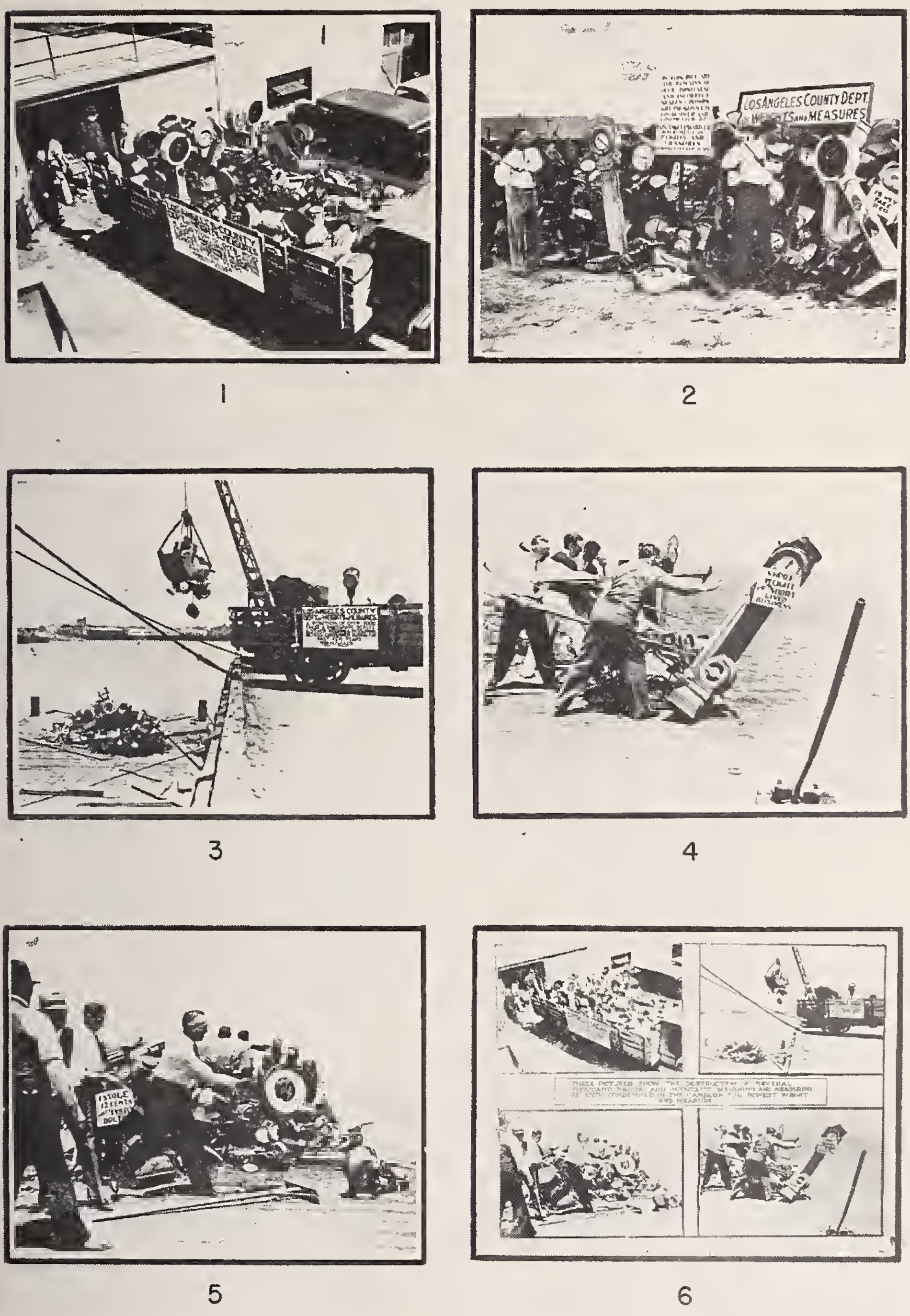

FIGURE 14.

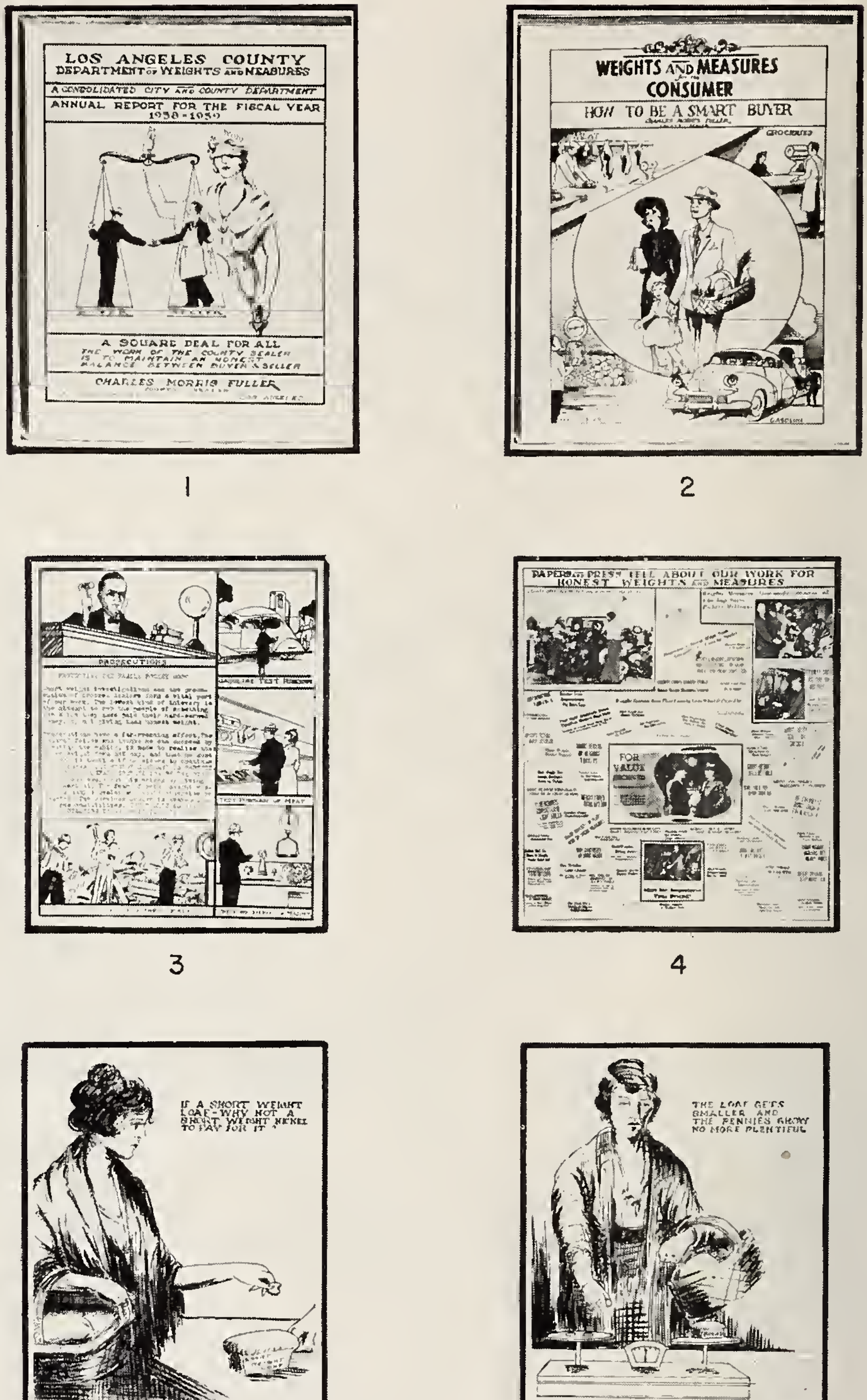
LOS ANGELES COUNTY
DEPARTMENT OF WEIGHTS AND MEASURES
A CONSOLIDATED CITY AND COUNTY DEPARTMENT
ANNUAL REPORT FOR THE FISCAL YEAR
A SQUARE DEAL FOR ALL
THE WORK OF THE COUNTY SEALER IS TO MAINTAIN AN HONEST BALANCE BETWEEN BUYER & SELLER
CHARLES MORRIS FULLER
1
WEIGHTS AND MEASURES
CONSUMER
HOW TO BE A SMART BUYER
2
PROSECUTIONS
3
PAPERS AND PRESS TELL ABOUT OUR WORK FOR HONEST WEIGHTS AND MEASURES
4
IF A SHORT WEIGHT LOAF - WHY NOT A SHORT WEIGHT NICKEL TO PAY FOR IT ?
5
THE LOAF GETS SMALLER AND THE PENNIES GROW NO MORE PLENTIFUL
6

Figure 15.

Propaganda? Sure it is propaganda, used honestly for the best interests of the people.

Men's service clubs and women's organizations are always on the lookout for good speakers. There is no better way to make personal contacts with representative citizens of every community. You will not lack for invitations when the word gets around that here is an entertaining and worth-while subject. Here, again, use the right method of approach in making these talks, as well as in speaking over the radio—sandwich in the facts and figures between interesting stories about the unusual, and the audience will be with you. I can tell you that being a speaker at more than 100 Rotary, Kiwanis, American Legion, and Women's Club meetings during the past two and one-half years has taken a lot of time and a lot of night work, but there is nothing that makes us feel better than meeting with these business and professional men and women in the community and getting their reaction when they learn what it is all about; in that manner we make boosters in every locality.

Charts are useful, especially at budget time, as a visual means of presenting facts. Do not be satisfied to use merely lines or columns drawn to scale. A combination of lines and sketches, whenever possible, will attract more attention. For example, if you are depicting the tremendous growth in population and consequent increase in the number of places of business over a period of years, this can be shown by pictures contrasting small business districts with a great metropolitan area. (Figure 16, Nos. 1 and 3.)

An interesting chart was made showing the increase in the number of gasoline pumps and computing scales. The columns were drawn to scale, and on the tops of these columns were sketches of the types of pumps and scales that were prevalent during those years. (Figure 16, No. 2.)

Of course, it is often necessary to use the conventional type of chart. (Figure 16, No. 4.) These serve a useful purpose and show at a glance the facts that make it essential to increase the personnel and the equipment of your department to keep up with the times.

You may ask why I am so sure that these methods will guarantee adequate financial support.

Next month, Los Angeles County will place in operation its new Weights and Measures Plant. (Figure 16, No. 5.) The main building of reinforced concrete with 7,800 square feet of floor space, houses the administration and business offices; assembly room; testing rooms for scales, weights, and liquid measures; petroleum laboratory; octane testing engine room; exhibits; storage of evidence and condemned weighing and measuring devices; and photographic dark room; together with locker and rest rooms, boiler room, and other requirements.

Adjoining is a sixty-foot, heavy capacity auto-truck scale. Separate metal buildings are provided for the towers which calibrate petroleum tank trucks and trailers, and the meter pit with equipment for sealing meters used in the measurement and sale of gasoline to service stations.

That is the answer!

We can well be proud of the part which we are taking in protecting the daily living of all the people. It is both useful and necessary. Don't keep it to yourself, and then wonder why it is so hard to get

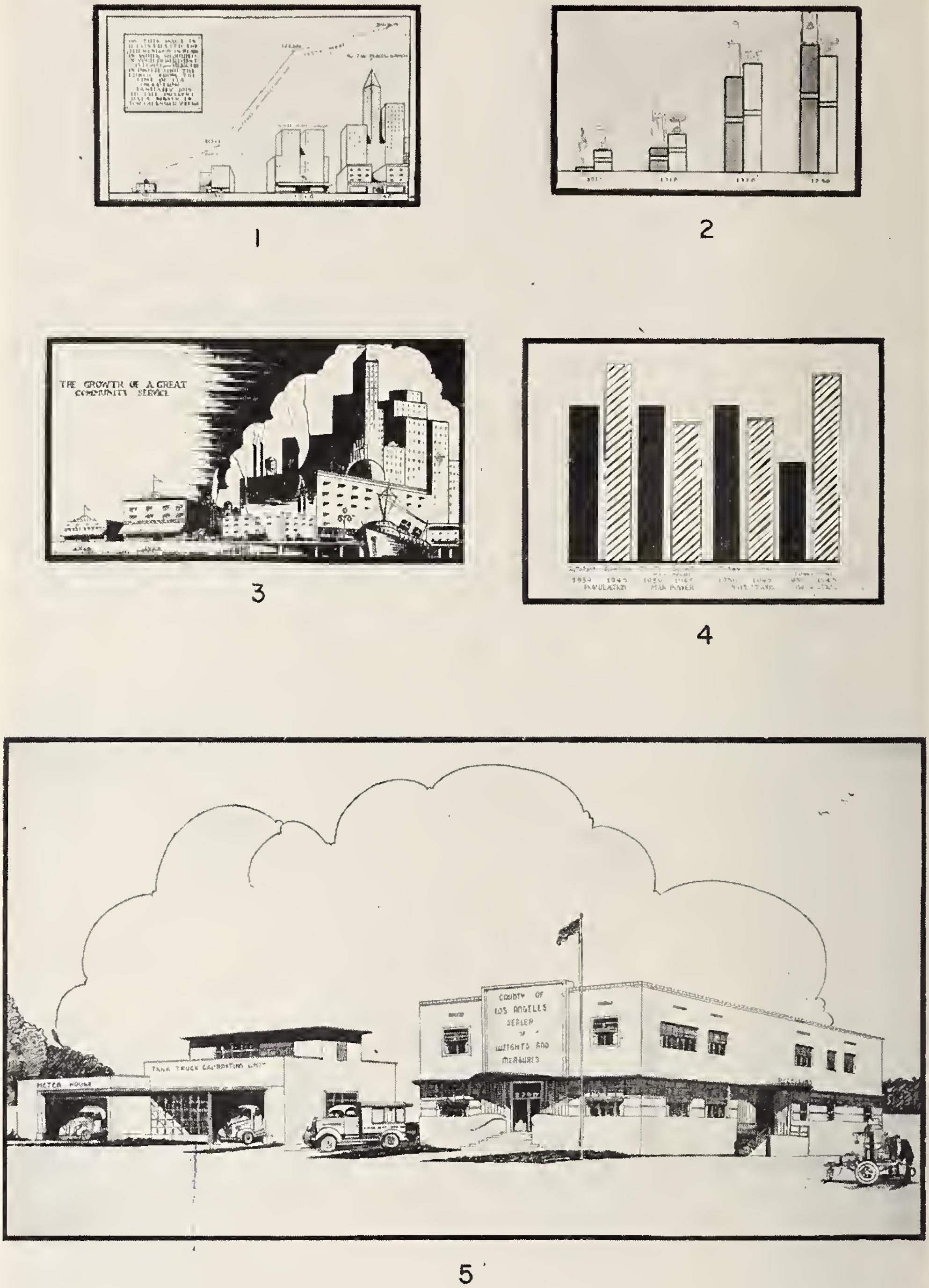
1
2
THE GROWTH OF A GREAT COMMUNITY SERVICE
3
4
COUNTY OF LOS ANGELES SEALER OF WEIGHTS AND MEASURES
METER HOUSE
TANK TRUCK CALIBRATING UNIT
5

FIGURE 16.

an adequate allowance when your annual budget comes up for consideration.

Tell the people of your community. Be a good salesman. It is easy to sell an idea when you know that it is right. When they understand, you will receive their enthusiastic support and cooperation.

Then, and only then, will your work achieve its utmost possibilities, and your department take its rightful place as the most essential and useful branch of governmental service.

(At this point, at 3:45 p. m., the Conference adjourned, to meet at 9:30 a. m., Thursday, September 25, 1947.)

SIXTH SESSION—MORNING OF THURSDAY, SEPTEMBER 25, 1947

(The Conference reassembled at 9:40 a. m., C. M. Fuller, Vice President, presiding.)

OPEN FORUM

PAPER MILK BOTTLES

The SECRETARY. One of the subjects that had been suggested for consideration at the meeting this year was paper milk bottles. They have been the subject of discussion at various meetings that I have attended, and considerable interest has been expressed in this general subject. One of the people who had expressed such interest was Mr. Reed of Georgia. I asked him to lead a discussion on this topic and then later it developed that he could not be here. An effort was made to get someone else to do it, and that was unsuccessful.

However, Mr. Reed did submit to me a letter containing some of the information which he would have presented had he been able to accept the assignment and I think it would be worthwhile, in order to get the subject before you and into the record, to read a portion of this letter. He said:

> From time to time, we have received complaints regarding shortage of milk in paper containers. In fact, my wife was one of the principal parties calling this to my attention. In our home, these shortages would run as high as a half to a cup of milk per quart and it seems that this complaint, as well as others, is always about buttermilk rather than sweet milk. Investigation proved that where there were leaks of buttermilk, the amount of shortage was larger than that of sweet milk.
>
> I made several checks in stores in Atlanta and I found quite a lot of containers short. The merchants do not like them because it is not only shortweight but contributes to an unhealthy sanitary condition in the refrigerators.
>
> One lady asked why some designation mark of fill was not available on such containers, and at one time I, too, thought that this should be on all containers, but investigation proved that this is not practical because a package will bulge variably because of temperature changes and of flexibility of the cardboard. This will make the filling point indication impractical in that under one temperature it would be just slightly under the fill point while under other temperatures it will be greatly under the fill point.
>
> I also found that during the war the quality of cardboard used varied in thickness and strength and this would permit some packages to bulge more than others.
>
> The fault of these containers lies in the fact that the handling of them sometimes breaks down the edges of the sharp corners or the bottom, making them spring leaks. Naturally, they will test correctly in the dairy; but a few hours later after they have been handled around on a truck and handled three or four times they will check short in the store or at the home of a consumer.
>
> I am advised by the manufacturer of the containers used in Atlanta, that they are in the process of making a container that will not spring a leak even if the package is dropped to the floor from a height of five feet. However, this has not been perfected just yet to the point where it can be manufactured. This company realizes that this is one of their greatest problems and they are spending quite a lot of money and time in order to perfect this.

Then Mr. Reed submitted a summary of the results of an investigation that he made in Atlanta. These are tests made at a packaging plant, and he reports tests made on a series of half-pint, pint, and quart paper packages, as follows:

One-half-pint packages:
Individual errors in cubic centimeters: −2½; −4½; −6½; −4½; −6½; −4½. Average error: −4 ⅚ cubic centimeters. Tolerance: 2 fluid drams or 7.38 cubic centimeters.
One-pint packages:
Individual errors in cubic centimeters: −3 (6 instances). Average error: −3 cubic centimeters. Tolerance: 3 fluid drams or 11.07 cubic centimeters.
One-quart packages:
Individual errors in cubic centimeters: −5 (6 instances). Average error: −5 cubic centimeters. Tolerance: 4 fluid drams or 14.76 cubic centimeters.

He contrasted with the foregoing results the results obtained on a corresponding series of tests made on glass packages, which were as follows:

One-half-pint packages:
Individual errors in cubic centimeters: +3½; +1½; −½; −2½; −½; +3½. Average error: +0.833 cubic centimeter.
One-pint packages:
Individual errors in cubic centimeters: +2; −3; +2; −3; −3; +2. Average error: −½ cubic centimeter.
One-quart packages:
Individual errors in cubic centimeters: +5; +5; +5; −5; −5; −5. Average error: zero.

Milk is an important commodity. Weights and measures officials have, for years, given close attention to glass milk bottles and to the amounts delivered in such bottles. The question is, Are we giving equal and proper consideration to milk marketed in containers other than glass?

As used in this country the paper container for milk is not a measure, the filled container being an ordinary "package." Perhaps greater attention should be given to the measuring machines by means of which these paper cartons are filled. In any event, the subject is one which, in my opinion, deserves more attention from officials than it has been receiving in recent years.

The Chairman. We have had some cases where filling machines have been set to deliver short measure, but we have also had other cases where the complainants were not properly checking the amounts of milk received in the cartons. We have followed the National Conference specifications in requiring milk bottles to be of correct capacity when filled to one-fourth inch below the cap seat; some people have used glass bottles to measure the amounts received in cartons, and have claimed short measure if the milk did not come up to the cap seat. In some cases these complaints have not been justified.

Mr. Bussey. We have shown that one of the principal causes for short measure in paper milk cartons is the leaky carton. I understand that manufacturers have had considerable difficulty in obtaining the proper type of paper board for the cartons; sometimes it is rough handling that causes these cartons to leak.

SALES OF SERVICE

The Secretary. There is another subject which we had hoped to cover on our program, and which I wish to mention so that officials may do some constructive thinking about it. This subject is the proper supervision over sales of service. By "sales of service" I mean those transactions which involve a weighing or measuring operation but not a transfer of tangible commodity, where the weighing or measuring operation is for the purpose of determining the charge to be made for the service rendered. The service rendered may be by a service company, such as a laundry or a rug-cleaning company; or there may be involved the compensation of a laborer which is based upon the amount of product which he produces or a service which he renders.

Scales and measuring devices used in these operations are "commercial" just as much as are the scales in a merchant's store. I think that some officials are not giving this phase of their regular work the attention which it deserves. I believe that more positive and consistent programs should be set up for checking in this field, just as checking is now carried out in the field of packaged goods and the amounts delivered when a food product or coal or other tangible commodity is exchanged. I wish to leave with you the thought that here is a good field for rendering additional service to your community by broadening the scope of your investigative and supervisory activities to include sales of service as well as sales of commodities.

Mr. Lang (Triner Scale and Manufacturing Co.). In laundries much of the service is charged for by the pound; most laundries do have adequate scales for general purposes, but they also have scales back in the various departments of the plant, particularly at the ironers, which are used for the double purpose of determining the volume of flat work as a matter of production record, and of determining the weight of wearing apparel in a bundle by subtracting from the total weight the weight of the flat work. Moreover, these scales may be used for determining the production of the individual members of a team of perhaps two or four girls working at these ironers, and so they are being used for determining wages. These scales are being used for a very important service, and should be on a par with all of the other scales used in the laundry. But we have observed that many times they are not adequate.

Mr. Crockett. In Baltimore, we consider all scales used in laundries as being used for commercial purposes and we test them all. It is news to me that some weights and measures officials do otherwise.

GENERAL SPECIFICATION NO. 1

Mr. M. W. Jensen. I wish to present the following statement which was prepared by Mr. George Warner, State Supervisor of Weights and Measures of Wisconsin.

General Specification No. 1 which was adopted by the 32nd National Conference on Weights and Measures last year reads as follows:

> Identification of Weighing and Measuring Devices.—All weighing and measuring devices except weights shall be conspicuously, clearly, and permanently marked, for purposes of identification, with the name, initials, or trademark of the manufacturer and with the manufacturer's designation which positively identifies the pattern or the design of the device.

On January 16, 1947, Mr. Ralph W. Smith, Secretary of the Committee on Specifications and Tolerances, sent out a committee-approved statement in an effort to clarify the intent of this specification. One objective of the specification was to relieve the equipment manufacturers of the necessity of marking each piece of equipment to suit each city, county, or State.

Some jurisdictions, including my home State of Wisconsin, use a special marking for the purpose of bonding the manufacturers. Our State law requires a designating number to be placed on milk bottles and Babcock test bottles and pipettes. We intend to get a bill before our legislature to adopt the specification, and bond our manufacturers, by using their name or initials and eliminate the word "sealed" and the designating number.

I would like to hear comments on broadening the specification to include such items as ice-cream buckets, single-service containers, milk and cream bottles, Babcock glassware, and other devices which might not be classed as strictly weighing and measuring devices.

If the Conference seems to favor the broadening of General Specification No. 1, I will recommend that it be referred to the Committee on Specifications and Tolerances for their consideration.

The Secretary. By the terms of General Specification No. 1, no exemption is made except in the case of weights, nor is the application of the specification otherwise restricted. The language is, "all weighing and measuring devices except weights." It is certainly the intention that the specification apply to the various types of equipment specifically mentioned by Mr. Warner, and I do not see how the specification could be more specific than it is unless we were to list all of the types of apparatus, and that seems unnecessary in view of our use of the expression "all weighing and measuring devices." Of course there is understood the general qualification that the specification covers only "commercial" weighing and measuring devices, but otherwise the specification is just as broad as we can make it with the single exception of weights, which of course could not be marked in the manner specified.

As I see it no reference to the Committee on Specifications and Tolerances should be necessary.

Mr. Sanders (National Association of Scale Manufacturers). I wish to express the appreciation of the scale manufacturers for the splendid cooperation which the various States have given in the matter of eliminating special marking requirements. As you know, there were a number of jurisdictions which required a State approval marking or serialization marking or both, and for such States every manufacturer had to have special identification markings. Since the action of the National Conference last year in adopting General Specification No. 1, we have worked closely with those States, keeping in touch with them in their efforts to eliminate their special marking requirements. So far as I know, every jurisdiction which had special marking requirements has either already eliminated them or has agreed to eliminate them within a very short time.

It was important to the manufacturers that all of the States act at the same time so that new name plates carrying identification numbers for the particular types of scales could be prepared without carrying any special markings. I think Mr. Baucom's remarks of yesterday were significant. He said that he had always favored some simplified system for marking scales and that he adopted the requirement for

784131—48——12

marking to show North Carolina approval because nothing better was available, and that he believes this new system will accomplish the desired result.

We also want to express our appreciation to Mr. Smith and to the Committee on Specifications and Tolerances for having written and published the interpretation which was issued following the Conference last year which went a great way toward clarifying the purpose and application of General Specification No. 1.

Mr. Baucom. Is a single-service container to be construed as a measuring device or simply a vehicle for transfer purposes? There appears to be some difference of opinion as to whether or not General Specification No. 1 applies to single-service measure containers and I should like to have the Committee on Specifications and Tolerances consider this subject before our next meeting and, if necessary, distinguish more clearly between a measuring device and a single-service container.

In the light of my present information I take the position—although I take the right to reverse myself—that a single-service container is primarily a transfer vehicle, and that we should require that the net content statement be truthful regardless of how the container may have been made or what markings it carries. The cylindrical type of container is rigid and will hold its shape and, therefore could properly be considered a measuring device according to the definition. But in the case of the rectangular shaped paper container used for oysters and similar commodities I feel that this is intended primarily as a convenient container and we shall insist that the commodity be measured and that the measurement be declared on the container. For example, we do not require type approval for vinegar bottles. We are not concerned with the method used for measuring vinegar but we do insist that the declared amount of vinegar be in the bottle.

The Secretary. I do not oppose the suggestion for further study, but I would suggest that the single-service measure container which is made of paper or cardboard, is identical in its general characteristics with the glass milk bottle with the one exception that the latter is not a "single-service" container but is put to repeated use. The measure container as covered by our code for single-service measure containers is the means by which the quantity determination is made at the time of retail sale; it is the measure which the retailer uses to determine the quantity which he dispenses, and it is required, of course, that it be marked with a statement of its capacity. General Specification No. 1 applies to these measure containers just as to other types of measuring devices.

Perhaps Mr. Baucom's remarks are directed more to the general requirements for single-service measure containers than they are to the general application of General Specification No. 1.

Mr. Baucom. As a container and a transfer vehicle these paper containers are all right; we shall continue to use them and I have no objection to them. But I am trying to protect all the parties concerned. I know that many of these containers were not type approved. When we approve something we are by such act establishing a guarantee that the measurement will be correct. I think we must be very careful when it comes to type approval of that type of container, and I do not know whether I want to approve it as a measuring device or not. I'm not going to object to its use but when it comes to the State of North Carolina approving it and saying in effect "This measuring device is dependable and will stand up under the specifications," I do not believe I can do it.

The SECRETARY. In my previous remarks I was not thinking of pattern approval. It does not follow that a measure container which is suitable for one use is necessarily suitable for all uses; perhaps Mr. Baucom's problem is the misuse of an otherwise satisfactory container. In this connnection, it is my understanding that in Massachusetts, measure containers may be approved for limited use or for general use depending upon the construction and the characteristics of the container. That, Mr. Baucom, may be the answer to your problem.

Mr. JUDKINS. In Massachusetts we have a paper container for milk which is approved by the State Division. I am very much opposed to it myself. When I go into a store that sells milk I can glance at the milk bottles and see if they are filled properly, but if the milk is in paper containers the only way I can determine that a container holds the proper amount is by actually measuring the contents. If anything goes wrong with the filling machine many of those containers may be short filled and it is for that reason that I am very much opposed to paper containers for milk.

The CHAIRMAN. In the case of some of the paper pails used for the sale of ice cream, merchants are protecting themselves from giving too much by having a rigid form in which the pail is placed while it is being packed, to prevent bulging.

SALE OF GARDEN SEEDS

By WILLIAM H. ROBERTS, *Inspector of Weights and Measures, Vigo County, Ind.*

Determining and enforcing proper methods of sale of garden seeds have proven perplexing problems to weights and measures officials for many years. The need for more regulation in the sale of such seeds has been recognized but, apparently, little has been done heretofore to bring about uniformity in the sale of this commodity. It is my hope this brief discussion, together with the recommendation made by your Committee on Methods of Sale of Commodities to the effect that garden seeds should be sold by weight, will result in the elimination of some, if not all, of the questionable practices now either tolerated or approved.

The three principal methods employed in the sale of garden seeds are (1) weighing from bulk at time of sale, (2) measuring from bulk at time of sale, and (3) in package form. The first method is employed by an increasing number of dealers in all their bulk sales and by many others in the sale of the larger seeds such as beans, corn, peas, etc. Many dealers sell from bulk by measuring the seed with the use of measuring glasses, dippers, and other small containers, none of which are known to be legal dry-capacity measures as defined in the Dry Capacity Measure Code adopted by this Conference. Practically all seed dealers, whether their bulk sales are made by weight or measure, sell packaged seeds. The larger packages containing the items previously mentioned are generally, if not always, labeled to indicate net weight. The small packets seldom, if ever, bear net-content declarations.

Weights and measures enforcement activities are based on the principle of buying and selling by weight, measure, or numerical count. It is recognized that the customer has a right to know exactly the quantity of any commodity he is to receive for his money. It should always be his privilege, and that of the weights and measures official, to check the quantity received by means of established standards. In the sale of dry commodities such as garden seeds, net weight has many advantages over dry-capacity measures. The latter are not legal in some jurisdictions and are not adaptable to the sale of garden seeds in amounts commonly purchased by the average home gardener.

The practice of selling bulk garden seed by weighing at time of sale, and the sale of such seed in packages labeled to indicate net weight, are both comparable and commendable. It is of no concern to the buying public or to weights and measures officials whether the packer weighs or measures the seed sold in packages as long as they bear a net-content statement. Reweighing, in either case, will determine if accurate weight has been given.

The sale of garden seed in packets not labeled to indicate net contents and the sale from bulk by means of the customary types of measuring devices is deplorable and undoubtedly illegal. In neither instance is any representation made to the buyer as to the amount to be received. I do not think it necessary to discuss the various types of measuring devices used other than to point out that many of them are accompanied with explanatory charts. These charts are usually furnished with the original order shipped prior to the seeding season and specify which of a series of measuring cups or dippers is to be used in making five-cent, ten-cent, fifteen-cent, etc., sales of different seeds.

It is argued by seed companies favorable to the practice of measuring seed, that such practices are more accurate and afford greater protection to the buyer than the actual weighing of seed. I question such arguments for the following reasons: (1) No representation is made as to the amount to be received, (2) the possibility that the wrong measuring device may be used for a particular seed, and (3) the possibility of improperly identifying the seed jars with the price stickers recommended by the accompanying chart. The use of these devices makes both unintentional and intentional errors hard to detect and legal punishment for them impossible.

Seed companies have pointed out that greater speed is possible in making sales with the use of measuring devices and that the cost of scales would be prohibitive to many engaged in merchandising this seasonal item. While I am not in a position to challenge these statements, I am strongly of the opinion the buying public would benefit from the sale of all garden seeds on a weighing basis. Pricing and selling by weight affords the public an opportunity to compare prices, which in itself would do much to prevent any general price increase based on operating costs.

In this discussion, I have attempted to place the sale of garden seeds in packages not labeled to indicate net contents and the sale of such seeds from bulk with the use of measuring devices in the same category. Both are undoubtedly in violation of law, and both give the buyer no information as to the quantity of seed he receives. If weights and measures officials are to successfully combat these practices, it would seem that they should be kept in the same category and attacked simultaneously. I know of no justification for permitting one practice and prohibiting the other.

SUPERVISION OVER DOMESTIC SALES OF FUEL OIL

By James A. Boyle, *Sealer of Weights and Measures, Portland, Maine*

Prevention of offense as against apprehension of the defendant is by far the better administration of the law. This is the general aim of the weights and measures officer. Thus we set up our codes with the idea in mind of making as perfect as possible the mechanical phases of weighing and measuring devices, and these codes properly enforced minimize short weight or measure through defects of the device. The human element is the most difficult phase we have to mitigate against. The device and the operator both have performance characteristics.

I preface my remarks thus, because this is the general theme of weights and measures enforcement, but in some cases we must go far in the prevention theory. This is particularly true of the "Supervision over Domestic Sales of Fuel Oil." We enact laws and regulations in relation to visibility to the consumer of the scale in weighing operations. If this is sound procedure, and I believe it is, how much more important it is when we have to do with commodities which are not visible to the purchaser but because of their nature, as fuel oil and gasoline, are delivered concealed through a hose and into a receptacle which in most cases already contains residue of a previous supply and therefore subject to a comminglement with the new supply leaving a situation wherein it is impossible to remeasure the immediate quantity delivered.

Our attitude, therefore, in relation to this commodity must be very strict in the control of the devices although we may be subject to criticism from what might appear to be overzeal in prevention. For example, Massachusetts, since 1937, has required selective valve control on power operated jobs employing a meter where multiple compartments are involved. Effect of this installation means that but one compartment can be open at any one time. This requirement, of course, slows up delivery, but experience has shown that there are great possibilities of fraud open to the operator of a vehicle with a multiple line system and power take-off. This takes away from the operator the opportunity of taking advantage of the power plant and manipulation of valve control.

In some instances it has been found that as much as 9 gallons of air may be registered through the meter even though the system is equipped with air eliminator unless the selective valve control system is employed. Air eliminators are not adequate to meet this type of fraudulent operations and in Massachusetts the approval extends beyond the measuring device itself and includes the whole system which means the meter, the pump unit, the piping, and air eliminator.

With relation to the air eliminator, questionable arrangements have been found, for example, when the vent is attached to the delivery side of the meter which can militate against accuracy in the device through discharging the vent into a solid volume of liquid instead of an empty compartment or the outside atmosphere.

The development of meter systems for accurate measurement of liquid fuel for household delivery has presented a difficult problem. These vehicle tanks, in most cases, are subdivided into two or more compartments with each compartment separately piped to a manifold and a common line running from the manifold to the measuring system. In instances involving but one compartment throughout, no great difficulty is encountered. Installations involving multiple compartments, however, present possibilities of operation of the system conducive to fraud, and careful tests should be made to eliminate this possibility.

Tests should first be made for the purpose of determining the accuracy and constancy of the meter at normal speed of operation, and normal speed of operation is defined as operation within the limits of the discharge rates ordinarily developed under conditions of installation recommended or specified by the manufacturer for the particular type of meter under test. (Meters are required to be legibly marked to show the maximum discharge rates under normal conditions of installation and minimum discharge rates, and the naximum working pressure for which they are intended to be used.) The minimum discharge rate to be employed, however, is 10 gallons per minute unless a lesser rate is specified by the manufacturer, in which case such lesser rate shall be employed.

These tests should involve two or more drafts of, at least, 50 gallons each, at maximum and minimum discharge rates of flow, with the line valve to the compartment from which the liquid is being drawn completely open. (On multiple compartment systems the line valves to the other compartments should be completely closed.) The tolerances to be allowed on this test shall be two-tenths of one percent.

In testing vehicle tank meter systems involving multiple compartments, the relative factors are the meter, air release unit, pump efficiency, piping and empty compartments as a possible source of air, and the contiguity of the empty compartment to the pump or suction head. Special tests should be made, therefore, for the purpose of ascertaining the limits of error by reason of these factors. The proximity of the empty compartment to the suction head is a decided factor in the matter of air induction. Maximum air induction is accomplished when the empty compartment is nearest to the pump and the test is made by first opening wide the empty compartment line valve, then allowing the pump to operate on this line until such time as the meter indicator stops before opening the valve of the compartment line from which the liquid is to be drawn. It is also to be noted that results will vary according to the degree of opening of the supply line valve. Further special tests should be employed involving varying degrees of opening of the empty compartment line valve and the liquid-containing-compartment line valve, and alternating complete and partial opening of these valves and retarding and accelerating the motor during the progress of the delivery (the minimum rate of flow to be 10 gallons per minute unless manufacturer represents the meter to deliver accurately at a lesser rate of flow, in which case the latter shall be employed). Several special tests should be made and the final error shall be the average of all the errors developed on these special tests, which error shall not exceed a tolerance of four-tenths of one percent.

The effect of this form of test is to induce air into the system with the liquid and thus determine the efficiency of the air release unit. These tests are designed to simulate conditions which may obtain by fraudulent or negligent use of the system. If inaccuracies develop under these conditions beyond the above permissible tolerance, then it is apparent that the air release unit does not properly function on multiple compartment delivery and the system should include proper selective valve control so that but one compartment line may be opened to the pump at any one time.

Also in Massachusetts, the law requires the issuance of a certificate or memorandum on sale of fuel oil in quantities of 10 gallons or over for heating or cooking purposes, which certificate must recite the name and address of the seller and purchaser of the quantity of oil delivered. This is similar to a requirement in many other States and this certificate is sometimes mechanically effective in the so-called meter duplicating devices. These devices, while mechanically and arithmetically accurate are, nevertheless, susceptible to fraudulent use.

Instances have been found wherein operators have been able to advance the recording digits by manual means, and it is also possible to allow tickets to remain in the recording device beyond the original delivery and record against the second purchaser the accumulated quantity of the two deliveries. Here, again, we have a situation wherein the device properly used is all right but the closest of supervision must be exercised in the use of these, and this can be done by the inspector by observation of fuel oil trucks that he may see stopped at the household in process of delivery. The State of Massachusetts has a one thousand (1,000) gallon testing unit for bulk station meters and mobile 50 and 100 gallon units for tank truck meters.

In New Jersey it is illegal to use or to employ any measuring device for use in the purchase or sale of any liquid fuel without the same first being approved as to type and construction by the State Superintendent of Weights and Measures and calibrated, tested, and sealed by any weights and measures official. The State Superintendent of Weights and Measures shall provide a form of certificate to be issued by a weights and measures official after the approval, testing, calibration, and sealing of any measuring device, which certificate shall expire 1 year from the date thereof following issuance thereof and shall be renewed annually. It is unlawful to sell or deliver or have in possession with intent to deliver any liquid fuel unless such certificate shall be in possession at all times or carried on the vehicle to which it applies.

All liquid fuel must be sold by volume. The unit of volume must be the standard United States gallon.

If the volume is calculated by weight, the net weight shall be determined by means of a scale of approved type and capacity, tested and sealed by any weights and measures official. For conversion of weight to volume and for temperature corrections, the National Standard Petroleum Oil Tables as approved by the United States Bureau of Standards shall be used.

Each sale or delivery of liquid fuel exceeding 50 gallons, but not exceeding 3,000 gallons, must be measured by means of a positive displacement liquid flow meter which has been tested and sealed.

This does not apply to liquid fuel sold in barrels or other containers upon which the quantity in terms of liquid measure is plainly and conspicuously marked. This requirement was established after study based on actual observations of marketing practices in this field.

The reason for prescribing the minimum of 50 gallons was to enable vendors to serve households with small quantities of fuel oil. Much of this vending is done by small dealers who use 5-gallon carrying cans.

The 3,000-gallon maximum for metering was prescribed to enable those who purchase fuel oil in large quantities to obtain their supplies by tank or compartment lots. This applies to large industrials and other large users, such as hotels, apartment houses, etc.

A delivery ticket and duplicate thereof shall be prepared upon the completion of delivery of each sale or delivery of liquid fuel exceeding 10 gallons. On each ticket there shall be distinctly and indelibly expressed the date, the name and address of the seller, the name and address of the purchaser, the number of gallons sold or delivered, the grade of liquid fuel, and the signature of the person making such sale or delivery or his agent. One of such tickets shall be given to the purchaser and the other shall be retained by the seller for a period of 1 year, such retained tickets being subject to inspection by any weights and measures official. Delivery tickets shall be serially numbered. No duplicate or retained ticket shall be destroyed but may be voided and kept on file; provided, however, that the provisions of this section shall not apply to liquid fuel sold to be delivered by the entire tank car or cargo direct from the vessels, boats, or railroad tank cars or bulk tank trucks or compartments thereof containing the same to one destination and consigned to one person, firm, or corporation and accepted by the purchaser on the original bill of lading or invoice as proof of measurement or weight.

Also in the State of New Jersey, it is unlawful after the approval, testing, and sealing of any measuring device or equipment used in delivering liquid fuel, to adjust, repair, or alter the same or to cause said measuring device and equipment to be adjusted, repaired, or altered, unless approval of a weights and measures official is first obtained; and it is unlawful to remove any meter from the tank to which it is affixed at the time of testing and sealing to any other tank, unless immediate written notification is given to a weights and measures official advising of necessity of alteration or change.

Connecticut has three test units for testing devices through which liquid fuel is sold and makes routine tests of all truck and bulk-plant meters at least twice a year.

The unit used for testing truck meters consists of a 100-gallon and 50-gallon tank mounted on a truck which is equipped with pump and meter. The pump is operated from the power take-off of the engine and has a capacity of 50 gallons per minute.

The 50-gallon tank can be removed from the truck and set on the ground for testing gravity meters.

Two units are used for testing bulk plant meters and tank compartments. One unit consists of a 500-gallon and 200-gallon tank and has a gasoline engine and pump to exhaust the liquid, the pump having a capacity of 200 gallons per minute. On the other unit the pump is operated by power take-off from the engine on the truck and this pump has a capacity of 150 gallons per minute; the unit also has a

500-gallon and 100-gallon tank. On this unit a meter is used to calibrate vehicle-tank compartments.

North Carolina requires that all liquid-measuring devices used in the domestic sale of fuel oil conform to the requirements adopted by the National Conference on Weights and Measures, sponsored by the National Bureau of Standards.

California requires that liquid measuring devices used for sale of fuel be equipped with adequate air release units, and meters are tested at least once a year.

Maine has established and equipped nine testing stations throughout the State with standards reasonably adequate for the testing of large-capacity liquid measures and liquid-measuring devices.

Mr. McBride. The Massachusetts procedure which Mr. Boyle outlined in his paper was the form of test which we prescribed in 1937 when the meters were 1 inch or 1¼ inch in size. The minimum rate of 10 gallons which was mentioned was later raised to 20 gallons, and yesterday as you will recall, the Conference adopted an amendment in regard to meters under 2 inches in size; so please have in mind that the minimum rate should now be 20 gallons a minute, subject to the Conference amendment for meters larger than 2 inches in size.

Mr. Rogers. I suggest that if anyone has legislation in mind he try to get a requirement for the automatic ticket printer. Our law is deficient in this respect and our efforts to correct this deficiency have been opposed.

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON TRADING BY WEIGHT, PRESENTED BY JAMES E. BRENTON

Since the 1946 National Conference on Weights and Measures, the general trend of trading in grains by weight has continued. A number of conferences with those in charge of developing plans for administering the Research and Marketing Act of 1946 have been held and the Committee on Grains has recommended that investigations be made of conditions and plans developed for bringing about the trading in grains by weight. This ties the responsibility for developing trading in grains by weight with the proper agencies and it gives promise of great progress in that direction in the near future.

Those in charge of statistics, inspections, and market news relating to grains have been interviewed and found to be not only interested but willing to actively support this effort. These, working together, should rapidly bring about more trading in grains by weight.

It is recommended that this committee be continued and that the Chairman contact and cooperate with those in charge of statistics, inspection, market news, and the activities relating to grains under the Research and Marketing Act as well as commercial agencies, and urge the promotion of trading in grains by weight in multiples of pounds or by the ton.

(Signed) J. H. Meek, *Chairman*,
J. E. Brenton
A. J. Jensen,
Committee on Trading by Weight.

Mr. JENSEN. We have 1,700 grain elevators in North Dakota, and I have discussed this problem many times with elevator men and members of grain associations. It seems that they want to continue to sell wheat, oats, barley, and flax by the bushel. However, feeds of all kinds and corn are sold by 100-pound units.

While I am on my feet I want to thank each and every one of you; you have all been fine to me. I may never be back here again; a good many of us are getting old and the young fellows will have to take our places but I want to say this one thing: When we leave this Conference here in Washington and go home, many of us fail to take full advantage of our attendance at the National Conference. We depend upon our local resources or our State Associations and fail to realize that the National Bureau of Standards is looked up to by people all over the United States and that here we get information which should be put to use all over this broad land. When you get home tell people that you were here and what happened here. Do it by radio. Give it to your newspapers. Say, "This is the final word on weights and measures, and comes from the place where the specifications and tolerances are made." You will find that the decisions will be looked upon as having much greater importance than when you rely only on your local authority saying, "We are making our own specifications and tolerances." Let us abide by the actions of the National Conference and unify the whole system of weights and measures in the United States.

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

CALIBRATION OF STATE STANDARDS

By WILMER SOUDER, *Chief, Metrology Division, National Bureau of Standards.*

TESTING AND CALIBRATING.—"Testing and calibration of standard measuring apparatus" is one of the basic functions of the National Bureau of Standards. This service is rendered without charge to the States and is an activity in which we take much pride, yet for which we anticipate little publicity. Any failure to supply accurate values for a standard can create extensive confusion in the field and definite embarrassment at the Bureau. A full measure of quiet is therefore very significant and truly satisfying to us.

The activities of the Bureau have been extended to many fields of research and standardization since its founding in 1901, but there has been no loss of interest in testing and calibrating State standards. Records of previous tests are kept. These are compared with current data and decisions are usually made on the probable behavior of a standard during the next 10 or 20 years. If the standard is no longer satisfactory, the State will be advised accordingly.

The difference between testing and calibrating may not be clear. This difference is of definite interest and will explain why our testing procedure is usually more extensive and necessarily consumes more time than the procedures followed in the State laboratory. When we make a complete calibration of an item we must make sufficient tests and intercomparisons under varying conditions to enable us to specify the value and behavior of the standard throughout all conditions of normal service. Such items as material, design, construction, density, response to humidity, temperature, pressure, and all other influences which may affect the standard or the indicated readings of the standard must be determined before we can say we have completely calibrated the standard.

The sealed weight which you use to test a weighing scale or to establish short weight in a retail sale has a very imposing history which can be called up if it is necessary to document your standard. Your use of the standard may last only one or two minutes in a complete test, but back of the standard are comparisons with the State standards and back of the State standards are days of testing, computing, and calibrating operations at the National Bureau of Standards. Incorporated in the values for the Bureau standards are the results of intercomparisons with the International Prototype Standards in Paris. The authenticity for your sealed standard is complete and can be made available should such verification be necessary.

Standards.—The standards given to the States by the Federal Government are no longer adequate for all of the needs of weights and measures officials. Some of the standards are seldom if ever used. Mr. Fischer listed 61 standards of mass in his report to the first Conference on Weights and Measures. The maximum single weight is 50 pounds. Different combinations of weights are now used, including 50, 100, 500, and 1,000 pound weights. The gallon and half-bushel were listed in capacity measures. The latter is gradually giving place to weighing instruments. Liquid measures of 5, 10, 50, 100, and 500 gallon capacities are now necessary for State standards. The yard bar as a standard of length is not so convenient for many needs as the 100-foot tape.

These changes to different types of standards have introduced no changes in the units of our standard measures. The pound, the yard, and the gallon are constant. The pound and the yard were fixed in 1893 by an Executive Order of the Treasury Department as certain definite relations to the International Prototype Standards in Paris. The gallon, being 231 cubic inches, is by reason of the definition of the yard, likewise controlled by the International Standard.

For each National Prototype Standard there is a correction which when applied makes it equal to the International standard. Each working standard has a similar correction. State standards when returned to you are accompanied by reports which give their values in terms of the International standards. The International standards are composed of platinum 90 percent and iridium 10 percent. They are the last word in permanence and have given unquestioned service since their adoption. Certainty about the exact values of our units and standards is now no longer in doubt as it may have been during the first one hundred years of our national history.

Retesting Standards.—All States do not uniformly submit their standards for tests at definite intervals. A hasty survey of recent records shows that at least 43 States have standard weights which have been tested by the National Bureau of Standards. The other States undoubtedly have standards which have been tested prior to the year 1901, when the Bureau was established.

The weights which you may submit will be delivered to our receiving department by messenger, mail, or transportation agency. If a letter has arrived describing the material, the box will be opened and inspected. Evidences of faulty packing are often discovered and it is not uncommon to find the container for the weights broken up and all weights mixed in a deplorable mess. (Broken glassware and dented capacity measures are familiar discoveries.) The weights must be inspected for injury which impairs their use as standards. If or when the shipment is accepted the weights will be put in line for testing. Work on hand, Federal and emergency work, and the schedule of tests being made in the laboratory determine the date at which the State standards will be tested. Delays of from one to six months are sometimes necessary, partly because the volume of work received is very irregular.

The methods employed in testing State standards have been given at previous sessions of this Conference. References to reports on these methods are listed at the close of this paper. A brief rehearsal of a few of the techniques used in the metrology laboratories may be of particular interest to some of the new members of the Conference and for that reason they will be given here.

Preparation and Precautions.—Preparation of standards for testing demands the removal of all foreign material. Dust, grease, and films must be removed from weights and length standards. Capacity standards must be clean and dry. Weights and length standards must not be rubbed in an attempt to clean or polish the surface. Any dust which can be removed with a soft brush or tuft of cotton may be brushed away. Grease films, spots of tarnish from wax, or tar-like materials may be removed with grain alcohol or benzol. Standards which have been coated with lacquer must not be cleaned with alcohol or other solvents which will remove the lacquer unless it is possible to relacquer them and bring them to a stable condition before the tests are made. Two-piece weights and weights having a sealing cavity must be cleaned in such manner than no cleaning solution is trapped in the weight.

Volumetric glassware may be cleaned with 20 percent fuming sulfuric acid. Cleaned glassware must be permitted to drain thoroughly. It is then rinsed three times in water and once in alcohol and dried. Failure to drain thoroughly may cause breakage from heat when the rinsing water reacts with excess residual acid. Care must be taken to keep the strong cleaning solutions away from etched lines which have been filled as they may remove the filling material, even the colored soft glass which is sometimes fused into the lines.

Dichromate solutions may be used when it is possible to permit the solution to stand in or around the glassware. We have found the following formula quite satisfactory for making a cleaning solution:

Sodium or potassium dichromate (pulverized)	75 cm^3
Water	15 to 20 ml
Sulfuric acid	750 ml

Mix the dichromate and water and add the sulfuric acid slowly and cautiously to prevent excessive heating.

Mass.—Standards of mass or weights of the smaller values (50 pounds and under) are usually tested on what are known as equal-arm balances. Very few, if any, balances have exactly equal arm lengths. Transposition of the weights or groups of weights gives increased precision. This method of weighing eliminates errors which would arise by reason of such inequalities, if the weights were not transposed from one side of the balance to the other. Reference 4 at the close of this paper describes such weighings. One practice which simplifies such weighings is to add to the lighter weight (unless it is known to be heavier than the standard with which it is being compared) or combination of weights being compared, a small supplementary weight which will cause the pointer to swing about a point near the center of the scale.

Rest points are computed for this combination, first as placed on the scale pans, then after the weights have been transposed from their initial position to the opposite pan. Obviously if these rest points are the same, the weights are equal. If they are not the same, the difference between the weights on the two pans is the extra weight which will cause the pointer to move to the mean of the two rest points determined in the primary and transpositioned weighings. This difference can be evaluated by adding a known weight to one of the pans containing the weights being compared and then computing the new rest point. Having the amount of change caused by the addition of a known weight it is a simple matter to compute the amount which should have been added to the pan having the lighter load to cause the rest point to change to the mean of the rest points computed in the original two weighings. Proper application of this correction for the change in rest point, subtraction of the value of the small weight added before the weighings were started, and the application of the correction for the Bureau standard, will give the value of the weight being tested.

Buoyancy corrections for pressure, humidity, and temperature of the atmosphere must be made when weights of different densities are being tested. Handbooks on physics and chemistry contain tables from which such corrections may be obtained as does reference 3 at the close of this paper.

For the usual set of 17 weights (50 pounds to 1/16 ounce) 41 independent weighings will be made. Thirteen of these weighings will compare directly the Class A standards with known standards of the Bureau. Twenty-eight will be made on various combinations of weights. From the data obtained, mathematical computations are made using the "Method of Least Squares" to secure the most precise value for each of the 17 weights tested.

For the most accurate weighing on multiple-lever and beam scales it is necessary to weigh by substitution. The same technique can be used on equal-arm balances if transposition weighing is not feasible. The weight under test (plus a small additional weight, unless the weight under test is known to be heavier than the standard) is placed on the scale and is "weighed," or counterbalanced if on an equal-arm beam, without making any notation of the weight or of the material used to counterbalance the weight. The poise on the beam or the counterbalancing material must not be disturbed until the substitution is completed and recorded. The weight under test and the added weight are removed and known standard weights are placed in the same position as that previously occupied by the weight under test. Known weights are added until the scale beam or balance beam takes a position identical with that taken when the weight under test was on the platform or pan. The known values of the substituted standard weights now in position are equal to that of the weight being tested and the added weight first placed on the platform or pan. From these known weights subtract the value of the small weight, first added to the weight under test, and the result is the value of the weight being tested.

Length.—Length standards such as yard or meter line standards may be compared by adjusting two rigidly mounted micrometer microscopes over the lines on the bar being used as a standard. When the micrometers are adjusted to the lines designating the length interval the standard bar is replaced by the bar under test. Any changes in the micrometers necessary to adjust them to the lines of the bar under test can be evaluated to give the difference in length of the two bars. Temperatures must be recorded and the coefficient of expansion of each bar must be available so that the report can be prepared to show the length at a specified temperature, usually 20°C (68° F) for State standards.

For a more precise determination of length the microscopes may be attached to a rigid carriage which can be moved along the length of the bars. The preferred arrangement (for bars 6 inches ormore in length) is to set the microscopes first over the zero and specified interval lines of the Bureau standard and then adjust the micrometers accurately to these lines. The carriage is then moved longitudinally until the microscopes are over the lines on the State standard being tested. The amount by which the micrometers must be adjusted represents the difference in length between the Bureau and State standard. In both methods the screw value of the micrometers must be determined so that the difference in length may be expressed in proper units of measurement.

Obviously the micrometer microscopes may be arranged so that one is on the zero line of each bar. The carriage may then be moved until the first microscope is exactly on the line of the interval being used on the standard bar. The amount by which the micrometer is away from the corresponding line of the bar being tested measures the difference in length of the two bars.

Tapes are placed on a flat steel bar or bench (or are suspended beside the bench and supported at specified intervals) and subjected to a definite tension. Intervals have been ruled on the bench. A finely graduated scale ($\frac{1}{100}$-inch graduations) is placed on the bench and against the tape. The corrections for the tape are read on this scale by the use of a low power microscope.

Volume.—Standards of volume or capacity are usually compared by weighing the container empty and again when it is filled with water. From the temperature of the water and tables of densities it is possible to compute the volume of the water in the container. Tables of the density of water at various temperatures are available in handbooks and in the publications listed under references 2 and 3 at the close of this paper.

Tests are usually made on the basis of the capacity of the container at 4° C. Knowing the coefficient of thermal expansion of the material used to construct the container, it is not difficult to compute its capacity at any desired temperature. The coefficients applicable to the usual capacity measures for each degree centigrade change in temperature are as follows: Brass 0.000054, copper .000050, iron .000035. The values for degrees Fahrenheit are 5/9 of those given. Tests have shown that the usual type of capacity measure, adjusted to contain say 5 gallons at 4° C, will deliver very nearly 5 gallons at 20° C (68° F). The amount of expansion of water between 4° C and 20° C is, for the typical copper container, equal to the volume of water which remains on the surface when the container is drained.

The difference between contain and deliver must not be confused. In making a test "to contain" the measure must be dry when the first weighing is made. In making the test "to deliver" the container must be drained for the specified number of minutes or seconds and must not be dried before weighing.

If a small capacity measure is used to test a metering device or pump which delivers several times the capacity of the standard measure the standard should be filled and drained once before the recorded test is started. Additional fillings and drainages will then be on the "to deliver" basis. To get away from the possible accumulation of errors and delays incident to such multiple usage of small standards, larger capacity standards are being used. A 500-gallon standard has recently been tested for the State of Illinois. The Illinois officials had adjusted this standard by using a 50-gallon measure which the Bureau had calibrated for the State of Illinois during the last year. The 500-gallon adjustment, as set by the State officials, was found to be in error at 60° F by no more than 12 cubic inches. This speaks well for the manipulative skill of these men who had to make 10 transfers from one container to the other.

This review of some of the more regular methods used in testing State standards has given you a general idea of the care and interest accorded your standards by the Metrology Division. When a standard is sealed or certified and returned to a State we have made an investment in which we have a continuing interest. We have confidence and the expectation that you will be enabled to give a service of the utmost in effectiveness and that you share with us a personal satisfaction in the noncontroversial administration of weights and measures obligations.

References

1. L. A. Fischer, History of United States weights and measures. First Conference on Weights and Measures of the United States. M4 (1905), pp. 6–24. Out of print.
2. R. Y. Ferner, Testing of capacity measures. Eighth Conference on Weights and Measures. M11 (1913), pp. 181–200. Out of print.
3. Standard density and volumetric tables. Circular of the National Bureau of Standards C19 (1924), 72 p. Price 30 cents.
4. A. T. Pienkowsky, Testing standards of mass. Nineteenth Conference on Weights and Measures. M74 (1926), pp. 103–115. Out of print.
5. L. V. Judson, Testing standards of length. Twentieth Conference on Weights and Measures. M80 (1927), pp. 28–31. Price 45 cents.
6. Lewis V. Judson, Testing of line standards of length. Circular of the National Bureau of Standards C332 (1927), 22 p. Price 10 cents.
7. Design and test of standards of mass. Circular of the National Bureau of Standards C3 (1918), pp. 1–89. Out of print.
8. C. A. Briggs and E. D. Gordon, Weighing by substitution. Technological Papers of the National Bureau of Standards T208 (1922), pp. 177–192. Price 5 cents.

9. Measurements of length and area, including thermal expansion. Circular of the National Bureau of Standards C2 (1912), pp. 1–21. Out of print.
10. Lewis V. Judson and Benjamin L. Page, Calibration of line standards of length. National Bureau of Standards Research Paper RP743 (1934), pp. 757–772. Price 5 cents.
11. Elmer L. Peffer and Grace C. Mulligan, Testing of glass volumetric apparatus. Circular of the National Bureau of Standards C434 (1941), pp. 1–27. Price 10 cents.

Earlier papers listed above are out of print but may be consulted or loaned at State, technical, or scientific libraries in the principal cities of the United States. Publications for which the price is listed may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Stamps are not accepted in payment for these documents.

Mr. Baucom. About 10 years ago we submitted some standards to the Bureau; adjustment was found to be necessary, but the Bureau did not make the adjustment for us. That did not seem reasonable to me.

Dr. Souder. In some instances, where it is practicable for us to make the adjustment, we will now perform that operation for a State.

Mr. Macurdy. Lead as an adjusting material is prohibited for all standards except those of Class C.

The Chairman. Dr. Condon, we all want to see more of you. You made the opening hours of our Conference very pleasant. Will you please take over for the final hour?

(At this point Dr. Condon, President of the Conference, assumed the Chair.)

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON RESOLUTIONS, PRESENTED BY LOUIS E. WITT, CHAIRMAN

APPRECIATION TO DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS

Whereas Dr. E. U. Condon, R. W. Smith, and their able and efficient staff have extended vaulable assistance and guidance to this Conference, of which the Conference is sincerely appreciative; Therefore be it

Resolved, That this, the 33rd National Conference on Weights and Measures, does hereby record its grateful appreciation to the above-named gentlemen.

J. E. WOODLAND AND J. W. SAYBOLT

Whereas two beloved members of this National Conference on Weights and Measures, J. E. Woodland and J. W. Saybolt, have since our last meeting suffered serious illness, but have recovered sufficiently to join with us again this year; Therefore be it

Resolved, That the Conference body formally express its heartfelt gratification at the improved physical condition of these gentlemen, and extend to them its best wishes for a return to full vigor and strength.

ENDORSEMENT OF WEIGHTS AND MEASURES SCHOOL

Whereas Dr. E. U. Condon, Director of the National Bureau of Standards, has been untiring in his efforts to foster and promote uniform and efficient weights and measures administration throughout the United States; and

Whereas he has given us further concrete evidence of this interest in our work by arranging to establish in the National Bureau of Standards a technical training school for weights and measures officials, to be started early next year; Therefore be it

Resolved, That this, the 33rd National Conference on Weights and Measures does hereby indicate its appreciation and gratitude, by pledging to Dr. Condon our wholehearted support of the school, and by the attendance at such school of many of the Conference members and the members of their various staffs.

IN MEMORY OF DECEASED MEMBERS

Whereas during the past year we have lost through the plan of Divine Providence several members and past members of this Conference; and

Whereas our association with these departed members has been an inspiration to us to continue with greater determination toward the ideals set by them; Therefore be it

Resolved, That we of the 33rd National Conference on Weights and Measures do hereby record this expression of sincere sorrow at the loss of these members.

ADOPTION OF NBS HANDBOOK H37 AS OFFICIAL MANUAL

Whereas there is considerable sentiment among the members of the National Conference on Weights and Measures for the adoption by the Conference of uniform test methods to be used by weights and measures officials; and

Whereas, There is now available at nominal cost a comprehensive and authoritative treatise on weights and measures supervision and the inspection and tests of scales and weights, titled "Testing of Weighing Equipment—National Bureau of Standards Handbook H37", Therefore be it

Resolved, that this body adopt Handbook H37 as its official manual for weights and measures officials in the inspection and testing of weighing equipment; and be it further

Resolved, that the Director of the National Bureau of Standards is hereby respectfully requested to arrange for the preparation and publication of a companion book to Handbook H37 to cover the inspection and testing of measuring devices, as soon as it is practicable and feasible for the National Bureau of Standards so to do.

APPRECIATION TO THE PRESS

Whereas the press of the City of Washington has 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 33rd National Conference on Weights and Measures does hereby record its appreciation to the press of the City of Washington and to the Scale Journal.

EDITORIAL IN "FOOD TOPICS"

Whereas "Food Topics", a trade journal with a circulation in the retail grocery trade, did, under date of September 22, 1947, on its

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editorial page, erroneously report and editorialize on the official action taken by the National Conference on Weights and Measures in its deliberations on Monday, September 22, 1947, to the effect that the Conference was planning to recommend legislation requiring all food dealers to weigh all packaged products at the time of sale; Therefore be it

Resolved, That the 33rd National Conference on Weights and Measures does hereby instruct the two members of the Conference who are this year in charge of press relations, Mr. J. T. Kennedy and Mr. R. W. Searles, to contact the editorial staff of the above-mentioned trade publication for the purpose of advising them that they have been misinformed and/or have misconstrued the Conference action, with the request that the editorial be retracted or corrected, in fairness and justice to the National Conference on Weights and Measures and also to the paper's subscribers.

(Signed) L. E. Witt, *Chairman*,
Nalls Berryman,
J. E. Brenton,
E. R. Fisher,
R. W. Searles,
I. R. Shultz,
J. C. Mays,
Committee on Resolutions.

Mr. Witt. For the information of the Conference members and to get it into the record, I will read the editorial referred to in the final resolution. [Reading:]

WEIGH EVERY PACKAGE?

The National Conference on Weights and Measures, now meeting in Washington, is planning to recommend legislation requiring food merchants to weigh all packaged products at the time of sale—and to charge according to the exact weight.

The Conference is apparently unaware of the burden this would force on the retailer.

In self-service stores, the greatest operating difficulty is at the checkout stand. If packages had to be weighed here in great numbers, a slowdown would result which would be costly to the retailer and inconvenient to the customer. The same problem would arise in service stores.

In any case, it is hard to see how the practice followed by packers of adding moisture to packaged products—essentially in maintaining freshness—can be tackled on the retail level.

Retailers must not sit back, however, and take it for granted that this proposal will fail.

Do something about it before you wake up some morning and find another millstone around your neck.

Write your congressman. Your associations also will be glad to help.

Accompanying this material is a cartoon headed "If You Had To Weigh Every Package!", showing a long line of people with their baskets at the checker's counter and the checker feverishly weighing butter and other packaged commodities that are presumably properly marked and checking them all out by net weight at the time of sale. The cartoon does not give a true picture of what the Conference wants done.

The Chairman. Is there discussion on any of these resolutions?

(The foregoing resolutions, as proposed by the Committee, were duly adopted.)

REPORT OF THE NATIONAL CONFERENCE TREASURER, GEORGE F. AUSTIN, JR.[14]

June 1, 1947.

Balance on hand June 1, 1946			$264. 60
Receipts:			
Sept. 28	Dues—1946 Conference	$440. 00	
	Interest accrued	7. 06	
			447. 06
			711. 66
Disbursements:			
Aug. 29	Rubber stamp—TREASURER NAT'L CONF. W&M	1. 50	
Sept. 27	Social evening Hotel Mayflower:		
	Refreshments	49. 50	
	Music	90. 00	
	Vocalist	50. 00	
	Telephone service	1. 20	
	Messenger, mimeographing, and stenographic services	40. 00	
	Cartage	1. 75	
			233. 95
Balance on hand June 1, 1947			$477. 71

Respectfully submitted,

(Signed) Geo. F. Austin, Jr., *Treasurer.*

(The report of the Treasurer was duly accepted.)

REPORT OF THE NATIONAL CONFERENCE COMMITTEE ON NOMINATIONS, PRESENTED BY V. D. CAMPBELL, CHAIRMAN, AND ELECTION OF OFFICERS

Mr. Campbell. Prior to presenting the Report of the Committee, I wish to inform you of our procedure before selecting our slate of nominees.

First of all I want to assure you that the members of the Committee had no axes to grind. We were not interested in disposing of anyone, neither did we have any particular candidate whom we wished to make an officer of the Conference. On the afternoon of Tuesday we set aside an hour to receive any members of the Conference who wished to make suggestions to the Committee; four persons appeared before us and recommended persons for office and all had good reasons for their requests.

On Tuesday evening we met in executive session and considered these suggestions. We had in mind the suggestions made by Dr. Condon in his opening address from which I quote:

> Moreover it is important that our work have as broad a base of participation by all the members as possible. On the other hand, continuity of knowledge of the work is also of the utmost importance.

That was the thesis laid down by Dr. Condon and laid down in selecting members of the Standing Committees. We, too, decided to take the same thesis. We took the list of registered persons here and listed beside their names any positions which they held on Standing Committees. We then tabulated the State men and also the city

[14] This report was presented to the Conference by the Secretary, because of the temporary indisposition of Mr. Austin.

and county men to make a comparison of their relative numbers so that we might have as broad a base as possible.

Following the preparation of these statistics the following motions were passed: (1) That members of the Conference who represent States and who have served but 1 year be allowed to serve a second year. (2) That county and city officials who have served 1 year should not be allowed to serve an additional consecutive year. (The reason for this is that the number of city and county men far exceed the number of State men, and to provide wider participation it is necessary to limit the county and city officials to 1 year terms.) (3) That Chairmen of Standing Committees should not appear on the slate for officers.

We are not trying to impose our procedure upon the nominating committees of subsequent Conferences. Dr. Condon told us yesterday that this is a very democratic organization and that we made our rules as we went along; I have given you the rules that we used this year. You will find that we have changed 5 Vice Presidents out of 6 and that we have on the proposed list of nominees 3 State men and 3 county and city men. The Executive Committee of 15 members includes 6 old members and 9 newcomers; the distribution is 8 State men and 7 county and city men. In the entire list there are represented 17 States and the District of Columbia, so that I feel we are proposing a fairly wide base.

I shall now present the report of the Committee. [Reading:]

The Nominating Committee begs to submit the following slate of nominees for the consideration of the 33rd Conference on Weights and Measures, to serve for the ensuing year.

OFFICERS

For President: E. U. Condon, Director, National Bureau of Standards.

For Vice Presidents: Russell S. Aekerman of Minneapolis, Minn.; Nalls Berryman of Florida; V. D. Campbell of Ohio; Edward R. Fisher of Rhode Island; Irvin R. Shultz of York, Pa.; Robert Williams of Nassau County, N. Y.

For Secretary: Ralph W. Smith, National Bureau of Standards.

For Treasurer: George F. Austin, Jr., of Detroit, Mich.

For members of the Executive Committee: C. A. Baker of New York; C. D. Baucom of North Carolina; James E. Brenton of California; Milo C. Griffin of Hartford County, Conn.; Joseph Giuliano of New Jersey; Erling Hansen of Minnesota; William A. Jones of Waterville, Me.; George H. Leithauser of Baltimore, Md.; Bernard A. Pettit of the District of Columbia; George A. Ritchey of Illinois; William H. Roberts of Vigo County, Ind.; Robert K. Slough of Akron, Ohio; R. D. Thompson of Virginia; and S. H. Wilson of Georgia.

Respectfully submitted.

(Signed) V. D. Campbell, *Chairman,*
J. T. Kennedy,
Erling Hansen,
W. S. Bussey,
J. P. McBride,
E. F. Usher,
Committee on Nominations.

The Chairman. I understand that it is a custom of some years standing for the Director of the Bureau of Standards to be elected President of the National Conference. I want to assure everyone of my deep interest in this work and of my desire to support it in every way in my official position. On the other hand, since I am a new man and before crystallizing this practice into a habit, I wish to say that you should by no means think that you ought necessarily to follow the practice of always making me President. I do not in any sense feel that that is a necessary accompaniment of my position, or that I would show any less interest in the work officially in the Bureau if I did not hold that position.

I think it should be on the record that the Nominating Committee should not feel the slightest necessity in continuing to nominate me.

I think the correct thing is to call for any nominations from the floor at this point.

(It was moved that the nominations be closed, that the report of the Committee on Nominations be adopted, and that the Committee nominees be declared elected; the motion was seconded, the question was taken, and the motion was agreed to.)

UNFINISHED BUSINESS

Mr. Witt. I move that the Secretary be authorized to draw upon the Treasurer of the Conference for the usual and customary expenses of this meeting.

(The motion was duly adopted.)

Mr. Saybolt. I feel that many of you, like myself, who have had the privilege of attending these National Conferences for many years, have never enjoyed one more smoothly operated, with better clicking, with less controversy, nor one with pleasanter echos throughout all of the four days.

Now on a personal note, I wish to say that during the period when I was ill the evidence of friendship in the many cards and letters and expressions of sympathy have been most deeply appreciated. Although I hold no portfolio from Woody I have heard him say the same thing. I want to express my most extreme gratitude to the Conference for its kindness in adopting the resolution in reference to both of us.

Mr. Crockett. In the absence this year of one of the men who has consistently attended this Conference in the past, and as a mark of respect for him, I think that we should mention our other friend, Charles C. Neale.

The Secretary. As one of Charlie Neale's oldest acquaintances, and I believe I can properly say oldest friends, in this organization, I may say he planned to be here. His business arrangements were complicated by illness, as a joint result of which he was not able to come. He sent me a wire during the early days of the meeting saying in his characteristic way, "Know that you will have a successful Conference. This is the third that I have missed in 37 years." That is a pretty good record. I know that everybody that knows Charlie loves him as I do and I am sure that it would be very appropriate if someone saw fit to move that the Secretary address to Charlie an official communication regretting his inability to be with us.

Mr. Bussey. I place Mr. Smith's suggestion in the form of a motion.

(The motion was duly adopted.)

NEW BUSINESS

TIME FOR HOLDING NATIONAL CONFERENCE MEETINGS

Mr. Fuller. There has been considerable informal discussion about the desirability of returning to the practice of holding the National Conference meetings in the Spring of the year, as was done for many years. I suggest that in planning the meeting for next year, due consideration be given to that thought.

Mr. Rogers. I think the attendance would be very materially affected by a return to the Spring dates, because so many Associations hold their conventions in the Fall. In New Jersey we passed a resolution recommending return to the Spring dates; many of our boys could not get the permission of their governing bodies to come to this meeting because our meeting, too, was held this month, and two meeting in a month were considered too many.

The Chairman. Washington is a very attractive place in the Spring. I think the Fall meetings were started because we were in a hurry to get going after the long war interruption; rather than wait until this Spring we had our first postwar meeting last Fall.

Mr. Kennedy. As a native Washingtonian I suggest that there may be more trouble with hotel reservations in the Spring than in the Fall; it has become the custom for many out-of-town schools to send their graduating groups to Washington in the Spring. I think the weather would be better in October than in September and I cannot believe that it would be beneficial to go back to the Spring meetings.

The Secretary. I consider that it would be impossible for us to hold a successful National Conference within 6 months of the preceding meeting. Therefore, if we were to decide to hold our meeting in May or June, the next meeting would necessarily go over to May or June of 1949. I do not believe that an 18-month interval before our next meeting would be too great. We have discussed this year a great many important matters and certainly have left with you enough to think about to occupy you reasonably for 6 months longer than usually intervenes between 12-month Conferences.

As to hotel reservations, it is true, as Mr. Kennedy says, that a great many groups do come to Washington in the Spring; but that was true when we were regularly holding our meetings in the Spring and I never felt that there was a serious problem with respect to hotel reservations because those groups usually were here for a very short time and in many cases are dispersed among the smaller and less expensive hotels. I do not think that hotel reservations would be a serious problem if you wish to meet in the Spring.

As far as I am personally concerned, and I believe I can also speak for the Bureau, it is quite immaterial to us when the meeting is held. A considerable number of officials have discussed this question with me during the course of this meeting and they have emphasized that a large number of State meetings are held in the Fall and that with our meetings coming in the Fall it is difficult in some cases for equipment manufacturers and officials to attend the National Conference or that if they do so it may be at the sacrifice of remaining away from their own State meetings. I have been told further that the custom among many of the States of holding their meetings in the Fall resulted from their past understanding that the National Conference would be held in the Spring, and that those State meetings scheduled for the Fall would avoid any interference with meetings of the National Conference.

These are factors in this problem. I think it might be well to explore this question by mail with the entire registered attendance of this meeting and with representatives of States which are not represented here. We can develop the concensus of the entire group and then put it up to the Executive Committee some time within the next few months to make the decision.

Mr. Bussey. Personally it makes no difference to me either, whether the National Conference is held in the Spring or in the Fall, but it seems to make a lot of difference to some of our members. I understand that a considerable number have been unable to come to our sessions this year because of conflicts with other meetings; the California and Massachusetts meetings I believe, are to be held next month and the Virginia and New Jersey meetings were both held this month.

I move that the Secretary's suggestion be adopted and that the Executive Committee then give full consideration to all of the information submitted. If it is decided to return to Spring dates it would be understood that the Executive Committee has the approval of the Conference to defer the next meeting to 1949.

(The motion was duly adopted.)

The Chairman. We have discussed the time for the next meeting. We might also discuss the place. We now have at the Bureau an auditorium with a seating capacity of about 300. If the Conference would prefer to meet out there instead of a hotel we would be glad to have that considered; on the other hand, if it develops that the general convenience is believed to be better served when meetings are held in a hotel, that will be all right with us. So much for a meeting place for the future.

Any of you who are not in too great a hurry to get back home will be welcome to visit the Bureau of Standards. We are wide open and on a peacetime basis except for a few military corners, and if any of you wish to visit us tomorrow or any time you are in town, please feel that you are entirely welcome and that we want to see you.

Are there any other topics to be brought before us?

(It was moved and seconded that the Conference adjourn, the question was taken, and the motion was agreed to).

(Thereupon, at 12:00 Noon, the 33d National Conference on Weights and Measures adjourned *sine die.*)

APPENDIX

[The following paper was presented by R. W. Smith, Secretary, National Conference on Weights and Measures, before the meeting of the National Scale Men's Association in Kansas City, Missouri, May 1, 1947. See page 123 of this Report for the reference to the inclusion of this paper herein.]

A COMMON PROBLEM

By Ralph W. Smith, *Secretary, National Conference on Weights and Measures*

When a problem has long been a topic for discussion among the membership of the National Conference on Weights and Measures, which I represent, and the

National Scale Men's Association, it is fair to say, I believe, that that problem is common to both of these organizations. It is in that sense that my remarks today are titled "A Common Problem."

The particular "common problem" which I propose to discuss is the official regulation of the mechanics who, acting either for themselves or as the servants of others, engage in the business of repairing or servicing commercial weighing or measuring devices. I shall bring to your attention a number of factors which I consider to have important bearings on the general problem, and shall suggest for your consideration a plan for regulation which I trust will appeal to you as at least meriting your further study.

Although, as I view it, this problem can be solved only by "regulatory" measures, probably initiated by weights and measures officials, and although, as such, the problem is perhaps the particular responsibility of regulatory officials such as comprise the membership of the National Conference on Weights and Measures, nevertheless the counsel and assistance of the National Scale Men's Association in reaching a workable and effective solution and in implementing that solution are not only appropriate but will, I am sure, be greatly appreciated by the weights and measures officials of the United States. To this end I invite your cooperation.

At the outset let me make it clear that what I shall say today represents, at the moment, only my personal views. I can not lay claim to originating the basic idea around which these views have been developed, but this development is the result of conference with numerous people who have been in a position to advise on one or another aspect of the problem to which a solution is sought. As yet the proposal which I shall suggest for your consideration has not been presented to or studied by the National Conference on Weights and Measures. It is my intention, however, to present these ideas to the National Conference, for weights and measures officials have long been plagued by the fruits of the low standards of business ethics, the incompetence, and even the dishonesty of a certain segment of the group known in general as "repairmen," and have long sought a fair and effective method for their regulation. If I can go to the National Conference with the benefit of your thoughts and constructive suggestions, this will be most helpful. If, perchance, you should endorse my proposals, that will do much toward placing these proposals in line for practical trial.

The conventional approach, during the past decade, to the problem of the incompetent, poorly equipped, careless, unscrupulous, or actually dishonest repairman, has been *control* by *licensing*. The approach which has recently been suggested, and which appeals to me as offering many advantages over "control by licensing" is *protection* through *bonding*. I shall discuss some of the elements of the problem and later contrast the potentialities of "control by licensing" and "protection by bonding."

One might, fairly enough, say that the problem embraces not only the servicing and repairing of weighing and measuring devices, but also the erection or installation of such devices and their sale when in other than new condition. I have no quarrel with such a broad concept, but in this discussion I shall limit myself to that part of the over-all problem which has to do with the servicing and repairing, for hire, of equipment used or to be used for commercial purposes, such equipment being owned or operated by some person or agency other than the person or agency performing the servicing or repairing operation. It is this phase of the problem which I consider to be most acute. Also, by so limiting this discussion, complications will be avoided which would necessarily be encountered if a discussion of all phases of the problem were to be undertaken. Those elements not now to be considered are not unimportant, and may well be discussed at some other time.

As to the men and agencies proposed to be regulated, servicemen and repairmen may be employees of established firms or they may be in business for themselves. In either case they should undertake to service and repair commercial weighing and measuring equipment in such a way that, among other things, this equipment will continue to meet, or will be made to meet, the official weights and measures requirements which are in effect. If the men are employed by established firms, they may represent factory agencies, independent sales agencies, servicing agencies, or repairing agencies; any such agency may properly be assumed to have a fixed address and to be possessed of at least some degree of business integrity and financial responsibility. If a serviceman or repairman is in business for himself, he may or may not have a fixed address, and he may or may not have a proper sense of business ethics or be financially responsible.

The interest of government in the activities of this group of firms and individuals stems primarily from a desire to protect the owners of commercial weighing and measuring devices against malpractices on their part. Particularly is it desired to protect such owners against financial losses. There is also the consideration of the desirability of out-of-order equipment being put promptly into first-class condition. Finally, there is the consideration of the elimination of unqualified so-called mechanics. The better elements of the affected group of firms and individuals also have a direct interest in proper regulation of the group as a whole, because through such regulation there can be brought about an elevation of the prevailing standard of equipment servicing and repair, the business can be dignified and standardized, certain vicious forms of competition can be eliminated, and fair compensation for honest and skilled service can become the accepted rule.

When the public interest is adversely affected to a sufficient degree, government applies corrective measures. Even though an abuse may be caused by only a small percentage of the members of a group, it is customary, and frequently unadvoidable, to apply the restrictive measures to the entire group. We find examples of this in compulsory automobile insurance, the bonding of fiscal agents and public officers, the licensing of members of trades and professions, compulsory health examinations for handlers of food products, and countless restrictions imposed under the general police power. In the problem under discussion it seems to be obvious that fairness, avoidance of charges of discrimination, and effectiveness of regulation all demand that in any system of regulating servicemen and repairmen of weighing and measuring devices, the restrictions be applied to all such persons.

Under any system of regulation, the cooperation of equipment owners is essential to success. To achieve this cooperation an intensive and continuing campaign of education is required. There is no way in which an equipment owner can be protected in spite of himself, and probably we should not be too much concerned about the protection of a man who fails to exercise reasonable diligence in protecting himself; government may be held to have done its part when it has provided and properly publicized a means for the use of the equipment owner in securing his own protection. Under any system of government regulation, the first responsibility for the educational campaign rests upon the government, but the forward-looking members of the regulated group will do themselves a service if they, too, consistently carry on an educational program of their own.

One fellow who causes a great deal of the trouble in the servicing and repairing of weighing and measuring equipment is the itinerant, who is here today and gone tomorrow, nobody knows where. But the segment of troublemakers also includes all of the unskilled, whether itinerant or not; it includes those who do their work on a "get by" basis, giving only so much in the way of honest service as may be necessary to meet the requirements of the moment; and finally, as previously suggested, it includes the unscrupulous and dishonest few whose deliberate objective is to get all they can and give nothing of value in return.

To be successful, any system of regulation must be fair and impartial to those who are regulated; specifically, there must be fairness to the mechanics as individuals, and there must be fairness to the firms employing mechanics to service and repair equipment for others. The efficiency of the system will depend to a considerable extent upon its simplicity and ease of enforcement. Low administrative cost is a factor which should not be overlooked, because to be effective in a broad sense, regulation must be put into effect in many separate governmental jurisdictions.

Let us analyze and contrast the licensing system of regulation on the one hand, and the bonding system of regulation on the other hand. First, let me explain the sense in which I shall use the terms "licensing system" and "bonding system". Under a licensing system the State licenses equipment repairmen and repair agencies, for a fee, and the law prohibits any but a licensed repairman from servicing or repairing commercial equipment. Under a bonding system, the law would require that a repairman or a repair agency be bonded, the equipment owner having recourse against the bondsmen to recover charges paid if the equipment were not properly repaired, or to receive reimbursement if the equipment were damaged in the course of unsuccessful efforts to recondition it, in the event that the repair man or repair agency failed to make proper refund or reimbursement. I may say, in passing, that the bonding system which I have in mind would provide, in any State, for a single bond to cover the repairmen employed by a single firm. It may also be well to say specifically that, although the bonds which I am considering are known among the bonding compaincs as "financial guarantee" bonds, they would be limited in their application to the two elements of repair or service charges and damage to equipment during attempted repairs, and that claims for losses resulting from the use of improperly repaired equipment would not be admissible.

Proceeding, then, to the analysis and comparison of the two systems, there is at once apparent the fundamental difference that under a mere licensing system the State assumes the entire responsibility, and that under a bonding system the primary responsibility is a financial one resting on the bonding companies as sureties for repairmen and repair agencies.

When the State licenses a mechanic, this action implies that the licensed mechanic is qualified to do the job for which he is licensed, and that if an equipment owner employs a licensed mechanic, the work will be competently performed. On the one hand, the State may license only after an applicant has successfully passed an examination; here the implication of competency of a licensee is clearly established. On the other hand, the State may license upon an assumption of competency and without examination; in this case, beneficial effects of the system can be assured only as demonstrated incompetents are gradually weeded out by having their licenses revoked after they have failed in one or more instances to do acceptable work. If the State specifies the kind and amount of testing equipment which a mechanic must provide before a license will be granted, the implication of competency of the mechanic's services is further strengthened. A licensing system demands that the State assume a continuing enforcing responsibility; this involves the policing of the entire field, for what the law actually does is to prohibit anyone from engaging in the business in question without being licensed to do so. Control is exercised through denial, suspension, or revocation of licenses, and by prosecution, and not otherwise. Under a licensing system the equipment owner receives no direct financial protection whatsoever.

Under a bonding system the responsibility of the State would be comparatively small, but the equipment owner who exercised the reasonable caution of dealing only with a bonded mechanic or agency upon the basis of a definite understanding of the results to be accomplished would be protected against certain direct financial losses resulting from incompetence on the part of the mechanic. It is natural to assume that the bonding company's investigation of an applicant for a bond for a repairman or agency would include an inquiry regarding the training and experience in servicing and repairing weighing and measuring equipment of the person or persons to be covered by the bond; but the investigation would probably be directed principally to the business integrity and the financial ability of the applicant, since the responsibility of the bonding company would become a financial obligation in a case where a bonded person or agency failed to "make good" on any transaction within the terms of the bond. Under this system the State could, if it wished, prosecute an unbonded person for engaging in the business of servicing or repairing commercial equipment owned by others than himself or his employer, just as, under a licensing system, an unlicensed person can be prosecuted, and for similar reasons; such action may occasionally become necessary under either system, even though there is no good excuse for the unbonded or unlicensed repairman getting any business in the first place, assuming adequate publicity and good sense on the part of equipment owners. Under bonding, final financial protection as to repair charges and damage to equipment would be made effective by negotiation or suit between an injured equipment owner and the bonding company, without intervention of the State except to the extent of certifying that repaired equipment did not meet State requirements. Elimination of undesirables from the group of bonded mechanics would, in effect, be accomplished by the bonding companies, upon the basis of the claims which they would be called upon to pay. Under this system, regulation would be accomplished by an economic process: Equipment must pass the official test or the owner doesn't pay for the repair work, and the mechanic or the company can not stay in business long if work is done for nothing. Furthermore, if the equipment is damaged in the course of efforts to repair it, the owner must be reimbursed for the damage. Finally, under bonding, the responsibility for getting equipment right would rest squarely on the mechanic, and he would know this just as he would know that if upon official test the equipment were found unacceptable, he must make good; and the State would not tell him how to do his job, or how much or what testing equipment to use to determine when his job is done right.

To sum up the case of licensing versus bonding, let us first stipulate that under either system the essential publicity will be adequate. We then have the equipment owner financially protected by bonding and unprotected by licensing. We have the State, under licensing, assuming a heavy responsibility and a considerable work load in determining the competency of mechanics or, as the alternative, admitting that it grants official licenses without assurance of the competence of the licensee; under bonding both the responsibility of the State and its work load in "qualifying" a mechanic under the law are relatively small. We have the State carrying a continuing heavy enforcement load under licensing and a comparatively light enforcement load under bonding. The straight clerical load on the State will probably be about the same under licensing and bonding. It seems reasonable to anticipate that, on the whole, undesirables would be eliminated at least as quickly and effectively under bonding as under licensing at its best, and that bonding would be greatly superior in this respect to a poor licensing system. Bonding should be less costly to the State than licensing. The net cost to the mechanic and to the repair agency would probably be higher under bonding than under licensing. Either system can be expected to improve the quality of equipment servicing and repair, with bonding holding the advantage over all but the best-administered licensing systems.

As a practical matter, I cannot conceive of any large number of States putting into operation really effective licensing systems. The States have had before them for a number of years the example of New Jersey, which has pioneered a licensing system based on oral, written, and practical shop examinations of applicants, and yet I know of no other State baving duplicated that set-up. New Jersey was perhaps unusually fortunate in having on the staff of the Department of Weights and Measures, men competent to conduct these examinations; practical shop experience is not the rule among weights and measures officials. On the other hand, I fail to see why any State weights and measures office should find anything difficult about the administration of a bonding system, or why any State organization should hesitate for administrative reasons to sponsor such a system.

Those who would be regulated under either a bonding or a licensing system may, understandably, recoil at first from the thought of more regulation, and their initial reaction may be to oppose any move for regulation. It is submitted, however, that such regulation will be to the advantage of the legitimate firm and the ethical and properly trained mechanic, as well as the owners of commercial equipment and the general public.

Perhaps I can anticipate and dispose of some questions about bonding which have already arisen in your minds. One important fact is that the bonding companies will issue bonds such as I have been discussing; I say this upon the authority of Mr. Howard M. Starling, the Washington manager of the Association of Casualty and Surety Executives, the Surety Association of America, and the Towner Rating Bureau, Inc. To crystalize my discussions with Mr. Starling, whom I approached for advice, it was necessary to reduce to written form my ideas of a law under which a State could initiate and maintain a bonding system of regulation for repair men and agencies. Based upon his wide experience, Mr. Starling made some valuable suggestions for modification of my draft; these modifications were incorporated and I then submitted a corrected copy of the proposed bill with a request for official comment from the agencies which Mr. Starling represents. I quote in full a letter under date of April 1, 1947, which I received from Mr. Starling:

ASSOCIATION OF CASUALTY AND SURETY EXECUTIVES

Washington Office
HOWARD M. STARLING, Manager
Washington Building
Washington 5, D. C.

April 1, 1947

AEO/PMS

Mr. R. W. Smith, Secretary
National Conference on
Weights and Measures
National Bureau of Standards
U. S. Department of Commerce
Washington 25, D. C.

Dear Mr. Smith:

Your letter of March 20th together with draft of the proposed "Weights and Measures Repairman Act of 19____" which you discussed with me on March 19th, has been received.

I have taken the liberty of referring the proposed draft to our legal staff, also the Surety Association of America and the Towner Rating Bureau, Inc.

It is respectfully suggested that Section 6 of the proposed draft be amended by substituting a semi-colon for the period at the end of Section 6 after the word "recovery" and adding "provided, however, that the aggregate liability of the surety to all owners shall in no event exceed the sum of said bond."

With the addition of this language the proposed bill has the unqualified approval of the three organizations mentioned above, and should such a bill be introduced in the various State Legislatures this Association would advise its local Advisory Committees to aid in obtaining passage of the bill.

As requested by you we are pleased to enclose a suggested form of bond to be used if the proposed bill is enacted into law.

Assuring you of our appreciation for the opportunity of reviewing this measure and of our continued interest, we are

Very truly yours,

/signed/ Howard M. Starling
Howard M. Starling, Manager.

Supplementing this letter, I was advised orally that the Towner Rating Bureau estimated that the "service charge" on the bonds should not exceed ten dollars per thousand.

I have available for distribution mimeographed copies of the proposed bill which is referred to above, corrected to include the proviso recommended, and attached as a supplement is a copy of the sample form of bond which accompanied Mr. Starling's letter.[15] I believe that it would be to the advantage of all concerned to have regulatory measures of this kind uniform among the States with respect to the language of the basic legislation and with respect to enforcement procedures. Such uniformity is especially desirable when a particular repair man or agency operates in more than one State. If agreement can be reached upon a model law and upon a standard form of bond to be required, then all parties at interest can work harmoniously together for the enactment and adoption of these standards. Endorsement by your organization of the principles involved, and subsequent processing of specific recommendations through the Committee on Legislation of the National Conference on Weights and Measures, would be one way to develop uniform legislation and avoid the distressing consequences of divergent requirements in adjoining State jurisdictions. I believe that legislation along these lines is on the way; bonding bills have already been introduced into two State legislatures. The question is, shall such legislation be allowed to develop as inspired by local thinking, or shall an effort be made to develop a national pattern through a sympathetic study of the problem and the promotion of a nation-wide consensus?

I have not cited in my remarks any specific examples of the evils which the licensing or the bonding of mechanics is designed to correct. I have assumed that these evils are well known, and that the advisability of corrective measures is admitted. It has been my intention to focus your thinking upon a system of regulation to provide those corrective measures which, considered academically, appears to offer numerous advantages over the system of licensing. I repeat that your constructive comment and criticism, at this meeting or by letter, will be welcomed.

[15] The full text of the proposed bill, and the sample form of bond are incorporated in the Report of the National Conference Committee on Legislation; see pages 130 and 132 of this Report.

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