

**U. S. DEPARTMENT OF COMMERCE  
NATIONAL BUREAU OF STANDARDS**

**REPORT OF THE  
TWENTY-SIXTH NATIONAL CONFERENCE  
ON  
WEIGHTS AND MEASURES**

**ATTENDED BY REPRESENTATIVES  
FROM VARIOUS STATES**

**HELD AT THE NATIONAL BUREAU OF STANDARDS  
WASHINGTON, D. C., JUNE 9, 10, 11, AND 12, 1936**

**MISCELLANEOUS PUBLICATION M157**









by the Twenty-Sixth National Confer  
le-testing equipments of the State of New J



U. S. DEPARTMENT OF COMMERCE  
DANIEL C. ROPER, Secretary  
NATIONAL BUREAU OF STANDARDS  
LYMAN J. BRIGGS, Director

MISCELLANEOUS PUBLICATION M157

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

*(Large-capacity scale-testing equipments of the State of New Jersey and the city of New York, N. Y., in background.)*







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JOHN J. LEVITT, State Superintendent of Standards, Springfield, Ill.

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*In Charge of Exhibits.*—B. L. PAGE.

*In Charge of Registrations.*—Mrs. H. E. ROSENBERGER.



# PERSONS ATTENDING THE CONFERENCE

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City: Birmingham----- R. M. JOHNSON, Chief Inspector of Weights and Measures, City Hall.

### CALIFORNIA

State----- C. E. TUCKER, Chief, Division of Weights and Measures, Sacramento.  
County: Alameda----- EDWARD K. STROBRIDGE, Sealer of Weights and Measures, 829 Harrison Street, Oakland.

### CONNECTICUT

State----- C. L. KLOCKER, Inspector of Weights and Measures, 100 Washington Street, Hartford.  
City: Bridgeport----- LOUIS SNOW, Sealer of Weights and Measures, 925 Main Street.  
Stamford----- FRANK G. SMITH, Sealer of Weights and Measures.

### DISTRICT OF COLUMBIA

District----- GEORGE M. ROBERTS, Superintendent of Weights, Measures, and Markets, 467 C Street.

### FLORIDA

State----- NALLS BERRYMAN, Assistant State Chemist, Tallahassee.  
City: Jacksonville----- HOWARD E. CRAWFORD, Inspector of Weights and Measures, Utilities Building.  
Miami----- H. E. HOWARD, Inspector of Weights and Measures, City Hall.  
ALBERT C. SPIRES, Secretary, Rate and Traffic Division, Courthouse.

### GEORGIA

State----- S. H. WILSON, State Oil Chemist, State Capitol, Atlanta.

### ILLINOIS

State----- JOHN J. LEVITT, Superintendent of Standards, Statehouse, Springfield.  
VIVIENNE MANNEN, Secretary, State Division of Standards, Statehouse, Springfield.  
City: Chicago----- JAMES O'KEEFE, Inspector of Weights and Measures, City Hall.

### INDIANA

State----- MARTIN L. LANG, Commissioner of Weights and Measures, Statehouse Annex, Indianapolis.  
GREGORY G. BALTAS, Inspector of Weights and Measures, Statehouse Annex, Indianapolis.  
HERBERT G. MEYER, Inspector of Weights and Measures, Statehouse Annex, Indianapolis.  
City: Gary----- CLEO C. MORGAN, Sealer of Weights and Measures, City Hall.

## KENTUCKY

City: Louisville..... WILLIAM H. ISING, Jr., Chief Inspector of  
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## MAINE

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Portland..... JAMES A. BOYLE, Sealer of Weights and Meas-  
ures, City Building.  
Waterville..... WILLIAM A. JONES, Sealer of Weights and Meas-  
ures, City Hall.

## MARYLAND

State..... S. B. SHAW, Chief, Department of Markets,  
College Park.  
City: Baltimore..... S. T. GRIFFITH, Chief, Division of Weights and  
Measures, Municipal Building.  
CHARLES G. CROCKETT, Inspector of Weights and  
Measures, Municipal Building.  
JOHN R. GRAEFF, Inspector of Weights and  
Measures, Municipal Building.  
GEORGE H. LEITHAUSER, Inspector of Weights  
and Measures, Municipal Building.  
THOMAS J. NAPFEL, Inspector of Weights and  
Measures, Municipal Building.  
ELMER E. NICHOLSON, Inspector of Weights and  
Measures, Municipal Building.  
FRED J. O'GORMAN, Inspector of Weights and  
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ELMER S. PIERPONT, Inspector of Weights and  
Measures, Municipal Building.  
HENRY SLITZER, Assistant Inspector of Weights  
and Measures, Municipal Building.

## MASSACHUSETTS

State..... JOHN P. MCBRIDE, Director of Standards, State-  
house, Boston.  
City:  
Boston..... JAMES A. SWEENEY, Sealer of Weights and  
Measures, City Hall Annex.  
Haverhill..... JOHN R. BOOTH, Sealer of Weights and Measures,  
City Hall.  
Taunton..... EDWARD C. WARD, Sealer of Weights and  
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City:  
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Measures.  
Detroit..... JOHN W. BATES, Sealer of Weights and Measures,  
1300 Beaubien Street.  
GEORGE F. AUSTIN, Jr., Supervising Inspector of  
Weights and Measures, 1300 Beaubien Street.  
Hamtramck..... ARTHUR J. WILHELM, Sealer of Weights and  
Measures, 2444 Andrus Street.  
Highland Park..... MANON L. FOWLER, Sealer of Weights and  
Measures, 25 Gerald Avenue.  
Lansing..... CHARLES T. QUINN, Sealer of Weights and  
Measures, Grand and Shiawassee Streets.

## MINNESOTA

City: Minneapolis..... RUSSELL S. ACKERMAN, Superintendent, Depart-  
ment of Licenses, Weights and Measures, City  
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## MISSOURI

City: St. Louis..... LOUIS G. WALDMAN, Commissioner of Weights and Measures, City Hall.

## NEW HAMPSHIRE

State..... WALTER G. WHITE, Commissioner of Weights and Measures, Statehouse, Concord.  
 HARRY G. HAGER, Inspector of Weights and Measures, Statehouse, Concord.  
 WILLIAM H. MANN, Inspector of Weights and Measures, Littleton.  
 EDWIN H. THOMAS, Inspector of Weights and Measures, Farmington.

## NEW JERSEY

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 ROWLAND K. BODENWIESER, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.  
 ELLIOTT B. HOLTON, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.  
 HARRY S. PROVOST, Assistant Superintendent of Weights and Measures, 187 West Hanover Street, Trenton.  
 ARCHIE T. SMITH, Inspector of Weights and Measures, 187 West Hanover Street, Trenton.

City:

Elizabeth..... WILLIAM J. BENDER, Superintendent of Weights and Measures, City Hall.

Jersey City..... JOHN S. BURKE, Superintendent of Weights and Measures, City Hall.

Trenton..... FRANCIS J. BLACK, Superintendent of Weights and Measures, City Hall.

County:

Bergen..... ALFRED F. BARNARD, Superintendent of Weights and Measures, Administrative Building, Hackensack.

Burlington..... CURWEN B. FISHER, Superintendent of Weights and Measures, 34 Brainerd Street, Mount Holly.

Cape May..... GILBERT S. SMITH, Superintendent of Weights and Measures, Avalon.

Gloucester..... WILLIAM P. ABDILL, Superintendent of Weights and Measures, Woodbury.

Hudson..... THOMAS J. WALDRON, Superintendent of Weights and Measures, Courthouse, Jersey City.

Mercer..... RALPH M. BODENWEISER, Superintendent of Weights and Measures, Courthouse, Trenton.

Middlesex..... CHARLES H. ENGELHARD, Superintendent of Weights and Measures, County Offices, New Brunswick.

Monmouth..... GLENN L. BERRY, Superintendent of Weights and Measures, Asbury Park.

Morris..... CHARLES S. WANDLING, Superintendent of Weights and Measures, Courthouse, Morristown.

Somerset..... O. B. MATHEWS, Superintendent of Weights and Measures, Courthouse, Somerville.



## NEW YORK

City:		
New York	-----	MATTHEW J. DISERIO, Deputy Commissioner, Department of Public Markets, Weights, and Measures, 139 Centre Street. MATTHIAS A. HARRINGTON, Chief Supervisor, Department of Public Markets, Weights, and Measures, 139 Centre Street. WILLIAM J. COAKLEY, Chief Clerk, Department of Public Markets, Weights, and Measures, 139 Centre Street.
Rochester	-----	MARTIN J. MACK, Sealer of Weights and Measures, 34 Court Street.
Syracuse	-----	JAMES H. CAHILL, Sealer of Weights and Measures, Syracuse Public Market.
County:		
Monroe	-----	EARL D. HUBBLE, Deputy Sealer of Weights and Measures, 1400 South Avenue, Rochester.
Niagara	-----	E. M. COYLE, Sealer of Weights and Measures, 366 Willow Street, Lockport.
Suffolk	-----	C. P. SMITH, Sealer of Weights and Measures, Box 412, East Moriches.

## NORTH CAROLINA

State	-----	C. D. BAUCOM, Superintendent of Weights and Measures, Box 1066, Raleigh. ORAL L. YATES, Inspector of Weights and Measures, Raleigh.
City:		
Asheville	-----	M. L. DANIEL, Inspector of Weights and Measures, City Hall.
Raleigh	-----	G. R. STALLINGS, Sealer of Weights and Measures, 435 Cutter Street.
Winston-Salem	-----	B. K. JONES, Inspector of Weights and Measures.
County:		
Guilford	-----	W. H. BLAYLOCK, Inspector of Weights and Measures, Guilford.
City and County: Charlotte, and Mecklenburg County.		F. C. YARBROUGH, Sealer of Weights and Measures, 300 South Poplar Street, Charlotte.

## OHIO

State	-----	O. E. BRENNEMAN, Chief, Bureau of Weights and Measures, State Office Building, Columbus. J. C. TINKEY, Deputy State Sealer, State Office Building, Columbus.
County:		
Licking	-----	C. R. MCFADDEN, Sealer of Weights and Measures, Pataskala.

## PENNSYLVANIA

State	-----	C. J. P. CULLEN, Director, Bureau of Standard Weights and Measures, Harrisburg.
City:		
Allentown	-----	JAMES E. McHUGH, Inspector of Weights and Measures, City Hall.
New Kensington	-----	JOHN H. EVANS, Sealer of Weights and Measures, 221 Walnut Street.
Oil City	-----	HENRY K. MOHR, Sealer of Weights and Measures, 509 East Front Street.
Reading	-----	WILLIAM A. HIGH, Sealer of Weights and Measures.
Williamsport	-----	R. J. WILSON, Inspector of Weights and Measures, City Hall.
York	-----	IRVIN R. SHULTZ, Inspector of Weights and Measures, City Hall.

County:

Adams.....	G. W. NAUGLE, Inspector of Weights and Measures, Orrtanna.
Bradford.....	R. L. BLOCHER, Sealer of Weights and Measures, Wyalusing.
Union.....	HOBERT R. SPAID, Sealer of Weights and Measures, 517 Market Street, Mifflinburg.
Wayne.....	CHARLES F. KELLAM, Inspector of Weights and Measures, Sterling.

RHODE ISLAND

State.....	EDWARD R. FISHER, State Sealer of Weights, Measures, and Balances, Statehouse, Providence.
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TEXAS

State.....	W. S. BUSSEY, Chief Inspector, Division of Weights and Measures, Austin.
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VERMONT

State.....	H. N. DAVIS, Deputy Commissioner of Weights and Measures, Montpelier.
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VIRGINIA

State.....	J. H. MEEK, Director, Division of Markets State Office Building, Richmond.
	M. A. HUBBARD, Supervisor of Weights and Measures, State Office Building, Richmond.
City: Richmond.....	B. W. RAGLAND, Chief, Bureau of Weights and Measures, City Hall Annex.
	JOSEPH B. ECK, Sealer of Weights and Measures, City Hall Annex.
	E. S. WALKER, Sealer of Weights and Measures, City Hall Annex.
County: Arlington.....	E. M. MORELAND, Sealer of Weights and Measures, Courthouse, Arlington.

WASHINGTON

State.....	J. B. FINK, Assistant Director, Department of Agriculture, Olympia.
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WEST VIRGINIA

State.....	C. L. JARRETT, Commissioner of Weights and Measures, Charleston.
	P. J. PELLEGRINI, Inspector of Weights and Measures, Charleston.

WISCONSIN

City: Milwaukee.....	WILLIAM F. STEINEL, Sealer of Weights and Measures, 1331 North Fifth Street.
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OTHER DELEGATES, AND GUESTS APPEARING ON THE PROGRAM

- BAUMES, HAROLD I., Director, Personnel Training, League of Virginia Municipalities, Richmond, Va.  
 BEARCE, H. W., National Bureau of Standards, Washington, D. C.  
 BRAITHWAITE, W. E., National Bureau of Standards, Washington, D. C.  
 BRIGGS, LYMAN J., Director, National Bureau of Standards, Washington, D. C.  
 DRAPER, Hon. ERNEST G., Assistant Secretary of Commerce, Washington, D. C.  
 GOULD, R. E., National Bureau of Standards, Washington, D. C.  
 HARRISON, M. J. J., Chairman, Committee on Method of Test of Motor-Truck Scales, National Scale Men's Association, Pennsylvania R. R., Altoona, Pa.  
 HOLBROOK, F. S., National Bureau of Standards, Washington, D. C.

HOLLAND, P. L., Chief Engineer, Public Service Commission, State of Maryland, Baltimore, Md.  
 JUDSON, L. V., National Bureau of Standards, Washington, D. C.  
 KERR, R. H., Senior Chemist, Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.  
 LETZKUS, C. R., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.  
 MILLER, D. R., National Bureau of Standards, Washington, D. C.  
 PEPPER, E. L., National Bureau of Standards, Washington, D. C.  
 PIENKOWSKY, A. T., National Bureau of Standards, Washington, D. C.  
 RICHARD, C. L., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.  
 SMITH, D. V., National Bureau of Standards Master Scale Depot, 5800 W. 69th Street, Clearing Station, Chicago, Ill.  
 SMITH, RALPH W., National Bureau of Standards, Washington, D. C.  
 SOUDER, WILMER, National Bureau of Standards, Washington, D. C.

# GUESTS REPRESENTING MANUFACTURERS OF WEIGHING AND MEASURING DEVICES

American Can Co.:

ELMER NALL, Special Representative, 104 South Michigan Avenue, Chicago, Ill.

HENRY B. TOURTELLOT, 230 Park Avenue, New York, N. Y.

Barnes Products (Inc.): W. J. BARNES, President, 6521 John R Street, Detroit, Mich.

Bowser, S. F., & Co. (Inc.):

C. P. GRIFFITH, Chief Engineer, Fort Wayne, Ind.

E. C. MARSH, Sales Manager, Fort Wayne, Ind.

Brodie, Ralph N., Co. (Inc.): D. W. KINGSLEY, Eastern Manager, 425 Chrysler Building, New York, N. Y.

Buffalo Meter Co.: T. J. HARRINGTON, 2917 Main Street, Buffalo, N. Y.

Chatillon, John, & Sons:

P. T. BOETELL, Vice President, 89 Cliff Street, New York, N. Y.

J. GEORGE HUGEL, 89 Cliff Street, New York, N. Y.

Cincinnati Ball Crank Co.:

J. GLORE, Works Manager, Cincinnati, Ohio.

IRWIN A. HYNES, District Manager, Cincinnati, Ohio.

Comag Lens (Inc.):

ROBERT E. FOSDICK, President, Box 476, Dayton, Ohio.

LYOYD E. JACKSON, Vice President, 2900 West Riverview Avenue, Dayton, Ohio.

Continental Can Co.: O. G. JAKOB, Division Sales Manager, 100 East Forty-second Street, New York, N. Y.

Dayton Pump and Manufacturing Co.:

E. E. EICKMEYER, Vice President and General Manager, Dayton, Ohio.

G. W. EICHHOFF, Eastern Sales Manager, 441 Lexington Avenue, New York, N. Y.

Dover Stamping and Manufacturing Co.: LOUIS S. CLEAVES, Vice President and Sales Manager, Cambridge, Mass.

Erie Meter Systems (Inc.): L. R. OLSEN, Engineer, Box 559, Erie, Pa.

Exact Weight Scale Co.: JOHN G. SIMS, Vice President, 944 W. Fifth Avenue, Columbus, Ohio.

Fair Scale Co.: ALBERT VETH, Louisville, Ky.

Fairbanks, E. & T., & Co.: F. E. TOWNSEND, Chief Engineer, St. Johnsbury, Vt.

Fairbanks, Morse & Co.:

J. F. CRUIKSHANK, Special Sales Engineer, 900 South Wabash Avenue, Chicago, Ill.

C. A. HENNIE, Sales Representative, 205 Water Street, Baltimore, Md.

JEROME KENNEY, Sales Representative, 415 Normandy Avenue, Baltimore, Md.

Gilbert & Barker Manufacturing Co.: J. A. LOGAN, Springfield, Mass.

Gurley, W. & L. E.: FRANKLIN G. WILLIAMS, Washington Representative, 3621 Newark Street, Washington, D. C.



**Hobart Manufacturing Co.:**

S. M. TEMPLETON, Assistant Manager, Dayton Scale Division, Troy, Ohio.

KENNETH C. ALLEN, Scale Engineer, Dayton Scale Division, Troy, Ohio.

JOHN MILEWSKI, District Sales Agent, Dayton Scale Division, 43 Florida Avenue NE., Washington, D. C.

**Howe Scale Co.:**

C. A. LINDSAY, Branch Manager, 1011 Filbert Street, Philadelphia, Pa.

FRANK J. HAND, Sales Department, 1011 Filbert Street, Philadelphia, Pa.

**International Business Machines Corporation:**

HARRY S. EVANS, Washington Manager, 1111 Connecticut Avenue, Washington, D. C.

L. S. SMITHERS, Special Representative, 270 Broadway, New York, N. Y.

Jacobs Bros. Co. (Inc.): J. E. WOODLAND, Sales Manager, Detectogram Division, Brooklyn, N. Y.

**Johnston & Jennings Co.:**

H. H. FLEMING, Vice President, 877 Addison Road, Cleveland, Ohio.

LYON McCANDLESS, Vice President, Oceco Division, Cleveland, Ohio.

C. H. BEEGLE, Cleveland, Ohio.

McGogy Pump Co.: D. H. MCGOGY, Chief Engineer, McMinnville, Oreg.

Martin & Schwartz (Inc.): E. C. SCHROEDEL, Sales Manager, 2933 Main Street, Buffalo, N. Y.

Milwaukee Pump and Tank Works: A. J. BOERGER, Vice President, Milwaukee, Wis.

Moore & Kling (Inc.): ELMER M. KLING, 221 High Street, Boston, Mass.

**National Meter Co.:**

RAYMOND H. BARGE, Engineer, Brooklyn, N. Y.

J. A. MCBRIDE, Sales Engineer, Brooklyn, N. Y.

**National Pumps Corporation:**

ERIO S. BERGNAN, Eastern District Manager, 122 East Forty-second Street, New York, N. Y.

WILLIAM H. DUNKER, Sales and Service Representative, 122 East Forty-second Street, New York, N. Y.

**Neptune Meter Co.:**

R. K. BLANCHARD, Vice President, 50 West Fiftieth Street, New York, N. Y.

GLENN D. FRYE, Sales Engineer, 50 West Fiftieth Street, New York, N. Y.

**Peerless Weighing and Vending Machine Corporation:**

L. D. CHAMBERS, 22-19 Forty-first Avenue, Long Island City, N. Y.

A. H. LILLIEDAHL, Traffic and Service Manager, 22-19 Forty-first Avenue, Long Island City, N. Y.

E. M. SCHIEMER, 3811 Copley Road, Baltimore, Md.

**Pittsburgh Equitable Meter Co.:**

H. I. BEARDSLEY, Manager, Oil and Gasoline Division, 400 North Lexington Avenue, Pittsburgh, Pa.

W. H. MARSH, 7800 Susquehanna Street, Pittsburgh, Pa.

E. E. SPARGO, 50 Church Street, New York, N. Y.

Richardson Scale Co.: H. RICHARDSON, President, Clifton, N. J.

Schirmer Dornbier Co.: W. P. SCHIRMER, President, Cleveland, Ohio.

Seraphin Test Measure Co.: THEO. A. SERAPHIN, President, 1314 North Seventh Street, Philadelphia, Pa.

Service Station Equipment Co.: C. A. DESIMONE, Manager, Weights and Measures Department, Conshohocken, Pa.

Silent Hoist Winch and Crane Co.: J. W. WUNSCH, Chief Engineer, 762 Henry Street, Brooklyn, N. Y.

Standard Computing Scale Co.: W. TOM WHITE, Assistant Supervisor, Sales Agencies, Detroit, Mich.

Streeter-Amet Co.: HARRY M. ROESER, Mechanical Engineer, 4101 Ravenswood Avenue, Chicago, Ill.

Tokheim Oil Tank and Pump Co.: GEORGE U. BRAKE, Sales Engineer, Fort Wayne, Ind.

**Toledo Scale Co.:**

S. Q. BENNETT, Manager, Service and Weights and Measures, Toledo, Ohio.

ELMER R. BATCHELDER, Factory Sales Engineer, 40 Broad Street, Boston, Mass.

H. O. HEM, Toledo, Ohio.

H. I. MAYCOCK, Toledo, Ohio.

V. V. RADIONOFF, 807 Rock Creek Church Road, Washington, D. C.

Viscote System, The: J. L. SCHATZMANN, Special Representative, Cincinnati, Ohio.

Wayne Co.:

CHARLES C. NEALE, Manager, Weights and Measures Division, Fort Wayne, Ind.

M. C. BROWN, 609 American Building, Baltimore, Md.

R. J. HEINEKAMP, 1000 Rhode Island Avenue NE., Washington, D. C.

#### GUESTS REPRESENTING TRADE AND ENGINEERING ASSOCIATIONS

American Petroleum Institute: DAVID V. STROOP, Secretary, Division of Marketing, 50 West Fiftieth Street, New York, N. Y.

Gasoline Pump Manufacturers Association: CHARLES C. NEALE, Fort Wayne, Ind.

National Scale Men's Association:

R. O. RASK, President, Bloomington, Ill.

M. J. J. HARRISON, Chairman, Committee on Method of Test of Motor-Truck Scales, Pennsylvania R. R., Altoona, Pa.

Underwriters' Laboratories: EARL J. SMITH, Engineer, Gases and Oils, 207 East Ohio Street, Chicago, Ill.

#### GUESTS REPRESENTING BUSINESS AND INDUSTRY

BOHART, JAMES G., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.

HANNA, J. P., Sinclair Refining Co., 630 Fifth Avenue, New York, N. Y.

PAIGE, J. B., Scale Inspector, New York Produce Exchange, 2 Broadway, New York, N. Y.

SAYBOLT, J. W., Sales Manager, Standard Oil Co. of New Jersey, 26 Broadway, New York, N. Y.

#### GUESTS REPRESENTING RAILROADS

EPRIGHT, A. W., Supervisor Scales and Weighing, Pennsylvania Railroad, Altoona, Pa.

GOE, R. B., Supervisor, Weights and Inspection, Illinois Central System, Chicago, Ill.

HARRISON, M. J. J., Scale Inspector, Pennsylvania Railroad, Altoona, Pa.

HOSFORD, CHARLES C., Scale Inspector, Pennsylvania Railroad, 1114 Pennsylvania Station, Pittsburgh, Pa.

PHERIGO, J. L., Chief Scale Inspector, Southern Railway, Washington, D. C.

RASK, R. O., Scale Inspector, Alton Railroad Co., Bloomington, Ill.

SCHLINKERT, WALTER, Supervisor of Scales, Illinois Central System, Centralia, Ill.

#### GUESTS REPRESENTING GOVERNMENT DEPARTMENTS

KERR, R. H., Senior Chemist, Bureau of Animal Industry, United States Department of Agriculture, Washington, D. C.

MILLER, J. C., Skilled Draftsman, Post Office Department, Washington, D. C.

SPILMAN, H. A., Senior Marketing Specialist, Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

#### OTHER GUESTS

BEHAR, M. F., Editor, Instruments, 1117 Wolfendale Street, Pittsburgh, Pa.

BUCK, CARL J., Lieut. Commander (S. C.), United States Navy, Naval Powder Factory, Indian Head, Md.

JACOBS, EDITH G., Secretary, Scale Journal Publishing Co., 1703 East Eighty-fourth Street, Chicago, Ill.

WHITLEY, ROBERT J., 20 Norwood Avenue, Albany, N. Y.

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# REPORT OF THE TWENTY-SIXTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

HELD AT THE NATIONAL BUREAU OF STANDARDS,  
WASHINGTON, D. C., JUNE 9-12, 1936

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## FIRST SESSION—MORNING OF TUESDAY, JUNE 9, 1936

(The Conference was called to order at 11:05 a. m., by Dr. Lyman J. Briggs, President of the Conference.)

### OPENING REMARKS BY THE PRESIDENT, DR. LYMAN J. BRIGGS

Gentlemen of the Conference, I appreciate very much this hearty welcome on your part, and in turn I wish to tell you with what deep satisfaction we welcome you at this, the Twenty-sixth National Conference on Weights and Measures.

It is particularly fitting that your meeting should be held at the National Bureau of Standards, for there is no other organization in the country with which the Bureau has closer contacts than this National Conference on Weights and Measures. The Conference is now attaining the dignity of years—this is your twenty-sixth meeting. But more important than the years themselves is the fact that they are marked with accomplishments.

I know of no more effective way of arriving at decisions and of accomplishing results than the procedure which you have adopted—the thorough discussion of your problems and the reaching of agreements through mutual understanding. This I take, in fact, to be the ideal and objective of your Conference.

We have a most interesting program before us, a program marked with some features of uniqueness. And so we shall proceed at once with the formal program and listen to the reports of the State officials.

### ABSTRACTS OF STATE REPORTS<sup>1</sup>

#### ALABAMA

By R. M. JOHNSON, *Chief Inspector of Weights and Measures, Birmingham*

Speaking for his own city, Mr. Johnson reported that gasoline and bootleg coal were the two commodities which caused the greatest trouble from a weights and measures standpoint, the difficulties in this relation apparently being similar to those encountered in other jurisdictions.

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<sup>1</sup>For convenience of reference, these reports have been arranged in alphabetical order throughout.

## CONNECTICUT

By C. L. KLOCKER, *Inspector, Department of State Police*

Mr. Klocker reported the promulgation in his State of certain specifications adopted by the National Conference in 1935. He cited the adoption in Connecticut of a 2-percent tolerance for barrels for beer, and stated that these containers were still the source of some trouble in his State. Mr. Klocker was recently placed in direct charge of the enforcement of the State weights and measures laws.

## DISTRICT OF COLUMBIA

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets*

Mr. Roberts reported that during the past year the appropriation for his department had been increased, permitting a 50-percent increase in his inspectional force. Reorganization was under way to place the work of the department upon a more efficient basis. On behalf of the District of Columbia, Mr. Roberts welcomed the Conference delegates to Washington.

## FLORIDA

By NALLS BERRYMAN, *Assistant State Chemist*

Mr. Berryman reported that there had been no changes in State weights and measures activity, the department of agriculture continuing to test only gasoline-measuring devices and to check on package goods. A general weights and measures bill was introduced at the last legislative session, but this was considered by the commissioner to have been poorly drawn, and he was instrumental in its defeat. A determined effort will be made at the next session of the legislature to secure passage of a bill patterned after the Model State Law adopted by the Conference.

## GEORGIA

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

Mr. Wilson reported that there was no new weights and measures legislation in his State, but that his office was still carrying on the testing of gasoline-measuring devices. Plans for the enactment of a comprehensive statute providing for State-wide weights and measures supervision had not been abandoned, and eventual success in this endeavor was anticipated.

## ILLINOIS

By JOHN J. LEVITT, *State Superintendent of Standards*

Mr. Levitt commented briefly upon the progress being made by his division and mentioned the special equipment, just acquired, for the testing of large-capacity scales, which he was to discuss in greater detail on the following day; in this connection he voiced his appreciation of the assistance in developing the details of this equipment, rendered during the past year by members of the National Bureau of Standards staff.



# INDIANA

By MARTIN L. LANG, *State Commissioner of Weights and Measures*

Mr. Lang confined his remarks to an expression of appreciation of the cooperation and assistance extended to his department along many lines by the weights and measures officials of the various States and by the National Bureau of Standards. He mentioned particularly his gratification over the continuing activity of the National Conference on Weights and Measures.

# KENTUCKY

By WILLIAM H. ISING, Jr., *Chief Inspector of Weights and Measures, Louisville*

Mr. Ising, speaking of conditions in his city, said that the boot-leg-coal situation was being brought under control through a plan of cooperation between his department and the local police department. Obsolete types of gasoline pumps had caused considerable trouble, but these were rapidly being replaced by modern equipment. He noted the inadequacy of his present inspectional force but hoped that an increase would shortly be granted.

# MAINE

By JAMES A. BOYLE, *Sealer of Weights and Measures, Portland*

Mr. Boyle discussed extensive investigations carried on in several large bakeries of his city relative to the shrinkage of bread prior to wrapping. He also mentioned several successful prosecutions in cases where paper and trays were being charged for at commodity prices, and noted the withdrawal from the market of a large quantity of packaged clothes line which was found to be 10 percent short of its marked length.

# MARYLAND

By S. T. GRIFFITH, *Chief, Bureau of Weights and Measures, Baltimore*

Mr. Griffith reported that there had been no change during the past year in the weights and measures organization of his State. The city of Baltimore continued to maintain active weights and measures supervision, and there were a few counties carrying on some inspectional work; there was, however, no general State activity in this field.

# MASSACHUSETTS

By JOHN P. MCBRIDE, *Director, State Division of Standards*

Mr. McBride reported that his organization had been especially active during the year with respect to tank-truck meter systems, and that these studies were still being carried on. He spoke of a current investigation on log rules and calipers and asked to be supplied with any information which other officials might have along this line. Successful enforcement was reported of a new law requiring that retail sales of meat and poultry be made on a weight basis only and not by the piece.

## MICHIGAN

By JOHN M. DANIELS, *Chief State Inspector of Weights and Measures*

Mr. Daniels stated that the outstanding problem of his division during the year had been irregularity in the standards for packages of flour; progress had been made in effecting standardization, but the situation was not yet entirely cleared up. Mr. Daniels noted the procurement by his State of a special equipment for testing large-capacity scales, about which he was to speak in detail on the following day.

## MINNESOTA

By RUSSELL S. ACKERMAN, *Superintendent, Department of Licenses, Weights, and Measures, Minneapolis*

Mr. Ackerman stated that the checking of deliveries of fuel oil for domestic heating plants was a problem of increasing importance in his city, and requested information from officials of other jurisdictions as to how such deliveries could adequately be checked.

## MISSOURI

By LOUIS G. WALDMAN, *Commissioner of Weights and Measures, St. Louis*

Mr. Waldman reported that recently a number of the smaller municipalities of his State had established weights and measures supervision, and gave it as his opinion that as this movement continues, it will eventually bring about the creation of a State weights and measures department.

## NEW HAMPSHIRE

By WALTER G. WHITE, *State Commissioner of Weights and Measures*

Mr. White outlined the plan which he had developed for keeping all of the weights and measures officials of the State informed as to what the others are doing. The State office acts as a clearing house for the distribution of essential data and maintains complete files, including "case histories" of individuals engaged in commercial pursuits in the State, and individual records of apparatus which is rejected and which may be reconditioned and resold. Numerous forms used in this connection were exhibited.

## NEW JERSEY

By JOSEPH G. ROGERS, *Assistant State Superintendent of Weights and Measures*

Mr. Rogers presented a comprehensive report of the activities of his department, mentioning particularly prosecutions, package reweighing, type approval of commercial equipment, drugstore testing, bootleg coal, certified weighmasters, liquid-measuring devices, tank trucks, net-content marking of packages, beverage bottles, beer barrels, packaged meats, lumber, textiles, and certain short-weight interstate shipments of mushrooms and potatoes. Two amendments of the weights and measures statutes were reported, suggestions were made for additional legislation, and the addition of eight solid-fuel inspectors was noted.

NEW YORK

(The State of New York was represented by a number of city and county officials. An invitation was extended by the chairman for one of these officials to speak for the State, but no report was presented.)

NORTH CAROLINA

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

Mr. Baucom reported a 100-percent increase in the appropriation for his office and a corresponding increase in his inspectional force. He stated that the percentages of correct and incorrect apparatus were remaining about constant, but noted an increase in the number of prosecutions for weights and measures violations. Transport trucking of petroleum products in vehicle tanks carrying 4,000-gallon loads had created an unusual testing problem and necessitated the construction of loading platforms which were accurately level. More vigorous steps were to be taken to insure submission for approval of new types of weighing and measuring devices.

OHIO

By J. C. TINKEY, *Deputy State Sealer*, and O. E. BRENNEMAN, *Chief Deputy Sealer of Weights and Measures*

Mr. Tinkey reported upon the activities of the past year, mentioning total inspections made, some changes in specification requirements, and certain publications issued. He noted that about one-half of the local sealers were new appointees, necessitating special training efforts by the State, and commented upon a new coal law being enforced jointly by weights and measures officers and regular police officers. In announcing that weights and measures work in Ohio had recently been given a separate bureau status in the department of agriculture, Mr. Tinkey introduced the new bureau chief, O. E. Brenneman, who spoke briefly, conveying to the Conference the greetings of his State.

PENNSYLVANIA

By C. J. P. CULLEN, *Director, State Bureau of Standard Weights and Measures*

Mr. Cullen discussed the development of the problem of bootleg coal at the Pennsylvania mines, the efforts made to control the situation, the collateral problem of overloaded trucks on the State highways, a drive on mine tipples many of which had been seriously inaccurate, investigations of short weighing in the packing of mushrooms, and the testing of beer barrels. He reported that two large equipments were being secured for the testing of motor-truck scales; also that his inspectional force had been increased somewhat during the past year.

RHODE ISLAND

By EDWARD R. FISHER, *State Sealer of Weights, Measures, and Balances*

Mr. Fisher extended to the Conference the greetings of the 39 local sealers of his State. He stated that he was particularly anxious to secure information relative to small meters which could be attached to fuel-oil burner installations to measure the consumption of oil.



## TEXAS

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

Mr. Bussey reported that his division was operating five fixed-location vehicle-tank testing stations in the State in cooperation with the controller's department; during the past 2 years 5,400 tanks had been tested. Among the special activities of the division, he mentioned supervision of cotton weights involving the annual reweighing of about 15,000 bales of cotton, original weighing of all "prison-system" cotton, supervision over the butter-fat determinations for all milk and cream sold in the State, and the inspection of gas, water, and electricity meters.

(At the conclusion of his report, Mr. Bussey extended a general invitation to the members of the Conference to attend the Texas Centennial celebrations, and on behalf of Governor James V. Allred, of Texas, presented to Doctor Briggs, President of the Conference, a commission as honorary Texas Ranger and, as a badge of office, a ranger's "ten-gallon" hat.)

## VERMONT

By H. N. DAVIS, *Deputy State Commissioner of Weights and Measures*

Mr. Davis announced that bootleg coal had become a problem in his State, truckers of marble and granite out of the State returning from the coal fields with loads of coal; he discussed the provisions of a recently enacted statute designed to control the situation, but stated that it was not entirely successful. Mr. Davis reported a recent regulation requiring poultry to be sold by weight, noted the satisfactory operation of his equipment for testing vehicle-tank meters and compartments, and discussed briefly the matter of bottles for malt beverages.

## VIRGINIA

By J. H. MEEK, *Director, State Division of Markets*

Mr. Meek reported that weights and measures supervision in his State had been extended and improved during the past years; details along this line would be discussed in his paper later in the day. He spoke of the weights and measures training school for local officials inaugurated during the past year under the sponsorship of the League of Virginia Municipalities, in connection with which the Virginia Weights and Measures Association was revived.

## WASHINGTON

By J. B. FINK, *Assistant Director, State Department of Agriculture*

Mr. Fink outlined the weights and measures organization of the State and described briefly the equipment and general plan of operation of the field inspectors. He pointed out that appropriations were sufficient to provide only four field inspectors, a force inadequate to handle the work properly in the territory covered by the State division, including as this does, the entire State with the exception of the cities of Seattle, Spokane, and Tacoma, which have city sealers.

## WEST VIRGINIA

(West Virginia was represented at the Conference, but although a report was called for on several occasions, none was made.)



WISCONSIN

By WILLIAM F. STEINEL, *Sealer of Weights and Measures, Milwaukee*

Mr. Steinel reported that it was because of a limited budget that George Warner, chief State inspector of weights and measures, was unable to be in attendance at the Conference. Speaking of his own city, Mr. Steinel reported that the work was being carried on very satisfactorily.

ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS<sup>2</sup>

CALIFORNIA SEALERS' ASSOCIATION

By EDWARD K. STROBRIDGE, *Sealer of Weights and Measures, Alameda County*

Mr. Strobridge, president of the association, reported the formation of the association at the time of the State conference held in Los Angeles in October 1935. He stated that a committee on civil service had been appointed and was actively engaged in preparations to secure the passage of legislation placing all local weights and measures officials of the State under civil service. The next meeting of the association will be held in Fresno in October.

ILLINOIS WEIGHTS AND MEASURES ASSOCIATION

By VIVIENNE MANNEN, *Secretary, State Division of Standards*

Miss Mannen, secretary of the association, reported that at the last meeting of the association, held at Springfield in January 1936, there was appointed a legislative committee to study the State weights and measures law and recommend needed amendments for presentation to the 1937 legislature.

INDIANA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By HERBERT G. MEYER, *State Inspector of Weights and Measures*

Mr. Meyer, secretary of the association, reported that an excellent 3-day meeting of the association was held in Muncie in April 1936. He stated that one of the outstanding principles of the association was the education of the public to a proper understanding of weights and measures supervision as an aid in law enforcement. He presented the regrets of the president of the association, Mr. Rollin E. Meek, at his inability to attend the National Conference because of illness in his family.

MAINE STATE SEALERS' ASSOCIATION

By JAMES A. BOYLE, *Sealer of Weights and Measures, Portland*

Mr. Boyle reported that no meeting of the association was held last year because of the temporary vacancy in the office of deputy State sealer. Plans were under way, however, to resume regular meetings of the association.

<sup>2</sup> For convenience of reference these reports have been arranged in alphabetical order.

## MASSACHUSETTS ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By JOHN R. BOOTH, *Sealer of Weights and Measures, Haverhill*

Mr. Booth, official delegate from the association to the National Conference, spoke of the close cooperation existing between the association and the State division of standards, which was particularly effective in the matter of weights and measures legislation. He mentioned an amendment which had been secured during the year to the statute regulating peddlers, and discussed the program to extend civil-service protection to sealers in towns of 5,000 or more population.

## MICHIGAN ASSOCIATION OF WEIGHTS AND MEASURES OFFICIALS

By ARTHUR J. WILHELM, *Sealer of Weights and Measures, Hamtramck*

Mr. Wilhelm announced the dates for the coming meeting of the association—August 31 and September 1 and 2—to be held in Battle Creek, and extended to the members of the National Conference a general invitation to attend.

## NEW JERSEY WEIGHTS AND MEASURES ASSOCIATION

By JOHN S. BURKE, *Municipal Superintendent of Weights and Measures, Jersey City*

Mr. Burke, president of the association, noted the large number of association members in attendance at the National Conference. He referred to the comprehensive State report presented by Mr. Rogers as serving adequately to cover weights and measures activities in New Jersey during the past year.

## NEW YORK STATE ASSOCIATION OF SEALERS OF WEIGHTS AND MEASURES

By C. P. SMITH, *Sealer of Weights and Measures, Suffolk County*

Mr. Smith, president of the association, reported the passage of an amendment to the bread law, sponsored by the association, bringing seed-covered bread within the weight provisions of the law. He also discussed in some detail a new law designed to control the boot-leg-coal situation through provisions for "certificates of origin", weighing by licensed New York weighmasters, special markings on the hauling trucks, and other requirements. Mr. Smith announced the next meeting of the association to be held in Rochester in July.

(At this point, at 1:00 p. m., the Conference took a recess until 2 p. m.)

## SECOND SESSION—AFTERNOON OF TUESDAY, JUNE 9, 1936

(The Conference reassembled at 2:22 p. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

### ABSTRACTS OF REPORTS OF REPRESENTATIVES OF STATE ASSOCIATIONS OF WEIGHTS AND MEASURES OFFICIALS—Continued

#### OHIO SEALERS' ASSOCIATION

By C. R. McFADDEN, *Deputy Scaler of Weights and Measures, Licking County*

Mr. McFadden outlined the weights and measures organization in Ohio, described the sectional meetings of the association, and announced that the annual meeting of the association would be held in Columbus on December 1, 2, and 3. He stated that the weights and measures laws of the State were in need of revision, and that the association was continuing its efforts, unsuccessfully up to the present time, to bring this about.

#### PENNSYLVANIA ASSOCIATION OF INSPECTORS OF WEIGHTS AND MEASURES

By C. J. P. CULLEN, *Chief, State Bureau of Standard Weights and Measures*

Mr. Cullen reported that because of the economic situation which had prevailed for the past several years, the association had recently been inactive, but that plans were being made to resume the annual meetings, with tentative arrangements already made to hold this year's meeting in August.

#### VIRGINIA WEIGHTS AND MEASURES ASSOCIATION

By B. W. RAGLAND, *Chief, Bureau of Weights and Measures, Richmond*

Mr. Ragland, one of the vice presidents of the association, described the revival of the association at a meeting held in Richmond in 1935 under the sponsorship of the State division of markets and the League of Virginia Municipalities. This meeting partook of the nature of a training school for weights and measures officials, and this idea will be continued in the 1936 meeting scheduled to be held at Winchester in September.

#### THE FEE SYSTEM OF INSPECTION OF WEIGHTS AND MEASURES

By GEORGE M. ROBERTS, *Superintendent of Weights, Measures, and Markets, District of Columbia*

Dr. Briggs, ladies, and gentlemen, I want to say, at the beginning, that throughout this paper I will make considerable reference to my experiences here in the District of Columbia. I do not want anyone to feel that this is done for the purpose of attracting attention to the work of my department. However, I feel that in discussing a



subject of this kind I can better drive my points home by referring to specific incidents.

I was recently amazed to learn that in some localities where the old system of charging and collecting fees for making inspections of weighing and measuring instruments had been outlawed, there has been manifested an inclination to try to have laws enacted providing for a return to that system.

Law making officials, looking about for places to raise small amounts of revenue, may, without investigation, listen to such suggestions. It is my opinion that investigation will disclose that such suggestions usually originate with unscrupulous merchants who desire to cripple the work of weights and measures departments and prevent a proper enforcement of weights and measures laws. It will probably be found that considerable numbers of well meaning persons who still believe that scale testing constitutes the entire work of a weights and measures department may be induced through insidious propaganda to favor the proposal to restore an obnoxious fee system.

It is the duty of weights and measures officials wherever the movement to restore the fee system is on foot to turn the light of publicity toward the broad functions of a weights and measures department in order that the public generally, and lawmakers in particular, may become informed of the disastrous results which are reasonably sure to follow if this plan to cripple their work is successful.

I think it may be safely asserted that if the general public and members of legislative bodies are fully informed there will be little or no danger of a movement of the kind described attaining any success whatever. Lawmakers generally desire to serve the public interests. Wherever they are found to favor a return to the fee system, it is probably because they have been deceived.

Weights and measures officials are probably largely to blame in any instances where advocacy of the system has gained headway. Far too much stress has been placed upon the work of testing equipment and far too little stress has been placed upon other and more important functions of weights and measures administration.

When I became Superintendent of Weights and Measures for the District of Columbia nearly 20 years ago, the law here provided for the collection of fees. It was later repealed, and a new law which abolished the fee system and was an improvement in many other respects was enacted by Congress. I have had experience, therefore, with laws of both characters, and I feel that I can speak with some authority on the subject.

The fee system is objectionable on so many grounds that time will not permit enumerating all of them. I shall mention only a few.

First, such a system obviously creates temptation for petty graft. I know of no place where weights and measures inspectors are paid salaries commensurate with the duties and responsibilities of their positions. Now, it is morally wrong and contrary to sound public policy to subject a poorly paid public employee like an inspector of weights and measures to the temptations which beset him on every hand by requiring him to charge, collect, and account for small fees from every merchant whose place of business he inspects. Weights and measures inspectors, after all, are only human and some of



them would doubtless give way to temptation under such circumstances.

Second, where a tax in the form of fees is laid against the owner of every store, or other business establishment, every time an inspection is made of the weighing and measuring instruments used by such proprietor in his business, resentment is immediately created even among the best business men, and there is aroused a spirit of enmity and obstruction instead of a feeling of friendliness. In many instances scales and measures will be secreted in order to avoid paying fees which the merchant knows he should not be required to pay, and the supervision over weighing and measuring instruments, therefore, becomes to some extent, at least, a farce.

Third, the principle of requiring the merchant to pay for such inspection service is wrong because inspections are made, not for his benefit, but for the benefit of his customers and the general public. Therefore, payment for the work should unquestionably be made from general revenues raised by general taxation. There would be just as much sense in having a health department charge the owner of a business a fee every time a health inspector looks his place over to ascertain whether or not such owner is complying with health laws, or in having a policeman charge and collect a fee from a citizen who called upon the police to stop a disturbance or a fight in front of his house, or in having the fire department charge a fee to cover the cost of putting out a fire.

Fourth, another and to my mind the chief objection to a requirement for collection of fees for testing weighing and measuring instruments lies in the fact that after such a system is established, a weights and measures department will be expected to expend less for its work than the amount it collects in fees. In other words, the intention will be to make the department not only self-sustaining but a producer of revenue. The result will obviously be a curtailment of the most important functions of the department, and, in some instances, practically an abandonment of such functions.

The prime duty of a weights and measures department, broadly speaking, is to maintain fair and honest competition among merchants both wholesale and retail and to protect consumers and other buyers of all commodities against deception and fraud.

In the performance of these broad duties, the testing of scales and measures is merely the first step. Comprehensive investigations are necessary to uncover the methods of those who cheat and to punish offenders against the numerous prohibitions contained in most weights and measures laws. If the activities of a department are curtailed to such an extent that it must be sustained by fees it collects, there will be little opportunity to stop the many forms of swindling now employed throughout the country.

Any situation whereby a department could expend no more than the amount it collects in fees would undoubtedly retard and in some instances completely destroy much effective work because a sufficient inspection force cannot possibly be maintained if expenses are limited to the amount of fees collected for testing weighing and measuring instruments. A situation of that kind would undoubtedly operate against the public interest and in the interest of dishonest trade

practices. If fees are charged for one kind of work, fees should be charged for other kinds of work.

Let us consider the logical conclusion to which a so-called fee collecting system leads. Shall consumers be charged a fee for the investigation of complaints which they may make? To whom should be charged the expense of conducting comprehensive investigations which are necessary to prevent the cheating of consumers and to sustain honest competition? The dishonest merchant would, of course, like to see such investigations stop. They could then pursue their unlawful practices without hindrance.

Here in the District of Columbia we have a very comprehensive weights and measures law. Of course it provides for semiannual tests for weighing and measuring instruments. As previously stated, that is merely the first step in enforcement of other provisions of the law. Provisions of similar character are contained in the laws of most of the States. Therefore, what I say about the District of Columbia applies with equal force to other localities.

The District of Columbia law prohibits the manufacture or sale of loaves of bread of other than certain definite weights. There are about 250,000 loaves of bread baked and sold daily in the District of Columbia, and it is the duty of the weights and measures department to see that the law relating to bread is enforced. In order to do that, it is necessary to weigh loaves of bread every day in retail stores, and to make periodical visits to the bakeries for the same purpose. It would be worse than nonsense to charge a merchant or a baker a fee for investigating the weights of his bread. That work is for the protection of consumers. And if a consumer reports that the bread he buys is short weight, should he be told that he must pay a fee to have it investigated? Our law provides that ice shall be sold by weight, and it is our duty to see that the law is carried out insofar as we can do so. If a consumer of ice makes a complaint regarding his iceman, should we be compelled to say to him that he must pay a fee before an investigation is made? The law prohibits the sale of oysters containing more than ten percent of liquid. If a consumer reports that his oyster dealer is selling more liquid in his oysters than the law allows, should such a consumer be informed that his complaint will be investigated provided he pays a fee?

The law also provides that fruit and vegetable containers shall be compactly filled, and shall be of certain prescribed sizes. When a retail merchant complains that the baskets and boxes of fruits and vegetables he receives from a wholesaler are of illegal size or slack filled, should he be required to pay a fee to have the swindle stopped? If a consumer of coal, of meats, of milk, of groceries, of yard goods, or any of the many other commodities which are purchased daily, makes complaint to the effect that the dealer from whom he buys is delivering short weight or short measure, should such consumer be told that he must continue to be swindled unless he is willing to pay the expense of an investigation? If the owner of an automobile reports that the filling stations are delivering short measure of gasoline, should the weights and measures department be required to inform him that he must pay for having the matter investigated?

I could state many additional propositions of similar character but the foregoing are sufficient to show the utter absurdities to which a fee system leads us if pursued to its logical end.

The fact that the scales used by a merchant have been tested and found correct is no proof that he delivers correct weight to his customers. Neither does the fact that gasoline pumps have been inspected and found correct prove that the gasoline dealer delivers full measure. Notwithstanding the truth of these statements, we still find supposedly intelligent people, some of them government officials, who believe that a merchant whose scales are correct always delivers full weight, and that the gasoline dealer whose pumps can be operated correctly always delivers full measure of gasoline. They also believe that if yardsticks are 36 inches long, a merchant cannot deliver short measure of yard goods.

My experience has been that the food dealer who cheats most is usually careful to have his scales correct. In order to deliver short weight he resorts to other methods and tricks; he is so foolish that he thinks if his scales are correct, that fact will assist him in defending himself in court should he be tried for selling short weight. The same is true of gasoline dealers who cheat by short measure. They have their pumps correct, foolishly believing that fact will help them when placed on trial for selling short measure.

Testing scales and measures is merely the beginning of the work of a weights and measures department. As stated, it is a function upon which entirely too much stress is placed by weights and measures officials.

The chief duty of a properly conducted weights and measures department is to make investigations and bring swindlers to justice for the benefit of consumers generally and for the protection of honestly conducted business against unscrupulous competition. The latter feature is often overlooked in discussing the subject of weights and measures. Nevertheless, one of the most important functions of a weights and measures department is to maintain fair competition. It is not unusual for me to receive complaint from a merchant regarding what he considers unfair competition to which he is being subjected in violation of the weights and measures law. I am now starting two very comprehensive investigations as a result of such complaints, which may require months to complete. Should the business man who believes he is being injured be required to pay the cost of the investigations? The question answers itself most positively in the negative. The injured party is entitled to protection which the law affords him without having to pay a fee for obtaining such protection.

Last year I conducted investigations of certain retail stores in Washington in regard to the sale of meats. Scales used in all of them were correct, but when I sent undercover buyers into the stores to make purchases, here are a few of the weights they received:

*Store 1.*—Shoulder, short weight 14 ounces; beef roast, short weight 1 pound, 1 ounce; ham, short weight 10 ounces; beef roast, short weight 4 ounces.

*Store 2.*—Smoked shoulder, short weight 1 pound, 2 ounces; lard, short weight 3 ounces; shoulder, short weight 5 ounces; beef roast, short weight 14 ounces; shoulder, short weight 4 ounces.

*Store 3.*—Smoked shoulder, short weight 12 ounces; corned shoulder, short weight 9 ounces; fresh shoulder, short weight 13 ounces; beef roast, short weight 1 pound, 2 ounces; fresh shoulder, short weight 10 ounces.

*Store 4.*—Smoked shoulder, short weight 11 ounces; roast beef, short weight 7 ounces; smoked shoulder, short weight 9 ounces.



Another investigation which I conducted was of sales of gasoline by a large corporation operating more than 60 filling stations in Washington. Its pumps had been inspected and found correct, but notwithstanding that fact, my undercover buyers received short measure on a large number of purchases of 5 gallons each. The short measure ranged from a few ounces to 2 gallons per purchase, and according to the best available information in regard to the quantity of gasoline sold per year in Washington by the corporation in question, purchasers of gasoline were being defrauded of more than \$100,000 per year by this concern alone. Prompt prosecution caused it to change its methods of doing business in this city. In connection with this investigation, it was necessary to go into the details of how the business of the corporation was being conducted in order to trace the blame for the fraud to the management, where it was found to belong.

Some months ago I directed an investigation relating to sales of dressed poultry in Washington by one of the large national chain store systems. Here, again, it was necessary through long and painstaking investigation to ascertain where the blame might be properly placed. It was necessary to obtain information relating to the inside operations of the concern with respect to requirements forced upon the managers of and clerks in its various stores, and to carefully study what effect such methods as it pursued were likely to have on the question of whether owners of the corporation were to blame for shortweight sales made by its clerks, and whether its methods were calculated to induce its employees to cheat customers.

In passing, it is not out of place to say that out of 81 purchases made by my undercover buyers in stores of this chain system situated in various parts of the city of Washington, only 13 were of correct weight. None were over weight, and 68 were short weight. Some of the short weights were small, but some of them amounted to more than a pound on a dressed chicken. After eliminating all the small short weights, 24 prosecutions were instituted against the corporation charging sales by short weight. An array of the most resourceful lawyers obtainable are engaged in the defense. Two cases have been tried. In one case the corporation was acquitted by a jury; in the second case the corporation was convicted. Its lawyers are now resorting to all the legal quibbles cunning can devise to prevent the remaining 22 cases from coming to trial.

The foregoing facts have been related to make plain the futility of undertaking administration of the weights and measures law by any department dependent upon the amount of fees it collects for expenses of operation. What is true of the District of Columbia is, I take it, true of other localities. I have simply referred to what has taken place here as a matter of illustration.

The cases discussed are only a few of the many investigations conducted. None of them could have been made if the District of Columbia Department of Weights and Measures had employed only the number of inspectors it could have paid from the proceeds of fees collected for testing scales and other devices. Had that been the situation the concerns named and many others would still be carrying on the same sort of fraud they have perpetrated in the past, and consumers would still be suffering accordingly.



The fee system is inherently vile in principle. It should be opposed by weights and measures officials and by honest people everywhere. It is inconceivable that after studying the subject any legislative body will for a moment consider voting for the return of a system which has long been generally discredited, which is in its essence pernicious, and which by its very nature is calculated to cause dishonesty, fraud, and graft.

In every State, in every city, in every community, where a return to such a system is advocated, consumers, merchants, and others who desire to have business conducted honestly and according to high standards, who desire to be rid of fraud and of unfair and unscrupulous competition, should unite for the purpose of disseminating accurate information in regard to the subject, and should see to it that such information is placed in the hands of every legislative official. They should not remain idle while thoughtless or unscrupulous persons spread propaganda in favor of a return to any such system. In this work, weights and measures officials should take the initiative. The public generally needs to be informed regarding the valuable public service you are rendering. An informed public will invariably support you. If it can be shown that a department saves money for consumers in the purchase of necessities, public support will be forthcoming.

It is rather surprising to learn the number of people who are not informed on this subject even in localities having weights and measures departments. For instance, within the present year I received a letter from a woman in New Jersey expressing the wish that they had a weights and measures department in that State. Now all of us know that the New Jersey department is one of the most active in the country. I may add that some time ago a lady came into my department to make a complaint. She had asked somebody as to whom to consult and they had referred her to me. That was the first time that the department had come to her attention.

Let me repeat here as emphatically as I can that I have no sympathy with loose talk indulged in by some irresponsible persons to the effect that lawmakers, as a rule, fail to look to the public welfare in performance of their legislative duties when fully informed upon any subject under consideration by them. I hope that I shall be pardoned for relating some personal experiences at this point solely for the purpose of driving home, if I can, my views on this subject.

During the many years I have been in charge of the Department of Weights and Measures of the District of Columbia, it has been my duty and pleasure to come in contact in my official capacity with many members of Congress. Whenever I have laid my case before the various committees of the House and the Senate, fortified by facts to uphold my contentions, I have always obtained wholehearted response to the public needs. When I took charge of the department, the old weights and measures law then in effect lacked much of being what was needed to protect the public against fraud and to maintain fair competition in business. After I became well acquainted with the situation and saw how the law needed revision, a bill was prepared, and introduced in Congress, proposing a new law on the subject of standard weights and measures for the District of Columbia. When I went before the committees of Congress,

explained its provisions, and the need for a new law, I found members of both the House and Senate ready and willing to pass the bill which I proposed. Of course, I was prepared to present facts. I realized that the man who is prepared is the man who wins his case. Again last year when it became known to members of the Senate and House Committees on Appropriations that I needed a larger force to properly carry on the work required by law, there was no hesitancy about increasing my inspection force by more than fifty percent. This was done notwithstanding the fact that, generally speaking, members of both House and Senate were at that time very reluctant to authorize new positions in Government departments.

Credit for presenting to Congress the facts regarding the desperate need for an increased inspection force is due largely to the active chairman of our local consumers council, who did very fine work.

The things most necessary to attain success in presenting a proposal to any legislative body are, first, to be convinced yourself of its merit; second, to marshal the facts in a way to present your case fully, fairly, and forcefully; third, to be able to show that what you propose is in the general public interest. When such a course is followed, favorable action is almost inevitable. However, unless one presents his case well there is little ground for expecting favorable action.

When the District of Columbia law which is now in effect was being considered in the House of Representatives, an amendment was offered to require collection of fees, but only 6 out of 435 members of the House voted for its adoption.

Wherever return to the fee system is proposed, the thing to do is to fight it on principle and with facts. Enlist the aid of consumers and of honest business men by presenting the facts to them, and asking their help. That is the way, in my opinion, to kill any such iniquitous proposition. Never surrender and never compromise. There is no ground upon which may properly be based a compromise on a question involving right and wrong.

#### DISCUSSION OF ABOVE PAPER

The CHAIRMAN. Is there discussion of this interesting paper by Mr. Roberts?

Mr. ROGERS. I consider that a very splendid paper on a very timely subject. There is undoubtedly a trend back to the fee system. There was quite a furor caused in New Jersey recently by an attempt of a newly created financial department to suggest that much of the work that we were doing really should be charged to the persons who benefit by it. It was, we will say, rather an astounding move, because we had not fostered it ourselves in our department and had always argued just as Mr. Roberts argues in his paper.

I think that this subject is so up to the minute now that if possible Mr. Roberts, through the District authorities, should have that paper prepared and it should be distributed, so that we can get copies of it, because I think he has cited all the arguments, practically, that can be made against the fee system. We know the viciousness of it, and the only reason that I can see now why there is a tendency on the part of State governments to go back to it is to make up revenues

that must be gotten somehow to take care of relief projects. I believe that is the situation around the country. It was natural to assume that this weights and measures angle would be considered in this connection. I think that we cannot be too well informed, that we cannot have too much material in our hands to place before our legislators, if these things are going to be proposed in our State jurisdictions.

I appreciated that humorous incident that you cited, Mr. Roberts. I think that is an experience a lot of us may have. People sometimes just don't know what is being done to protect them along weights and measures lines.

When you speak of educating the public, it is sometimes a difficult matter, through the medium of the newspapers, to do that. Weights and measures are being treated more or less today as a trite subject. They take the attitude, "We have dealt with that and have disposed of it." They know all about it. They dislike to publish the things we do. I have prepared articles two or three pages in length, only to be given three or four lines on the fourth or fifth page, down in the corner. Of course that isn't conducive to encouraging people to try to educate the public through those channels.

We have turned to the speakers' platform, and as I said in my paper this morning, a number of our men are taking speaking courses. These fellows are going out and doing a splendid job. They are going into the schools—there is the fundamental place to take up the educational projects, because the boy and girl of today are the breadwinners of tomorrow. There is the place to start off.

We notice there is a very healthy respect on the part of the parent-teacher associations. They like to have speakers. Civic clubs are going in for it. If we are going to lose the medium of the newspapers to spread our propaganda, as we call it, we have still the spoken word, and sometimes we have had the experience of being asked to broadcast on courtesy programs.

Mr. CAHILL. Four years ago there was a bill introduced in the State of New York providing for charging fees. Our State officials who knew the evils of the fee system went out to defeat that. One of our local sealers wrote a very able paper on this subject. I took that paper and spent about a week in Albany, and consequently the bill didn't come out of the committee. We sealers were very much pleased that we, as a body, could defeat that bill, which we knew was bad.

Mr. BAUCOM. I move that this paper be mimeographed and copies distributed at the expense of the Conference.

Mr. HOLBROOK. Of course, this paper will be printed in the Conference report. However, if there is a real need for putting this paper in your hands before the report is issued, I don't believe it will be necessary to spend Conference funds to do it. I think we will be able to take care of it in the Bureau as a matter of course.

The 1935 Conference report, as you all know, was very much delayed. We expect to get it out very much earlier this year. It will probably be out before the first of the year; I think perhaps by the first of December. Are there enough legislative sessions at which fee systems are likely to be proposed, before the first of December, to justify doing this work? If you have this paper in



printed form as part of the proceedings of this organization, I think it will be given more attention and respect by legislators than if it is in mimeographed form.

Mr. O'KEEFE. Is it the sense of this meeting that this Conference go on record as opposed to the fee system, and that we are voting on that as a whole? We have a fee system in Chicago and I would hate to leave Washington and have every member of this Conference think that there was graft and so forth attached to the fee system, because I am here to tell you that so far as the city of Chicago is concerned we have a very fine, clean department. I have 41 inspectors and I don't think one of my men, as I know them, could be accused of graft.

I am not taking that personally, from that report. I am not going to go on record here as voting against the fee system, because we must have it in Chicago. We have a city of 3,500,000 people, and we have no other means of raising revenue for that particular purpose.

The CHAIRMAN. There has been no motion proposed, sir, as putting the Conference on record in the matter.

#### THE PROBLEMS OF A LOCAL SEALER IN A STATE NOT HAVING A STATE DEPARTMENT OF WEIGHTS AND MEASURES

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

Mr. Chairman, members of the Conference, and ladies, the title of this paper pretty well describes Florida, except that we do have a very efficient inspection of gasoline pumps down there, handled under our commissioner of agriculture, Mr. Mayo. Mr. Berryman, who spoke to you for a few minutes this morning, is the assistant State chemist under Mr. Mayo. Their inspections go into other branches, such as analyses of gasolines and oils and other commodities.

The problems of a local sealer in a State not having a State department of weights and measures are of many and varied types. If I may place emphasis on these problems, but at the same time point to some of the advantages, I feel that most of you may accept this report with open minds and feel that the motive of the writer has been without bias.

All city sealers who become well established and successful in their work enjoy the independence granted them in the operation of their department. In some instances these sealers have been permitted to retain their offices during their entire lifetime. They have enjoyed the experience of speedy and satisfactory prosecutions through municipal courts. The penalties imposed by these courts have usually been mild, but conviction more certain. From the standpoint of preparation much less effort has been necessary, thus allowing the sealer to return more quickly to his varied duties.

There is no question but that many of us who have started in local fields, where there was no State weights and measures supervision, have had grave doubts as to the proper methods that we should follow in carrying out the duties of our offices. In such cases about the only reference we have had was to our National Bureau of Standards. This recourse has been splendid, and the



cooperation of its directing officials all the layman could ask for. However, the personal contact has proved to be the necessary missing link; the correction of the errors of the inexperienced local sealer requires the valuable aid of a State supervising head. New local sealers always require the sympathy and understanding of those who are familiar with the needs of a local department. He realizes the need of confidence, so that he may feel certain he is proceeding along accepted lines. But because there is no State department member to whom he can personally refer, he must necessarily base his judgment on his own experience as he acquires it from day to day.

The new local inspector who can rely on no State department for guidance, recognizes very early after assuming the duties of his office that the responsibilities incurred make it necessary for him to proceed with utmost caution. He cannot wisely institute proceedings upon the discovery of any violation of the law. Thus the inexperienced local sealer must lose much valuable time while waiting to be certain along which line to proceed. Were he to be operating within a State having a weight and measures department, he would have reference to that department whose experienced agents could ably guide him and aid in an early and prompt execution of his duties.

The local official is often in need of reference to State standards which are of greater accuracy than those in a city office. Where his state has no such department, he must refer to the standards of our Federal Government. This brings an expense and is inconvenient, and often causes the official to neglect having sufficient tests made.

It is agreed that publicity is one of the most important mediums in molding the favorable opinion of the public towards the weights and measures cause. In many cities the sealer cannot obtain the cooperation of his local news agencies. It is possible and probable that if a strongly established State organization existed the news agencies would recognize this publicity need. They would publish items pertaining especially to prosecutions because of their fear of neighboring cities carrying items of this valuable information to their readers, which would react to the discredit of the local press. An example which truly worked a hardship on the writer's local department occurred a few years ago when it was discovered that a certain merchant was stuffing turkeys at the Christmas season with wet corn meal. On investigation we found that each turkey was filled with from  $1\frac{3}{4}$  to  $2\frac{1}{4}$  pounds of meal, and that between 900 and 1,000 turkeys so stuffed had already been sold. After carefully collecting and preserving the evidence, a case was made in our municipal court. This court promptly tried the case, found the defendant guilty, and imposed a penalty. There was no newspaper publicity following in any local or State press agency. It was interesting to note however that one of those same local papers later carried an item from Washington written by Harry Ferguson. This article described how an agent of the United States Department of Agriculture had uncovered at another point, what our department had previously found here. Yet because of our lack of aid from a State department we had failed to secure proper publicity. Therefore, our observation is that our most valuable asset, favorable public opinion, can be more easily secured by the cooperation of an established State department.

Now in regard to laws. In many States without State weights and measures departments, there are no adequate laws pertaining to this enforcement branch. Consequently the sealers of the various cities and municipalities have no uniform codes to which to refer for guidance. Merchants and shippers are at a loss when dealing in consignments from varied localities. If there are no State laws in conflict, a grower of produce may follow a local custom in selling and delivering by measure what the city sealer's law requires to be sold by weight. Then, too, in some States there are no laws or regulations specifying the type of weights and measures equipment permitted for commercial use. In these States there is usually no weights and measures supervision, and because of this the local inspector encounters one of his most important handicaps. In such instances the local sealers' difficulties are general. Agents and individuals ship condemned weights and measuring devices into contiguous territory, and frequently this same fraudulent equipment is found in use, at a later date, in the locality in which it was originally condemned. The results of this condition are worth serious consideration, for we find the unscrupulous manufacturer's agent or fraudulent dealer disposing of worthless equipment to the unsuspecting merchant of another locality. Often these devices are against the merchant, causing losses that may contribute to his ultimate business failure; while on the other hand he may have been persuaded to purchase same because it was evident that it would deliver a short quantity.

Practically all of us have had experiences similar to those that I have mentioned. In Jacksonville, Fla., we were having a great deal of trouble with equipment that had been shipped out coming back on our hands from time to time, usually offered for sale by the little secondhand dealers. When Jacksonville became free of secondhand scales that were worthless, in the outside territory, South Georgia and going down into Florida, there were plenty of them to be found everywhere, because there was no weights and measures inspection. I was down in Ocala a few weeks ago with a friend, taking a vacation. We went around and found computing scales on the market being sold at prices of \$5 or \$10. Many of those scales came from Jacksonville, Fla.

State laws bring about a uniform State enforcement, and operate not only in adjacent counties but in the rural sections within the county surrounding the city in which the local sealer operates. Many of the sealer's most discouraging difficulties are due to the lack of supervision in these immediate local neighborhoods. A few years ago we found several of our local merchants displaying cane sirup put up in gin bottles of a capacity of only one-fifth gallon each, but marked "One Quart". Most of the merchants were found to be ignorant of this shortage. Had it not been for the reasonable attitude of these offending farmers this practice might have continued for a year before it was eventually stopped. Our department addressed a letter to each producer requesting that all sirup so labeled be taken up and properly relabeled. Because these farmers were willing to conform with the law, this illegal practice was promptly discontinued. We can easily realize how great a quantity of this commodity may have been sold in other communities. Had a

strong State weights and measures department existed perhaps this practice might never have started. The active local sealer observes that this or similar practices seldom originate within his own jurisdiction.

Where disputes arise concerning shipments from points within State borders, the local sealer finds a great need of cooperation of a State official. While the local inspector can substantiate the shortage or excess, as well as the accuracy of weighing devices employed in his city, he has no one to whom he may refer for investigations elsewhere.

With an active State department, strong State laws usually exist. These laws tend toward equal enforcement throughout the entire State. Local municipal laws cannot exist where they are in conflict with State laws. Hence the city sealer in a State without these central laws encounters many unnecessary problems, and it is usually to be observed that neighboring cities have laws that are in conflict with his own.

In our own State of Florida the weights and measures laws, except in a few instances, are weak and inadequate or not sufficiently explicit. Since we have no State weights and measures department, several of our cities have during recent years established their own divisions of this service. Each of these cities has set up its own enforcement body, and has enacted legislation without regard to uniformity. Laws in one municipality may conform to the model law which we as a body advocate, while other cities have enacted laws which they felt were necessary from their observation of their immediate needs. In many of our cities these laws have not demanded adequate attention to this branch of enforcement. Several others have only part time enforcement; and again some have given this authority to heads of departments directly responsible for the observance of other laws. In only a few localities are weights and measures departments found to be separate and distinct units. The department in Jacksonville over which I have direct charge was, until 6 years ago, a branch of our municipal inspector's office. His chief duty was to inspect all city licenses and collect from merchants who were delinquent. He was responsible for the collection of license fees which went into the city's general fund for the purpose of reducing millage against homes and business property. Thus, he was overburdened with the duties of his office and consequently he and his employees had little time to devote to our branch of enforcement.

We find that confusion results from this lack of uniformity, and that the absence of an active State authority operating under adequate State laws is largely responsible. As a solution to the problems of a local sealer so situated State enforcement may be regarded as ideal, but those of us who have labored to secure proper State laws with a suitable enforcement agency realize the difficulties encountered. Legislatures seldom appreciate the importance of needed laws unless there is a State law enforcement body to urge their passage. During these last few years legislatures have endeavored to satisfy what they believed to be popular opinion by holding down any increase of expenditures in State budgets. For this reason only, many States have been deprived of this needed branch of enforcement.



Until a State regulating body is secured, why not solicit the aid of the State's league of municipalities—where one exists? Through the cooperation of this important medium the cities in our individual States might operate with more uniformity until the ideal may be obtained—an adequate State weights and measures department.

### THE TRAINING OF PUBLIC OFFICIALS

By HAROLD I. BAUMES, *Director, Personnel Training, League of Virginia Municipalities*

Mr. Chairman, members of the Conference, "trained public officials" is a phrase which several years ago was but the subject of theoretical discussion. It appeared in text books and was mentioned in college class rooms, but in actual practice, very little was done about it. Today, we are beginning to see the idea materialize. The movement has received emphasis perhaps largely as a result of increasing burdens heaped upon public officials and the inability of our young people to find private employment during the depression. The training of public officials has gained momentum rapidly and has now reached the point where colleges and universities, Federal and State divisions of vocational education, leagues of municipalities, various governmental units and associations of public officials themselves are attracted by the possibilities offered from this constructive endeavor.

All of these organizations may well be interested in the training of public officials as indicated by the following facts. A reliable estimate places the total number of public employees, Federal, State, and local in 1932 at  $3\frac{1}{2}$  million, approximately. Of this number over 1 million were local employees. In that same year, we appropriated something over  $4\frac{1}{2}$  billion dollars in salaries and compensation for public officials. Further than that, these individuals supervised the expenditure of all other governmental appropriations and I submit to you, is it not good business to make available a reasonable sum to train these officials to expend that money wisely and more effectively? And then, with this increase in the public personnel, has come a change in the attitude of citizens and taxpayers. Unquestionably, they have come to look to the government for more services than ever before. As a result, they are more interested in securing those services more effectively and economically. From the facts, it would appear that people are less inclined to the theory once stated that the government which governs least is best, and more inclined to efficiency in administration as expressed in Pope's statement, "For forms of government let fools contest; whate'er is best administer'd is best."

There are, of course, several distinct types of training for public service including for instance, advance training in colleges and universities, in-service training in colleges and universities, and in-service training sponsored and conducted by governmental officials themselves. It is particularly to this latter type of training that my remarks are addressed this afternoon, because this is the only kind of training which can benefit many of those now in active service and it is unfair in my opinion, to expect continually higher and higher standards of administration without at the same time afford-



ing an opportunity for those upon whom falls the responsibility of administering the affairs of our government to better qualify themselves.

Perhaps the training programs providing this opportunity to the greatest number of local government officials are those conducted with the assistance of leagues of municipalities which are merely State-wide organizations of local government officials now existing in about 35 States. The league training program in one State now embraces the following groups of officials: Policemen, firemen, water-works superintendents, food inspectors, finance officers, purchasing agents, assessors, public-works officials, municipal clerks, sealers of weights and measures, public-welfare officials, park officials, building inspectors, civil-service officials, sewage-disposal-plant operators, milk and dairy inspectors, recreation officials, janitors, mechanics, health officials, engineers, corporation counsels, plumbing inspectors, education officials, managers, judges and boards of plumbers. Similar but less ambitious training programs have now been inaugurated in several States and undoubtedly will extend in the near future to practically every section of the country.

Now let us see what is the position of weights and measures men in the training program developed for all of these important public officials. It is true that your number is relatively small as compared with some of the larger groups, but on the other hand, what service now provided by any of our governmental units requires more expert knowledge, technical skill, and patient diplomacy than the work now being carried on by you men to protect the public interests and to assure fair dealing among our people? It seems to me to be an opportune time for those of us who are most vitally concerned with weights and measures activities to see to it that the officials and employees of these important units be given the opportunities provided by the training programs in the various States.

While going through some material in my library in preparation for this talk, I came across "Weights and Measures Administration" by our mutual friend, Ralph Smith. The book was published in 1927 and contains a chapter on the training of the weights and measures official. Mr. Smith recognized the value of training as indicated in his statement, "in the case of the new and inexperienced official, the obvious course is the best one to follow; and that is, after he has learned all that he can from the published material on the subject of inspection and testing, let him seek the assistance of an experienced official for a course of practical training in actual field work." This was written 9 years ago and was sound advice. In fact, at that time, that probably was the only kind of training available to weights and measures men. There is one weakness, however, in such a plan which we now recognize, namely, that some of us who are most efficient in administering our daily tasks are entirely ill-fitted to instruct others. All of you, I am sure, are personally acquainted with people who are skillful in doing certain work themselves, but who would be utter failures in attempting to teach someone else how to do the same job. It is largely for this reason that we have now organized training schools either at a central point in the State or if the number of officials to be trained is sufficiently large, at several convenient points throughout the State.

It was our pleasure in Virginia last year to organize and conduct a central school for weights and measures officials which was typical of many of the short courses for other groups of public officials which have been held throughout the United States. The school was conducted by the League of Virginia Municipalities with the cooperation of the State Division of Markets and the State Division of Trade and Industrial Education with the assistance of the National Bureau of Standards. Mr. Ralph Smith of the National Bureau of Standards directed the school. This 2-day course was attended by State, county, and municipal weights and measures officials and was well attended considering the relatively small number of these officials in our State. I would like to outline briefly some of the principles followed in our school with the thought that they may be of interest to some of you who undoubtedly will plan similar schools in your State during the next few years. As a matter of fact, those of you who are connected with State associations of weights and measures officials are in an admirable position to inaugurate schools of this kind with the assistance of your State division of trade and industrial education and various associations of government officials. The following technique in organizing and operating a specific school is suggested:

1. *Make the school a weights and measures activity.*—It has always been my thought that if the training of any group of public officials is to reach its greatest possible success, the program must be organized and conducted by those officials themselves. In other words, it should be your training program.

2. *Plan all details for the school carefully in advance.*—In cooperation with the National Bureau of Standards, your State division of weights and measures, your State division of trade and industrial education, as well as with the cooperation of other professional groups, it is preferable, I think, to outline in detail everything which must be done before, during, and after the proposed school together with the approximate dates and time for each.

3. *Adopt curriculum after careful consultation.*—Consult not only sponsoring organizations of public officials but technical experts, educators and other qualified persons. Confine the curriculum to practical necessities of vital interest to the group to be trained. You will not have time for any extraneous or uninteresting material.

4. *Secure qualified instructors enjoying confidence of group.*—Upon your choice of instructors depends more than anything else the success or failure of your school. By all means, engage only those instructors in whom you are positive each member of the class has implicit confidence. In my experience, it is necessary to have one person in charge of the school who should be assisted by various specialists and practitioners in the particular field being studied.

5. *Sell each governmental unit in advance on the value of the proposed school.*—An appeal should be made to governors, mayors, city managers, legislative officials and department heads to take an active interest in any school which you propose to hold. This is important for several reasons. If they do not believe in the school themselves, they may think it a waste of time for any of their subordinates to attend. In other words, make your officials feel that the school is an important part of the activities of your particular governmental unit.



6. *Arrange program for necessary announcements, publicity and letters.*—Regardless of how good a curriculum and how well qualified a teaching staff one may have, the school will not serve its purpose unless you secure a good attendance of enthusiastic students. For this purpose, it is most important to outline in detail suitable publicity and announcements starting at the very beginning showing the need for training for a particular group of officials right through to the end when all specific details in regard to the opening of the school will be given. Approximate dates should be fixed for sending out each announcement and letter.

7. *Be sure your schools retain the atmosphere of a school.*—The training school should be distinguished from the annual convention of State associations of weights and measures officials as far as possible. Each serves a particular purpose. The school is intended for instruction only.

8. *Award appropriate certificates of attendance.*—I believe you will find that your officials will take considerable pride in certificates of attendance awarded at the conclusion of each school. In Virginia, for instance, these certificates carry considerable prestige through the inclusion of the signatures of the State supervisor of trade and industrial education, as well as of the director of the school, the head of the State division of markets, and the president of the League of Virginia Municipalities.

9. *Secure public backing for the school.*—Do not overlook suitable opening and closing exercises, which add greatly to the prestige and dignity of any school. If possible, have prominent government officials of participating communities present to speak briefly and also a few prominent citizens. Public relations of the weights and measures official are most important to the attainment of his objectives in the community and therefore the schools can assist him to this end, if properly planned.

Any kind of a training program results in a desire for more training. Once inaugurated, it will gain momentum rapidly and develop in a surprising manner. Moreover, it will be most conducive to loyal public support. This in turn will lead to greater respect for the work which you are trying to do, and in the end not only will benefit taxpayers and citizens who are the recipients of the service which you give, but should benefit you directly by recognition of the importance of the position which you hold and the technical skill at your command. As a result of the school held last year in Virginia, the Virginia Weights and Measures Association formed several years ago was revived. So much satisfaction was expressed at our first school that we are now planning to lay out a long term program of instruction in cooperation with the National Bureau of Standards by which the whole field of weights and measures work can be thoroughly covered one step at a time. My brief contact with weights and measures work has been most enjoyable. My associations with such men as Mr. Holbrook and Mr. Smith of the National Bureau of Standards, Mr. Meek of the Virginia State Division of Markets, Mr. Ragland of Richmond, and all the local sealers of weights and measures have been most pleasant. The little progress we have made in Virginia is a satisfaction to us and has served to stimulate our desire to develop the work started. It is probable

that some of you have gone much further in your States. Your experience will be valuable to us. On the other hand, if there are those of you present who have not developed training schools for weights and measures officials and who would like to do so, the results of our study in Virginia and the material collected is available to you upon request. The National Bureau of Standards, I am sure, stands ready at all times to cooperate in establishing training schools, and I would suggest also, if you have not already done so, that you contact your State league of municipalities.

It is often said that experience is a sure teacher. Many of us have learned this only to realize also that it is at the same time a tedious and costly teacher. There is represented in this room, for instance, several hundred years of weights and measures experience—considerably more than even the most optimistic of you individually can ever hope to have. By means of a training school the experience of each of you will be made available to your colleagues. Often, an exchange of ideas and experiences will save many costly experiments. In short, the kind of training which I have just described is nothing in the world but an endeavor on the part of the weights and measures officials themselves to make available to their own group the best knowledge and the best experience in weights and measures work known to date. I venture to predict that those of you who inaugurate training will never regret it nor will it ever be a disadvantage to you in any way. On the other hand, I am confident that you will find it a distinct benefit not only to the community which you serve but to you yourselves individually. None of us ever becomes too old to learn. Conditions and methods are constantly changing and we must continually study if we are to keep up-to-date, and retain an advantageous position as compared with our fellow men. Indeed, it has been the experience of all of us that the more we learn the more we realize how much we have still to learn. Last week I attended a meeting of fire school instructors in Virginia for the purpose of outlining a training program for the coming year. One of the fire school instructors present, a man of middle age who has contributed probably fifteen years of his life to the protection of life and property, stated that after he returned home from last year's school a member of his department facetiously asked him, "What did you learn at school this time?" and the fireman replied, "I though I knew something about the work of a fireman for years before I attended this school, but now I realize that I was only a 'lamp boy'." That is about the best recommendation of the training of public officials which I can make. Once you start training, you will never give it up.

You men can well take pride and must derive great personal satisfaction from your splendid contributions toward making this world a more honest and a happier place in which to live. Your work will maintain its important place among the most vital governmental services. Training undoubtedly will contribute in part to the desired development of your work in the future and if it does, it is my hope that it will not only better equip you and your colleagues to administer your important function of government, but at the same time build a truer conception of this function and a mutual understanding between citizens and officials which is so essential to improvement in



governmental administration. May it give you the confidence which comes from the realization that knowledge and skill possessed can never be taken away and the contentment that comes from a job well done.

SECRETARY'S NOTE.—Mr. Baumes left for the information of the delegates copies of the registration card used at the central school, the subjects included in the first curriculum, the certificate of attendance, and a list of those in attendance.

## THE STATE AIDS IN STRENGTHENING THE LOCAL DEPARTMENTS IN TEXAS

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

Mr. President and gentlemen, it is my privilege to present a paper at this Conference on a phase of our work in Texas in which I have been very much interested and fairly active for the past several years. Our State Department has enjoyed quite a marked success in this particular line, and no doubt this fact prompted the Conference secretary to extend the invitation to me to speak on this subject, "The State Aids in Strengthening the Local Departments in Texas."

As the great State which I represent is surrounded by jurisdictions where weights and measures administration is practically unknown, we have been compelled to work along without the advice and counsel of experienced neighbors. Being comparatively young in weights and measures work and as head of the State department, I have not heretofore been privileged to attend State or National conferences, or visit in such well-organized departments as are maintained in the various jurisdictions represented at this meeting. What we have accomplished, in spite of these disadvantages, I shall attempt to relate to you.

As you know, this field for service varies considerably in the different States. Some State laws make it mandatory upon cities of certain size to maintain weights and measures inspection; others simply make it possible for the cities to maintain the service, and leave it entirely to them as to whether or not they do so. The latter is the case in our State. In either case, however, the city department is under the supervision of the State, and the success or failure of the local department depends largely upon the aid and cooperation received from the State. Our weights and measures work is a division of the Department of Agriculture, of which Mr. J. E. McDonald is commissioner.

The State of Texas has about 20 cities ranging in population from 20,000 to over 300,000, and at the time the present commissioner took office in 1931, there were only four cities in the State maintaining a full-time weights and measures department, and each of these had only one inspector. About five or six other cities had a man who devoted part of his time to the work, but in most cases his activities were limited to answering complaints and requests. I venture to say that out of this number, very few had a proper conception of the work they were supposed to perform.

Mr. M. S. Frazee, who was then chief of the weights and measures division, now chief of the live stock division of the department of agriculture, became interested in this condition, as did the commis-

sioner and other members of the department. We began to make plans to improve the situation. The task has proved no easy one, and is not yet complete, but we have made considerable progress.

The city of Houston (named for General Sam Houston, hero of San Jacinto), which is the largest city of Texas, had been without weights and measures supervision of any kind, when, in March 1934, a modern ordinance was passed, creating a department composed of a chief inspector, three deputy inspectors, and a secretary. This was the first time in the history of the State that any city had gone so far in the weights and measures field. Our department was encouraged, and assisted in every way possible to make the new department a success.

One year later, in March 1935, the city of San Antonio (which is the third largest and probably the oldest city in the State), having only a one-man department at the time, passed similar ordinances and established a department with the same number of employees.

Then, in January 1936, the city of Dallas (Centennial Exhibition center, second largest city in the State), after encouragement from the State department, also adopted new ordinances and added two inspectors to their one-man force. It is understood that two additional inspectors will be added soon, to give Dallas the same size department as Houston and San Antonio.

The city of Fort Worth (live stock and trade center, our fourth largest city and the city which took the lead in weights and measures supervision in 1928), is now drafting new ordinances, proposing to increase their force from one, to three men, and make weights and measures a separate department of the city government, instead of a stepchild of the health department.

The city of Wichita Falls (home of the present Governor, a city famous in oil production, known as the "City of Faith"), has passed new ordinances, providing a one-man department, as yet not organized.

Let me assure you, these improvements in local departments were not easily gained. They did not just happen. They were accomplished only after a good deal of hard work, usually following this procedure: If the city in question already had a capable inspector, we first attempted to teach him the real meaning of his job and the importance of his office—that it was not only a matter of bread and meat to him, but one of economic interest to every one in the community. We endeavored to make him realize that the proper performance of his office was vital to the public welfare, affecting as it does the purchase or sale of every commodity, whether it be a box of candy for the sweetheart, or Texas' greatest product, the downy staple of "King Cotton." Then we enlisted the aid of civic organizations such as chambers of commerce, better business bureaus, and retail merchants' associations. Therefore, we were successful in obtaining the aid of the mayor, city manager, or some councilman, to the extent of sponsoring an ordinance. Now, it is an absolute fact that we have never failed to get a city to adopt modern ordinances and provide an adequate weights and measures department, when we pursued this course.

In our work with cities, the most frequent difficulty we encounter is finding a way to finance the department. Most cities in Texas

are already considerably involved for civic improvements, and are reluctant to make further outlays. However, once we have thoroughly convinced them of the necessity of the service—really sold them on the idea—they have always found some way to provide the funds necessary to carry the work forward. The city of Dallas inaugurated the unique system of a graduated tax on gasoline pumps in filling stations. We contend, however, that the most efficient and satisfactory way to finance the department is to include the amount in the city budget, so that it will be paid from the general fund.

We have found that city officials are always willing to do what the citizens want, once they have been convinced the desired change or improvement is a legitimate one, and renders a service that the people need and have every right to expect. In my opinion, there could be no proposition offered to a city government more desirable or more profitable in the long run, than that of an efficient and effective weights and measures administration.

Now, in getting these ideas across, and establishing new city administrations of weights and measures, we have been put to considerable work, and we have expended a lot more time and labor than is called for by the bare routine of our office. But we do not regret any of it. It has been time and labor well spent, for the advantage to us in having the cooperation of full-fledged, working departments in all the larger cities of the State cannot well be overestimated.

As I observed previously, our task is not yet complete. For, in addition to the cities mentioned, we have several others really interested, and we are expecting immediate results. We do not expect to stop until we have raised our supervision of weights and measures throughout the State to the high plane worthy of the great State of Texas.

I thank you.

#### HOW ARE THE BENEFITS OF STATE-WIDE INSPECTION BEST TO BE SECURED?

By J. H. MEEK, *Director, Division of Markets, Department of Agriculture, State of Virginia*

In speaking on this subject I find it necessary to state some of my own experiences in Virginia, for which you will please pardon me. Conditions in some other States differ with those in Virginia, which may make it impractical to put into effect policies and carry out plans that have been used in Virginia. However, I believe in a number of States, particularly those in the South without a number of large cities or not densely populated, similar plans and policies can be used effectively.

I do not wish to brag about what has been done in Virginia, as I would like for a great deal more to have been accomplished, and I feel humiliated that there is not more being done at present, but, under the existing conditions I am proud that some worth-while things have been developed and put into effect in Virginia, even during the critical period of the depression.

For many years prior to 1924 there had been but little activity on the part of the State of Virginia relating to weights and measures.



The general assembly that year passed a weights and measures law very much in the form recommended by this conference and the National Bureau of Standards. Following this, there was considerable activity on the part of the State office to get local sealers appointed in the various counties and cities on the strength that the law required that they appoint sealers. Some local officials refused to appoint sealers, and others felt that the expense was too great. As a result of this, the law was amended in 1926 leaving it optional with the local authorities to appoint sealers.

When local authorities found it was not a requirement of the law, a number of counties and some small cities discontinued the work. Through economy and consolidation the funds for the State office were reduced to about \$4,500 annually. Local authorities were urged to maintain or appoint sealers and the work was encouraged and fostered in general ways, but it was found that officials of sparsely settled counties and small cities were right in failing to finance the full-time activity of a sealer. In many cases where sealers were appointed they were inadequately supported, or did not give sufficient time to perform the duties properly. Under these conditions it became necessary to develop some plan with but little financial support, to extend some type of weights and measures activity to the large portion of Virginia where nothing was being done.

Believing that the testing of gas pumps was one of the great needs, several qualified men were sent into various sections of the State to test gas pumps. Facts giving the results of these tests were compiled and presented to the county and city officials where no work was being done, with a plan for performing the service by the State office, at a very low cost, by getting local funds paid to the State to supplement State funds. Local authorities cooperated finely in this plan, and gas pumps in from 20 to 47 counties were tested annually for a period of 4 years. The results of this work were compiled and placed before the general assembly in 1932, when practically all public expenditures were being reduced or discontinued. As a result of this, the general assembly authorized the Governor to transfer out of the gasoline tax an amount not exceeding \$25,000 annually for the purpose of inspecting gasoline and motor-grease measuring and distributing equipment.

With this authority the governor transferred from the gas tax fund \$15,000 annually for inspection of gasoline and motor-grease measuring and distributing equipment for 2 years. This enabled the State office to check all gas pumps in the State, where there were no sealers, and give sealers such assistance in inspecting gas pumps as they desired.

During this time the officials in counties and small cities where there were no sealers were requested to cooperate in financing the inspection of scales in a similar manner. In this way, the inspection of scales was started in a number of counties and small cities where it had never been done before.

For the biennium 1934-36 there was some reduction in funds appropriated for testing gas and grease pumps along with reductions in other appropriations to meet certain policies in effect in the State. During this time there had been a growing demand for the State office to inspect weights and measures equipment throughout the

State, not only from counties and small cities where no previous work had been done, but by sealers and local authorities where the work was not adequately financed.

As a result of this, the general assembly of 1936 restored the cuts in the appropriation for testing gas and grease pumps, and it is believed that a substantial increase in funds to meet the demands would have been appropriated had it not been for the unusual situation of a number of members of the general assembly getting sick. Also serious weather conditions broke down the roads and the repairs had to be financed by the appropriation from which the additional amount for testing gas and grease pumps would have been taken.

It is now generally considered in Virginia that it is impractical to maintain local sealers in the smaller sparsely settled counties or in towns or cities of less than 8,000 inhabitants. Some of our larger cities, particularly Richmond, have well organized and active weights and measures bureaus or services, but some of them are inadequately supported. We give such assistance to local sealers as they need and call for, and try to strengthen their activities as much as possible.

With our appropriation for the biennium 1936-38 we expect to test all gas and grease pumps and truck tanks, in jurisdictions where there are no local sealers. We also expect to secure financial support from local officials to supplement the State appropriation for testing scales—including livestock, coal, and warehouse scales—in a larger number of counties and small cities than before, where there are no sealers. With the increased demand from local sealers for assistance in their various duties, we will be unable to make the inspections of various weights and measures equipment in places where there are no sealers as regularly as we would like to; but we expect to get more done in Virginia than ever before, not only by the State office but by local sealers.

In these ways we hope to build interest in weights and measures work within the State that will get sufficient support to enlarge the appropriation in 1938 for testing gas and grease measuring equipment, and build a more permanent and adequate inspection service on scales throughout the State in places where there are no sealers, as well as cooperate with local sealers in enlarging and improving their work.

My closing statement will be made without intention of any reflection whatsoever upon the work of the National Bureau of Standards. That has been wonderful, and our cooperation from the Federal Bureau in the State of Virginia has been 100 percent. However, in view of the lack of Federal financial support in this great activity—our weights and measures work throughout this country—I have added this closing statement.

Since the Federal Government is spending money in so many different ways it certainly seems that with all the constitutional authority that Congress has to do weights and measures work, Federal money to supplement State and local funds should be used for developmental, promotional, and enforcement activities relating to weights and measures. This would bring about uniformity and enlarge the activity to meet the needs of the people. I hope this group



will make a strenuous effort before the next session of Congress to that end. Congress has spent large sums of money in almost every other conceivable way, and it seems time that weights and measures should be given some consideration.

Mr. DANIELS. I very heartily agree with the paper Mr. Meek delivered, but the last section of it was worth more than all the rest he said. I have been waiting for a long time to hear someone say that. I didn't have the nerve to. I believe he has said something that ought to bring good fruit.

#### PROPOSED AMENDMENTS TO MODEL STATE LAW ON WEIGHTS AND MEASURES

The CHAIRMAN. The Model State Law on Weights and Measures was adopted by the National Conference many years ago, and since that time it has been amended in a few respects. At this time Mr. Holbrook, secretary of the Conference, will propose for the consideration of the Conference certain amendments which are believed to be advisable. Mr. Holbrook.

Mr. HOLBROOK. Mr. Chairman and gentlemen, I have for your consideration certain proposed amendments to the Model State Law on Weights and Measures which I would like to present at this time.

Section 6 of the Model Law states, in general, the powers of the State superintendent of weights and measures. In section 6 powers are given to promulgate regulations for the guidance of county and city sealers, which are to govern the procedure to be followed by these officials in the discharge of their duties.

The Conference for some years, as you know, has been writing specifications and tolerances for weights and measures, yet in no place in the Model Law is the promulgation of specifications and tolerances made a specific power of the State superintendent of weights and measures. Now it may be that the general provisions are broad enough to cover this particular phase of the superintendent's work, but it seems desirable specifically to include this power in the provisions of the law.

I have heard it said by some local and State weights and measures officials that they have been informed that rules and regulations promulgated by a State superintendent were not valid as a matter of law. Some of them feel that the power to adopt specifications and tolerances belongs to the legislative branch and that the action of the executive branch in that particular respect will not be enforceable.

I do not believe that this is the proper interpretation, because I think it has been held by the U. S. Supreme Court many times, and most recently in the case of the Nebraska bread law, that rules and regulations may be promulgated which will have the force and effect of law. The legislative branch should outline the scope within which the rules and regulations are to be confined. The section which I will propose to the Model Law will set up such a framework.

As I have pointed out, the last sentence of section 6 provides for the issuance of regulations by the State superintendent of weights and measures. Specifically, it is suggested that section 6 be amended by adding at the end thereof the following:

The said regulations may include specifications and tolerances for all weights, measures, and weighing and measuring devices of the character of those speci-



fied in section 8, which shall be designed to eliminate from use, without prejudice to apparatus which conforms as closely as practicable to the official standards, those which are not accurate, which are of such construction that they are faulty—that is, which are not reasonably permanent in their adjustment or which will not repeat their indications correctly—or which facilitate the perpetration of fraud. For the purposes of this act apparatus shall be deemed to be correct when it conforms to all applicable requirements promulgated as specified in this section; other apparatus shall be deemed to be incorrect.

There are three suggestions for amendments, Mr. Chairman, but it seems that inasmuch as they are not directly related to each other they might be considered separately.

The CHAIRMAN. Gentlemen, a motion would be in order for the adoption of this amendment.

Mr. GRIFFITH. I so move.

Mr. HARRINGTON. I second the motion.

Mr. GRIFFITH. On the discussion, Mr. Chairman, may I inquire whether the phraseology of the amendment is sufficient to include the codes adopted by the National Conference on Weights and Measures for various weighing and measuring devices?

Mr. HOLBROOK. The codes adopted by this Conference may be made official in any State by promulgation by the State official. I have not suggested in here, nor did I intend to suggest, that the codes adopted by this Conference were to become operative in any State without the promulgation of the State official. I think that such an action might be very unpopular.

Mr. WARD. I have listened to the reading of the amendment and it sounds to me a little difficult to entertain without careful study, and for that reason I move that it be laid on the table until tomorrow, in order that the delegates present may have more opportunity to study it before taking action on it.

Mr. HOLBROOK. I think that is a very good suggestion, Mr. Chairman, inasmuch as these things are not in the hands of the delegates. I think these should be adopted only when the delegates have had an opportunity to study them carefully. If the gentleman will amend his motion to lay it on the table until later in the Conference, rather than tomorrow, we will have mimeograph copies struck off and will distribute them at the Conference tomorrow, and call this matter up again on either Thursday or Friday.

Mr. NEALE. I second the motion.

The CHAIRMAN. Will the gentleman accept that suggestion?

Mr. BLAYLOCK. I would suggest that the gentleman put in his motion a provision that it be made a special order the first thing Friday morning or Thursday afternoon, or some other certain time, so we may know when it is coming up.

The CHAIRMAN. What would you suggest as the time, Mr. Holbrook?

Mr. HOLBROOK. The first thing Thursday afternoon. That will fall in the center of a general discussion of subjects of interest brought up from the floor, and I think part of that time might well be devoted to this subject.

Mr. WARD. Mr. President, I accept that date when action shall be taken upon the amendment.

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

Mr. HOLBROOK. If I may, then, I will read the other two suggestions, in order that I may tell why they are being advocated. We may consider that those fall in the same classification as the other, and fall within the terms of the motion adopted.

For some years efforts have been made, as you doubtless know, to enact Federal legislation to the effect that slack-fill and deceptive package goods be made illegal, whether or not correctly marked with the quantity contained in the package. Several States have that legislation upon their statute books, but as yet it has not been adopted by the Congress. It is being currently considered by Congress in connection with the proposed amendment of the Federal Food and Drugs Act, known popularly as the Copeland bill.

I think most of you will recognize the character of packages which are in mind. One buys a package, and sometimes finds that it is improperly filled only after taking it home and opening it. There is a certain type of package which, while slack filled, may never be discovered to be so—such packages as the perforated top package, out of which spice or some material of that kind is sifted. This package is thrown away without ever having been opened.

This suggestion is based upon the proposed provisions of the Copeland bill. It is intended to be known as section 23-a and reads as follows:

It shall be unlawful to keep for the purpose of sale, offer or expose for sale, or sell any commodity in package form if its container is so made, formed, or filled, or if it is so wrapped, as to mislead the purchaser as to the quantity of the contents; or if the contents of its container fall below the standard of fill prescribed by regulations promulgated as provided in this section. For the effectuation of the purposes of this section the superintendent (commissioner) of weights and measures is hereby authorized to promulgate regulations fixing and establishing for any commodity in package form a reasonable standard of fill of container.

It will also be necessary to amend section 23, second paragraph, first line, by striking out the word "section" and inserting in lieu thereof the word "act", since the words "in package form" will now have application to more than the one section in which they are at present contained.

The last suggestion is in relation to bread. We have heretofore specified that loaves of bread shall be sold in certain standard weights, and no other. Since the time when the section was adopted bread has commonly come to be sold in wrapped form rather than unwrapped form, and in some of the courts, arguments have been raised that the wrapping of bread in waxed paper results in its being made into a package rather than a loaf of bread. If it were to be held that bread in wrapped form was a package, it would no longer have to be of standard weight but might be marked with any weight which the maker desired to bake.

Also there is the new method employed in the sale of bread—sliced bread in wrappers is becoming very common. Again, tolerances in excess only have been provided for in some States and these have now been upheld as legal by the Supreme Court. The present wording provides for tolerances in excess and in deficiency. Therefore, it is proposed that in section 26 of the Model Law, in relation to bread, the first proviso be amended to read as follows:

*Provided, however,* That rules and regulations for the enforcement of the provisions of this section, not inconsistent therewith, shall be made by the

superintendent (commissioner), and such rules and regulations shall include reasonable variations and tolerances, in excess only, or in excess and in deficiency, which may be allowed.

Also, at the end of the section, the following words should be added:

For the purposes of this section, bread shall be deemed to be in the form of loaves whether or not the loaf is wrapped, and whether or not the loaf is sliced.

Mr. BLAYLOCK. We have a custom in our State where a good many of the bakers at one time marked their bread "16 ounces when baked." We cut that out. Then they got to marking it "15 ounces or over." Now they put a pound and a quarter in the loaf and still mark it "14 ounces or over." I would like to have the sense of the meeting as to whether that is permissible.

Mr. HOLBROOK. What is the object of marking bread which weighs a pound and a quarter, "14 ounces or over"?

Mr. BLAYLOCK. The idea was that we prosecuted them if the bread was too light; therefore they went to cutting down the marking of the bread and made the loaf they were baking any size they wanted to, and marked it "14 ounces or over." They knew they were absolutely safe, but they weren't marking what the bread actually did weigh.

Mr. SWEENEY. I don't know whether I quite caught the intent of the section that Mr. Holbrook spoke about. In Massachusetts at the present time the law specifies that bread shall be sold in loaves weighing 1 pound, 1½ pounds, or a multiple of a pound. Subsequently it states that bread may be sold in any weight, provided, if it is unwrapped bread, that it contains a sticker containing the manufacturer's name and the weight of the bread, or if it is wrapped bread, it contains a statement on the wrapper of the amount of bread contained in the wrapper. Is there anything there in conflict with what you are bringing out?

Mr. HOLBROOK. The Model Law section is a standard weight section exclusively; it does not allow the sale of other sizes than the sizes specified in the section, whether marked by weight or not.

Mr. SWEENEY. In the Massachusetts law you don't have to mark a standard loaf.

Mr. HOLBROOK. As I recall it, bread is not required to be marked under the terms of the Model Law, but it may be baked only in sizes weighing 8 ounces, 1 pound, 1½ pounds, 2 pounds, or multiples of a pound. This amendment is simply designed to state that that applies to wrapped bread as well as to unwrapped bread, and to sliced bread as well as to unsliced bread, because there has been some question as to whether wrapped bread or sliced bread is in the form of a loaf.

Now, in answer to the question of Mr. Blaylock. If the law does not prescribe standard weights only, then if bread is labeled "14 ounces or over" and weighs 16 ounces, that bread is undoubtedly legal in view of the decision of the Supreme Court in the first Nebraska law, which was to the effect that the bread laws were designed to prevent short weight, and that overweight was entirely permissible.

The latest decision of the Supreme Court in the case of the present Nebraska bread law is to the effect that certain excess tolerances



may be provided for, but only when these tend to prevent fraud through the baking of a size so large that it might reasonably be confused with the next larger size.

Mr. BLAYLOCK. But that gives them a chance to put out a 14-ounce loaf if they want to.

Mr. HOLBROOK. If you have no standard-weight bread law I think the people of your jurisdiction are very fortunate if the bakers of your section are putting 16 ounces in a loaf supposedly weighing 14 ounces.

Mr. STROBRIDGE. In California we have a bread law providing a tolerance in excess of 1 ounce on the 1-pound loaf and  $1\frac{1}{2}$  ounces on the  $1\frac{1}{2}$ -pound loaf, but no tolerance in deficiency.

Mr. WARD. Is the intent of this amendment to standardize the loaf of bread?

Mr. HOLBROOK. The Conference is on record as favoring the standard-weight principle. The effect of the amendment proposed is to this effect, namely, that wrapped bread shall be in the same category as unwrapped bread, and that sliced bread shall be in the same category as bread not sliced, for the purposes of the section as it now stands upon our books.

Mr. ISING. Will the packages mentioned in the second proposed amendment have to be sealed?

Mr. HOLBROOK. It depends upon the law. Under the Model Law of the Conference anything which is wrapped, whether sealed or not, is in package form, because the words "in package form" are construed to include commodities in containers or wrappings of any kind. There is no requirement that the wrappings be sealed in order to make it a package under the Model Law.

In the case of each State the definition of a package controls the answer that would be given for that particular State. I can only speak in this connection about the definition contained in the Model Law of this Conference, unless I know the definition contained in a particular State law.

Mr. ISING. According to that, potatoes put up ahead of time before the customer comes up and buys them really ought to be marked, "10 pounds", or whatever might be in them.

Mr. HOLBROOK. Yes; under certain definitions of packages. In many jurisdictions I think it is required that packages put up in advance of sale be marked with their weight.

Mr. ISING. One of our chain stores was advertising potatoes at 10 pounds for 10 cents. They sold them by the bag, and we weighed one of the bags and it weighed  $7\frac{1}{2}$  pounds.

Mr. HOLBROOK. That is a question of the development of the evidence of what really went on in the transaction.

Mr. JONES. Isn't there a law that whenever a package is done up and tied it is compulsory to have the net weight of the contents marked on the package?

Mr. HOLBROOK. You would have to tell me the jurisdiction. It is not a general law by any means.

Mr. JONES. In the State of Maine we have this practice, that the net weight contents must be put on any package that is put up, but it does not constitute a package unless it is tied up.

Mr. HOLBROOK. That again depends upon the definition of the word "package." I consider that anything put up in a paper bag,

ready for sale before the time of sale, under the present Model Law definition, would be in package form.

Mr. JONES. Providing it was weighed in front of the customer?

Mr. HOLBROOK. Only if put up in advance of sale. Otherwise the quantity is determined after the order and it is simply put into a bag for the convenience of the purchaser. I am talking about things put up in advance and held for sale to a future customer.

Mr. JONES. We have our potatoes put up in bags containing fifteen pounds, and they are so marked.

The CHAIRMAN. These three amendments, then, will be mimeographed, distributed tomorrow, and brought up before the Conference on Thursday afternoon as the first order of business.<sup>3</sup>

Gentlemen, the session tomorrow morning will be devoted to the important subject of the testing of large-capacity scales. Again our program is a full one and it is urged that the members of the Conference arrive at the Bureau in time, so that we can get the session started promptly at 10 o'clock.

Mr. NEALE. It has been my privilege to visit or attend every Conference that has been held here since 1910, as an official thereof for 11 years, and I dare say never before has there been placed before this Conference a group of papers so closely allied as those you have heard this afternoon. It would be well if those could be bound in a separate issue.

(At this point, at 5 p. m., the Conference adjourned to meet at 10 a. m., Wednesday, June 10, 1936.)

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<sup>3</sup> See p. 92.

### THIRD SESSION—MORNING OF WEDNESDAY, JUNE 10, 1936

(The Conference reassembled at 10:15 a. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

#### THE INSTALLATION AND MAINTENANCE OF LARGE-CAPACITY SCALES

By ALBERT VETH, Fair Scale Co., Louisville, Ky.

The installation of a large-capacity scale is probably as important as the scale itself, because the best manufactured scale has often been ruined by poor installation. Just what constitutes a good installation depends a good deal upon the work which the scale will have to do. We will describe a first-class installation which would be made by a purchaser with unlimited funds or who from experience appreciated the value of good practice. This installation would cost a good deal more than the average user wishes to spend. In the majority of cases in which the sealer's opinion is asked, it will be by the latter class of purchaser. In the first case his advice will not be requested, as the prospective user will probably buy a scale of high quality and follow good practice in its installation without the sealer's advice.

Just what constitutes good practice? We shall consider first a motor-truck scale, as this will probably be the type you will come in contact with most. A motor-truck scale depends entirely on the adequacy of the foundation for its satisfactory operation. Naturally this will be of concrete and it should be poured monolithic, that is, the side walls and bases which support the scale stands should all be poured without interruption. This will prevent, to a great extent, cracks through which water may seep into the pit and also give the piers the added bearing area of the end and side walls. In my opinion every motor-truck scale pit should be at least 5 feet deep in the clear and should be connected to an adequate sewer. In addition to having a 5-foot vertical clearance for purposes of inspection, it is also essential to provide ample clearance between the lowest live parts of the scale and the foundation. The use of low main-lever stands to meet a demand for economy in pit construction by purchasers in general who cannot see the value of a deep pit should be discontinued. In first-class installation, I would have the clearance between the lowest working part of the lever system and top of pier at least 8 inches. This will provide sufficient room for accumulation of dirt and foreign matter without obstructing action of the scale during the average interval between cleanings.

The top of the pit walls should be bound by coping steel, preferably angle iron, on all four inside edges. One of the poorest economies is to omit this on the sides. The concrete will soon be broken off and a valley will be formed in which foreign matter will naturally



collect and fall into the pit. Particular stress should be placed on the manner in which this coping steel is cast into the concrete. In general practice the foundation builder will wire this coping to the forms with the result that when the concrete is poured, the form moves inward away from the metal, leaving a projection inside the pit just on the bottom edge of the coping, which provides an excellent resting place for slack, coal, gravel, etc. Ordinarily when one looks at the top of this scale the clearance around the boards will seem to be sufficient, but this little ledge of concrete, usually about 3 inches below the top, has caused many a weight argument. It can be readily overcome by securely bolting the angle coping to the form boards. The foundation should extend under the floor of the building or office in which the beam is located and the beam pillars and standards should be mounted directly upon this foundation.

Another point in a first class installation which has often not been considered is ventilation of the pit. This has been gone into rather thoroughly in railroad track scale installations, but seems to have been overlooked in the case of motor-truck scales. It can be accomplished by a suitable vent pipe leading from the bottom of the side walls up through the roof of the scale office. Such ventilation would eliminate a good deal of corrosion which takes place in certain locations.

The top of the pit should always be located above the surrounding grade in order that no water shall drain towards it. It has been my experience that you can almost never get a scale located too high, especially in the average coal yard where there are no concrete driveways. There should be a roof over the scale, of adequate size. It is hard to understand why so many people build a shed over the scale just about the exact size of the scale platform. A roof, to do any real good, should extend at least 8 feet beyond the scale platform in all directions, and there should be ample clearance between the scale and the supporting posts.

Then too, a scale should be located so that normal-length levers can be used. I am very much opposed to the use of extra extension levers, which are often made necessary by the careless location of scales. I have frequently seen two short even levers, not over 10 inches long, used to place a beam in some particular location. This is very bad practice and should be avoided. If the manufacturer of your scale has designed it well, he will have eliminated as many levers as possible, and to place extension levers between it and the beam is to lose all the advantage gained by this design.

In discussing the scale itself it is difficult to go into detail without seeming to favor one make or another. The three most practical and best-known types of motor-truck scales are the conventional track-scale pattern, which is really a small two-section railroad track scale; the "A" lever pattern in which two long levers extend from the far corners of the pit and meet at the beam rod and have two short levers from the other two corners connected to them at the longitudinal center line of the scale; and the torsion-lever type, which is more generally known as the "pipe-lever" scale. Each has its advantages and if well designed one will do just about as good work as another. I am a believer in the

liberal use of cast iron in scales, and would say that the scale which is designed to use the least amount of what is commonly called wrought iron or steel in the lever system would be the most durable. Levers built up from structural parts, wrought pipe, etc., arc-welded together, in my opinion, have no place in a first-class installation.

Now comes the discussion of bearings and pivots. Pivots, of course, should be of standard pivot steel, fitted, hardened, and ground according to sound practice. The bearings which rest against these pivots should be of the same quality steel, handled in the same manner.

You have heard a good deal about rigid, ball, and suspension bearings. The rigid bearing is the oldest type. The levers are suspended by links and loops and the load is transmitted to them thru a bearing casting rigidly bolted to the weighbridge. This type is the least used in modern installations. There has always been some question in my mind as to whether or not rigid-bearing scales carefully designed and given the same opportunities as the other types would not perform as well as the other types. Each type can be built to the AREA specifications which have also been approved by the National Scale Men's Association and the Twenty-fifth National Conference on Weights and Measures. If these specifications are conscientiously followed by the manufacturer the buyer will get a good scale.

The suspension-bearing type is very popular. Here the main lever is supported on rigid stands resting on the piers. The load is transmitted through a suspension connection, the design of which depends on the manufacturer. This design should permit the weighbridge to move freely in all directions without disturbing the position of the lever system when the load is applied. This is very good, providing all the pivots and connections in the lever system, and the elements of the bearing assembly, are kept free of corrosion to prevent their "freezing", which means that the pivots and bearings must all be protected by an adequate covering of grease.

Use of these first two types of scales makes check rods necessary to control the oscillation of the platform. Check rods should be carefully fitted. They must be set level, or slightly higher on the girder ends, and must be absolutely free when the platform is at rest. Bumpers have been substituted for check rods on some suspension-bearing scales.

The ball bearing is used almost entirely with the pipe-lever type. It accomplishes the same purpose as the suspension bearing with the use of fewer parts. It consists of a bearing casting resting on the load pivot of the lever, which casting has on its top two saucers to receive the balls which are covered by another ball plate bolted to the weighbridge. This design is very simple, requires no check rods, and also gives adequate platform movement without disturbing the position of the lever. It should be noted here that these balls have no part in the weighing function of the levers and that a pipe-lever scale depends for its accuracy upon properly fitted knife edges just as much as in the case of a suspension-bearing or rigid-bearing scale.

The weighbridge of our first-class installation should have main girders of strength sufficient to carry the maximum loads without

deflection computed according to formulas used in general structural-steel design. There should be sufficient cross bracing between these girders to stiffen them, but otherwise the space between them should be clear of any other deck supports. If a wood deck is to be used, a suitable number of cross beams should be placed across these main girders and the floor timbers laid thereon. If a concrete deck is to be used these cross beams are not necessary.

The deck should be of sound timbers 3 or 4 inches thick, depending upon the nature of the timber used and the capacity of the scale. If a sufficient number of cross beams are used under it, a very nice installation can be made by laying the deck boards lengthways instead of across the platform. The deck boards should always be cut "under" to provide greater clearance at the bottom than at the top.

A concrete deck, of course, is ideal and should be not less than 5 inches, but preferably 6 inches thick. I am in favor of binding a concrete deck with I-beams rather than channels, as it provides more clearance around the sides. When used, the sidewalls of the pit should have at least a 1-inch recess matched to the bottom flange of this I-beam to provide clearance for cleaning.

We might briefly describe some of the features in the weighbeam of our first-class scale. It would be of the full-capacity type and the main bar should have 1,000-lb notches with fractional bar having 10-lb notches. It has always seemed very foolish to me to place 5-lb notches on 15- and 20-ton scales. Such little good as may be accomplished by the use of 5-lb graduation is probably nullified many times by the 500-lb errors which occur with the use of 500-lb main graduations made necessary thereby. The main poise should run on ball bearings.

The satisfactory operation of all this equipment will depend entirely upon how well the actual installation has been made by the mechanic on the job. If he has been careful to set all his levers level, and keep all connections perfectly plumb, the scale should give long and satisfactory service.

We might now consider what might be termed an average installation. In most cases the differences would be in that the main-lever stands would be shorter, the pit much shallower, little or no provision made for drainage, the beam mounted on the floor of the office instead of on its own foundation, etc. The weighbridge will be known as the shallow pattern, in which the space between the girders is filled with nailing timbers for the deck. The whole arrangement combines to make the scale very inaccessible and difficult to maintain. There are hundreds of scales of this type in use, due to the fact that money could be saved on the pit, and that the steel work was somewhat cheaper. If the work of installation is well done this type of scale will give very good results up to the point where dirt collects around the lever system. This dirt, of course, becomes wet, with resulting corrosion and, due to the fact that it is hard to get to, is rarely ever entirely removed until it has caused considerable inaccuracies by its interference with the working parts of the scale.

I believe that a sealer should give as much attention to the type and manner of installation of the scale as to the actual testing of it. Frequently I have seen scales freeze up tight overnight which had just been sealed the day before as correct. This condition subjects



the sealer to criticism because the user is very prone to blame someone else for his own carelessness in not keeping his scale clean. He also forgets that it was his own financial nearsightedness which prompted him to install a shallow-type scale in the first place. You will find from this time on, you will meet more numerous installations of this kind under various trade names. They have been made to meet a demand for a scale which can be cheaply installed, but they eventually will cause the owner and the sealer just as much trouble as the poorest grade of scale made. Wherever possible the sealer should urge the use of a scale built along the ideal lines heretofore described.

No doubt all of you have had some experience with pitless scales. In my opinion the pitless scale is entitled to no consideration whatever from any sealer, unless exceptionally well made and then built with a pit under it, in which case it would cost more than a first-class pit scale. Most pitless scales I have seen have been made to attract a purchaser who wanted a whole lot of scale for very little money, with the natural results connected with all merchandise made with that idea in view.

We have not said very much about the old wagon scale, although there are many of them still in use. Naturally, when they are of timber construction, they depend as much upon the soundness and strength of the timbers used as upon the foundation itself. When they are of steel construction, the foundation rules as outlined at the beginning of this paper hold good. It has often been asked whether or not they can be successfully used for weighing motor trucks and the answer is "Yes", providing the rated capacity of the scale is not exceeded. Generally speaking, a wagon scale is good for weighing motor trucks up to 60 percent of its nominal capacity. There are certain cases in which the scale is actually heavier than the capacity marked on the weighbeam in which cases the motor-truck rating would be higher than 60 percent.

The greatest disadvantage of weighing motor trucks on wagon scales occurs in the checking system. Wagon-scale checking systems are designed to hold only the weight of the load put on the platform with the help of the team, which usually being on the approach acts as a brake to stop the load on the scale. Likewise this team applies the force necessary to start the load in motion against the approach. In weighing motor trucks this is different. Scale platform and checking system must take the shock of the entire braking action necessary to stop the load. Then when the truck is started to drive off, the scale platform must again resist the force of the wheels necessary to overcome the inertia of the load. When a wagon scale is intended to be used for a good deal of motor-truck weighing, the check rods and check pins should be increased at least 100 percent in size. This applies to rigid- and suspension-bearing scales. In the ball-bearing type no change need be made.

Rules applying for the installation of motor-truck scales apply also to most of the larger sizes of industrial scales used in manufacturing plants and otherwise. When scales are installed on the ground floor it is well to have as much pit as possible, although the 5-foot depth recommended for outdoor scales could be reduced somewhat. Particular attention should be given to the location of indus-

trial scales to avoid unnecessary travel over the scale platform. In general design, most of the industrial scales made by the better manufacturers are patterned after motor-truck scales and would be covered by the same rules.

When it is necessary to install an industrial scale in a steel or wooden frame building, the problem of securing adequate foundation is more difficult, and a competent architect should be consulted to provide the proper strengthening of the building around the scale. If the scale is located on the second or third floor, particular care should be given to shield the working parts from air currents which will cause considerable variations in weight. The sealer, however, will not have much occasion to pass on industrial scales of this type, as most of them are used to weigh material between departments in the same plant and as no transactions with outside parties are involved, he really has no proper jurisdiction.

Probably the next best known scale which the average sealer will be called to give advice upon will be the dormant warehouse scale. He will have very little difficulty in the quality of these scales, as most of them are made by reputable companies, and while there is unquestionably a difference in the advantages of certain designs, they will all do the work expected of them if properly installed and if they are bought heavy enough. At present most dormant scales are rated very high and it is my opinion that if the user is to weigh average loads of 1,500 lbs. he should not buy less than a 3,000-lb. scale. When the loads range around 5,000 or 6,000 pounds the average construction runs heavier in proportion and not so much additional capacity need be recommended. It is desirable in all cases, but especially so in heavier service, that dormant scales be manufactured with "bridged" ends. These eliminate the tipping action of the platform and cause all four load pivots to take the initial shock of the load, instead of only two. The value of this design is appreciated in track scales and it is just as desirable in dormant scales. They can be bought on special order but are not included in any of the regular lines I have seen.

The dormant scale is probably the most abused in the manner in which it is installed. A large percentage of the time the user provides his own foundation according to his own ideas and makes the installation with his own men, and then calls the sealer to check his work. It is here that the sealer should thoroughly inspect the manner in which the scale is installed before making his tests. If he has been consulted before the purchase has been made, he can readily determine if his advice has been followed and his course is clear and easy. If he was not consulted he is in the uncomfortable position of making the user tear up some of his own work. This is particularly difficult if the scale should happen to test correctly with a nominal amount of test weights.

When a dormant scale is installed in a concrete floor the pit should be at least 12 inches deeper than the depth of the scale itself. This provides space for the accumulation of dirt and water, makes the intervals between necessary cleanings longer, and naturally contributes to a more satisfactory operation of the scale. It might be well to repeat here that care should be used in mounting the angle coping around the edges of the pit so that the face of the wall will be per-



fectly flush with the angle, providing a clear passage for the dirt to fall through to the space provided under the scale. Concrete piers should be brought up from the bottom of the pit to match the principal bearing points of the scale, which are, in most cases, at the four corners. While these should be large enough to adequately support the scale, they should not be so large as to obstruct clearance space for dirt to fall through to the bottom.

There are an increasing number of what is known as "skeleton-constructed" dormant scales, as compared to the fully self-contained type, which was the only one known several years ago. The skeleton type is much superior to the fully self-contained type if the installation is well made and the scale parts are carefully assembled by an experienced man. Because no box is used, there is considerably less space for dirt to lodge and cause trouble.

When a dormant scale is to be installed in a wood floor the self-contained type, however, is much to be desired, as most wood floors do not provide the kind of foundation necessary for the successful operation of the skeleton type. The sealer should particularly advise the user concerning the difference in these types. It will be much easier for the user to make his own installation when a fully self-contained dormant scale is used.

The next type of heavy capacity scale we will consider is the hopper or tank scale. The large 2,000- and 2,500-bushel scales will not generally come under the average sealer's jurisdiction as they are mostly used for loading grain at terminal points and their inspection is taken care of by those having more experience and knowledge of such scales than the average sealer. In these large scales, as well as in the smaller tank scales, the same attention should be given to the foundation as in the scales heretofore described. There are so many different kind of buildings into which these scales are to go that it would be difficult to lay down any hard or fast rule as to what to recommend as a first class installation.

When a hopper scale is to go into a wood-frame elevator, it is desirable that its construction be such that a certain amount of settling of the building under heavy loads will not cause excessive errors. For this type of installation an "A" lever scale is probably to be desired. Where the construction of the building is such as to provide a rigid foundation, pipe or torsion-levers may also successfully be used. The pipe lever has the advantage of providing more clearance space for the outlet of the hopper or tank. It is also advisable to use all-steel construction and steel tanks on hopper scales. All valve-control levers should preferably be mounted on the hopper frame.

It has been found to be very bad practice to attempt to install the beam of a hopper scale on a floor below that on which the scale itself is installed. To do this requires the use of extra extension levers, which are a frequent source of trouble. The most satisfactory results will always be obtained by setting the beam on the same floor as the scale, in such a position that the levers may be directly connected to it. The room in which the scales of this character are installed should be so arranged that there will be no draughts or air currents around the scale. On large scales air currents can easily make a difference of several hundred pounds. In hopper or tank scales it has generally been preferable to use a weigh beam graduated to 1,000 pounds with



counterpoise weights making up the balance, although full-capacity beams are also used. The counterpoise weights can be readily checked on a sensitive balance, and the beam reading of 1,000 pounds can also be easily checked. From here on, the testing of a hopper scale, especially of the larger size, is somewhat a theoretical proposition. In fact when properly installed, the accuracy depends on the quality of work done on the scale before it left the factory, and for this reason the user of a hopper scale should use the most extreme care in the purchase of it.

I have also been asked to discuss the subject of maintenance. Adequate maintenance of scales which have been properly installed consists almost entirely of simply keeping them clean, parts free of rust, knife-edges and bearings packed in grease, and the platform in good condition. In general use, the platform of the scale gradually drops below the level of the surrounding floor. This should always be corrected and the scale platform kept just a trifle higher than the floor. Experience shows that a platform projecting even as much as three-quarters inch above the floor will not cause as much breakage of parts as one just a quarter-inch lower than the floor.

In the average beam scale and well constructed dial scale, frequent testing is not so necessary as it has sometimes been made to appear. The scale user should beware of the numerous service men who come about soliciting regular monthly testing and maintenance service, as most of this does little or no good, and has often resulted in harm. It has been my experience that any trouble that arises within the scale is usually quickly discovered by the man who does the weighing, at which time a competent scale man can be called in and the necessary work done thoroughly. The sealer should be especially cautious in testing scales which have numerous alleged testing labels posted upon them. This is not due necessarily to any inefficiency or lack of honesty on the part of the man who has applied these labels, but rather to human nature. In cases of this kind the owner feels he has done all that is required in employing someone to maintain his scales, and completely forgets about giving them any attention himself. On the other hand we have the man who has been testing this particular scale for possibly a year at monthly intervals, and always found it correct. Being in a hurry at that particular time, when he should have made a thorough inspection and cleaned out the pit before making his tests, he simply used a small number of test weights on the platform and affixed the label. It is well to note here that it is not necessarily a fact that a scale is correct because it tests within tolerance, as the weights obtained in actual service may be very incorrect, especially if an adequate test load has not been used.

There is also another reason for the solicitation of periodical test and maintenance service, and that is that it would give the one doing this work regular access to the scales and result in his being favored with the repair business. A further disadvantage of this service is that sometimes scales which are perfectly all right are taken up and overhauled unnecessarily. This condition is unconsciously encouraged by users of scales when they make the contract. They expect this periodical testing to overcome all their trouble, but usually do not want to pay what it is worth to do it conscientiously.

The best course for the user of scales to take is to purchase types of adequate size and the types best suited for his work, install them properly, and have his own men keep them thoroughly clean. If he follows this course, he will not have very many troubles. When they do occur he could call in a reputable man to correct the trouble and if, after reasonable length of time, shop repairs are needed, have them made. This again places his scale in its original condition.

I can see no reason why well installed motor-truck scales, which have been kept perfectly clean and dry, should have any tendency towards inaccuracy during the first year at least, and this also applies to almost all other beam scales. Automatic-indicating scales are subject to more troubles than beam scales and while, in general, the best ones should run 12 months at a time without any particular adjustment under ordinary conditions, it is also likely that they might become inaccurate at any time. Troubles of this kind, however, are usually caught by the operator as soon as they occur and could not be avoided by monthly inspection anyway. I do not mean by these statements to condemn good automatic scales, because the advantage gained by their use far outweighs the expense of the additional amount of service required to keep them in first-class condition.

We now get around to the point where maintenance hinges upon the thoroughness of the owner in keeping the scale clean, and the ability of the scale man who is to take care of such troubles as may arise. It is unfortunate that this scale man, who has been depended upon to do the work and possess the knowledge, has been responsible for a larger part of the troubles found in practical use of the scales. There are very few first-class, reliable scale men in proportion to the number of scales in use. Too often a man who has had experience with only one particular type or class of scale undertakes work on another type with which he has had no experience, to the owners' ultimate sorrow and expense. And then there is the scale man who has worked on every kind of scale for everybody and had 10 or 15 or 20 years' experience. I know some of these who are no better scale men at the end of 15 years than they were the first 15 weeks of their experience.

I hope the time will come when scale men will be classified and bonded, and thus restricted to work upon the scales for which they are qualified.

#### RECENT ACTIVITIES OF THE NATIONAL SCALE MEN'S ASSOCIATION

By R. O. RASK, *President, National Scale Men's Association*

Mr. President, members of the Conference, the last few years have affected the National Scale Men's Association probably a good deal as they have other lines of endeavor, in that its membership and activities have been restricted. But during the past year there has been put into effect a system of local branches as extensions of the main body, this for the purpose of interesting the men who work on scales other than large-capacity scales, and sometimes to interest men who for economic reasons have been unable to join us in our conventions. We have four such branches now, located at some of the larger points where a good many scale men come in, and we have

hopes of including not only the old guard that we have always had, but also the local scale men with industries and sealers of weights and measures.

The work of the members of our body is usually concerned largely with the large-capacity scales, due to the fact that the sealers of weights and measures usually do not have the equipment necessary to do the testing to take care of these. We have a common cause, in that the testing of large-capacity scales by railroad and industrial scale men is for the same purpose as the work done by the sealers of weights and measures, although we do have different work. The man concerned with the smaller type scales has his problems, as we do. In regard to sealers of weights and measures, I may say that I encounter them frequently in the States through which I work on the large-capacity scales, and I am always rather put out, each time a change of administration comes, to see some mighty good men arbitrarily taken out of office. This occurs usually at just about the time they have become really efficient as, in any line of work, regardless of education or background, it takes time to develop a particular knowledge of the routine and methods. I am probably out of place in saying this, but I sincerely believe that a merit system established to maintain these men in office would probably be of the greatest good to the fraternity as a whole.

In conclusion, I want to say that our next convention will be at Pittsburgh some time between April 15 and May 15 of next year, and we would be very glad to have such of you as are able and have the time, to attend with us. I thank you.

## TESTING EQUIPMENTS FOR LARGE-CAPACITY SCALES, METHODS EMPLOYED, AND RESULTS OBTAINED

PAPER PRESENTED BY ARCHIE T. SMITH, INSPECTOR, DEPARTMENT OF WEIGHTS AND MEASURES, STATE OF NEW JERSEY

From all accounts there would seem to be a crying need for heavy tests on the wagon and motor-truck scales from practically one end of this land to the other, and heavy-duty testing equipments have not in any measure kept up with the developments in heavy-duty scales.

New Jersey, I believe, was among the very first to recognize this need and do something about it. In 1927 we purchased and out-fitted our first heavy-duty test truck, with 4-cylinder motor, enclosed all-steel, covered-wagon type body, solid tires, and a top speed of 20 miles per hour. The truck was equipped with nine 500-pound test weights and a 500-pound 4-wheel truck. A chain hoist on a trolley suspended from an eye-beam track in the roof of the body and operated by hand, raised and lowered the weights as desired. It was necessary to push or pull the weights in and out, and spot testing was a very slow and laborious task. Nevertheless, heavy-duty scales started to sit up and take notice so to speak. A 5,000-pound spot test and a 15,000-pound gross-load end test was more than a good many of them could stand up under and deliver accuracy.

The truck was used mainly for special work at first, but it proved so popular with the scale owners and the demand for its services became so great, that about five years ago, it was put on full-time



duty. On the first complete tour of inspection, condemnations ranged from 25 percent to as high as 55 percent in the various jurisdictions. It took intensive effort during all open weather to make the rounds of the State in 18 to 20 months time and we have only been able to make three complete tours of the State, including back calls on condemned equipment. We hope to cover the entire State in 1 year with our new outfit which we have recently obtained. By strict adherence to tolerances and careful diagnosis of trouble encountered in each scale, we cut condemnations to a maximum of 20 percent on the last tour, which brings us to the advent of our much-needed and long-sought new equipment.

In designing our new equipment, we set up specifications which we felt would give us a maximum of efficiency in every detail and the results have so far proven very satisfactory. The truck is equipped with dual rear wheels taking 10.50 by 20, 12-ply tires, and with four-wheel air-brakes; it carries a factory guarantee for a constant gross weight of 30,000 pounds and is capable of sustaining a 45-mile an hour speed on level roads. It has five speeds ahead and, of course, a reverse. The motor has a piston displacement of 525 cubic inches and is rated at 48.6 horsepower. Due to low coverings over a good many scales throughout the State, it was necessary to keep the overall height to 8 feet when light. This meant cutting the head room inside the body to 4 feet. However, this has proven sufficient for all practical purposes and we are now able to drive under all coverings and make our tests.

The overall length of the truck is 22 feet 6 inches with a 40-inch track extension at the top rear. The wheel base is 172 inches and enables us to drive on all scales with sufficient capacity to handle the 30,000-pound load. All scales of 30,000 pounds or over, with a very few exceptions, are wide enough to take our dual rear wheels. For those few exceptions, we carry a 24 by 18 by 2 inch board beveled on one end which we place on the scale platform and run one set of wheels onto it, thus raising the outside tire free of the foundation wall and permitting the entire weight to rest on the scale platform. Being part of the truck equipment it does not have to be balanced out and works very successfully.

The enclosed well-built, waterproof body is sheathed with steel, both inside and out. It is 7 feet 4 inches wide, 11 feet long, and 4 feet high inside. Running lengthwise down the center of the smooth steel deck are two 1-inch angle irons 24½ inches apart which keep the 500-pound weights from shifting. A headlight mounted in the front of the body and controlled from the dashboard in the cab furnishes plenty of light when working under cover on dark days.

A dual winch is mounted in the front of the body with controls in the cab. There are three controls, all operated by the truck motor through the regular clutch. One control shifts the motor drive to the winch. This has the same effect as the motor idling out of gear and prevents potential accidents. The other two controls do the work. One moved forward from its neutral position raises, and moved back lowers the weights. The other is operated in a like manner and moves the weights in and out of the truck. The operation is the same as the ordinary shifting of gears and is positive drive in all

four directions. The clutch is pushed to the floor and the controls shifted, whereupon the clutch is let in and the winch operates. The clutch pushed out, automatically sets the brakes on the winch and instantly holds the load at any desired point. The speed of operation is governed by the regular accelerator and the winch may be operated at high speed or very slow speed, as required. We have found this arrangement very satisfactory and a vast improvement over the old hand-operated chain hoist of the original truck.

Our testing equipment consists of four 25-pound weights, thirty 50-pound weights, twenty-two 500-pound weights, a 500-pound four-wheel rubber-tired truck, which will carry 5,000 pounds, and a two-wheel dolly with which one man can shift 500-pound weights to any part of a scale platform. Nine of the 500-pound weights and the 500-pound truck are from the original equipment purchased in 1927. The 500-pound weights, the 500-pound truck, and the new two-wheel dolly were all designed by our department.

It is imperative on a gross-load test that a very accurate check on gasoline consumption be kept at all times. With this in mind we had our gas tank equipped with a special gage of our own design and while this is very simple it performs its task admirably. It consists of valves at top and bottom on one end of the tank with a tubular glass gage connecting them, such a device as is used on a steam or hot-water boiler in your home. A heavy brass plate, fastened top and bottom and slotted in the center, was designed to permit a clear indication of the height of liquid in the glass gage at all times; this also acts as a guard against breakage of the glass. The tank was leveled and calibrated both in gallons and pounds from 0 to 38 gallons; 0 indicates a full tank, and thus the operator is enabled to determine accurately just how many pounds of gasoline have been used at any time and to deduct the correct amount from the total known load. The calibration markings are cut into the brass guard plate and are similar to those on a straight-face spring scale. Of course, the truck must be on a level plane for accurate reading and since this is the case when it is on a scale platform, the device does a good job.

Our method in testing heavy-duty scales as a general thing is to use the gross-load test on all scales of 30,000 pounds or over; on those of that capacity we make spot tests only when it is necessary to locate trouble or when calibrating State highway scales. All wagon and truck scales under 30,000 pounds capacity are given a spot test, and a capacity corner test certainly does show up any and all discrepancies. I want to say here that we have found the heavy spot test puts the careless or inefficient scale mechanic "right on the spot." Knowing his work will be carefully checked by our department, he is compelled to do good work or he will be very definitely "shown up." This is developing a very healthy condition in Jersey on scale repairs.

While three men are preferable, we are able with only two men on the truck to unload 2,500 pounds, spot all four corners of a scale, reload, and be on our way in not over 20 minutes, and we have done it on a speed test in 12½ minutes. A 5,000-pound spot test will average 25 to 35 minutes. Using three men we have unloaded the entire

equipment, assembled the two-wheel dolly, made a spot test on a State highway scale, and reloaded in 1 hour and 5 minutes.

The truck is operated by one man from our department, who contacts the superintendents of the several county and municipal departments while operating in their jurisdictions. I want to say here that each and every one of our local officials has given his wholehearted cooperation in our testing projects and rendered the operator of our heavy-duty scale testing equipment every possible assistance.

In closing, I would like to add that we have equipped the truck with every possible safety device. It has signal lights for turns and fender guides, visible both day and night, and a 2-quart fire extinguisher under 100 pounds air pressure at all times.

We feel we have a piece of equipment that will stand up and give a good account of itself for some time to come.

(At the conclusion of this paper Mr. Smith showed lantern slides of the equipment formerly in use. Through the courtesy of the State of New Jersey, the new equipment described in the paper was on exhibition during the Conference and was demonstrated to the delegates at the close of this session.)

PAPER PRESENTED BY MATTHEW J. DISERIO, DEPUTY COMMISSIONER, DEPARTMENT OF PUBLIC MARKETS, WEIGHTS, AND MEASURES, CITY OF NEW YORK, N. Y.

I trust 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.

On January 2, 1936, I succeeded Honorable Alexander Hamilton as deputy commissioner in charge of the enforcement of weights and measures statutes and ordinances, in the city of New York, who formerly, in 1935, appeared before you at a similar conference representing the city of New York, and gave a talk upon the enforcement of the coal ordinance.

As a member of the New York Bar for the past 18 years, the only problems of weight with which I have had to contend, or become proficient in the handling and checking of, have been the so-called weighty tomes of law, and as for scales—a feeling possibly of confusion and wonderment, as to why the mythological figure, portraying Justice, should have for so many centuries and until our present period, permitted herself to remain so blindfolded, and her scales so unbalanced, in the dispensation of justice, as performed and administered in her good name. But that, of course, is not to be the subject of my discussion.

Prior to my appointment to this post, I had been for a while secretary to the department of licenses of our city of New York. This department, as some of you well know, has jurisdiction over the issuance of some fifty-odd branches of the licensing of various businesses and professions; and while in this department, I obtained considerable experience in the prosecution of licensees for violations of the various city ordinances, and statutes, as well as of the rules and regulations governing the same. Such experience at least qualified me, to a considerable extent, for the business of carrying on the official and administrative work of civilian policing, and the necessary enforcement required by the statutes and ordinances, in connection with the application and enforcement of true or standard weight



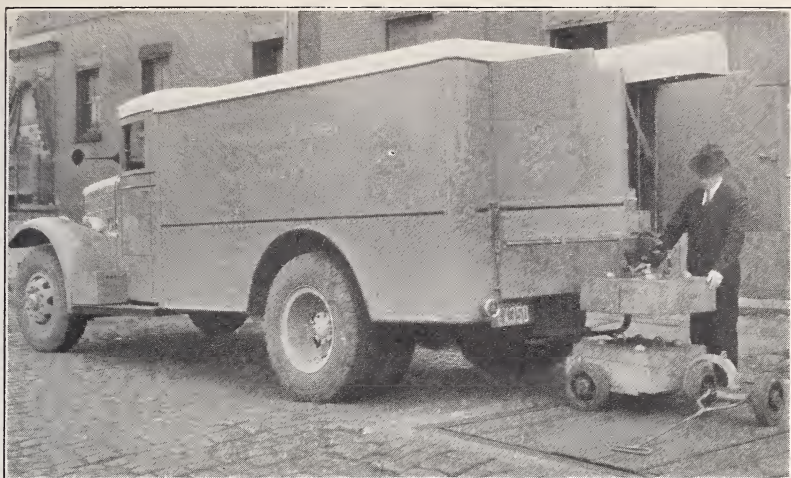


FIGURE 1.—*General view of large-capacity scale-testing equipment of the State of New Jersey.*



FIGURE 2.—*Another view of New Jersey equipment showing crane, hoist, weight-handling truck, weights, and interior of body.*



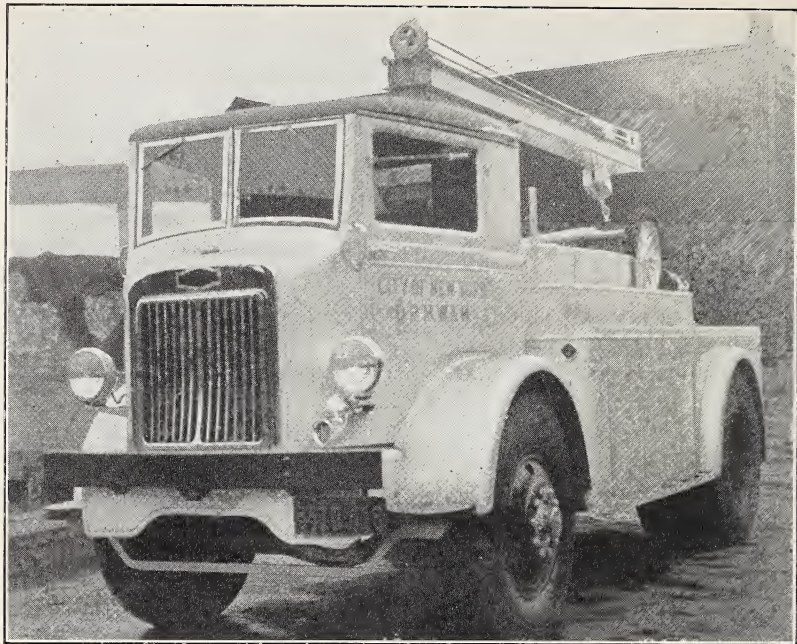


FIGURE 3.—General view of large-capacity scale-testing equipment of the city of New York, N. Y.

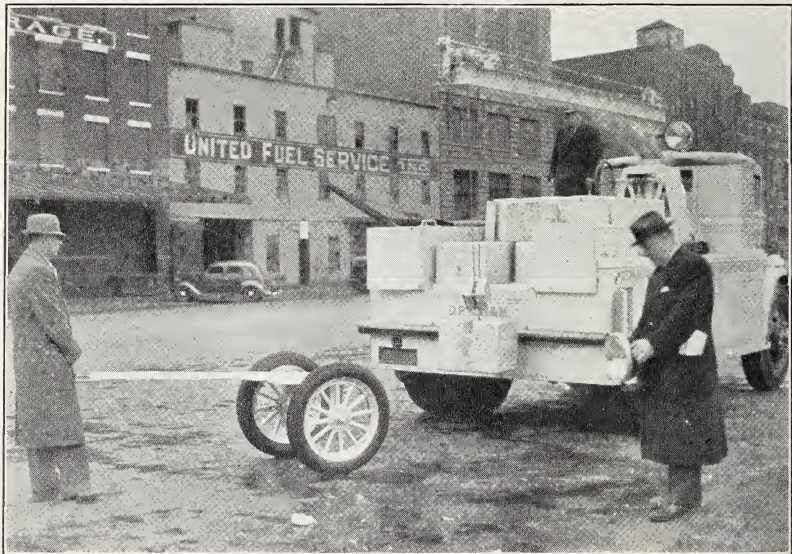


FIGURE 4.—Another view of New York equipment showing crane, hoist, dolly, and weights.

and measure in the city of New York. For the information of those who do not know, such enforcement in our city is at present exercised by the division of weights and measures of our department, known officially as the department of public markets, weights, and measures of the city of New York.

Formerly, the division of weights and measures, in such period known as the mayor's bureau of weights and measures, was an entirely separate city department with approximately 23 employees. In those days, the duties of the bureau were concerned chiefly with enforcement of the State statutes relating to correct standards of weights and measures, and included among such duties were the inspection and certification of scales, weights, and articles of count, or measurement. It at no time had reached the height nor the vast activities which are now embraced by the present division as now consolidated with the department of markets. In April 1933, the mayor's bureau of weights and measures was ordered consolidated with the department of public markets, and the title of both departments combined became then officially the department of public markets, weights, and measures.

The staff in my division, alone, now consists of approximately 75 employees, of whom approximately 70 are civilian-officers clothed with police power, engaged daily in the field of inspection and policing, and in the prosecution of violations and offenses. Since its amalgamation with the department of public markets, it has grown and assumed a position of even greater importance and is considered by many one of the finest units maintained by any municipality, for the enforcement and civilian-policing of such laws and ordinances, as well as for the investigation, supervision, and regulation of the other ordinances, or statutes with which the division of weights and measures is now entrusted, such as ice, coal, and kosher food.

New equipment for proper field inspection was purchased, and now under nonpartisan, progressive, and aggressive administration as had under the administration of Mayor LaGuardia, the enforcement of the provisions of the Federal and State laws, and city ordinances has now reached a point where I believe I can properly appear before a body such as this, with just pride in our accomplishments.

To give you a comparative analysis, in 1932 the total amount expended by the city for the administration of weights and measures activities was only the sum of \$78,290. Twenty-three men were in the field, and there was no automobile equipment, except an antiquated old truck for the carrying of 50-pound weights. When it is considered that the total budget of the city for that year was nearly 520 millions of dollars it can only be said that the city administration at that time did not give to the enforcement of the laws concerning weights and measures, the full consideration it merited, nor to the residents of our city the protection to which they were entitled.

In the 318 square miles in the city of New York, there are more than 7,600,000 people. There are over 5,500 miles of streets. Some idea of the magnitude of the job of proper enforcement of the weights and measures laws and ordinances can be had when I inform you that last year alone, we licensed nearly 8,000 coal vehicles. The total number of inspections alone for 1935 was 105,519; instruments and measures, 249,894; large scales, 3,534.



Since the reorganization of the division, we have attempted to remedy the woeful neglect of previous city administrations. We now have seventy men in the field, or more than double the number in previous years. We have five passenger automobiles, making the force much more mobile, and thus we can cope with the problem of keeping up with, following, stopping, and checking coal trucks. The expenditure for weights and measures enforcement last year was \$114,539, an increase of approximately 46 percent over the previous figure. It is hoped that with increased activity such figure shall become increased.

The results of this increased activity have fully justified the effort. Our men are turning in frequently as high as 1,000 violations a month. Compare this with 1932, when only about 800 violations for the entire year were reported, and this does not mean that New York is any the worse now than it was 4 years ago. It is obvious that the law was just not enforced.

Probably the most concrete improvement in the efficiency of the division, and one in which we take considerable pride, is our new equipment, a motor vehicle for the testing of the large-capacity scales, on display here and recently placed in operation. The cost of the vehicle was approximately \$8,300. With the 21,000 pounds in weights which it carries, the truck and equipment weigh almost 20 tons. In the consideration of and in the ordering of such apparatus, the various publications of the National Bureau of Standards and others, were studied for ideas, and the apparatus already in use by other weights and measures jurisdictions was carefully investigated. We believe we have one of the most modern test trucks in the country.

The equipment, we find, will fill a long required need. Within the limits of the city of New York, there are 130 platform scales with total capacities of up to 30 tons, which are designated and bonded as official coal scales, for the reweighing when necessary, of coal deliveries to protect the consuming public from the possibility of short weight. A city ordinance requires that these scales be tested at least once in each month. This actually required more than five such official tests for each working day. In addition to these official scales, there are located at the various coal yards in the city more than 300 large scales. Further, the license fee for motor trucks in New York State is based on the gross weight of the truck, and in our city this must be determined on a scale tested and approved by the division of weights and measures. There are nearly 116,500 motor trucks so licensed in New York City alone.

The chassis of the truck is a standard six-cylinder engine-under-the-cab type, upon which is mounted directly back of the standard three-man cab, a traveling trolley crane. A special body was designed to carry the weights and to provide a working platform. The truck has dual rear wheels, and the tires are 11.25 by 24 heavy-duty truck balloon tires. The body is of 10-gage steel, the front, bottom, and sides being welded solidly together. The top edges of sides and front are flanged to provide stiffness. A 2-inch oak floor is bolted through the body floor and angle framing is provided to support the test weights and to hold them in place. The body skirting is of 16-gage steel. Rolled-edge fenders are provided. Enclosed

cabinets of 14-gage steel with oak floors and oak rub strips are for the stowage of smaller test weights and other equipment. A diamond tread 14-gage walkway is provided on each side of the body to prevent slipping by the operator, and the space around the crane and crane winch is closed to furnish a proper platform for the operator.

The crane consists of a structural-steel base and frame which carries a cast-steel mast support. A 12-foot horizontal double-channel boom swings through 180 degrees by means of a hand-wheel-operated worm gear. The load is carried by a four-wheel trolley running on top of the boom. This trolley at present is moved along the boom by a manually operated chain device, but this will be improved to operate by power. In the near future a power-operated trolley will be installed in its place. The crane winch is operated by a power take-off from the transmission.

We tried, as you will observe, to get an attractive and striking job for the psychological effect, as well as for general appearance. A canvas cover protects the test weights from the elements when not in use. Swing screw jacks are provided to relieve the chassis of strain when the load is over the side of the truck, and to take the weight off the tires when the truck is standing idle.

The wheelbase of the truck is 129 inches and the entire over-all length from the front of the radiator to the edge of the tail gate is 220 $\frac{3}{4}$  inches. The over-all width is 97 $\frac{3}{4}$  inches. The height of the floor of the body from the ground is 48 inches, and the over-all height to the top of the boom is 124 inches.

The test weights are twenty 1,000-pound, one 500-pound, and ten 50-pound weights. They are cast iron, aluminum-bronze painted, with lifting handle and adjusting plug. The 1,000-pound weights are 15 by 15 by 20 inches. These weights have been certified by the manufacturer as being within the class "C" tolerance of the National Bureau of Standards and since delivery, the Bureau of Weights and Measures of the State of New York, through the very kind cooperation of State Director Reynolds, sent a representative from Albany to certify and seal the weights with the State seal. By means of a two-wheeled cart or dolly with automobile wheels, one man or even a boy, as was demonstrated by the young son of Mr. Holbrook, is able to move one of the 1,000-pound weights about on scale platforms with ease.

The chassis, cab, body, crane, etc., weighs 17,000 pounds (8 $\frac{1}{2}$  tons). The dolly and other extra equipment bring the total weight up to 38,800 pounds. We paid \$1,307.50 for the 21 large weights, \$67.50 for the dolly, and \$5,942 for the truck, crane, etc.

On April 15, 1936, and after a private demonstration before Mr. Holbrook and Mr. Smith of the National Bureau of Standards, the truck was inaugurated into service by Mayor LaGuardia and other city officials at City Hall, and it has been in service ever since. The time has been really too short to develop any particularly valuable technical data on the results obtained with such new equipment. However, from about April 15 to May 16, 105 large-capacity scales were tested. Eighty-four were approved; the others showed errors of from 100 pounds to 800 pounds at the gross weight used of 38,800 pounds. Four of these indicated errors of 100 pounds, five of 150 pounds, five of 200 pounds, one of 250 pounds, three of 300 pounds,

and one of 800 pounds. On another scale, an error of 170 pounds at 5 tons was found, and one scale was condemned for mechanical defects. Two scales a short distance apart in Brooklyn, in the yards of two of the most reputable coal companies, were found to differ 350 pounds—one was 150 pounds fast and the other 200 pounds slow. Both of these scales, to our surprise, were official scales.

The importance of testing counterpoise weights has been brought home very forcibly. At one of the city institutions a new platform scale was installed by one of the largest scale manufacturers, and the division of weights and measures was requested, as is the custom, to test the scale before payment. This scale, which had a beam capacity of 24 tons, was found to be accurate. The scale company in order to increase the capacity to 27 tons, supplied a counterpoise weight marked 6,000 pounds. On further test, it was found that the weight actually balanced 8,250 pounds, an error of 2,250 pounds. I am hopeful that after we will have had more opportunity to use this new equipment, and especially after the speeding up the operation which will be accomplished with the installation of the power-trolley, we shall be able to develop further statistics of a more useful, technical, and practical nature, which he hope to report in the future.

New York City is not too large nor too proud to gratefully acknowledge the splendid aid and cooperation as received from the Division of Weights and Measures of the National Bureau of Standards through the official cooperation and assistance of Mr. F. S. Holbrook, its Co-Chief and secretary of this Conference, as well as the aid, cooperation, and assistance of the weights and measures officials in neighboring and other jurisdictions. I extend a cordial invitation to those of you who should happen to visit our city, to call and personally become better acquainted with our division.

(Through the courtesy of the city of New York, the equipment described in this paper was on exhibition during the Conference and was demonstrated to the delegates at the close of this session.)

PAPER PRESENTED BY JOHN J. LEVITT, SUPERINTENDENT, DIVISION OF STANDARDS, DEPARTMENT OF AGRICULTURE, STATE OF ILLINOIS

Mr. President, ladies, and gentlemen of the National Conference, I do not know of any phase of weights and measures work which is as important today as the testing of large-capacity scales. This phase of the work has been brought on by the rapid development of transportation facilities. The weights and measures departments, as well as the scale manufacturers, have tried to keep abreast, and it has been a hard job to do it.

All of you know that up until a few years ago the wagon scale was used for weighing wagon loads of materials, the load being evenly distributed, and usually of 3 or 4 or 5 tons. But today, with the modern truck hauling from 10 to 20 or 30 tons, with about 75 percent of it concentrated on one end of the scale, it is a different problem from what we had a few years back.

I am rather new in weights and measures work; I have only been in it about 4 years. But after taking over the State department I realized that we were wasting a lot of time and money going out and testing 20- and 30-ton scales with a handful of 50-pound weights, 1,500 pounds in all. Accordingly, I contacted members of the National Scale Men's Association, members of the National Bureau of



Standards, and some of my good friends in the scale fraternity. We immediately set about to figure on a real testing equipment for motor-truck scales. We had a committee appointed and held some 8 or 10 meetings. We considered the various designs in use; we drew up some designs of our own. At one time we were all sold on a roller wheel weight of 1,000 pounds or 2,000 pounds, and we even went so far as to impose on one of our good railroad friends and have a set of them made in their railroad shops. We figured that there were three things in connection with this heavy-duty testing that were necessary. The first thing was accuracy; the second was speed; the third was safety. With that preliminary survey, which covered about a year's time, the State of Illinois recently awarded a contract for the construction of what we think is the most modern, efficient, accurate, and practical large-capacity scale testing equipment yet designed.

This equipment consists of a 3- to 5-ton tractor truck with a specially designed custom-built semitrailer. The trailer has tandem wheels at the rear, the forward end being supported by the tractor, and has a clearance of only 12 inches from the pavement, and a loading height of only 18 inches. The equipment carried in this trailer consists of four 2,500-pound test weights, forty 50-pound test weights, one complete set of sealer's test weights from 50 pounds down to grain weights, and a complete set of test cans and measures from 5 gallons down.

The trailer also carries an electrically operated industrial fork lift truck, which is calibrated to weigh 5,000 pounds and is used to transport the 2,500-pound weights from the trailer to the scale, to different positions on the scale, and back to the trailer. The loading and unloading is accomplished by means of steel ramps, 10 feet long, which enable the industrial unit to load or unload two 2,500-pound weights at each operation. The power for operating the industrial unit is generated by an automatic gas-electric power unit, installed in the front end of the trailer, and the power is conveyed by means of a large insulated cable, 100 feet long, operated from an automatic reel, permanently installed in the trailer. This reel always holds the cable tight. The cable is attached to the industrial truck by means of a special plug that permits instant detachment when the truck is being used as a test weight. The installation of the power-generating unit and cable within the truck permits the maintenance of a reasonably constant accurate weight of the industrial truck, thereby making it available as a test-weight unit. The fork of the truck may be raised to a height of about  $4\frac{1}{2}$  feet, thus permitting stacking of the weights. With this mobile electric truck a complete test of a 10 to 40-ton scale, including corner tests, can be completed in from 30 to 40 minutes actual time, from arrival to departure.

The 2,500-pound test weights are of cast iron, rectangular in shape with tapered leg base, providing 5-inch clearance for the lifting fork to pass under the weight; each weight is provided with a 2-inch offset at either end of the top of the weight to facilitate stacking of weights. Each weight is provided with a sealing cavity in the center of the top under a lifting plug socket, similar to the one used on National Bureau of Standards weights. This lifting plug socket will permit the handling of weights by means of an adapter with

block and tackle or other suitable lifting device in case of an emergency, and also facilitates the calibrating of the weights. These weights are secured in the truck in stacks of two, suitably anchored to prevent any moving while in transit, and the industrial truck is likewise secured. The use of this industrial truck and these weights eliminates all manual labor, and also eliminates the abuse to which weights are subjected when they are pulled about on the platform. With our equipment you slip the fork of the industrial truck under the weights, pick them up, drive onto the platform, set the weights where you want them and back out. In that way there is practically no wear at all on the weights.

The entire testing unit is 28 feet long and 7 feet in width and the maximum height is 9 feet 6 inches from the pavement.

The trailer is equipped with a small door in the front of the right side to permit easy access to the gas-electric generating unit, and double rear doors are attached on piano hinges to permit swinging of doors against the sides of the car when opened. The tractor, trailer, and industrial truck are painted a rich dark blue, trimmed in orange, with the inscription, "State of Illinois, Motor Truck Scale Test Unit, Division of Standards, Department of Agriculture", appearing in orange on the sides and rear of trailer.

Delivery of this equipment will be made during the week of June 15th, and an invitation is hereby extended to all persons interested to attend the dedication ceremony to be held at the National Bureau of Standards Master Scale Depot, Saturday morning, June 20th. At this time, representatives of manufacturers who supplied parts of the equipment will be present and a thorough demonstration of the unit will be given.

It is the intention of our department in making tests of motor-truck scales to use test weights equivalent to one-fourth the capacity of the scale on each of the four corners, using the industrial unit as a strain load at the center after each corner test. This test will require a 2,500-pound load for 5-ton scales, a 5,000-pound load for 10-ton scales, a 10,000-pound load for 20-ton scales, and a 15,000-pound load for 30-ton scales. The readings will be recorded on a special report blank, a copy of which will be given to the scale operator and one copy sent to Springfield with the report of the inspection. This report will be valuable to scale repair men when making repairs or adjustments on scales that have been condemned for not being within tolerance. The 50-pound weights and smaller weights will be used in determining errors and for checking scales of smaller capacities than 5 tons.

In the past, tests on motor-truck scales have been made with thirty 50-pound weights on all scales regardless of capacity. The weights were handled by one man, and it required from 2 to 4 hours to check one scale. During a special survey made by this department covering 200 scales of all types and capacities, using 6 men and 5 tons of 50-pound weights, we found that over 50 percent of scales that were within tolerance on 1,500-pound tests were not within tolerance, when one-fourth of the scale capacity was applied on each corner. This survey was made at the suggestion of some of our mutual friends in the scale fraternity and the findings were sufficient to satisfy us that the methods we were employing were obsolete, inaccurate, and really

meant little or nothing. With this information and the encouragement of the National Bureau of Standards, National Scale Men's Association, Coal Dealer's Association, Grain Dealer's Association, and reputable scale manufacturers we were able to convince the administration officials of the necessity of a modern testing unit, with the resulting appropriation of \$20,000 for such purposes.

The time consumed in the testing of a scale is important to our division. We work under a fee system and the department is expected to be at least partially self-sustaining. But that is not the most important consideration. The most important reason for speed is to accommodate the owner of a scale. Down in our State we have many coal mines, and a large amount of the coal is handled by trucks. When we go in to test a man's scale he may have 10 or 15 trucks waiting to be loaded and weighed. When you tie him up for 2 or 3 hours in testing his scale you do not make of him a good friend of your department. If you can go in and tell him you will make a complete test of his scale in 20 or 30 minutes you are really accomplishing something—you are saving him a lot of time and money. That is one of the reasons we considered the time element as being very important.

Since the appropriation was made we have found it necessary to get permission to use some contingent funds to give us a little more money to carry on, but the money will be well spent and I think everybody is going to be well pleased with the outfit. The cost of this truck, trailer, industrial unit, and weights was approximately \$10,000.

Our department is deeply grateful to all those members of the scale fraternity, who so ably assisted us in working out the details of this unit. At this time I wish to personally thank all who participated in any way in bringing the design and construction of this testing unit to a successful conclusion, and I trust the improvement in the service of our department will partially repay them for the many hours of work and study they so freely gave us in assisting on this project.

(At the conclusion of this paper Mr. Levitt showed a number of lantern slides of the equipment described in the paper.)

#### DISCUSSION OF ABOVE PAPER

Mr. WARD. How much effect will snow storms have on the operation of that truck? You have a limited clearance there and your snow storms in Chicago are sometimes quite heavy.

Mr. LEVITT. The clearance seems very limited, twelve inches, but the ordinary passenger car has only ten and a half to twelve inches clearance, and we can operate any time a passenger car can operate. We went into that very thoroughly. There may be days when it is real bad when we will have to tie up.

Mr. HARRINGTON. Could you tell me the total cost of that outfit?

Mr. LEVITT. Approximately \$10,000. That included everything. Our purpose in buying the whole equipment on one contract was that the contractor would then be willing to devote a lot of time and attention to the unit. Also he could give a guarantee on it, whereas if we bought the truck one place, the trailer another, the industrial unit another, and so on, in case of any difficulty each would



try to blame it on the other fellow's equipment. We decided that the proper thing to do was to have one company build it and have them assume the responsibility for the operation of the truck, which they were glad to do.

REMARKS OF EDWARD K. STROBRIDGE, SEALER OF WEIGHTS AND MEASURES,  
COUNTY OF ALAMEDA, CALIF.

When I came into the department of weights and measures of Alameda County in 1917 the department was equipped with a light truck that carried a ton of 50-pound weights. I realized shortly that the testing of heavy-duty scales with a ton of weights was rather a joke, so I induced my board of supervisors to furnish me with a larger capacity truck. When we secured that two-cylinder truck we thought we had the finest equipment in the world.

The County of Alameda has a area of 800 square miles and there are some sections that are inclined to be a little hilly. I was much disappointed to find that when we had 5 tons of weights on the new truck we did not have power enough to get around to some of the scales that were located in the hilly territory, so we would have to unload half of them to get up to the scale and then go back and pick them up again.

In 1925 I designed a motor-truck scale-testing equipment consisting of a four-cylinder truck carrying five 500-pound weights, 5,000 pounds of 50-pound weights, a 500-pound dolly, and a 350-pound dolly. The weights were loaded on the dollies, and we made corner tests with 5,000 pounds on the ordinary scale. Of course, we used the truck as a strain load in conjunction with the corner tests. We never had an absolute known weight of the truck itself because there would be a variation in the amount of gasoline consumed, and we had to estimate that loss. This equipment was practically duplicated in New Jersey soon after mine was in operation; Mr. Foley, who was then superintendent of weights and measures of New Jersey, had me send him my plans and specifications, and their equipment was designed from mine.

In time we found that the size of the scales was developing much faster than the equipment for the testing of them, and after the experience of having designed two other equipments for testing heavy-capacity scales I saw no reason why we shouldn't have in combination with a truck a known-weight trailer, about which there would be no question as to its accuracy. This would be accomplished by having it sealed on the Southern Pacific master scale, which is tested each year by the National Bureau of Standards.

This new outfit was accordingly procured, and was put in service last fall. It is what we call a general utility piece of equipment, designed to test the 148 heavy-capacity scales in my territory. It comprises a truck carrying 8,000 pounds of standard weights, and a semitrailer loaded with railroad rails and standardized at 20,000 pounds. The outfit measures, when coupled up, 33 feet over-all. It is operated by two men.

In testing a multiple-section motor-truck scale, we use the truck to place the trailer over one of the end sections of the scale, and then drive the truck off the platform. The wheelbase of the trailer between the rear wheels and the small wheels that drop down to



FIGURE 5.—General view of motor-truck scale-test unit of the State of Illinois.



FIGURE 6.—Another view of Illinois equipment showing industrial truck, weights, and ramp.



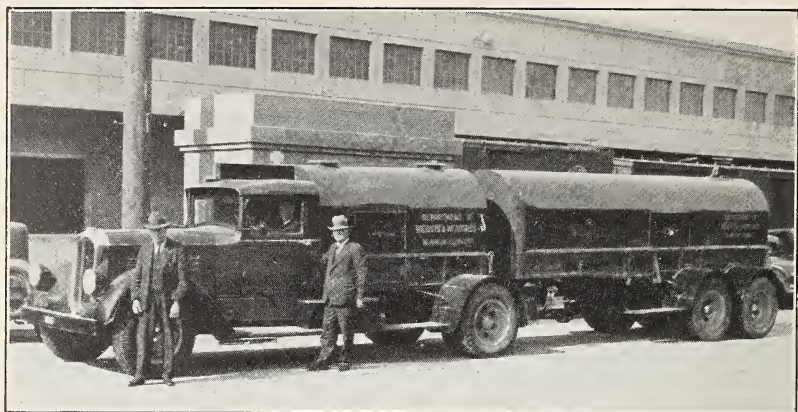


FIGURE 7.—General view of motor-truck scale-testing equipment including known-weight trailer, of county of Alameda, Calif.

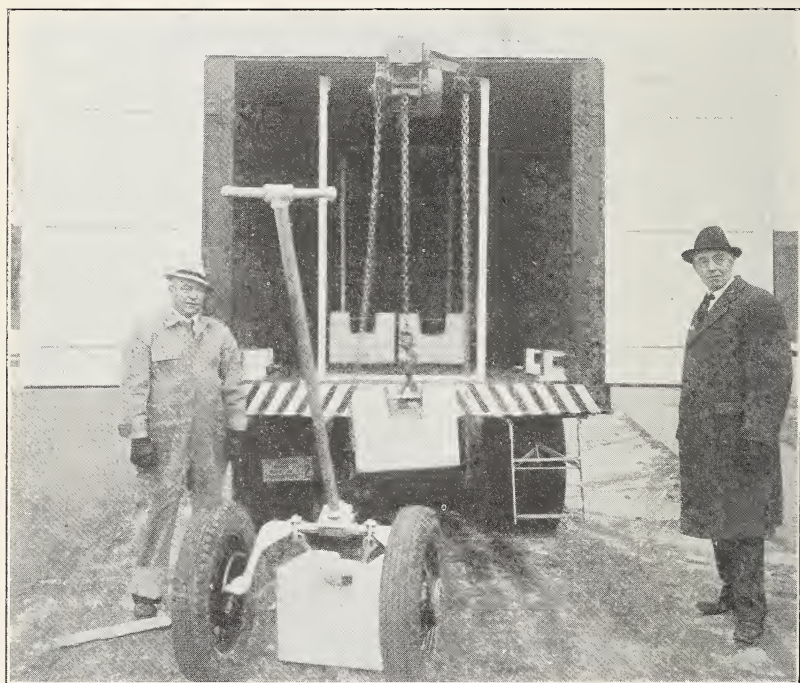


FIGURE 8.—Rear view of large-capacity scale-testing equipment of State of Michigan showing crane, hoist, dolly, and weights.



support the front end of the trailer, is 76 inches, so that we have our entire load on one section of the scale where it ought to be. After the test of the first section, the truck is attached, the small wheels are raised, and the trailer is moved on to the next section, and this is tested. This operation is repeated for the remaining sections until we come to other end section, where we couple up again, drive off, turn around, and bring our trailer back on to this end section so that the weight will be exactly over the section as it was at the opposite end.

When we have made this test and find that the scale is testing out at 20,000 pounds correctly we pull the trailer off and weigh our truck, which weighs about 18,250 pounds. This also was weighed on the master scale, and the variation will be slight, based on the amount of gasoline that has been consumed. When we have weighed the truck we couple truck and trailer together and put them on the scale. This is a test load of about 38,000 pounds.

When we started out with this equipment we thought that it would be necessary to make a corner test, but after using it for a short time we saw no reason, unless a scale was badly out of repair, to spend the time to make this. If the scale did not test out it was the job of the scale mechanic to find out where the trouble was and to correct it.

We still maintain in the truck the old 500-pound dolly and the chain blocks and the 500-pound weights, so that we can make corner tests if we feel it is necessary. When we do this we make the test with a load of 3,000 pounds. We also still carry the 50-pound weights which are accessible from the side of the truck.

In working a territory the motor-truck scales are tested first. The trailer is then parked and the inspectors go into the different warehouses or factories and use this equipment for the testing of all types of dormant scales. We have made it a practice, where we can, to put 1,000 pounds of known weight on a 1,000-pound scale, and 5,000 pounds of weight on a 5,000-pound scale.

We feel that this equipment is probably as good a general utility piece of equipment for the testing of dormant and motor-truck scales as there is in any county in the United States.

(During the course of his remarks, Mr. Strobridge showed lantern slides of the equipment which was being described.)

PAPER PRESENTED BY JOHN M. DANIELS, CHIEF INSPECTOR OF WEIGHTS AND MEASURES, DEPARTMENT OF AGRICULTURE, STATE OF MICHIGAN

Mr. President, ladies and gentlemen of the Conference: Michigan has long realized the necessity of a heavy-capacity scale-testing equipment, and on the 18th of December last an equipment of this nature was put into service. In view of what has been written and discussed relative to heavy-capacity scale-testing equipment and methods of testing, it is quite difficult to provide any new or novel apparatus, which in many cases must be limited in expense to conform to funds available. Therefore, in Michigan it was deemed best to provide a test of 10,000 pounds of known weight, due to road, bridge, and weather conditions. A heavier outfit might have proved troublesome when gravel roads were encountered at certain periods of the year.

The test units consist of ten 1,000-pound weights, carried in a standard commercial truck, provided with a 6-inch I-beam running entire length of truck body and extending 24 inches beyond at rear, the body being closed entirely with doors for full opening at rear. The body height of 6 feet provides ample head room for operating the hand-operated 1-ton combined hoist and traveler for moving the 1,000-pound units from truck to scale platform. A special two-wheel dolly is employed to transfer the weights to the desired locations on the scale platform.

This equipment has operated continuously since it was put into service excepting for 2 days of extremely cold weather. After this period of use under varying conditions it is obvious that improvements could be made. A power-operated hoist, and a hand winch form of traveler are the most important of these, since greater speed in making a test would be realized. Loading the weights is now a test of the physical ability of the operator. The type of traveler mentioned is quite necessary in the many instances where the approach to scale platform is steeply inclined. In some instances this prevents a test, it being impossible to move the weight along the inclined I-beam. Under normal conditions there is sufficient incline to the I-beam to prevent any danger of the weights getting out of control. Another method of overcoming the inclined-beam difficulty would be to provide a flexible support at inside end of beam and a method of adjusting the outside end of beam over a range of at least 6 inches.

To avoid unnecessary loss of time in loading and unloading the weights, the floor of body should be made as low as possible; the width should be no greater than cab to facilitate backing the truck to a scale and to make it safer in turning when in transit. A permanent top cover and sides is not desirable. A tarpaulin with fastening arrangements is sufficient to protect against storms. In case of a 10,000-pound equipment it will be found to be of benefit if the truck, minus the test weights, weighs slightly less than 10,000 pounds. Then, by a small added weight, the truck can be made to indicate the same as the test weights did and its weight thus accurately determined. The test weights can then be added, one or two at a time. A strain load of 10 tons is desirable in instances of 15- to 30-ton scales.

Owing to the numerous installations of housed or covered scales, the total height of equipment should be kept as low as possible to permit the use of the truck in instances where the scale capacity permits. The method of applying the test necessarily must vary to suit particular circumstances. The first step in all instances is the use of one ton applied on all corners; then one ton is applied on each corner at one end of platform, and this is followed by adding a like amount to opposite end of platform. The balance of the weights are then applied at the center, or in case of a 15- to 30-ton scale these may be applied to ends of platform only, or a special arrangement of weights may be used to further develop an indicated error. In all instances possible the truck is used to provide a strain load and thus bring the test into the commercial range of the scale. Great care must be used to avoid overloading a light or old scale by passing the gross load over the platform. The

loaded truck should be kept off the platform until an examination of scale capacity and construction has been made. As yet no damage to a scale or appurtenances has occurred through the use of this heavier equipment.

The reactions of scale owners has thus far been very gratifying. They have long realized that the former testing methods were inadequate. Needless to say, the purchasing public are equally pronounced in their approval of fair methods of testing. In numerous instances, scales indicated very well when tested as formerly, but when a more severe test was applied, serious errors were apparent. This was as anticipated by all parties familiar with scale performance.

The citizens of Michigan may justly feel proud that they have at the head of the department of agriculture men who are alert and responsive to the need and requirement of accuracy in fair dealing. James F. Thomson, commissioner, George S. Willard, deputy commissioner, and George S. Barnard, director, bureau of foods and standards, are giving their unqualified support to weights and measures activity in this State, and have made possible the equipment previously mentioned.

The writer would seem very ungrateful if mention was not made of the valuable and cheerful assistance rendered by Irving G. Wheeler, sealer of Jackson County, who had previously constructed a similar equipment.

The CHAIRMAN. Gentlemen, I feel that the Conference is to be congratulated upon the many evidences of cooperation among the members of the Conference in developing this important equipment for the testing of heavy-duty scales.

#### APPOINTMENT OF COMMITTEES

The CHAIRMAN. I have certain important committees, the membership of which I desire to announce.

*Committee on Nominations*—J. J. Levitt, of Illinois, chairman; James A. Boyle, of Portland, Me.; S. T. Griffith, of Baltimore, Md.; Martin L. Lang, of Indiana; Harry S. Provost, of New Jersey; Louis G. Waldman, of St. Louis, Mo.; and S. H. Wilson, of Georgia.

*Committee on Resolutions*—Walter G. White, of New Hampshire, chairman; W. S. Bussey, of Texas; J. M. Daniels, of Michigan; J. B. Fink, of Washington; C. P. Smith, of Suffolk Co., N. Y.; E. K. Strobbridge, of Alameda Co., Calif.; and J. A. Sweeney, of Boston, Mass.

#### ANNOUNCEMENTS

The CHAIRMAN. I would like to call upon our secretary, Mr. Holbrook, for certain important announcements.

Mr. HOLBROOK. The following material is now available on the desk for distribution: The proposed amendments to the Model State Law; a report of the Committee on Specifications and Tolerances on modifications of specifications and tolerances and regulations for scales; a list of those in attendance at the present Conference; a sheet descriptive of the tour of the National Bureau of Standards laboratories, which will take place this afternoon; and, for those who desire it, a circular letter on specifications for the repair of scales of large capacity.



## EXHIBITION AND DEMONSTRATION OF LARGE-CAPACITY SCALE-TESTING EQUIPMENTS

Mr. HOLBROOK. I think the Conference owes a vote of thanks, very sincere thanks, to the State of New Jersey and the city of New York for bringing, at their own expense, to this Conference their large-capacity scale-testing equipments which you have heard described. The next half hour will be devoted to a demonstration of those equipments, which are located, as you have doubtless observed, a short distance from the front door of this building. They will be available for more detailed examination in the afternoon and tomorrow also, but they will be in operation during the next half hour.

I might also mention that we are fortunate in having a Toledo exhibit truck here, in which are located various scales and precision devices. That truck is parked adjacent to the large-capacity scale-testing outfits, and I think it would be well worth while for you to make a visit to that. That will also be on exhibition this afternoon and all day tomorrow.

Mr. COYLE. If right and proper at this time, as a matter of record, I would move that this Conference extend to the city of New York and the State of New Jersey its sincere thanks for bringing their large-capacity scale-testing equipments here.

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

(At this point, at 12:30 p. m., the Conference witnessed the exhibitions and demonstrations referred to above, and took a recess until 2 p. m.)

## FOURTH SESSION—AFTERNOON OF WEDNESDAY, JUNE 10, 1936

### TOUR OF THE LABORATORIES OF THE NATIONAL BUREAU OF STANDARDS

(The afternoon session of the Conference consisted of a visit to various laboratories of the National Bureau of Standards, particular attention being devoted to the Division of Weights and Measures. Special demonstrations were given in the laboratories, designed to illustrate the character and scope of their activities. In order to make the tour of maximum interest and helpfulness, the delegates and guests of the Conference were divided into small groups, each group being in charge of a member of the staff of the Bureau.)

## FIFTH SESSION—MORNING OF THURSDAY, JUNE 11, 1936

(The Conference reassembled at 10:15 a. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

The CHAIRMAN. The session will please be in order.

The Chair has some announcements to make. Inasmuch as I am to appear on the program a little later this morning I desire to place the first part of this morning's program in the hands of Vice President Baucom, and the program tomorrow morning I wish to place in the hands of our first vice president, Mr. McBride. The program this afternoon I will place in the hands of Vice President Lang. I shall ask Vice President Tinkey to take the chair immediately after the address of the Assistant Secretary of Commerce.

Will Vice President Baucom please come to the platform?

(Mr. Baucom was not present.)

### DEMONSTRATION OF RECENT DEVELOPMENTS IN WEIGHING AND MEASURING APPARATUS, BY REPRESENTATIVES OF MANUFACTURERS

SECRETARY'S NOTE.—At this point several manufacturers brought before the Conference samples of apparatus embodying new design features, and demonstrated them to those in attendance. Particular attention was given to the new features incorporated, the method of manipulation of the adjustments provided, and the answering of questions asked by members. As was the experience in former cases, it was found that many of the remarks made are of no value to a reader when a sample of the product is not before him, and thus no good purpose would be subserved in printing such material here. Consequently it has been omitted from the report.

It may be noted that such demonstrations as these, which familiarize the delegates with new apparatus, are of great interest and value to them. Attendance at the Conference is the only way in which advantage can be obtained from program features such as this. The delegates were duly appreciative of the efforts of the manufacturers who took part in this demonstration.

(During the progress of the demonstration, C. D. Baucom, second vice president of the Conference, assumed the chair.)

### END TESTING VERSUS CORNER TESTING FOR MOTOR-TRUCK SCALES

By M. J. J. HARRISON, *Chairman, Committee on Method of Test of Motor-Truck Scales, National Scale Men's Association*

Mr. President and gentlemen of the Conference, my program assignment might appear to limit my remarks this morning to the testing of motor-truck scales as a specific class. While I shall use that term for reference purposes in what I have to say, I would like to emphasize that, from the point of view of a weights and measures official, there is no reason for distinguishing between a motor-truck scale, as such, and a wagon scale, as such. It is elemental, of course, to mention that there are important differences between these two classes, from other than a weights and measures standpoint. These



differences include platform sizes, nominal capacities, and, most important of all, structural strength in proportion to nominal capacity. However, it is hardly the function of the weights and measures official to determine whether a given scale is a motor-truck scale or a wagon scale; it is his function to determine whether or not the scale will indicate the correct weight of any load within its nominal capacity. Both motor-truck scales and wagon scales are provided for the weighing of highway vehicles, and, in practice, a wagon scale may be used to weigh a motor truck, or vice versa. Therefore, for the purpose of the present discussion, let us assume that a motor-truck scale is any platform scale on which highway vehicles are weighed.

As a second preliminary in this connection, I would like to make the point that, in any line of endeavor, it is appropriate from time to time to take stock of methods and practices—to examine them to see if they are up to date or if they are merely the result of more or less adapted tradition. Every one of you gentlemen has seen changes in merchandising methods with the passing of years, and the introduction of new equipment of every kind by so-called progressive merchants. This has come about, often at considerable expense, simply because those merchants have been convinced in one way or another that their old equipment or methods were no longer efficient. It is just as important that weights and measures officials should examine their practices to determine their efficiency. I therefore propose a few pertinent questions, and my own answers thereto, with respect to the testing of motor-truck scales.

First, what are the objects of testing a motor-truck scale? I am of the opinion that they are three in number, to wit: (1) to insure proper physical condition of a newly installed or reinstalled scale; (2) during the useful life of the scale, to insure that its indications are accurate within legal or customary requirements; and (3) in the event of inaccuracies in weight indications as developed by test or otherwise, to aid in determining what corrective action should be taken.

It is obvious that the number of times that the official will have a new scale to examine and test will be relatively few as compared with the number of routine tests which he will normally make. Furthermore, subject to local conditions and to applicable regulations governing the amount of mechanical work to be performed by the weights and measures official, and more especially as a result of the gradual improvement in weighing equipment which always results from active enforcement of appropriate weights and measures laws and regulations, the number of times that the official will have to determine the exact corrective action to be taken with respect to a particular scale will be fewer than the number of routine tests which he will normally make. I therefore submit that the first consideration of the official should be to satisfy himself as a matter of routine that the indications of the scale are correct under practical conditions of loading.

This immediately suggests my second question, which is "What are practical conditions of loading of a motor-truck scale, and what relation should exist between such conditions and the technic of testing?"

In considering this question, let us refresh our memory as to the development of scale-testing technic. All of you gentlemen are

familiar with the procedure outlined in Handbook M85 of the National Bureau of Standards for testing platform scales, which rather definitely contemplates what may for convenience be called "corner testing." This is a perfectly proper procedure for the smaller sizes of platform scales, where the location and manner of application of the load on the platform are hardly to be controlled. So long as the load is entirely supported by the platform of such a small scale, its center of gravity may reasonably be assumed to occupy any position on the platform. However, this is by no means true with respect to motor-truck scales, where the loads are invariably applied to the platform on axles. Here we have at least a partial control over the lateral location of the center of gravity of the applied load, and that center of gravity will never, in practice, be at either side of the platform. Bear in mind, if you please, that the maximal width of motor-truck scale platforms is 10 feet, and that the over-all tread of highway vehicles varies from 5 to 8 feet, depending somewhat roughly on the carrying capacity of the vehicle. From these figures, it will immediately be obvious that the center of gravity of a small vehicle may, at the most, be 2.5 feet away from the longitudinal center line of a wide scale platform, while the center of gravity of a large vehicle would never be more than 1 foot away from that center line.

It will be admitted, I believe, that these considerations cannot be said to justify "corner testing", especially since the average operator of a highway vehicle will always tend to spot his vehicle near the center of the scale platform rather than close to one edge.

And, speaking of the development of testing technic, it is by no means improbable that the relatively small quantity of test weights with which all too many tests of motor-truck scales have been made has, in itself, suggested "corner testing." If this be so, it has probably been because the amount of test load was so small that no overload would result, no matter how the test load was concentrated on the platform, and it was simply applied as a "corner test" because that was the only way in which any material amount of load could be applied to a given main lever. In other words, I can easily believe that the practice was the result of circumstance, rather than a development of real testing technic.

My third question has to do with manufacturing practice. Has any change occurred therein which has a bearing on testing technic?

There is at present an apparently strong manufacturing tendency to produce motor-truck scales on what is usually called the "rail-road pattern." This type of construction has been accepted as entirely satisfactory by scale men, and has been used for many years in the construction of railway track scales. From a weights and measures standpoint, the pertinent feature of this design is the absence of provision for "corner adjustment." In other words, there are no nose irons on the main levers, and lever ratio adjustment is possible only as between the ends of the platform, or for the scale as a whole.

My fourth question has to do with the amount of time required by the weights and measures official to make an adequate test. I emphatically do not want to be understood as suggesting that sufficient time should not be taken to accomplish the full purpose of the

test. However, is there any point in spending more time in doing a job than is required for the specific result desired? The amount of time required for a test of a scale to some extent controls the number of tests which the official can make in, say, a day, and in any event, directly determines the length of time during which the owner of the scale is deprived of the use of his property. It is obvious that the busier the scale, the more important it is that its accuracy or otherwise be determined, and the more costly to the owner will be his inability to use the scale by reason of the presence of testing equipment on or adjoining the platform. To my mind, the official should keep in mind the fact that a busy motor-truck scale is an important adjunct of the business of its owner, and, while sufficient time should be taken to make a competent test, the official should so conduct his test as not to tie up the business for an undue length of time. Therefore, if he can save time by not making "corner tests", as such, and at the same time satisfy himself as to the accuracy of the scale, he should so arrange.

It has been argued that "end testing" will not necessarily develop the same order of errors as will "corner testing." Personally, I doubt the validity of this argument, and I submit that an experienced inspector who makes an "end test" with an adequate test load will know beyond question whether or not the scale he is testing is weighing correctly. My belief, as just expressed, is confirmed by the comment made yesterday morning by Mr. Strobridge.

Those of you who heard my remarks at the Twenty-fifth National Conference, or who read the report of that Conference, will recall that I then called attention to the tentative recommendation of the National Scale Men's Association to the effect that corner tests of motor-truck scales need not be made except for information in the event repairs or adjustment were necessary. In what I have said today, I have tried to outline the considerations which led to that conclusion. These can be summarized somewhat as follows:

(1) Testing technic should be consistent with the conditions of practical use of the device under test.

(2) "Corner testing" is consistent with conditions of practical use of small-capacity and floor scales. It is not consistent with conditions of practical use of motor-truck scales.

(3) Modern manufacturing tendency is definitely along accepted lines which do not contemplate nose iron adjustments to affect individual corners.

(4) This Conference should formally recognize the value of that testing technique which requires the least time for testing a given scale, provided that sufficient test load is used to develop satisfactorily the correctness or otherwise of the scale under test.

(5) This Conference should formally recognize the development of conditions which did not obtain and could not be anticipated when the present Conference recommendations, as set forth in Handbook M85, were adopted, and should act to modify those recommendations so that they may be consistent with modern requirements. Specifically, it should be recognized that "end testing" of motor-truck scales will, as a matter of routine, save time in testing and develop all essential information for the weights and measures official.

I do not care to take up the time of this morning's meeting by reading the definition of a standard test of a motor-truck scale as tenta-



tively adopted by the National Scale Men's Association. However, I shall supply your secretary with a copy of that document, with the suggestion that it be included in the report of the present Conference as an appendix to my remarks this morning.

NATIONAL SCALE MEN'S ASSOCIATION TENTATIVE DEFINITION OF A STANDARD  
TEST OF A MOTOR-TRUCK SCALE (MAY 21st, 1935)

1. *Ideal Test*.—An ideal test of a motor-truck scale would be a test to the full nominal capacity of the scale, using test weights exclusively. Under favorable conditions, this can be approximated by the use of a sufficiently large quantity of test weights and a series of "strain loads", so ordered that the test can be carried forward by steps to the nominal capacity of the scale.

2. *Minimum Quantity of Test Weights*.—In practice, an acceptable test of a motor-truck scale requires a known test load of not less than 25 percent of the nominal capacity of the scale under test. When 25 percent of the nominal capacity of the scale exceeds 10,000 pounds, at least 10,000 pounds of known test load should be used. This test load should consist of standard test weights which have been properly verified and sealed.

3. *Strain Load*.—One or more strain loads, not necessarily of known weight value, are also required. It is essential that the total load applied to the scale (strain load plus test weights) at least equal the gross weight of the heaviest loaded vehicles presented at the scale for weighing. This total load will generally approximate the nominal capacity of the scale.

4. *Intermediate Strain Load*.—If the strain load used, or to be used, to produce the above named condition of loading, exceeds twice the value of the known test load used (test weights), an intermediate strain load should also be applied as part of the test procedure. The value of this intermediate strain load should approximate the value of the known test load (test weights) used in the test.

5. *Test Procedure*.—After balancing the scale with no load on the platform, the known test load should be applied, in increments of not less than the value of the main graduations on the weighbeam. As a minimal requirement, the apparent error of the scale should be noted and recorded when approximately one-half of the test-weight load is on the platform, and again when all test weights have been applied. Each element of the weighbeam and/or dial should be tested. "Corner tests" need not be made except for information in the event repairs or adjustments are necessary. The test weights should now be removed from the platform, and the balance condition of the scale should be checked. The intermediate strain load, if such is to be used, should be placed on the scale platform, and its weight as indicated by the scale should be carefully determined. The test weights should again be applied in the same way as above indicated.

If a second strain load is necessary to carry the test through the commodity-weighing range of the scale, the platform should again be cleared and the balance condition of the scale should be checked. The second strain load should then be applied, its weight as indicated by the scale should be carefully determined, and the known test load should again be applied as above indicated.

The value of the SR should be observed and recorded at both zero load and under the maximal applied load.

6. *SR Defined*.—In scales provided with a beam and trig loop, the SR (sensitivity reciprocal) is the weight required to be placed upon the platform to turn the weighbeam from a horizontal position of equilibrium at the middle of the trig loop to a position of equilibrium at the top of the loop.

7. *Performance Requirements*.—The tolerances to be allowed in excess or deficiency on all motor-truck scales shall be two-tenths (0.2) of 1 percent of the applied load; provided, however, that the manufacturers' tolerances or the tolerances to be applied on all new or newly rebuilt motor-truck scales and wagon scales shall be one-tenth (0.1) of 1 percent of the applied load; and provided further, that the tolerances so applied shall in no case be less than the value of one of the minimal graduations on the weighbeam, except that the manufacturers' tolerances or the tolerances on new or newly rebuilt scales shall in no case be less than the value of one-half of one of the minimal graduations on the weighbeam.

The maximal value of the SR should not exceed twice the value of the minimal graduation on the weighbeam, and shall in no case exceed 20 pounds. For new or newly rebuilt scales, the maximal value of the SR should not exceed the value of the minimal graduation on the weighbeam, and shall in no case exceed 10 pounds.

When the scale is of the automatic-indicating and/or recording type, the tolerances to be allowed in excess or deficiency for tests at increasing loads shall be those specified for beam scales; provided, however, that the tolerance on the dial or reading face shall in no case be less than the value of one of the minimal graduations on the dial or reading face, or one five-hundredth of the capacity of the dial or reading face, whichever is less, except that on such of these scales as have a minimal graduation of 1 pound or more on the dial or reading face, such tolerance shall not be less than 1 pound. The tolerances on any beam or beams with which these scales may be equipped shall be the same as those specified above, except in cases where the value of the minimal graduation on any such beam is less than that of the minimal graduation on the dial or reading face, or one five-hundredth of the capacity thereof, whichever determines the minimal tolerance on the dial or reading face, in which case the minimal tolerance on any such beam shall be the minimal graduation on any beam with which the scale may be equipped. The manufacturers' tolerances or the tolerances on all new or newly rebuilt automatic-indicating and/or recording scales shall be one-half of the values specified above.

8. *Miscellaneous*.—If the scale is equipped with a type-registering weighbeam, or with an automatic recording device, the inspector should satisfy himself by trials at several points between zero and full capacity that the type impressions are clear and legible and that the recorded values agree with the respective poise or dial indications.

An adequate report form is essential. All readings should be taken with due care and with as much precision as is consistent with the sensitivity of the scale; however, it should not be necessary to take readings closer than to the nearest pound. The entries on the report form should convey a clear picture of the performance of the scale under test conditions.

Attention is called to the necessity for caution in interpreting test results and in applying tolerances when strain loads are used in addition to the test load of known value.

Attention is further called to the fact that several testing agencies have demonstrated the economy of using test weights of 500- and 1,000-lb denominations instead of the more usual 50-lb weights, for testing scales of the classes here referred to. Appropriate means of transportation and devices for handling must, of course, be provided if weights of the larger denominations are to be used.

#### THE NATIONAL BUREAU OF STANDARDS PLAN OF COOPERATION WITH OFFICIALS IN RELATION TO TESTING EQUIPMENT FOR LARGE-CAPACITY SCALES

Dr. BRIGGS. Mr. Holbrook and Mr. Smith of the Bureau have recently given much attention to the subject of testing equipment for large-capacity scales used in weighing motor vehicles. The discussion yesterday confirms our belief that the adequate testing of these scales and the design of equipment for this work is one of the most pressing problems of the weight and measures official and that this subject is one of the most important things before the Conference.

I am happy to inform you that the Bureau has recently made arrangements for the purchase of equipment for testing large-capacity scales. We have two reasons for procuring this equipment. One is that it will enable us to test large scales owned by the Government; the other, and perhaps the more important one, is to assist those States that have not as yet procured suitable equipment for the testing of large-capacity scales. Through the agency of this equipment we shall be able to secure and furnish information to these States regarding some of the scales in their respective jurisdictions. This will



enable them to determine whether or not they require special testing equipment and to present the results of actual tests in case it is demonstrated that such equipment is needed.

The discussion yesterday gave us up-to-date information regarding the various types of equipment which have been developed for this purpose. Throughout the development of all of this equipment, including our own, there has been an extensive interchange of ideas among these various groups in the effort to realize equipment which will be the most satisfactory for its purpose.

Mr. Chairman, may I now suggest that you call upon Mr. Holbrook to outline the procedure which the Bureau expects to follow in the operation of its equipment, and then upon Mr. Smith to describe briefly its type and design? Thank you.

The ACTING CHAIRMAN. We will now hear from Mr. Holbrook.

Mr. HOLBROOK. Dr. Briggs has told you that we are purchasing a large-capacity scale testing equipment and has emphasized that this is being procured in furtherance of a desire to assist you in obtaining your own equipments for the adequate test of large-capacity scales. We intend no routine testing of scales, except, as he has said, of those owned by the Government of the United States.

As you know, the advent of the large-capacity scale has been extremely rapid, and the capacity of these scales has been increasing by leaps and bounds, so that the weights and measures official has in many cases been left far behind in the procurement of equipment for the proper test of such scales.

The Bureau has been doing, up to this time, what it could to assist the various jurisdictions in their efforts to obtain equipment. For some years the item of proper testing equipment has been recurrently upon the program of this Conference, and we have attempted to put before you all significant advances in equipment. That is well illustrated, I think, by the papers this year, when five highly desirable equipments were described, all of which have been obtained within the past year. Also the Bureau, a few years ago, issued a special miscellaneous publication describing some of the equipments in use and containing an introduction strongly emphasizing the need of the adequate test of large-capacity scales.

My first job with the Bureau of Standards in 1910 was an investigation of commercial weights and measures throughout the United States. That sounds like a big assignment, and it was, in fact, a big assignment. In 1910, weights and measures inspection was almost unknown, or at any rate it was known in only a small percentage of the jurisdictions in the country. Massachusetts was inspecting weights and measures; New York State was inspecting weights and measures, and a few of the other States and some of the large city jurisdictions were doing such work, but inspection of weights and measures was not country-wide by any manner of means. The Bureau inspectors, of which I was one of two, visited, I think, every State in the United States inside of a period of 2 years. They made inspections of weights and measures in commercial use in perhaps some 250 cities in the country. They made reports on the conditions existing in those cities, and those reports, I may say, demonstrated extremely unfortunate conditions, conditions which are probably not known today in any part of the United States.



Those reports were avidly seized upon by State legislatures throughout the length and breadth of the country, and within a very short period, a number perhaps approaching half of the States had enacted some legislation in relation to the inspection of weights and measures; much of the legislation was general in its nature and established inspection departments.

Perhaps today, in this particular field, we have an opportunity of doing much the same character of thing which we did in 1910 and 1911 in the general field.

Roughly, the plan is this: We will have an equipment which will be competent to determine the condition of large-capacity scales. We will entertain requests from States and large city and county jurisdictions which are not properly equipped at the present time—and that certainly includes a very large majority of the jurisdictions in the United States—to bring that truck into a State or a large city or county jurisdiction at the request of the State or local weights and measures official. With his assistance and cooperation we will test a certain number of motor-truck scales in the jurisdiction, perhaps 50, perhaps 100, perhaps 150 scales in jurisdictions which have a very large number.

The State or local official may pick the scales which are to be tested and lay out a routing before the Bureau equipment arrives. The truck will be accompanied by a representative of the State or local jurisdiction who will work along with our men who are operating it. We will test the designated scales; we will prepare an individual report on each scale tested, which will be furnished to the official and to the owner of the scale; and at the conclusion of the work in a given jurisdiction we will be prepared to make a summary report showing the general condition of the large-capacity scales in the jurisdiction as demonstrated by those tested. This report will include recommendations to the official in charge as to the proper proceeding which he should adopt in this connection.

We suspect that in jurisdictions in which tests have not competently been made, it is probable—I think perhaps it is inevitable—that the conditions will demonstrate the necessity of the State or city having a test truck of its own. States have told us—many of them—that if they were able to demonstrate conditions there would be no question but what the legislature would appropriate the money for proper equipment. With this report in his hands the official will be able, certainly in most cases, to demonstrate that necessity. Armed with that report he can go before his governing board or body, his Governor, his budget committee, or his legislature, and point out the necessity which exists. We hope through the operation of this equipment that we will obtain in many of the jurisdictions of the United States information by means of which the State or local weights and measures official will be enabled to strengthen what is now one of the weakest features of his work—the testing of large-capacity scales.

The ACTING CHAIRMAN. I might say right here for North Carolina, to Mr. Holbrook, that we hereby make our request and extend our invitation for a visit to our State as soon as he is ready to proceed with this testing program.

Mr. HOLBROOK. That will be recorded, Mr. Baucom.

(At this point, Mr. Tinkey, fourth vice president of the Conference, assumed the chair.)

The ACTING CHAIRMAN. Ladies and gentlemen, this is quite an honor, I assure you. The next speaker on the program will be Ralph W. Smith of the National Bureau of Standards. He will continue the subject under discussion.

Mr. RALPH W. SMITH. I shall outline to you very briefly the characteristics of the testing truck which the Bureau is about to acquire. I may say, in preliminary comment, that in deciding upon the type of vehicle we had a number of considerations in mind. One was that we proposed to operate the vehicle throughout the United States, over all kinds of roads, in the mountains where the elevations are great, and over severe grades. We expect our unit to be away from base most of the time.

We desired a unit of conventional type insofar as such conventional type would adapt itself to the needs of the testing service. We desired a unit which could be duplicated, or modified only in more or less minor respects, by States to fit their particular needs, both mechanical and budgetary. Therefore we decided, finally, after giving consideration to all of these factors, upon the general type of equipment which may best be described as the swinging boom, traveling trolley and hoist type.

The chassis of this equipment will be a six-wheel job with a motor amply powerful to meet any condition which we may anticipate. It will be equipped with an inclosed cab and will have an open body. Behind the cab will be mounted the mast of the boom and crane assembly; there will be side boards but nothing more in the way of side body. Weather protection for the weights will be secured by means of a tarpaulin cover of some kind. Adequate storage facilities will be provided for carrying the personal baggage of the men in charge of the equipment and the small weights, accessories, and tools which are necessary in the operation of the equipment.

The crane will be of a type which will successfully handle three 1,000-pound weights at a time, thus permitting the 15,000 pounds of weights which the truck will carry to be set off on a scale platform in a minimum of time.

The test procedure contemplates end testing with the full 15,000 pounds of known weights when the capacity of the scale under test is such as to justify that load. The weights will be unloaded from the truck directly on to one end of the scale, and will later be moved to the opposite end of the scale by means of the conventional two-wheeled hand-operated cart. At the conclusion of the test at that end of the scale the weights will be removed by the cart; the vehicle itself, the truck, will be placed upon the scale as a strain load and the weights reloaded into the vehicle, thus applying them with the scale under the strain load. That is a brief outline of the normal test anticipated.

The boom will swing through such an angle that the weights may be directly spotted upon the scale platform during the unloading operation from the truck, and they can be picked up for reloading from almost any position in which they may be placed when removed from the second end test.

We are providing all of the safety factors that we know of, both for operation during the testing and operation on the highways. With our six-wheel job we have reduced the axle loading to a mini-

mum. That enables us to comply with the load limitation requirements in the majority of the States, and not to exceed the requirements in the other States by any more than is absolutely necessary. It also will give us good traction and roadability, we believe, and make for safety in operation on the highway. The weights are to be carried on the bed of the truck on a metal base with built-up mushrooms, something like traffic buttons, only rectangular in cross section, which will fit into recesses in the bottoms of the weights. We believe that that will give us ample anchorage of the weights during travel of the vehicle under any conditions which will be met in its operation. The weights are of somewhat special design in a few respects, but are largely conventional rectangular weights, except for the recess in the bottom to fit over the mushrooms.

The special equipment which will be carried in addition to the fifteen 1,000-pound weights will include a set of class C weights to be used on the scale, part of them being balanced out before the test is begun, so that errors both plus and minus may be determined by the addition or subtraction of known weights on the platform rather than by manipulation of a weighbeam.

I believe that you are all sufficiently familiar with the general type of this equipment, so that with that brief outline you will have a very good picture of what we propose to secure. The actual specifications for the job are rather extensive. I shall not attempt to go into them in detail. We tried to cover as many points as we could anticipate, and we found that we had covered just a few too many and had to recede from some of our requirements in order to get the job made. However, for purposes of reference these are of value, and will be available from time to time for the assistance of those officials desiring to consult them in the preparation of their own specifications.

The ACTING CHAIRMAN. On behalf of Ohio I am ready at this moment to go back and recommend to our director of agriculture that we make a request for this testing outfit to be used in Ohio.

(At this point, Dr. Briggs resumed the chair.)

The CHAIRMAN. Members of the Conference, I take much pleasure in presenting to you the Acting Secretary of Commerce, the Honorable Ernest G. Draper, who will address you on the work of the United States Department of Commerce.

#### ADDRESS BY HON. ERNEST G. DRAPER, ACTING SECRETARY OF COMMERCE

Mr. Chairman and members of the Conference, to you who are attending the Twenty-sixth National Conference on Weights and Measures, I extend a most cordial welcome. Secretary Roper has requested that I give you his personal greetings also and convey his regret that he is unable to participate in your meeting. It has been necessary, however, for him to leave Washington in order to represent the President at the opening ceremonies of the Texas Centennial Exposition in Dallas. He wishes me to say on his behalf that he is in wholehearted sympathy with the efforts this group is making to facilitate the orderly progress of the Nation's commerce. No one appreciates better than he that your work is essential in the preser-



vation of a basis of mutual confidence. Without this confidence the present-day structure of our business world could not exist.

This organization of weights and measures officials is a valuable adjunct to the Department of Commerce. I do not mean to imply that this Department should attempt to direct your activities. But I do mean, and I think you will agree, that we have a close mutual interest in numerous fields. This common interest is well illustrated in the close relationship which has existed, so I am informed, between the Conference and the National Bureau of Standards since the formation of your group in 1905. The success of your organization is attested in its growth from a mere handful of officials 31 years ago to your present attendance, representative of all sections of the United States. During these years the National Conference has earned an enviable reputation for thoughtful, fair, and constructive action upon the technical and other matters which come before you at your meetings. It is with pride, therefore, that we consider you as an essential part of the Department of Commerce family.

What is today the United States Department of Commerce was originally conceived as an organization "to promote the commercial interests of the United States." That original conception is always in our minds. However, there are now embraced in the duties of the Department of Commerce manifold activities which could not be foreseen by Gouverneur Morris, in 1787, when he proposed the creation of this Department. As members of our family, I believe you will be interested in phases of our service other than those of the Bureau of Standards with which you come into immediate contact.

The Bureau of Foreign and Domestic Commerce gathers and disseminates all kinds of statistical and factual information. To those engaged in domestic or foreign trade this Government service is invaluable. Studies are constantly being conducted in the field of production. Basic information regarding markets at home and abroad is likewise assembled as an aid to selling operations. Foreign offices, maintained in 34 commercial centers throughout the world, supply a constant stream of reports on foreign business activity. A wealth of information is thereby made available to business interests as well as to public agencies. This data supplies a much needed background for long-range planning and sound business judgment.

Another fact-finding agency of the Department is the Bureau of the Census. Contrary to popular belief, this Bureau does not confine itself to the taking of the decennial census of the population, although that still remains its largest single task. From the first decennial census of 1790 up to the year 1902, this Bureau had an intermittent existence. Expiring as each successive census was completed, it remained dormant until the next decade. In 1902, however, it became a permanent Bureau and is now beyond a doubt the largest statistical office in the world. Besides taking the decennial census, it is now continuously engaged in the compilation of statistics covering a wide range of subjects. In addition to the voluminous reports of the decennial census, this Bureau has an annual output of almost five thousand pages of statistical tables and text.

In the Bureau known as the Coast and Geodetic Survey, we have a different sort of fact-finding organization. This unit might be

called the "map and chart" bureau since the results of its research activities are largely embodied in the maps and charts which it issues. Extensive surveys of our coastline are made to provide basic data for navigators' charts. The magnitude of this task will be appreciated when I tell you that we have a seaboard of approximately 103,000 miles in length, a distance four times that of the world's circumference. There are the geodetic surveys of all inland territory also, supplying information for the wide assortment of maps in current use. Supplementing these observations are scientific studies of tides and ocean currents, magnetic surveys, and earthquake investigations.

Further aid to those engaged in ocean and inland water transportation is afforded by the Lighthouse Service and the Bureau of Navigation and Steamboat Inspection. The work of the Lighthouse Service was provided for in one of the first acts of Congress. Today this Service establishes and maintains lighthouses, lightships, radio beacons, and water-channel guides so essential to the safe and expeditious movement of ships. The Bureau of Navigation and Steamboat Inspection has as its primary functions the promotion of safety for ships and passengers.

In the course of your everyday work, you gentlemen are constantly associated with machines and mechanical assemblies of one kind or another. It is probable that you are well acquainted with the part played by the Patent Office in the development, manufacture, and marketing of such devices. For more than 125 years, it has been the function of that Bureau to secure to inventors the rights to their "brain children." By stimulating scientific progress and development this Bureau is making an important contribution to the lives of every one of our citizens. Besides the granting of patents, this agency likewise registers trade marks, designs, and labels used on merchandise entering interstate and foreign commerce.

Finally, in this short outline of some of the units comprising the Department of Commerce, I would mention the Bureau of Air Commerce. In the rapidly expanding field of air transportation, this Bureau plays an important part. Among the outstanding accomplishments is the development and maintenance of our Federal airways system—a vast network of more than 21,000 miles of lighted and radio equipped air lanes. Emergency landing fields are maintained to provide safe landing facilities at 50-mile intervals between regular airports. The inspection of aircraft and those who pilot commercial ships are likewise duties of this Bureau. Constant effort is being made in the field of research to improve the safety and facilitate the speed of air travel.

It is unnecessary for me to emphasize the important role which has been assigned to you in the drama of our Nation's business. Few of our people appreciate the extent to which we are dependent upon the standards of length, mass, and measure. Transmitted to you through the National Bureau of Standards, these standards are indeed fundamental to a wholesome commerce among our people. Once established, they are of little value, however, unless observance is universal among those who produce and sell.

Your work is, therefore, equally essential. We must depend on you in the exercise of your supervisory power to insure the constant and correct use of measurements complying with these standards.

The equitable determination of quantities of merchandise commercially exchanged is now virtually your responsibility. Believing it will be a source of encouragement to you, I have tried to give you some appreciation of the manner in which other closely allied agencies serve the business community. True, there is a wide variation in the tools that are used. But essentially we are bound together by one common purpose—to promote commerce and industry on a basis of mutual confidence and understanding among those who produce and those who consume.

As a final word, I would assure you again that the Department of Commerce believes whole-heartedly in the work which you are doing. We willingly pledge ourselves anew to cooperate with you to the fullest extent of our abilities in advancing this work and raising still further the high standard of your efficient service.

The CHAIRMAN. May I express, on behalf of the Conference, our deep appreciation of your kindness in being with us this morning and addressing us. In view of the many responsibilities placed upon Mr. Draper at this time, including not only his own normal work but that of the Secretary's office as well, we can not hope to have him remain with us. I will, therefore, call Mr. Tinkey to the chair.

Mr. SWEENEY. Before Mr. Draper leaves, may I suggest at this time that a rising vote of thanks be extended to the gentleman for the splendid address he has given us here this morning in representing the Department of Commerce?

(The motion was seconded, the question was taken by a rising vote, and the motion was agreed to.)

(At this point, Mr. Tinkey resumed the chair.)

#### DRAINAGE CHARACTERISTICS OF DISPENSERS FOR CANNED LUBRICATING OIL

By RALPH W. SMITH, *National Bureau of Standards*

Mr. Chairman and gentlemen, those of you who were here last year will recognize before you on the table the same group of dispensers which were exhibited by Mr. Lang in connection with his paper on canned lubricating oil.

The variety of types of these devices suggested to the Bureau that it would be an interesting thing to study the drainage characteristics of these types and learn how they differed and determine whether or not certain recommendations might be in order. You will recall that this more or less parallels the study along similar lines made upon lubricating-oil bottles in 1931.

The present study has not been an exhaustive one, but it is believed that it is adequate to form the basis for one or two recommendations. We had two primary objects in view: First, to determine the drainage characteristics of the cans themselves; and second, to determine the drainage characteristics of the dispenser units. A secondary, but more or less essential object was to determine the amount of oil contained in the cans inclusive of all oil that might adhere to the can after drainage; in other words, the amount of oil actually put into the cans by the refiner.

For ease of reference these dispensers have been arranged in two groups, three being of the "funnel" type and two being of the "con-



tainer" type. Let me emphasize that in everything I say, and in the equipment which is on display, we are referring only to type, and not to the product of any particular manufacturer. We have designated these dispensers by number to facilitate reference to them. The oil which we used was from 1-quart cans, and we had both SAE 30 and SAE 40 oil for purposes of study.

It will be interesting to you, perhaps, to observe that there is a variety in the kind of cut made by these various dispensers. (Cans opened by the several dispensers were displayed.)

We made an effort, in our study, to duplicate the commercial method of operation which would be followed by the filling station operator in dispensing lubricants. All of our determinations were made by weighing, not by measuring volumetrically. Drainage periods were timed from the beginning of the flow from the dispenser.

For each of the periods studied, separate determinations were made on the amounts retained by the can and by the dispenser. With the funnel type the flow was started with the dispenser held in normal manner, as a filling-station operator would hold it if he were dispensing direct to a crankcase. You will readily appreciate that some oil will be retained by the dispenser when it is used, and that some oil will necessarily drain away from the dispenser during the period elapsing between successive uses of the device in practice. For this reason, all of the observations on these three dispensers were corrected for a 10-minute period of drainage of the dispenser itself, because that was believed to be an inevitable condition of use; for this drainage, the dispenser was placed in what was felt to be the commercial manner on a drain rack.

In the case of the container type, a 10-second period was allowed after the can was punctured before the spout was turned down. That interval was determined by trial as the necessary period for the station operator to go through the manipulation of inserting the can in the dispenser, probably setting them on the pavement to puncture the can, picking them up, and getting ready to deliver the oil into the crankcase. The flow was started with the dispenser held in the normal manner. In the case of this type of dispenser the plotted observations are based upon a clean container, as distinguished from a slightly oily container in the case of the dispensers of the funnel type. Separate determinations were made to determine how much one of these dispensers would drain during a 10-minute period of drainage.

Our first step was to determine how much oil was contained in the cans. These particular cans contained, at 75° F., an average of 58.5 cubic inches of oil of SAE 30 grade, an overfill of about 0.75 cubic inch, or 1.3 percent. At 60° that would be equivalent to an overfill of only about 0.35 cubic inch, or 0.7 percent. For the SAE 40 oil at 75° F., the average content was 58.94 cubic inches, an overfill of about 1.2 cubic inches, or 2.1 percent; that would be equivalent to an overfill of about 0.85 cubic inch, or 1.5 percent, at 60°.

Figure 9 illustrates the amounts of oil retained in the cans at varying periods after the drainage started. The upper chart illustrates the SAE 30 oil, the lower one the SAE 40 oil, both charts being based upon results at 75° F., approximately laboratory temperature at the time the test was made.

It will be noted that the drainage characteristics of these various cans under any method of opening, as determined by the type of dispenser used, are practically the same. In other words, after 30 seconds of drainage, a can containing SAE 30 oil retained about 1 cubic inch, regardless of the type of opening made in the can; at the end of 60 seconds the amount retained was reduced to approximately three-fourths of a cubic inch. The average overflow of those cans is illustrated by the dotted line, indicating that after 30 seconds these cans were not sufficiently overfilled to deliver from the can itself into the dispenser the nominal amount of 57.75 cubic inches. After 60 seconds that condition was almost realized.

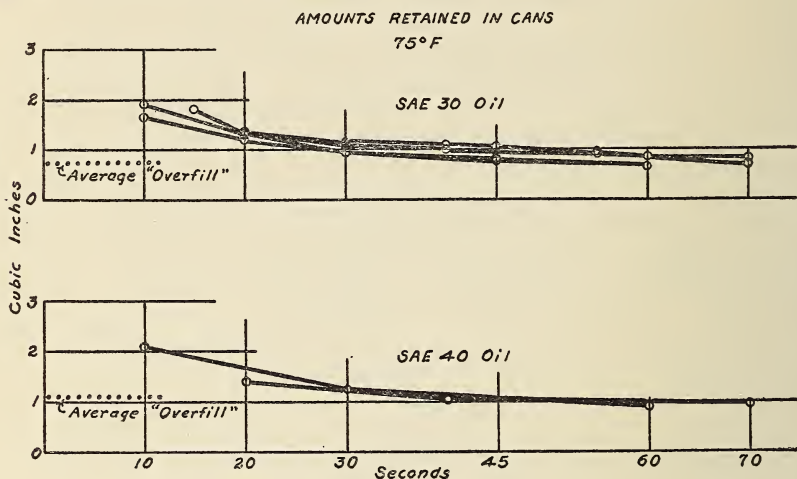


FIGURE 9.

In the case of the SAE 40 oil, a heavier grade, the drainage curves are similar, but slightly raised on the chart. After 30 seconds drainage about 1.25 cubic inches were retained; after 60 seconds about 1 cubic inch was retained. The average overfill of these cans is indicated by the dotted line, and corresponds fairly well with the amount delivered at 60 seconds; there is some failure to deliver full measure at 30 seconds.

In figure 10 are plotted the results obtained with the three funnel-type dispensers at 75° F. The upper curves illustrate the total amounts retained by both can and dispenser; the lower curves illustrate the amounts retained by the dispensers alone. The differences between corresponding curves represent, of course, the amounts retained by the cans. These results are fairly uniform, with no large differences between the results for individual dispensers, although some slight advantage appeared in the case of one of the dispensers. In this chart the solid lines indicate SAE 30 oil, and the broken lines indicate SAE 40 oil; it will be noted that the heavier oil was somewhat slower in getting out of the cans and dispensers, so that the total amounts retained and the amounts retained in the dispensers only, were greater in the case of SAE 40 oil than in the case of the SAE 30 oil.

Figure 10 shows that a total of approximately 1.5 cubic inches of SAE 30 oil were retained in the case of any one of the funnel-type dispensers at the end of a 30-second period after the main flow had started; at the end of 60 seconds the amount retained was about 1 cubic inch. In the case of the SAE 40 oil, the corresponding figures were approximately 2 cubic inches and 1.5 cubic inches, respec-

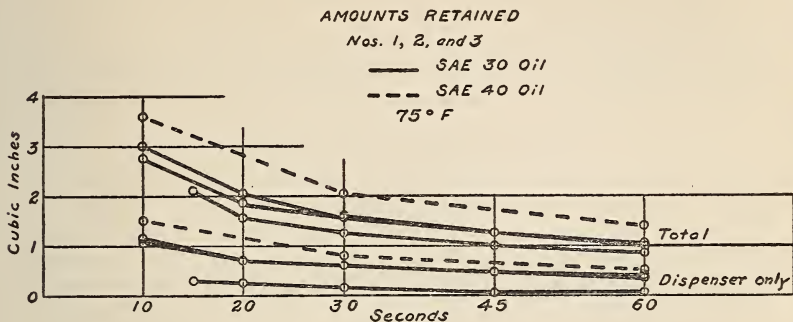


FIGURE 10.

tively. Expressed in another way, these results show that for full-measure delivery of SAE 30 oil at 75° F., there would be required an over-fill in the can of approximately 2.5 percent for a 30-second delivery period and 1.7 percent for a 60-second period; for SAE 40 oil, the corresponding figures would be 3.3 percent and 2.5 percent, respectively.

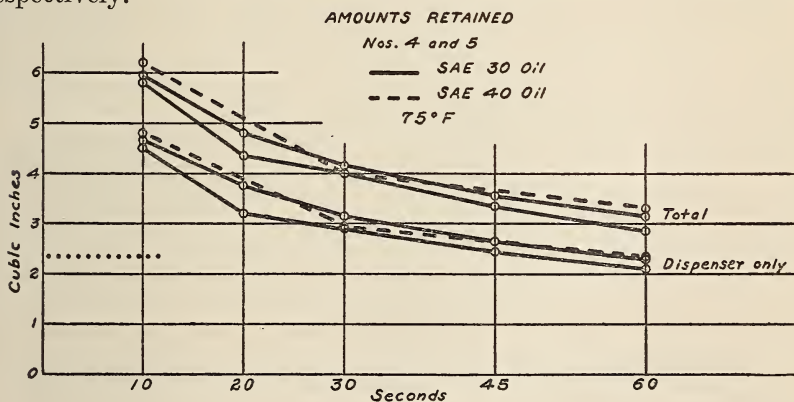


FIGURE 11.

In figure 11 are plotted the results on the two container-type dispensers. Again the total amount retained is indicated in the upper curves and the amount retained in the dispenser alone in the lower curves, solid lines representing SAE 30 oil and the dotted lines representing SAE 40 oil. Here the difference between the SAE 30 and the SAE 40 oil does not show up so prominently. There is, however, a noticeable difference between these two curves and the curves for the funnel-type dispensers, in that the total amount retained by the container types was very much greater than it was in the case of the



funnel types; but it is to be remembered that the results shown in figure 11 are all plotted upon the basis of a clean dispenser; that is, one from which all of the oil was drained before the delivery was started.

A separate study was made to determine the amount of oil retained in these dispensers after a normal delivery period, and that amount is indicated by the short, horizontal dotted line at the left of the chart. After the dispenser is once used and is wet with oil, if that oil is allowed to remain in the dispenser—as would be proper—it will compensate for an equal amount retained on the subsequent delivery; in other words, the chart would be plotted under these circumstances with the zero line where the dotted line now appears. In such cases the total amount retained by can and dispenser would, in effect, be something like 1.5 cubic inches for a 30-second delivery period or 1 cubic inch for a 60-second delivery period. By that it is meant that the difference between the amount of oil in the can and the amount actually delivered, under proper conditions of use of this dispenser, would closely correspond with the amount retained in the can and would be approximately 1.5 cubic inches after 30 seconds; after 60 seconds the amount would be reduced to approximately 1 cubic inch.

If, however, an operator deliberately turned the spout down between dispensing operations, and drained out of this type of dispenser all he could get, then the correct zero line is the zero line shown on the chart, and the shortage which would be anticipated—the difference between the amount of oil in the can and the amount delivered—would be about 4 cubic inches at 30 seconds, and about 3 cubic inches at 60 seconds.

Provided that this type of dispenser is properly used—that is, that it is not drained between deliveries—these results show that for full delivery there would be required an over-fill in the can of approximately 3 percent for a 30-second delivery and 1.7 percent for a 60-second delivery for either SAE 30 or SAE 40 oil.

As a purely collateral study to the drainage of these dispensers, we made a very brief study of the drainage characteristics of the flexible type of spout and the rigid type of spout for glass bottles. The purpose of this was to determine whether or not the flexible spout retarded drainage materially. Also, with these bottles, we made a few observations at low temperatures to determine the effect of a low temperature upon the delivery of oil from the bottles, upon the theory that the amount by which the delivery was slowed down in the case of the bottle would be proportional to what it would be in the case of a dispenser for canned oil. The results of this study are shown in figure 12.

There are not many data plotted here. The solid curve represents drainage characteristics with the rigid spout, and the broken curve represents results with the flexible spout. By reason of the broken curve being slightly higher than the solid one, it will be seen that the flexible spout showed up not quite so well as the other, but there is very little difference between them. At the right-hand side of this chart are shown the results at low temperatures. The circles represent individual observations, solid circles indicating SAE 30 oil and dotted circles indicating SAE 40 oil. It will be noted that some of these circles, representing observations made with the oil at a temperature in the neighborhood of freezing, are much higher on the

chart than the circles at the left, representing observations at 75°, showing that the delivery is materially slowed down when the temperature drops to a low point.

Based upon the results of this study, there are four brief recommendations which I wish to present for your consideration:

1. In no case should the serving period with any one of these types of dispensers be less than 30 seconds. Preferably it should be longer than that.

2. For the container-type dispenser, any drainage between operations is practically equivalent to a fraudulent method of operation. Drainage of this type of dispenser between deliveries should not be permitted.

#### AMOUNTS RETAINED IN BOTTLES

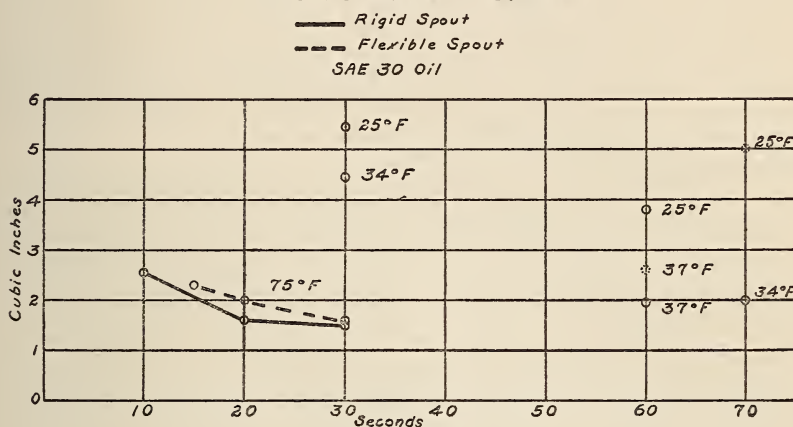


FIGURE 12.

3. During cold weather the oil in cans should be stored in heated quarters so that it will flow with reasonable rapidity when dispensed to the crankcase.

4. The overfill in the cans themselves should certainly be not less than 2 percent, and preferably should be 3 percent or a little more, in order to insure the delivery of a quart of oil into the crankcase when the motorist buys and pays for a quart.

#### DISCUSSION OF ABOVE PAPER

Mr. STROBRIDGE. Have you ever gone into a service station and used a stop watch on some of the operators putting oil into a car?

Mr. R. W. SMITH. I have timed them only in the case of my own purchases. I have found that they have taken not less than 30 seconds, and sometimes they have taken as much as a full minute. I have however, observed a lesser period than that when a purchase of more than 1 quart was being made; sometimes the time would be cut down to perhaps 10 seconds for the first quart, and then the second quart would be given a reasonable 30 or 40-second period for drainage.

Mr. STROBRIDGE. I have found, in making an investigation (the operator didn't know what I was doing) that the average, unless they inserted the bottle or funnel into the car and then went to cleaning

the windshield, was from 19 to 25 seconds. Very seldom did it run to 30 seconds.

Mr. BAUCOM. Is there any process of law or otherwise by which we can force an automobile oil manufacturer to put an excess amount in a can? If he sells a quart, can you make him put up more than a quart?

Mr. R. W. SMITH. I believe it is the general practice on the part of the refiners who are marketing canned oil to put in an excess amount. It is their desire to have full-measure delivery. I think that in all cases the cans are sufficiently large to permit at least a 3 percent overfill. Of course the refiner frequently does not sell to the motorist; the actual retail sale of the quart of oil is made by a filling-station owner. That might influence the character of regulation which you would have to draft in order to realize proper overfill. But I believe that you can accomplish the desired result without any difficulty in certainly the large majority of cases by enlisting the cooperation of the refiners, because it is already an established custom among the refiners to overfill their cans.

Mr. BAUCOM. I grant that is true.

The next point I want to raise is this: In your opinion do these dispensers aid in the perpetration of fraud, in that it is very easy to lift the spout before drainage is completed? I am inclined to feel that this is a device that could be construed as an aid in the perpetration of fraud, and that therefore it should be outlawed.

Mr. R. W. SMITH. The device is not, in itself, a measure; it is a dispensing unit. From the weights and measures standpoint, the question is how much oil is put into the crankcase. As to the extent to which a weights and measures official can impose restrictions on the use of a piece of noncommercial apparatus of this kind I would not care to express an opinion. My personal thought is that if there is evidence of misuse of this type of dispenser, it may eventually become necessary to do something about it. I have at hand no information that there is any serious misuse at the present time. If and when that condition develops, I think the matter should be given due consideration.

Mr. SAYBOLT. I think Mr. Smith's paper was very illuminating and very helpful, and his guess as to the practice of refiners in general I think is correct, in that overages are filled into the sealed containers at the manufacturing plant. It is my recollection that those overages vary, based on the consistency of the oil. That is, the thinner the oil the lower the percentage of overage, and the thicker the oil the greater, because both the cohesive and adhesive qualities of the product are increased as the consistency or viscosity of the product increases.

The tendency of the buying public has undoubtedly been in the direction of the sealed container, and I have no doubt that if the question were presented fairly and squarely to the millions of motorists crossing this country, they would perhaps prefer the practical proof of quality in a product and would not object to the loss of the small percentage of retained product in either the can or the can and container, rather than to run the chance of substituted, diluted products which is so very possible in bulk operation.

A point occurs to me in relation to the chart shown by Mr. Smith, illustrating that at low temperatures the percentage retained was



higher on the higher SAE-bodied oil. It is rather common practice on the part of the motorist, as you undoubtedly know, to use the thinner oils in the winter time, and I think, therefore, that it is quite likely that the percentage of retained product retained by the dispenser and the can would probably equalize itself season for season.

I am quite sure that you gentlemen feel that the oil companies have no desire whatever to give short measure. We hope that the overage filled into the can takes care of that situation. There would be more expense and more trouble and more red figures if the oil companies attempted to collect the ounce or two that might be retained and carry it back to the refinery and fill it in again than there would be in giving full measure.

Now, so far as the legality of the transaction is concerned, it occurs to me that we could take care of the proper protection of the motorist if, after emptying the container, we offer him the mutilated container with the retained oil in it, and let him take it home and drain it himself.

Mr. BOYLE. I would like to say, from my observation, that the amount of oil retained in the can is greater than the amount retained a few years ago, when the use of pumps was more common. I might add that the retention of oil is sometimes deliberate, and is facilitated because the buyer can not see the amount of oil that is held back; in several instances I have found a number of cans setting up on a funnel being drained, the oil not to be given to the customer but to be used in the station attendant's own car. In the case of bottles, I have found many slack filled, and the explanation was that if I would come around an hour or two later the sun would have caused an expansion and changed the volume, and the level of the oil would be up to the proper marking. In the winter time the bottles were placed near a stove to become heated, to take advantage of the expansion.

The ACTING CHAIRMAN. Are there any further questions?

We are fortunate, in Ohio, in having a law that demands net weight or measure at the time of sale, so in the case of canned oil the can must deliver what it is marked.

Mr. HOLBROOK. Mr. Chairman, ladies, and gentlemen, I think that the preparation and submission by Mr. Trump, controller of the Standards Department of the Board of Trade of Great Britain, of the paper which I am about to read to you is good evidence of international cooperation in weights and measures matters, and is a very friendly action on the part of the English officials.

#### WEIGHTS AND MEASURES ADMINISTRATION IN GREAT BRITAIN

By R. J. TRUMP, *Controller, Standards Department, Board of Trade of England*

*Introduction.*—This paper is designed to provide a summary of the law and practice governing the control of weights and measures in Great Britain, that is to say, England, Scotland, and Wales. It does not apply to Ireland, where the matter is under the independent jurisdictions of the Irish Free State and the State of Northern Ireland, respectively. At the time of the setting up of these two States, the laws then in force in Great Britain continued valid in Ireland, but since that date certain modifications on both sides render the position no longer uniform. Similarly, so far as the various domin-

ions and colonies are concerned, there is independence of jurisdiction; and although certain measures of coordination in respect of the principal standards are in force, and a certain degree of collaboration takes place, nevertheless wide differences in law and administration exist. Obviously over so wide a field, having regard to the differences in local circumstances, and the varying mentality and customs of so many races, no close degree of uniformity would be practicable.

The law of weights and measures was last consolidated in the act of 1878, which still remains the act by which the main administrative machinery is governed, although it has been amended on a number of occasions as later developments have rendered it necessary. It is perhaps preferable not to follow through these changes, but to proceed at once to set out the position as it now stands.

*Primary Standards.*—The first step in any official system of control of weights and measures is to establish the standards from which the units are derived, and to provide means by which authentic series of standard weights and measures are put into the hands of the officers whose duty it is to control the appliances used by traders.

Two systems of weights and measures are admitted by the law and these are usually described as the imperial and the metric systems, respectively. The standards of the imperial system are the yard, pound, and gallon, of which however only the yard and pound are primary standards, the gallon being secondary or derived. The present primary standards were legalised in 1855, to replace the previous standards, which were lost in the fire which in 1834 destroyed the Houses of Parliament where they were then kept. A number of copies (parliamentary copies) were legalised at the same time, and statutory provision made for periodical comparisons between them. If at any time the primary standards, which are in the custody of the Standards Department of the Board of Trade, are destroyed or damaged, the copies will be available to reproduce them.

There are now five such copies of the yard and pound. One set is kept at the Royal Mint and one at the Royal Observatory at Greenwich. One set is deposited with the Royal Society, an association founded in the reign of Charles II for promoting the advancement of knowledge. The fourth set is enclosed within the wall in the Houses of Parliament, and the fifth set, of later construction, is at the disposal of the Board of Trade for use in precise comparisons, thus obviating the necessity for referring direct to the primary standards themselves.

The primary standards and the parliamentary copies are similar in construction and material. The yards are bronze bars about 1 inch square in section, and some 38 inches long. Near each end a circular well is sunk to about the depth of the bar, and in the bottom of the well a small gold plug is inserted. Upon these plugs the defining lines are drawn. The "yard" is defined as the distance between the lines on the imperial standard at 62° F. The pounds are cylindrical in form, with a groove near the top in which a lifting-fork can be inserted. They are of platinum, except for the Board of Trade copy, which is of platinum alloyed with iridium. The "pound" is defined as the weight of the primary standard pound in vacuum. (The distinction between mass and weight was not clearly recognized at the time the pound was legalised.)

The gallon is defined not on the basis of cubic content, but by the fact that, under certain standard conditions, it contains 10 lb. of distilled water. The definition is not perfectly precise, but in practice the uncertainty is too small to cause any difficulty. This unit, unlike the yard and pound, which have remained substantially constant for centuries, dates only from 1824, when it was introduced to replace a number of different measures which were in use for different purposes, although all of them had apparently been originally alike. One of the measures so replaced was the "wine gallon", which was fixed in 1707 (Anne Reg.) at 231 cubic inches, just as is the American gallon today. This is about one-sixth smaller than the British imperial gallon. From the latter all measures of capacity, whether for dry or liquid goods, are derived. These derived measures, although similar in name to those in use in the United States, are therefore not equal to them in value.

The units of weight and linear measure do not differ in any essential particular from the units in customary use in the United States, except that the ton consists of 20 cwt of 112 lb. A weight of 100 lb is called a cental, and the terms "long ton" and "short ton" are not recognized by law.

The metric system is also legal for most, but not quite all purposes—for instance, it may not be used in selling milk—and there are also restrictions upon its use in connection with made-up packages of foodstuffs. Actually, however, except in connection with export trade, it is very little used for the sale of goods.

The weights and measures of the metric system follow rigidly on international lines. The law which legalizes the system states only that metric weights and measures shall be "derived" from the British national prototypes of the kilogram and meter, but gives no directions as to whether the known errors of these two standards as against the International Prototypes shall be taken into account. In practice, these errors are in fact always allowed for, and arrangements are now made for these standards to be taken to Sevres at intervals to be retested against the standards of the Bureau International des Poids et Mesures, so that any necessary corrections can be applied.

It will be seen that the two systems, imperial and metric, are independently defined, but for convenience in working, an order of the Privy Council has been issued, containing a list of equivalents which may legally be used in trade.

*Secondary and Derived Standards and Their Verification.*—By an arrangement between the Board of Trade and the Department of Scientific and Industrial Research, The National Physical Laboratory at Teddington now look after the scientific side of the verification of the standards, and the Standards Department of the Board concentrate upon the administrative aspect. The Laboratory therefore now carry out the periodical comparisons of the primary standards of the yard and pound and their principal copies, as well as conducting the tests necessary to build up from them a complete set of all the multiples, submultiples, and derivatives which constitute the denominations of standards of length and weight which are legal for use in trade. From these "first derivatives" the Standards Department verify the measures of capacity, and the necessary reference and working standards which are required for their own use in testing the "local



standards" which are employed by the various inspectors of weights and measures (sealers). The inspectors also have their own working standards, which they themselves verify against their local standards. The periodical testing of the whole chain, from the primaries downwards, is provided for either by law or by statutory regulation.

The parliamentary copies must be compared with each other every 10 years, and with the primary standards every 20 years. The Board of Trade secondary standards must be compared with a parliamentary copy or with each other every 5 years. The inspectors' (local) standard weights must be reverified every 5 years, and their measures every 10 years. From these they must retest their own working standards every 6 months, and adjust them if necessary.

*General Provisions of the Law.*—By reference to the primary standards, all the units of weight or measure which may be employed as the basis of trade transactions are defined, and in order to secure uniformity, it is made an offence to employ any others. The basic word, running right through the acts, is the word "trade", which is defined broadly speaking, so as to include any transaction based upon weight or measure. It includes, not only the sale of goods, but the charging of tolls or duties, the carriage of goods, the performance of work, and the payment of wages, and, in general, any transaction calculated in relation to weight or measure. It does not cover transactions where weight or measure do not form the basis upon which payment is made. It therefore excludes sale by price or money's worth, without reference to weight or measure, and also excludes sale by number or count. Machines used in factories or works for the purposes of internal records only, are not in use for "trade" in this sense; nor are household machines as a class subject to control. Machines for ascertaining the weight of the person are subject to jurisdiction only in a few special areas under the provisions of acts of local application only. All transactions by way of "trade" must be conducted in terms of one of the legal units of weight or measure—that is the units of the imperial system as defined in the acts, or in the terms of the metric units.

All weights, measures, and weighing instruments for use for trade must be stamped by an inspector, acting in accordance with regulations issued by the Board. Once duly stamped, they are legal throughout the kingdom until they become inaccurate. Measuring instruments in general are not subject to verification, but the Board of Trade have power to impose this obligation by regulation (subject to the concurrence of Parliament) upon such classes of instrument as they may specify. At present, only instruments for the measurement of liquid fuel (which includes motor spirit) and lubricating oil in quantities not exceeding 20 gallons have been so treated.

Inspectors are empowered to enter premises where they have reason to believe that articles subject to their jurisdiction are to be found, in order to examine and test them if they desire to do so. They may also stop carts carrying coal in order to ascertain, if necessary, that the load is as described on the driver's weight ticket.

In addition to the control of apparatus, there are also provisions governing the transactions themselves. Coal, and certain articles of food such as bread and potatoes, must be sold by net weight; others such as butter may be weighed with the wrapper if it does

not exceed a certain proportion of the gross weight. Loaves other than those of fancy bread, if more than 12 ounces in weight, must weigh 1 pound, or some multiple of a pound. Milk except when sold by the pennyworth, or for consumption on the premises of the seller, must be sold in multiples of half a pint. There are also restrictions upon the weight of made-up packages of certain of the commoner articles of food. Short weight or measure in connection with the sale of any articles of food is an offence, but this does not apply in respect to other commodities, except coal.

The acts provide for the penalties necessary for enforcing the law, for instance, for the possession, sale or use for trade of incorrect appliances; for forgery of stamps, obstruction of inspectors, for offences in connection with the sale of food, and so on. Where the court finds that there is an intention to commit fraud, the penalty may include imprisonment.

Prosecutions may be conducted by inspectors of weights and measures, and are usually dealt with by the magistrates in the local courts, subject to appeal in the usual course.

*Administrative Authorities.*—As is the case in so many other branches of government, the control of weights and measures in Great Britain is divided between the central and the local authorities. By the central authority is meant the Board of Trade, responsible to Parliament through its Minister, the President of the Board. In particular, it includes the Standards Department of the Board, through which the detail work of administration is conducted. The term "local authority" is not so easy to define—in fact, in different phases of local government it has different meanings. For present purposes, it may be sufficient to say that, so far as the weights and measures acts are concerned, only the counties and the boroughs come into question.

The counties constitute the largest of the local areas, their boundaries having remained largely as they happened to be fixed in the distant past and they vary widely in area and population. With a few exceptions, the council of every county constitutes a separate local authority for the purposes of the weights and measures acts. The exceptions arise from the fact that, in a few cases, a county (as for instance Yorkshire) is divided into two or three divisions, each of which has its own council, while in others, two or more counties have combined, as they may do, to administer these acts as if they were a single area. Excluding London, with its very large population in a small area, some five or six counties have a population of between one and two millions, while there are several with a population of only about 20,000 or less.

Next to the counties come the boroughs, but at this point a little complication arises, for although Scotland has been joined to England and Wales under one Crown since 1603, and one Parliament since 1707, much of her own domestic law and local organization has been retained, in a form rather different from that prevailing, as we say, "over the border."

So far as England and Wales are concerned, a lower limit of population of 10,000 was set by an act of 1888 for a borough competent to administer the weights and measures acts. Many boroughs which are qualified to take up this duty have not done so, but have left the

administration to be carried on by the county, and others have given it up.

There has in fact been a steady tendency for the smaller boroughs to relinquish their powers, either by merging them into those of the surrounding county, or by appointing the same inspector. The trend of recent times towards new types, and larger and more complicated appliances, and the need for more extensive and costly equipment for the use of the inspector have made it increasingly difficult for the smaller authorities to carry out the work.

So far as Scotland is concerned, the position is a little different. In addition to the geographical counties, every "burgh" is in theory entitled to administer the weights and measures acts. There are nearly 200 of these burghs, some of which have a population which is counted only in hundreds. In practice, only a very few appoint their own independent inspector. A number retain their powers only to an extent which almost automatically involves their adopting the inspector appointed by the county in which they lie.

In sum, while there may be perhaps about 500 local authorities entitled to administer the acts, only about 270 maintain independent jurisdictions. Of these, the larger areas may appoint several inspectors, the smaller may share a single inspector. The total number of inspectors actively employed is rather less than 700, but as will be understood, the number varies from time to time.

*Distribution of Duties.*—The distribution of powers and duties between the central and the local authorities is such as to give the former the task of coordinating and unifying the work of the inspectors, who are appointed by the latter. The Board are responsible for the verification of their own standards, and also those of the inspectors. Weights and measures which may legally be used in trade are limited to certain sizes (denominations), and every legal denomination must be represented among the Board of Trade standards.

Although in certain cases, inspectors may verify their own local standards against a set which is still legal, this course is very seldom adopted, and these standards are almost always verified by the Board. A few years ago a voluntary system of *in situ* verification of inspectors' standards at their own offices was introduced, and most of the local authorities have adopted it. This service has been carried on by means of a motor van fitted up to carry all the necessary apparatus, much of which was specially designed for the purpose. It tours the country as required, and deals with all the inspector's equipment on the spot. New standards, and the standards of those authorities who have not adopted the scheme, are verified at the central office of the Standards Department. Fees are charged to cover all verification work, and an additional charge is made for the *in situ* service.

In order to secure uniformity of procedure, the Board of Trade are empowered to issue regulations which all inspectors are bound by statute to obey. These regulations are in the main technical, in that they lay down certain requirements as to materials, form, and construction, and prescribe the tolerances for the various types of weighing and measuring appliances which are subject to control. In conformity with these regulations the inspector applies his stamp—without which no such article is legal for use in trade—or obliterates



an existing stamp as the case may be. Once stamped by any inspector, any appliance is legal throughout the country, "unless it is found to be false or unjust."

The regulations also require the local authorities to provide adequate offices and equipment for the use of their inspectors, and to see that the inspection of traders' premises is periodically carried out.

Another essential factor in securing uniformity is the control of novel designs. Before any instrument having any novel features can be stamped by an inspector it must first be submitted to the Board for examination and test to see whether its material and principle of construction is such as to facilitate the perpetration of fraud. This examination is not therefore primarily a test for accuracy, although of course accuracy has to be looked at. The principal point to which attention is given is as to whether it can be tampered with, or so manipulated while it is being used that the customer is reasonably likely to be deceived; similarly, any feature which permits of an instrument being readily made incorrect, in a way that would not be immediately obvious, is also looked for. Attention is also paid to consistency of performance over a period of time, or under different conditions, and so on.

If the Board are satisfied with the result of their examination, they issue a certificate; but if they decline to grant such a certificate, no appliance made in accordance with that pattern is legal for use for trade, nor can it be stamped by an inspector. It will be seen that the Board deal only with the pattern. The local inspectors test the instruments in actual service, with the aid of descriptive Notices which are issued to them by the Board on the completion of their examination of the pattern.

The Board have the power to decide in cases of dispute between the Inspectors and others as to the meaning and construction of the regulations, and as to the methods of test applied by an inspector. They may also be referred to by the courts when the accuracy or otherwise of any appliance is in question. Formal reference of such questions to the Board is, however, rarely made. Inspectors are in constant and close touch with the Department, who are therefore in a position to advise them at an early stage, so that disputes seldom come to a head.

The inspectors, for their part, have their own association, which arranges an annual meeting, and there are also some half dozen district associations, which usually meet twice a year for the reading of papers and discussions. These meetings also greatly assist in securing uniformity of administration.

While the local authorities appoint the inspectors, it is a necessary condition that the person appointed shall hold a certificate of qualification. These certificates are issued by the Board of Trade on the results of an examination held by them to ascertain whether candidates possess "sufficient practical knowledge" of the duties of an Inspector. Candidates are expected to qualify in elementary physical and mechanical science, and the law and practice of weights and measures, and to pass a practical and oral test covering as far as may be the active side of the work. Only candidates nominated by a local authority competent to appoint an inspector can be given certificates of qualification.

The local authorities are required to appoint a sufficient number of inspectors, and see that the administration of the acts is properly carried out; to obtain local standards sufficient for the needs of the district, offices, and equipment, scale beams and balances, tools and inspection kits for their inspectors. They are also responsible for the detection of offences, the prosecution of offenders and the enforcement of the law generally within their boundaries. The work is of course actually carried out through the inspectors, who although they are subject in general to the instructions they receive from their own authorities, are themselves personally responsible for the safe keeping of their standards, and for the due observance of the Board of Trade regulations. Fees are taken by inspectors for all verification work, on a scale fixed by Order at the instance of the Board of Trade, and paid over to their Local Authorities. Periodical reverification of weights and measures is not compulsory.

There is no provision for the general supervision of inspectors and the Board have little power of direct intervention in cases where the weights and measures acts are not fully and properly enforced. They may institute an enquiry in any area, but it is doubtful how far they can compel the attendance of witnesses, or enforce any reforms which the enquiry may show to be necessary. The success of the Board and the inspectors in securing uniformity of practice largely depends upon the maintenance of a cordial relationship between their officers and the officers of the various local authorities, and fortunately little difficulty is experienced in this direction. The system of dual control gives rise to certain anomalies which are not met with in countries where the weights and measures system is wholly centralized, but good-will and cooperation go far towards overcoming them.

The ACTING CHAIRMAN. I consider that a very splendid paper. It appears that Great Britain has its problems of weights and measures the same as the United States. I believe that there are a number of things there that we can learn with profit.

#### GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS

The ACTING CHAIRMAN. At this time officials should bring before the Conference for consideration all subjects of interest to them not elsewhere listed on the program. At the request of certain weights and measures officials, a considerable amount of program time is being reserved for this item, so as to provide ample opportunity for full discussion. All officials are urged to participate.

Mr. GRIFFITH. While you have all of the exhibits of canned oil and dispensing devices there, I think it would be of some interest to the Conference to be acquainted with another type of dispensing device used by one of our major oil companies in the dispensing of its product. It has come to our attention that substitutes are even being made for a dependable product in what is supposed to be a bottle which cannot be tampered with. If you will grant Inspector Crockett, of Baltimore, a few minutes, he will demonstrate for the benefit of those present how we discovered what was being done.

Mr. CROCKETT. Gentlemen, in making this piece of apparatus [exhibiting apparatus] I confined myself to the actual materials that you

will find in a filling station. Everything but the air pressure which operates this you will find there. This is the bottle which I desire to refill. You have all seen them in filling stations. Now we find that you don't have to have this expensive piece of apparatus ordinarily supplied. Any gentleman in a filling station, of an inventive turn of mind, which lots of them have, can construct such a piece of apparatus as I have here.

This is just an ordinary pump [exhibiting] such as is used in putting air into a football bladder, and this cut-off valve is nothing more than the cut-off valve that you find on any automobile. (Mr. Crockett demonstrated the refilling of the bottle with oil.) I have to fill it slowly, because if I put too much pressure on it we might have an avalanche of crankcase oil. All you have to do is apply the pressure to fill the bottle with crankcase oil.

The gentlemen who make the standard refilling apparatus go to a lot of expense and trouble, but they still don't take into consideration the man in a garage who has an inventive mind.

(At this point, at 1 p. m., the Conference took a recess until 2 p. m.)



## SIXTH SESSION—AFTERNOON OF THURSDAY, JUNE 11, 1936

(The Conference reassembled at 2:20 p. m., at the National Bureau of Standards, Dr. Lyman J. Briggs, President of the Conference, in the chair.)

The CHAIRMAN. The Conference will please be in order for the afternoon session.

Is Mr. Lang in the room? If so, I would like to have him take the chair. (Mr. Lang was not present.)

You will recall that the matter of amendments to the Model Law was postponed for discussion as the first order of business in this Thursday afternoon session. I will ask the secretary to present those amendments.

### PROPOSED AMENDMENTS TO MODEL STATE LAW ON WEIGHTS AND MEASURES—Continued<sup>4</sup>

Mr. HOLBROOK. These amendments were distributed yesterday to the delegates and you have had the opportunity to study them.

Section 6 of the Model State Law on Weights and Measures prescribes certain duties of the superintendent of weights and measures. It probably is unnecessary to read the section in full; the latter part is to this effect:

The superintendent (commissioner) shall issue from time to time regulations for the guidance of county and city sealers and said regulations shall govern the procedure to be followed by the aforesaid officers in the discharge of their duties.

As I mentioned the other day, there is no specific provision in the Model Law giving the State superintendent the power to issue specifications and tolerances in relation to commercial apparatus. An amendment is now proposed which gives to the State commissioner that authority in specific terms. The amendment is to the effect that the section which I have read in part, be amended by adding at the end thereof the following:

The said regulations may include specifications and tolerances for all weights, measures, and weighing and measuring devices of the character of those specified in section 8, which shall be designed to eliminate from use, without prejudice to apparatus which conforms as closely as practicable to the official standards, those which are not accurate, which are of such construction that they are faulty—that is, which are not reasonably permanent in their adjustment or which will not repeat their indications correctly—or which facilitate the perpetration of fraud. For the purposes of this act apparatus shall be deemed to be correct when it conforms to all applicable requirements promulgated as specified in this section; other apparatus shall be deemed to be incorrect.

There are several amendments, Mr. Chairman, but in view of the fact that they are all individual it would seem advisable to take each up as it is read.

Mr. BAUCOM. Mr. President, I move that that be adopted.

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

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<sup>4</sup> See p. 32.

Mr. HOLBROOK. The second amendment: It is proposed to add a section to the Model Law in relation to slack-filled and deceptive packages. Again briefly, to bring the subject to your attention, I may say that some of the States have legislation of this character. It is not at this time a requirement of the Federal Food and Drugs Act. Bills have been presented in Congress from time to time during the last few years to provide that it shall be misbranding to put up an article in a deceptive or misleading package. The provisions are now carried in the proposed amendments to the Food and Drugs Act which is before the present Congress, in the bill popularly known as the Copeland bill. The wording adopted here is based upon the language now used in the Copeland bill, although it is not identical with it.

It is proposed, then, to add a new section to the Model Law, to be known as section 23-a, and to read as follows:

Section 23-a. It shall be unlawful to keep for the purpose of sale, offer or expose for sale, or sell any commodity in package form if its container is so made, formed, or filled, or if it is so wrapped, as to mislead the purchaser as to the quantity of the contents; or if the contents of its container fall below the standard of fill prescribed by regulations promulgated as provided in this section. For the effectuation of the purposes of this section the superintendent (commissioner) of weights and measures is hereby authorized to promulgate regulations fixing and establishing for any commodity in package form a reasonable standard of fill of container.

Now a purely formal amendment is that if this section is adopted, then in the second paragraph, first line, of section 23, the word "section" shall be stricken out, and the word "act" shall be inserted in lieu thereof, inasmuch as the present definition of the words "in package form" is limited to apply to one section, and those words must also apply to this section if it be adopted.

Mr. SWEENEY. The whole intent and purpose of this section, Mr. Holbrook, is to make illegal the action on the part of some dealers who are putting up spices and things of that kind in packages which give the public the impression that they are getting a much larger package than they are really getting?

Mr. HOLBROOK. The amount of commodity appears to be much larger than the amount actually delivered. Spices may serve as an illustration. During the World War spices became very high in price. The quantity of spice in the retail package was considerably reduced, but the packages were kept the same size as formerly; in case they were required to be marked, the net weight was correctly marked thereon, however. The fact that the packages of spices were not filled often did not come to the attention of the purchaser because they were usually sold in cans with a sifting top, and the package was not opened. That is an example. There are other packages that you have seen from time to time; for instance, false-bottom packages, and packages which, by various devices, are made to look very much larger than the contents warrant. This section is aimed at such goods. There may be other packages which are simply slack filled or incorrectly filled, and this the purchaser may discover when he buys and opens them, but at that time the transaction is complete.

Mr. SWEENEY. Mr. President, I move you, sir, the adoption of this section.

Mr. HOLBROOK. I think this section probably deserves a good bit of consideration, because it is not part of the Federal law, although

it may be. We can not tell. We can not tell whether or not the Copeland bill will be enacted, and we can not tell whether or not this provision will be in the Copeland bill if it is enacted. But some of the States now have this law, and I think that you should decide whether you want to recommend it as a part of the Conference program.

Mr. BAUCOM. I fully endorse the first part of this, but we meet here to bring about a simplified and uniform system. If we give power to make this regulation to every commissioner in the United States we are liable to have many regulations in the different States. It is going to make it mighty difficult for a man to pack his commodity and make it applicable to any State. Do we want to give that power to him, or should we back up a little and declare the law? I bring that out because we don't want to have one set of specifications in North Carolina and another in New York and another in New Jersey regulating the same commodity. I say this for the benefit of the packers, and I would like to have that carefully thought over before we finally act on the latter part of this paragraph.

Mr. McBRIDE. If the Federal Copeland bill became law then this provision would not apply. If we vote in favor of this proposition and the Copeland bill fails of passage, we will have made some progress; otherwise we will have no control over the standard of fill. I think that favorable action should be taken on this proposed amendment which will give us power in the event the Copeland bill does fail.

Mr. HOLBROOK. If the Copeland bill does not become law, then this would fully apply in the States in which it was passed, of course, but in no others. If the Copeland bill does become law, then this section would take care of goods put up and sold in the State which did not enter into interstate commerce; also this section is general in nature, referring to all commodities, whereas the Copeland bill refers only to "foods, drinks, drugs, and cosmetics."

Should the Copeland bill pass and the regulations be issued by the Secretary of Agriculture in conformity with the act, it would certainly be highly desirable that the State superintendent of any State give careful consideration to those regulations in issuing his own, because those regulations would inevitably govern all food in package form which enters into interstate commerce in any event.

Mr. LEVITT. There is quite a little difficulty in setting a definite fill for package goods. We ran into that in Illinois. We had complaints on soap flakes being put up in packages. We took it up with the packers. We found that they have a machine that fills those packages. One grade of soap flakes is bulkier than another grade, but in order to facilitate the packing—to keep from having different sized packages and to have uniform shipping cases—they use the same package. I think we ought to be a little careful as to just how far we go.

Another thing on spices. The spice people put out a 1-ounce package of spice. Pepper will probably have more bulk than nutmeg or cinnamon, but they want to have uniform packages so that when the packages are placed in the pantry they are of uniform size. This provision gives the superintendent discretionary power, and he can really be unreasonable in exercising his discretion. There should be



something done about that. I am in favor of a fill law, but I don't think we ought to be arbitrary about it.

MR. HOLBROOK. This is just the kind of discussion that I wanted to promote. If you do not believe that a State should pass such a law as this, the proposed amendment should be rejected; but I thought it was extremely advisable to get the consensus of the Conference in that regard.

MR. GRIFFITH. The provision merely provides the power to make the regulations. It is not mandatory. If you don't make them you don't subject anybody to their enforcement. As to the sizes of packages of spices being uniform, it is known that each manufacturer selects a different package, of different size and different color, so that there is no uniformity. Certainly it does promote the better regulation of commodities—not only foods, as you so well remarked, but others—and the public as well as fair trade are protected, by providing that packages shall be filled within a reasonable distance of their top, rather than slack filled. It is a step forward, I think, in assisting trade and protecting the consumers.

MR. ACKERMAN. Does the Copeland bill specify any certain amount of fill?

MR. HOLBROOK. The Copeland bill is similar in wording to this; the Secretary of Agriculture is authorized under the Copeland bill to promulgate such regulations as are specified herein. I believe also that a committee is provided for which shall give consideration to the matter and make recommendations to the Secretary. I can read you the provision, if you like.

MR. ACKERMAN. I wouldn't care for that. We tried to pass an ordinance of this kind in Minneapolis 4 years ago. We got a lot of opposition from the packers. We discovered packages containing 20 ounces to the package, and other packages sold in the cut-rate stores carrying only 16 ounces to the package and selling for 1 cent less, so that if you bought the cheaper package you were actually paying more for the commodity. We are interested in passing this same kind of regulation.

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

MR. HOLBROOK. The next amendment is in relation to bread. It is proposed to amend section 26 to make it read as follows:

SEC. 26. The standard loaf of bread shall weigh one pound, avoirdupois weight. All bread manufactured, procured, made, or kept for the purpose of sale, offered or exposed for sale, or sold, in the form of loaves, shall be one of the following standard weights and no other, namely, one pound, one-half pound, one and one-half pounds, or multiples of one pound, avoirdupois weight: *Provided, however,* That rules and regulations for the enforcement of the provisions of this section, not inconsistent herewith, shall be made by the superintendent (commissioner), and such rules and regulations shall include reasonable variations or tolerances, in excess only, or in excess and in deficiency, which may be allowed: *And provided further,* That the provisions of this section shall not apply to biscuits, buns, crackers, rolls, or to what is commonly known as "stale bread" and sold as such, in case the seller shall at the time of sale expressly state to the buyer that the bread so sold is stale bread. When twin or multiple loaves are baked, the weights specified in this section shall apply to each unit of the twin or multiple loaf.

It shall be unlawful for any person to manufacture, make, procure, or keep for the purpose of sale, offer or expose for sale, or sell, bread in the form of loaves, which is not of one of the weights specified in this section within such variations or tolerances as may be fixed by the superintendent (commissioner)

as provided herein. For the purposes of this section, bread shall be deemed to be in the form of loaves whether or not the loaf is wrapped, and whether or not the loaf is sliced.

Standard-weight bread laws recently passed provide that for a certain period of time after baking, bread shall not weigh less than the standard weight provided for. Under this section as originally worded the commissioner is required to make tolerances "in excess and in deficiency." The Supreme Court of the United States has upheld the recent Nebraska Bread Act, in which the tolerances for a period were in excess only; thus the Supreme Court has put the seal of its approval on tolerances which are solely in excess. In order to allow the superintendent to specify such tolerances, the four words "in excess only, or" are proposed to be added to the section after the words "variations or tolerances" in the first proviso.

The last sentence of the section as read, is new material. At the time this section was first passed, wrapped bread was much less common than it is now, and sliced bread in the form of loaves was practically unknown. It has been contested in some States whether the wrapping of bread does not make a package out of the bread, in which event it might be marked with any weight in accordance with the package goods law, and the standard-weight requirement would be broken down. This is added to clear up the fact that wrapped bread is still bread in the form of loaves within the meaning of the section, as is sliced bread also.

Mr. TINKEY. I think there has been one vital point omitted. A baker could easily, shortly after bread is baked, call it stale bread, undersell his competitors, and create all kinds of confusion.

Mr. ACKERMAN. Mr. Chairman, we have a similar law to this in Minnesota, and the law defines "stale bread" as any bread that is over 24 hours old. The bread has to be up to weight for 24 hours after baking, and if it is sold after that it is sold as "stale bread" and must be described as "stale bread", otherwise they are guilty of short weight if the loaf is short.

Mr. TINKEY. That is similar to the Ohio provision.

Mr. LEVITT. I think that is a very good law. Our bakers got to the point where they baked any size loaf—I was in one grocery store where they had loaves of bread of 13 different weights. Therefore, I move the adoption of this amendment.

Mr. FISHER. I second the motion.

Mr. FRANK G. SMITH. Most bread now delivered in Connecticut is delivered from New York, and all that bread comes wrapped in packages delivered from the largest bakers. There is none of that bread kept on the shelf for 24 hours, because the driver picks up the next day, the bread that is not sold. There is no chance of it becoming stale. The only time they ask for stale bread is around the holidays, when they want it for stuffing turkeys, etc. At any other time there is no such thing as stale bread.

All those standard bakers in New York wrap their bread and it is sold and marked in ounces. I have never found, in all my inspections, any bread delivered by the large concerns, all of which comes wrapped, and some of it in elaborate wrappers in order to make the sale better, to be of short weight, except that by mistake one time I found an 8-ounce loaf wrapped with a 16-ounce wrapper.

I picked them all up and prosecuted the baker, but he claimed that was a mistake made by the wrappers at the factory.

Mr. HOLBROOK. If no bread becomes stale bread and none is sold as such, the provisions of the section do not apply. There is no difficulty there.

Mr. SWEENEY. I should like to ask Mr. Holbrook whether or not he would think it advisable to make a declaration within the present section as to just what stale bread is.

Mr. HOLBROOK. I think it is entirely unnecessary. This section follows the Chicago ordinance, which was upheld by the Supreme Court of the United States in the Schmidinger case (226 U. S. 578). This provides that the provisions of the section in relation to standard weights shall not apply to what is commonly known as stale bread and which is sold as such. In other words, the seller must state to the purchaser at the time of sale that the loaf so sold is stale bread. I think that is the broadest provision as to stale bread that you can very well write, yet the ordinance containing that language was upheld by the Supreme Court of the United States. I would hesitate to depart from it.

Mr. BAUCOM. In here the commissioners are given power to make tolerances. Why can't we establish tolerances in the section, based on the experiences of the commissioners? There are men here who have been in this work for some time. They know what is reasonable. I would like to see the tolerances put right in the law itself. Or, set up the tolerances on bread in another place; I think we ought to set them up right here.

Aside from that, I doubt whether we can enforce that bread law. I don't think we can make it unlawful for a man to put up a package and sell it, when the Food and Drugs Act says that any food in package form may be sold if it has its weight marked on it. I tried enforcing it, and the bakers said, "We will take out an injunction and make you let us sell it." They don't know where to stand themselves. They want a standard loaf, yet with a change in the price of wheat, and competition, they have to change the size of their loaf.

Mr. HOLBROOK. The United States Supreme Court, in 1924, in the case of the Nebraska Bread Act, said it was perfectly competent for the State of Nebraska to fix standard-weight loaves and provide that bread shall be sold only in such loaves.

Mr. BAUCOM. What about interstate commerce?

Mr. HOLBROOK. Only a very, very small fraction of the total amount of bread sold in the United States, enters into interstate commerce. As a matter of fact, I do not believe that the interstate commerce angle was considered by the court in the Nebraska case.

Mr. BAUCOM. I was just thinking of our friend from Connecticut.

Mr. BUSSEY. There is another point in this law that I want to bring to the attention of the Conference. We have a standard-weight bread law in Texas similar in wording to that which we have here, which refers to the loaf of bread and deals with the loaf throughout the law. For the past few months it seems that we have about ceased to have any loaves of bread in Texas. They have all begun to put out a product that they call "sliced rolls." Instead of baking a loaf of bread they put four, five, or six pieces of dough



in a regular bread pan, bake it, wrap it sliced, and mark it "sliced rolls." There are several cases pending in court at the present time on that, and I don't know how we are coming out. In city ordinances recently passed in Texas, we have refrained from referring to a "loaf" of bread; we are referring to "bread", making it take in any kind of bread, rolls, or what not.

Mr. DAVIS. Inasmuch as we in the northern part of Vermont lie along the Canadian border, Canadian bakers are sending over their product into our State, and all we can demand is that they mark the weight on their loaves of bread. It must be wrapped, according to our law in Vermont. We had a condition there that gave us a lot of concern because they insisted on sending it over without any marking on it at all. I don't know whether that law would take care of this or not.

Mr. HOLBROOK. Do you have a standard-weight bread law in Vermont?

Mr. DAVIS. No, sir.

Mr. HOLBROOK. Then all you could reasonably require of any baker, inside or outside the country, would be that he mark the weight on the bread. If a baker from Canada sends bread into Vermont, the weight of which is not marked, you could certainly prevent the sale of such bread at retail in the State.

Mr. McBRIDE. We have a standard-weight bread law in Massachusetts which follows very closely the language here, with some exceptions. We have the power that is proposed in this law to set up tolerances, and we have never been challenged. I don't expect that we will be, since Mr. Holbrook has said that the essence of this law has been passed on by the Supreme Court.

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

#### GENERAL CONSIDERATION OF SUBJECTS OF INTEREST AND QUESTIONS BROUGHT UP FOR DISCUSSION BY OFFICIALS—Continued

The CHAIRMAN. Gentlemen, it is in order to continue the general consideration of subjects of interest, and questions brought up for discussion by officials of the Conference, continuing the discussion of this morning. Are there any matters to be brought up by members of the Conference?

Mr. McBRIDE. We have a peculiar problem in Massachusetts in relation to fuel oil. Massachusetts consumes a very large quantity of fuel oil, and the method of measuring it has apparently come up for considerable consideration. That commodity is different from most of those we deal with, in that in most cases the commodities are physically present and visible to the eye as you apply them to a scale. The only visible feature of a fuel-oil delivery is the measuring element.

There has been developed there a manifold piping which is located at the rear of the delivery truck, and the compartment lines feed into that manifold. Our difficulty has been this: In the first instance, where the feeding line valve is the only one opened, no difficulty has been experienced in determining accurate measurement. It is entirely possible, however, for an operator to start drawing from one compartment and to exhaust that compartment; then go to another and fail to close the compartment from

which he has drawn. In that case you have a possibility of air entry into the liquid line, and that, of course, is very much aided by the efficiency of the pumping unit which is drawing the liquid through.

In addition to that a situation may develop wherein the operator will not fully open the valve from the compartment supplying the liquid. In that case we have found that the worst errors develop. We feel that that situation is one that may easily arise—whether by design or neglect—but in Massachusetts it has been said that we are testing with undue severity when we employ that method. That is particularly in reference to the situation where the operator doesn't fully open the compartment valve line from which he is drawing the liquid. However, we have required that the devices shall be so equipped as to meet a test of that character. I wonder what experience any of the other men have had along that line, and I wonder whether you think that is a test of undue severity.

Mr. ENGELHARD. I believe a section we discussed last year requires that where pipes from the various compartments lead to a common manifold, effective means shall be employed so that liquid cannot flow back into empty compartments. That sounds fine, but in the State of New Jersey there is only one truck in every one hundred which is so equipped. Ninety-nine percent of the trucks would be taken off the road if that were enforced. I believe a sufficient time should be given for the manufacturer or owner of a truck to equip his truck so that there would be a check valve which would permit the liquid to flow out of a compartment but never from the manifold into a compartment. I believe that that is already taken care of in the model specifications that we drew up last year.

Mr. BAUCOM. I rise to a point of inquiry and instruction. Last year, by an act of the Twenty-fifth Conference, a committee was appointed to draw up a draft for a constitution and bylaws. This committee had a basis upon which to start our deliberations upon arriving here. A sort of tentative draft was sent each member of the committee. Upon the convening of the committee it developed that we were not in accord; our minds were not in tune as to just what the duties of the committee were, what were our obligations, and what we were supposed to do. One part of the committee seems to think that we have the power to decide whether or not we need a constitution and bylaws, and that we have power to bring back a report in this form. The other faction complains that we have no authority to do other than what was commanded in the motion which provided for and set up this committee. Therefore, with your permission, I would like to read the minutes of the Twenty-fifth Conference and the motion which was made, and ask that you instruct us so that we can proceed according to the mandates of the motion or according to the will of the Conference.

On the last day of the Conference the Resolutions Committee brought in a resolution which was voted down by one vote, which set up certain procedure for deliberations. Then a member got up and addressed the chair and said, "I think we have a way of meeting the situation so presented by the Committee on Resolutions, and which has value. I make the motion that the Chairman or the President of the Conference appoint a committee of not less than three members of the Conference to draw up a constitution and set

up bylaws for the guidance of this organization." The motion was seconded, the question was taken, and the motion was agreed to.

Now then, as I say, our committee finds itself somewhat at a deadlock as to what procedure to take. We want to bring a report to the Conference, and the question is, Can we bring back anything other than a constitution and bylaws, as this commands?

MR. O'KEEFE. I am a member of that committee and we did discuss the question very thoroughly the other evening, for perhaps 3 or 4 hours, and I was one of those who dissented. I don't think this body needs any constitution and bylaws. Of course, being appointed on a committee, perhaps it might have been our duty to bring in some sort of bylaws, but I don't know how this body . . .

MR. GRIFFITH (interposing). I rise to a point of order, please.

THE CHAIRMAN. Will the gentleman please state his point of order?

MR. GRIFFITH. We are not discussing a need of the organization. That has already been settled. Definite instructions were included in that motion, which was legally passed by this body last year, and it is the will and order of this body. The clear question here is whether we shall do what it says there.

THE CHAIRMAN. I think, gentlemen, that this whole question is out of order at this time. A committee has been appointed for this purpose. The committee will bring its report before the Conference. Specific provision is made for it tomorrow morning. The Conference as yet has no knowledge of what that report is going to be. If you do not approve of the report, it is the privilege of the Conference to so indicate, and to give its instructions accordingly. With your indulgence the Chair makes this ruling and defers this whole matter until the report comes up in the proper order of business tomorrow morning.

MR. ISING. I would like a little information regarding the delivery of coke in wet weather. It naturally accumulates a lot of water. Is there any tolerance allowed for that?

MR. MCBRIDE. In Massachusetts our law says that coke may be sold by weight or measure. That isn't the answer, but the difficulty is there present, and I think that it may be said that coke can absorb as much as 80 percent of its own weight. The only way that we handle it there is, where excess moisture may be present in coke, to say that the coke should be sold in the other alternative way, by measure. I think it is without possibility of answer unless a defined moisture content could be drawn on coke. That is our way, but it isn't a complete way.

(At this point, Mr. McBride assumed the chair.)

MR. GRIFFITH. We have a specification for liquid-measuring devices providing that the indicating medium shall be visible within a field of 120 degrees. There is some confusion in the minds of some of us as to how to definitely define that field in relation to the indicating face of the dial or plate. The question is whether you take the center of the dial or the figure to get the 120-degree angle.

THE ACTING CHAIRMAN. I think that is defined, but I think we can save time in answering it. Mr. Holbrook spent some time last year illustrating that, and if Mr. Holbrook will favor us I think he can clear it up.



Mr. HOLBROOK. The specification in question provides that in the case of a retail device this field shall be defined by two vertical planes each at an angle of 30 degrees with the counter, graduated scale or dial, or the reading face, and passing through the center thereof. I take it that that means that if you erect a perpendicular to your dial and draw lines making an angle of 60 degrees on each side, these lines will lie in the vertical planes mentioned. (Drawing on blackboard.) This is the plane of the dial as seen from above. This is a line erected perpendicular to this plane. Through the center of the dial, you draw a line here and here, with 60 degrees in here and 60 degrees in there. There are now two equal angles making a total angle of 120 degrees. That determines your field. If the purchaser places himself at any point inside that field, he shall be able to read the registration of the meter.

Mr. GRIFFITH. That is my interpretation of it, too. I just wanted it confirmed.

Mr. FISHER. I would like to ask you what experience you have had with the small meter that is placed in the cellar of the house of the customer who buys fuel oil and that is connected between the storage tank and the furnace. Have you approved that in your State, or have any of the other States?

The ACTING CHAIRMAN. Massachusetts has approved that so-called household meter, but it is not in use in the State.

Mr. FISHER. What means do you use to test that meter annually?

The ACTING CHAIRMAN. None, because it isn't in use.

Mr. FISHER. It is expected to be in use.

The ACTING CHAIRMAN. Under our law testing and sealing shall be annual. The thought that we had on the matter was that a bench test could be made of a number of meters and the meters properly identified and sealed; they could be located in the cellars of the householders but they would have to be removed from the cellars once a year for subsequent bench tests. That doesn't appear to be particularly difficult, because of the construction of the meter. It is a gravity fill from a more or less constant liquid head. The supplying company will have to see that provision is made for sealing facilities.

Mr. WHITE. Recently a grease-dispensing device was submitted to me for approval, and it was my understanding that it had been approved in some of the other States. This device is so constructed that it takes a 1-pound can of rear end or transmission grease in a holder; there is a plunger, operated by air pressure, that comes up from below, cuts the bottom of the can out, and forces the grease through a spout into the transmission or differential.

The point I want to raise is visibility. There is no indicator on the device to show when the can is empty. I believe that there are present at this Conference State men who have seen that device, and who perhaps have passed on it. I would like to have their opinion on an indicating element being placed on the device.

Mr. GRIFFITH. Does that device become inoperative when the can is empty?

Mr. WHITE. It is possible to stop this plunger any time during its travel up the can by releasing the air vent. The customer can not see whether it has traveled the entire distance or not.

The ACTING CHAIRMAN. Is that for the purpose of ejecting grease from a container which the customer has purchased?

Mr. TINKEY. We had something similar to that and after we inspected it we determined it was a nonmeasuring device, an ejector. It doesn't come within our jurisdiction.

The ACTING CHAIRMAN. That is the view we took of it, that it is an ejecting device, the same as the dispensers.

Mr. WHITE. That is perfectly true, but there is a great chance to perpetrate a fraud.

The ACTING CHAIRMAN. We wouldn't consider that that was a means of measuring a pound of grease. When determinations are made of quantity a price is paid by reason of a quantity delivered. There must be a measuring element, and this is not regarded as a measuring element.

Mr. WHITE. That is true, but I think it should be considered by our weights and measures officials.

Mr. ISING. What tolerances are allowed on coal deliveries, in the different States?

The ACTING CHAIRMAN. I don't think that is a matter of law; it is a question of judgment. I don't know of any such tolerances.

Mr. BAUCOM. We have set a tolerance of 20 pounds on the load.

The ACTING CHAIRMAN. How did you establish that?

Mr. BAUCOM. That is 1 percent on 1 ton. We claim that any man who can't weigh a load within 20 pounds ought not to be allowed to weigh. We set that up; it is not a law. We believe that that is ample for any little mistake that might be made by a man who is weighing coal. We usually catch our man the minute he hits the sidewalk and probably hasn't driven his truck over 30 or 40 feet; if it doesn't come within 20 pounds of what he puts on the ticket we take him to the court house.

Mr. SWEENEY. I might say for the enlightenment of the Conference that in Massachusetts we have a statutory definition of weight as applied to food and fuel. They must be sold by net weight; there are no tolerances permitted.

The ACTING CHAIRMAN. While Mr. Sweeney has told you we have a law which says that no tolerance is permissible on food or fuel, don't take it that we say that coal must be absolutely as represented on the ticket. Good judgment prevails.

Mr. O'KEEFE. In a great many smaller towns they have only one or two truck scales on which to weigh a load. In Chicago we have hundreds of them and we have to give them a little leeway somewhere. There is a variation in scales. We allow 1 percent.

Mr. ISING. That is what we are doing. I didn't know whether that was right.

Mr. WHITE. Last year in the specifications, tolerances, and regulations for vehicle tanks we passed the following: "For vehicle tanks equipped with meters the tolerances to be allowed in excess or deficiency shall be the same as those specified for liquid measuring devices of the wholesale type; that is, 1 cubic inch per indicated gallon of delivery, with a minimum tolerance of 50 cubic inches."

Since reading that over after it passed last year, it seemed to me that the word "minimum" should have been "maximum." I wrote to Mr. Holbrook on that and he came back and said it should be

"minimum", as printed. I may have the wrong understanding of that, but it seems to me that the meter would have to be set off 50 cubic inches, and that doesn't seem reasonable.

Mr. HOLBROOK. That is not a required error; it is an allowable error. It would be desirable if the meter were to have a zero error, but it is allowed an error of 50 cubic inches. Consequently that is not a maximum tolerance; it is a minimum tolerance. Plus or minus 50 cubic inches is the smallest tolerance which can be applied against the meter. If the smallest delivery falls anywhere within that range, the meter is deemed to be a correct device. When you make a very large test draft your tolerance must be greater than 50 cubic inches.

The minimum tolerance of 50 cubic inches ties up with the recommended smallest test draft of 50 gallons. If you have a test draft of 50 gallons with a tolerance of 1 cubic inch per gallon, then you have a minimum tolerance, as of course, of 50 cubic inches.

Mr. ENGELHARD. I agree that the word should be "maximum" and not "minimum." If it is plus or minus nothing, that is minimum. If it is fifty, then it is maximum.

Mr. HOLBROOK. If you drew 1,000 gallons of gasoline through a meter would you expect to allow an error of no greater than 50 cubic inches? If you have a maximum tolerance of 50 cubic inches, as I see it, you wouldn't allow more than 50 cubic inches, regardless of the size of your draft.

We use this principle of minimum tolerance frequently. Suppose we consult a table of tolerances to be allowed on platform scales. We find that the tolerances start at half an ounce and go up by ounces into pounds, eventually becoming 200 pounds. We provide, however, that there shall be a minimum tolerance of one of the minimum beam graduations, because if you have a scale which has a minimum beam graduation of 5 pounds, for instance, it is perfectly ridiculous to try to enforce a tolerance of half an ounce against it—half an ounce could not be detected. Similarly, we have a minimum tolerance which is to be applied against any device.

Now, on the wholesale meter the minimum test draft is supposed to be 50 gallons. General tolerances for meters provide that there shall be allowed an error of 1 cubic inch per gallon. If you draw a minimum of 50 gallons at a tolerance of 1 cubic inch per gallon you have inevitably a minimum tolerance of 50 cubic inches. That is not a maximum tolerance, because if you draw 1,000 gallons the allowable error is very much more than 50 cubic inches. The actual error, however, might be zero.

Mr. LEVITT. Under that ruling the tolerance is 1 cubic inch per gallon, with a minimum tolerance of 50 cubic inches. If I went out to test a meter and drew only 20 gallons out, and it was 25 cubic inches short, I could not hold the meter because the minimum tolerance is 50 cubic inches. I have to draw 50 gallons. That is done to keep them from trying to make a test of a meter with 5 or 10 gallons. It is to compel you to draw 50 gallons in order to make the test.

Mr. BAUCOM. To clear it up, just say that your tolerance is 0.2 percent and that will cover the whole works.

Mr. HOLBROOK. Then suppose you took a test draft of 5 gallons from a wholesale meter. Your tolerance certainly must be more than 0.2 percent of 5 gallons.



Mr. BAUCOM. I don't mean small meters, getting down to that point.

Mr. HOLBROOK. Suppose you had a flat tolerance of 0.2 percent on a bulk-type meter and attempted to make a test with 5 gallons. Your tolerance should not be 0.2 percent of 5 gallons, because your test draft is too small. Your tolerance should be 50 cubic inches as a minimum to be enforced against a wholesale meter.

Mr. McBRIDE. Are there any further remarks under that heading, gentlemen? Is that clarified, Mr. White?

Mr. WHITE. I am not operating under that.

#### CHICAGO ORDINANCE IN RELATION TO VEHICLE-TANK METERS AND THE ENFORCEMENT THEREOF

By JAMES O'KEEFE, *Inspector of Weights and Measures, City of Chicago, Ill.*

In 1935 Chicago passed an ordinance which requires that any petroleum product to be used for fuel, must be measured at the place of delivery, by standard 5-gallon measure, or by a meter which has been approved by the department of weights and measures.

This ordinance reads as follows:

Measurement of Fuel Oil.—It shall be unlawful for any person, firm, or corporation to sell, offer for sale, deliver or attempt to deliver, any petroleum product or other liquid to be used for fuel, by tank, truck, trailer, or other wheeled conveyance, unless measured at the place of delivery by standard liquid gallon or 5-gallon measure, or by a meter which has been tested, approved, and sealed by the inspector of weights and measures.

Any person, firm, or corporation, including any weighmaster or deputy weighmaster, that shall violate any of the provisions of this article, shall, when no other specific penalty is herein provided, be fined not less than \$5 nor more than \$200 for each offense. The inspector of weights and measures shall enforce the provisions of this article.

We believe that this is the first law of this nature operating in any community, the practical effect of which is to require that fuel-oil deliveries must be measured at the place of delivery by means of a meter. The delivery man has the option of using a 5-gallon standard test bucket, but since the time element would be great, the companies delivering have practically all equipped their tank trucks with meters.

The petroleum industry has increased its volume of business at a phenomenal rate during the past 10 years. In 1935 it is reported that over 17,000,000,000 gallons of gasoline were sold in the United States, an increase of 1,000,000,000 gallons over the preceding year, and there were millions of gallons of oil sold for fuel consumption.

An industry marketing such a large volume of its products by measure should require considerable attention from weights and measures officials, and the previous prevailing practice of allowing the use of a crude measuring device called a "gage stick" was entirely out of relation to accurate measuring practices covering the sale of other commodities.

Weights and measures officials contended that meters were not accurate, but our department found on testing meters of many different makes, an accuracy of measurement which confined the errors to very small amounts. For instance, while the specifications adopted by this Conference allow 1 cubic inch per gallon tolerance, and specify a minimum testing draft of a tank meter of 50 gallons,

allowing a 50 cubic inch tolerance, our experience indicates that this tolerance could be practically reduced to approximately one-tenth of that amount, since 245 meters which were tested varied only 1 cubic inch for each 50 gallons.

Before the ordinance was passed, a committee of the city council held an open hearing at which representatives of the petroleum companies argued for and against the ordinance but we find that since the ordinance has been operating, practically all the companies are in favor of it.

Since the average cost of equipping each tank truck with a meter is approximately \$350, and the company must change drainage pipes so that all of the oil must pass through the meter, it was necessary to be very tolerant in giving to the truck owners time to complete the installation of equipment. After the ordinance was passed, all companies were notified that they must be equipped within 3 months, but several extensions were given where a reasonable excuse was made for failure to equip. After another 3 months, inspectors were instructed to halt each tank truck and ascertain whether or not the meter was being used and whether it had been properly tested and sealed. If not, the inspector issued a ticket to the company for a violation. This action brought the few remaining dilatory companies into line and we feel that 99 percent of the trucks delivering fuel oil are now equipped with meters.

We tested 263 meters on the same number of fuel-oil trucks. These tests are to be made twice a year and the fee charged for each test is \$1, or an annual fee of \$2.

We find that meters are being used to measure gasoline at the time of delivery, although it was not our original intention to force the metering of gasoline to service stations. We believe that it will be only a matter of a few years until all gasoline will be sold through meters, since the fuel-oil truck is usually used in the summer to deliver gasoline and it is quite natural that the company should make use of the meter which is already installed.

The next step must be the education of the purchaser to see that the meter is on zero before delivery is made, to see that the hose is full to the nozzle, and to see the final reading by the meter when delivery is completed. We have secured the assistance of the newspapers in carrying on a campaign of education for this purpose.

In order to test the accuracy of the meters, the department secured space in one of the city-owned garages, where a steel balcony 12 feet above the floor was erected, containing a 100-gallon calibrated tank and a 50-gallon calibrated tank. The tank truck is driven into this garage and the meter is set to deliver 100 gallons. This is pumped into the 100-gallon tank—which has an over-and-under glass gage in the neck—and the amount over and under 100 gallons is recorded. A 4-inch outlet allows the fuel oil to drain back into the compartment from which it was taken. A 50-gallon draft is next pumped from the tank; then a 100-gallon and a 50-gallon draft are pumped without having the meter set to stop at any predetermined amount.

The meter is then sealed with a lead wire seal. The company is required to notify our department before breaking the seal and once this is done, the meter must again be tested and sealed before being used.

We have received a great deal of commendation for this ordinance and the fuel-oil consumers of Chicago have been very generous in their praise.

#### AIR ELIMINATION FOR VEHICLE-TANK METERS

By C. D. BAUCOM, *Superintendent of Weights and Measures, State of North Carolina*

Ladies and gentlemen, the subject of my address, as you will readily recognize, is technical; therefore, I shall first refresh your memory on certain fundamental physical facts which you learned while in school.

First, a body immersed in liquid is buoyed up by a force equal to the weight of the liquid displaced; second, a body in motion will continue in a straight line unless acted upon by some external force; third, when a body of liquid which is not homogeneous, is in motion and is forced to change its direction, the heavier or more dense portions, which have a greater resistance to such change of direction, will take the outside path around any curve, arc, or angle, and the lighter portions will take the inside path; and fourth, the cohesion between the molecules of a fluid is an important factor (but not the only one) in determining the rate at which a foreign particle will rise or fall through the fluid.

Now then, in discussing air in petroleum products, we must bear in mind these major facts and apply them to the problem confronting us. Under the first item, because of the difference in density air will tend to rise through gasoline at a rate of about 1 foot per second. Any currents in the gasoline stream will have a tendency to reduce this rate. However, if the air bubbles are very much reduced in size this buoyancy force (due to difference in density) on a single bubble will be less than the force of cohesion between the gasoline molecules, and the escape of the air from the gasoline is thus prevented.

As stated in the beginning, a body in motion will continue in a straight line unless some external force is exerted upon it. Manufacturers have endeavored to build a device which will eliminate air that has been caught in the delivery line by collecting it in a dome or chamber and discharging it from there. Baffle plates, grids, and screens have been used in the belief that they will be of vital help, but let us see if they really do help.

When this liquid strikes a baffle plate, its course is changed. As soon as the course is changed, we then run into basic principle three. The heavier portions of the liquid follow the perimeter of the containing chamber and the air is forced toward the center. As an illustration, take an air eliminator built something like the air chamber on a water pump. The liquid enters from the side at the bottom, strikes the baffle plate and then rises to the top of the dome or chamber. Here its course is changed and it starts down with a whirling motion, thereby creating a vortex just above the baffle plate. When the liquid reaches bottom, its course is changed again and it leaves the chamber with the air in the same position as it was upon entering, assuming, of course, that it went through the eliminator at the same rate of flow as before entering. Sometimes screens are put in the line for the purpose of straining out particles which



would affect the eliminator or the meter and with no other purpose in mind, yet if these strainers are of exceptionally fine mesh, they will so completely break up the bubbles of air as to practically atomize them. The power of the air bubbles to rise or to overcome the cohesion between the molecules of the liquid itself is reduced, and they will, in their relative positions, pass through both the eliminator and the meter without any visibility whatsoever, but they will cause an overregistering of the meter.

That is a point that probably some of you have not experienced, but I ran into one situation where a manufacturer was putting a 400-mesh strainer in the line, and it was actually demonstrated that a volume of 12.5 percent of air would pass through, yet you wouldn't see it in the visigauge. This resulted, as I just stated, from breaking it up into such extremely small bubbles, that they were not able to overcome the cohesion of the gasoline molecules. Later on, when it was in a glass bowl, you could see the bubbles rising something like bubbles in champagne.

Now then, having applied these basic principles to the problem of air elimination for petroleum products, the question arises, can air be successfully eliminated from petroleum products being delivered in tank wagons? If so, how? Practically all of the bulk-hauling gasoline-tank trucks use a 2-inch discharge. A 2-inch discharge pipe carries 0.1623 gallons per foot, or 6.121 feet of 2-inch pipe will hold 1 gallon of liquid. The pumps used on these tanks are designed to pump about 200 gallons per minute. Thus, a molecule of air in a stream of liquid being discharged through a 2-inch pipe at the rate of 200 gallons per minute travels 1,224.2 feet per minute, or 204 feet per second. Under natural atmospheric pressure air rises in gasoline at about the rate of 1 foot per second. From these figures you will readily see that in a 2-inch pipe a bubble of air while rising from the bottom to the top will travel 34 feet ( $204 \times \frac{1}{6}$ ). When it goes through an eliminator it may not have time to rise to the top. So it may not be eliminated unless it happens to be at or near the top of the liquid when it enters an eliminator.

From these facts we are forced to conclude that in order to eliminate air with an eliminator that is not excessively long, the velocity of the liquid must be greatly reduced and the eliminator chamber must be of such dimensions that a bubble or molecule of air will not be swept beyond the confines of an air receiving chamber before having time to arise to the top of the liquid.

A study of these conditions will reveal that the controlling element is time necessary for elimination (excluding factors, which will follow), and necessary time is controlled by width and length of receiving chamber.

I have given this considerable study in the past few months and have drawn the following conclusions, satisfactory to me, and which I believe will furnish the only solution. I derived the formula  $W \times L \times D \div D/12 = Q$ , where  $W$  represents the width of chamber,  $L$  the length,  $D$  the depth of liquid in chamber,  $D/12$  a constant which indicates time in seconds for a bubble of air to rise  $D$  inches through the liquid, on the basis that it rises 12 inches per second, and  $Q$ , quantity of liquid flowing in cubic inches per second. This formula may be written  $W \times L \times D \times 12/D = Q$ , and further simplified to the

form,  $W \times L \times 12 = Q$ . Using this formula, we conclude that the air eliminator to take care of 200 gallons per minute, if 12 inches long should be 5.35 inches wide. I might add right here, however, that I have not had sufficient opportunity to test this formula under varying conditions and, therefore, do not suggest that it is infallible.

I mentioned excluding certain factors which would follow. If the liquid be in a whirling motion, it is almost impossible to extract the air from the liquid. Referring to the fact quoted regarding bodies in motion, the heavy molecules are thrown to the extreme outside of the circle which is being described, thus forcing the lighter molecules to the center. As an illustration, I will mention slinging a bucket of water over your head. Some eliminator manufacturers have attempted to prove that if the liquid were thrown over a baffle plate, or otherwise caused to take up a whirling motion, the air would be forced out, which is in fact just the reverse of what actually does happen. If their theory were true, slinging the bucket of water over your head would empty the water from the bucket and cause it to fill with air. Another factor is that liquid in motion has a tendency to hold molecular structure more or less in status quo.

Another problem involved in tank-wagon deliveries is that liquid will flow at the rate of 176.4 gallons per minute through a 2-inch pipe and with a 5-foot head excluding resistance of elbows and bends in the line. This rate of flow is reduced to 78.54 gallons per minute with a head of 1 foot. Thus, you will readily see that when a pump is attached to a delivery pipe and a delivery of 200 gallons per minute is obtained, the suction on the gasoline will tend to separate the molecules and we will have what is commonly known as the breaking up of the liquid, that is, vaporization. When the suction of the pump reduces the pressure on the liquid gasoline, some of the gasoline will vaporize and this gasoline vapor may be driven off along with the air by the eliminator. Naturally, the result of this is that the gasoline meter will not register correctly the number of gallons which were in the tank; in other words, the meter will register a shortage. If, however, on the other hand, the eliminator did not work, the gasoline would be put through the meter in an expanded or vaporized condition and you would get an overregistration. As I see it, the solution of this problem would be the requirement that all pipe lines connecting to a manifold or to the pump must be of such size as to permit a flow of not less than the capacity of the pump when discharging under gravity force.

Another problem which has arisen in connection with tank-wagon deliveries is that practically all of them are connected through a manifold and usually the valves to all compartments are opened before the pump is started. If by accident the valve of one of these compartments is only partially opened the other compartments will be completely emptied before this last compartment, which would result in the admission of an amount of air through the empty compartments far greater than any air eliminator I have as yet seen attached to a tank wagon is able to take care of. You, of course, know that the pump is going to take its suction from the line of least resistance and if the flow from the compartment is throttled, the difference would have to come from the emptied compartments.

Now then to sum up in a few words the whole problem of air elimination for tank wagons, we must conclude:

1. That the pipe lines leading from each compartment through the manifold must be of such size as to permit the gravity flow of a number of gallons equal to the capacity of the pump.

2. That an air eliminator must be used of such size and dimensions as to be able to eliminate air from petroleum products traveling through same at the rate of pump capacity.

3. Screens and strainers must not be used having a mesh so fine as to break up and atomize the air bubbles.

4. Some kind of device must be designed which will prevent the complete emptying of the meter and air eliminator and pipe lines to a level below the bottom of the tank itself.

5. Proper vacuum brakes must be provided just past the cut-off valve if and when hose is to be drained.

6. Some mechanical means should be provided which would prevent the partial opening of any valve for discharging.

#### DISCUSSION OF ABOVE PAPER

Mr. GRIFFITH. It seems to me that the importance of the subject matter of this paper is very great and it should come to the attention of all weights and measures officials, especially in localities where the heating of buildings by the use of fuel oil is rapidly increasing. I believe it would be very desirable to request the National Bureau of Standards to assist us by an investigation of the principles underlying air elimination so that we could adopt, possibly at the next Conference, more comprehensive requirements for air elimination in connection with meters installed on tank trucks.

The ACTING CHAIRMAN. I think it might be a good idea if this Conference were to request the Bureau to conduct some research on the question of air elimination. Do you think there could be objection to that, Mr. Holbrook?

Mr. HOLBROOK. No; there is certainly no objection to it. If such a resolution is passed we will certainly take steps to see what we can do for you. I can not decide off-hand what character of investigation is desired, or necessary, but we could ascertain the problems. If there is any way in which we can be of assistance, we will be very happy to do whatever we can.

The ACTING CHAIRMAN. That might take the form of a suggestion to the Resolutions Committee.

Mr. GRIFFITH. Just as you decide.

The ACTING CHAIRMAN. The Resolutions Committee can bear the suggestion in mind and take appropriate action in relation thereto.

Mr. WHITE. The Resolutions Committee is meeting at seven o'clock, and they will be glad to entertain any suggestions for resolutions from any member of the Conference.

Mr. GRIFFITH. I move you, sir, that the suggestion just made be considered by the Resolutions Committee and a suitable resolution returned.

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



PORTABLE TESTING EQUIPMENTS FOR LARGE-CAPACITY METERS  
AND VEHICLE-TANK COMPARTMENTSPAPER PRESENTED BY WALTER G. WHITE, COMMISSIONER OF WEIGHTS AND  
MEASURES, STATE OF NEW HAMPSHIRE

It is probable that a large percentage of weights and measures officials are faced with two problems instead of one when they are considering the adoption of new and sometimes untried testing equipment. There is, of course, the problem of securing equipment that will accomplish the task, and this is difficult when pioneering in a heretofore almost unexplored field. The second problem I refer to is one of finances. I speak of this because it bothered me as much as the selection of proper equipment. Why, I do not know, but it seems to be the opinion of many that weights and measures work can be carried on with little or no cost. Unless your department is financially able to purchase equipment, similar to that which I am about to describe, it is my opinion that you had better let it alone until it is; for we started out with just the meter, and had all kinds of trouble.

Assuming that necessary funds have been provided, even though they may be limited, you should make a survey of your territory, having in mind the type of equipment to be tested, and under what conditions you will be compelled to work. From this survey you will then determine the nature of your testing equipment. It will be of two general classifications, either portable or stationary. In this discussion I will deal only with the portable. Aside from the actual determination of the accuracy of the device being tested, you will face numerous other factors in the operation of the testing equipment.

In New Hampshire, our survey showed that we would be dealing with gasoline, kerosene, and two grades of fuel oil as testing mediums. We found in some instances gravity flows could be used but at other stations power would be necessary. We also found that not all stations had electric power, or had power but no outlets. We were quite concerned about our source of power for the pump and considered a gasoline-powered generator, a generator to be run from a power take-off from the automobile motor. All of these were considered while the portable testing equipment was in the embryo stage; but finally, due to safety factors, we selected the municipal lighting system as our source of power. With this decided and with the other information gained from our survey we then made a rough sketch of the proposed testing equipment and submitted it to a manufactory where meters, pumps, etc., are made for the petroleum industry.

The testing equipment consists of the following: One 100-gallon test measure mounted on three legs that are adjustable, having a  $4\frac{1}{2}$  inch dome with a glass gage calibrated 50 points plus and minus, and a two-way level mounted on its top; one explosion-proof  $\frac{1}{3}$ -hp electric motor, wired so that either 110 or 220 volts may be used; one vapor-proof switch; one pump with by-pass, capacity 20 gallons per minute; one air eliminator and strainer; one meter; and one quick-acting gate valve (the gate valve is an added safety factor). The motor, pump, air eliminator and strainer, and meter

are all mounted on the test measure so that it becomes one unit and this unit is fastened to skids which, in turn, are bolted to the bottom of the pick-up body in which it is carried. The position of the valves and piping will be explained later when the slides are shown.

If possible, we use a gravity flow through our meter for calibrating vehicle-tank compartments. By gravity flow, I mean that we connect direct to the outlet or delivery line of the bulk storage tank and run the testing medium through our meter and into the compartment under test, without the use of the pump. In many cases the bulk stations have a special connection for us to use, but sometimes the piping is such that we cannot connect without a great deal of trouble; so under this circumstance we draw the testing medium into the 100-gallon test measure and use the pump to complete the test. In some instances, where the bulk station has meters installed in their delivery lines, we first verify the meters with our test measure and then use the line meter to calibrate the vehicle-tank compartments. Where a great amount of work is to be done at one station this method expedites the work with a minimum of interference with the operation of the station. After the vehicle-tank compartments have been calibrated, and while they are still full, we check the vehicle meter if the vehicle is so equipped. In verifying the vehicle meter the testing medium is circulated from the tank compartment through the meter and back into the tank compartment until about 25 gallons have passed through the meter, to avoid all chances of partially filled lines. Then nozzle is closed and placed into the 100-gallon test measure. After meter has been verified we dispose of testing medium in our test measure either by the use of our own pump or that of the vehicle. If vehicle pump is used, connection is made from the drainpipe of the test measure to the manifold or intake line of the vehicle.

Not many of the vehicle tanks in New Hampshire are equipped with gravity flow meters. Where this circumstance is encountered, it is now necessary to place the vehicle tank on a higher level than our test measure. This is not entirely satisfactory and if the use of gravity meters increases, we will be obliged to make special provisions for this work, probably by the use of a light 50-gallon test measure that can be placed on the ground.

I mentioned that gasoline would have to be used as a testing medium under certain conditions. On bulk-station line meters, that is, meters on the delivery lines, it is obvious that the testing medium must be that medium which regularly is dispensed through the meter. It follows then that gasoline must be the testing medium for meters dispensing gasoline. Also, you will occasionally find a bulk station that does not handle anything but gasoline. Here, again, gasoline must be the testing medium for verifying the meters as well as the vehicle-tank compartments. Outside of the hazard involved, gasoline is quite reliable as a testing medium when properly used. Due to the fact that gasoline is usually stored in overhead tanks, its temperature is fairly close to the atmospheric temperature, and as the test is run in a few minutes, little opportunity is given for expansion or contraction. In using it as a testing medium, the dome of the vehicle-tank compartment must be covered to prevent losses through vaporization. Also an extension pipe must be installed on nozzle so that fluid will be delivered to the bottom of compartment

tank. However, we never test with gasoline except as the last resort. We never use gasoline as a testing medium from underground storage, due to the difference in temperature, and we never test until after the plant manager has been advised of the dangers and consents to the test.

I have neglected to mention the fact that the testing equipment is so arranged that the meter can be verified with the test measure. Each week during the period the testing equipment is in operation the meter is verified. Such frequent checking probably is not necessary, as we have never found it to be out, but wanting to be on the safe side this policy is still in force.

Finally, portable testing equipment must be as its name implies, portable. Yet, for the sake of portability, accuracy and efficiency must not be sacrificed.

Too many kinds of tests should not be tried with the same equipment.

While specifications adopted last year, by this body, allow a minimum testing draft of 50 gallons, I believe a test draft of 100 gallons is much more satisfactory. We do not follow the minimum tolerance requirement of 50 cubic inches, as approved by this body last year. I may have the wrong understanding of "minimum tolerance", but I can see no reason for allowing a tolerance of 50 cubic inches on 50 gallons. Fifty cubic inches is enough tolerance for a testing draft of 1,000 gallons and even greater amounts.

Our record of tests indicates that the meter method of measuring is very satisfactory. Here I have the inspection report forms that we have developed for this work. It is probable that somebody may be interested in them. I will leave them on the desk. If you care to tear out some for samples you are at liberty to do so.

In the National Bureau of Standards they have facilities for calibrating meters. From what I was able to learn while here last year, the meters they test are used principally for checking brewery meters, and I am informed by Mr. Holbrook that the testing medium is water. This year I wanted to have our meter calibrated by the National Bureau of Standards, but I did not dare to allow the use of water as a testing medium. It seems to me that the use of meters for testing work will increase rapidly. Many States have already adopted this method, and many others are considering their adoption. The accuracy of the meter is of tremendous importance. I believe most State departments will not have the means of carrying out the precision work necessary to determine their accuracy, and so I am suggesting that the National Bureau of Standards consider means of rendering this service to the States.

It is probable that I have not covered many points of interest. It is difficult to know what is interesting to others. The program has allotted time for discussion of the papers given this afternoon. I will be pleased to answer any questions, either during this meeting or afterwards.

(At the conclusion of this paper Mr. White showed a number of lantern slides of the equipment described in the paper.)



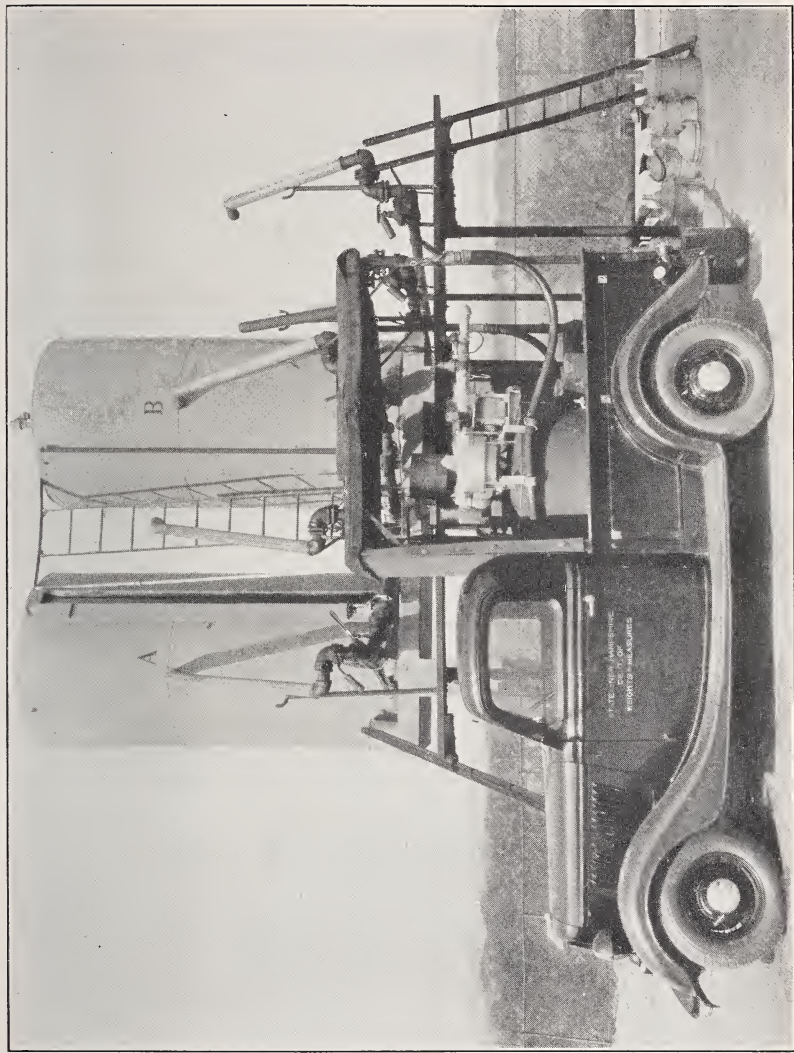


FIGURE 13.—Portable testing equipment for various liquid-measuring devices, of State of New Hampshire, at a typical bulk storage plant installation.

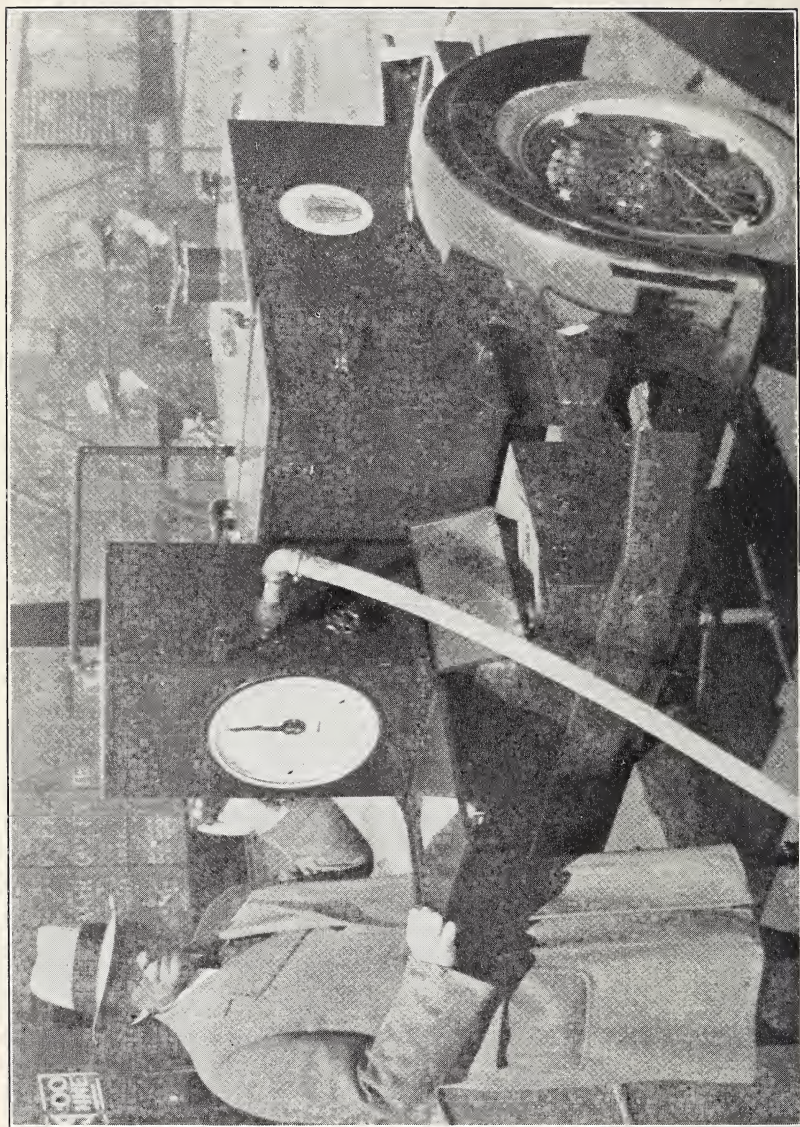


FIGURE 14.—Portable testing equipment for large-capacity meters and vehicle-tank compartments, of the State of Massachusetts.



PAPER PRESENTED BY JOHN R. BOOTH, SEALER OF WEIGHTS AND MEASURES, CITY OF HAVERHILL, MASS., AND DELEGATE FROM MASSACHUSETTS SEALERS' ASSOCIATION

In preparing a paper on this subject the thought occurs to me that it might be well to go back a few years into the question of some of the early methods employed in delivering and measuring fuel oil and gasoline, point out some of the errors and possibilities of errors of those methods, and endeavor to show the advantages of the present system. So, with your indulgence, I will go into this phase of the matter.

It will be recalled that deliveries of these commodities first commenced in the conventional 5-gallon bucket can, all of which were sealed. The matter of testing and sealing these cans presented no great difficulty but many sources of error in this form of delivery were manifest, i. e., spillage, dented cans, improper filling of cans, especially neglect to fill can to the designated filling point, and the great length of time consumed by this method. These early cans were wide-necked cans not graduated, and an error of a few cubic inches in reading the liquid level in the neck of the can was easily made. This error, multiplied by the number of times the can might be used in delivery, would make an appreciable difference; for instance, in delivering a 500-gallon compartment 100 drafts would be made. This method also entailed the danger of loss of count, and the variation of temperature over the long period of time during which a delivery was being made presented another source of error.

To overcome this situation entire compartment deliveries were contemplated and the compartments were tested and sealed. This method required all compartments to be sealed with a definite filling point. This point took the form of an adjustable brass or steel tongue on a threaded bolt held in place by check nuts. If the compartment lines were manifolded it was necessary to equip such lines with check valves in order to prevent backflow of oil from one compartment to another. It was also necessary to stencil on the outside of each dome the capacity of that compartment, and to identify each compartment and its proper discharge line. The piping, likewise, had to be considered and, in some instances, it formed a part of the compartment capacity. This method of delivery presented no way of determining quantities of less than compartment capacity except by the so-called gage stick. The stick system has never been regarded as legal in Massachusetts and has many possible sources of error, i. e., not holding the stick perpendicular; tank not being level; creepage of the liquid on stick; and the substitution of a wrong stick for a specific tank.

It soon became apparent that the 5-gallon graduated can was not the proper means of testing a compartment as it can be readily seen that a compartment of capacity of anywhere from 150 to 500 gallons or more necessitated the consumption of a great deal of time and had possibilities of error due to loss of count, temperature variations, and failure to keep a correct check as to the filling point reached in the graduated neck of each can. I might say here that the trend in Massachusetts is now definitely toward measuring tank-wagon deliveries by meterized equipment, so that tests of compartments are becoming less frequent.



The first departure from this 5-gallon graduated measuring-can method, was to accurately test a tank-truck compartment and use this as a testing unit. This method was adopted as a temporary expedient. Manifestly this was an improper procedure because the sealer had no permanent custody of the testing unit as it was the property of the oil company and was used in regular commercial practice; therefore no assurance of accuracy could be had, so that a retest was necessary on each subsequent use of the compartment for test purposes.

To properly meet this situation calibrated tanks of 50- and 100-gallon capacity were developed. The first of this type of tank was transported on the sealer's truck to points of test. The objection to this type of tank was twofold. There was no means of emptying other than through the faucet, on gravity tests, which made it difficult to save the liquid used in test, and this confined the testing liquid to water. In tests involving meters, water, of course, was not a proper liquid. Likewise, in gravity tests, it was necessary to place the test tank on an elevation, fill with liquid, and then empty into compartment under test; thus the method gave a result only on capacity of compartment to contain.

The State division of standards in 1933 developed a 100-gallon portable test tank. This tank was mounted on a trailer which was readily attached to an automobile. The tank was equipped with an electric motor-driven pumping unit, air separator and meter, and with suitable levelling devices. By means of the pumping unit it was possible to pump the liquid from the test tank, which was properly equipped with facilities for draining, and with this tank it was possible to use the same liquid for which the meter or compartment was intended to be used. Also, with the later equipment the test is made in relation to the accuracy of the compartment to deliver. The State division of standards is equipped with two test tanks, one of 100-gallon capacity and one of 50-gallon capacity, and many of the cities and towns now are equipped with a similar type of portable test tank. Before I describe these, however, I want to describe an equipment owned by the city of Springfield.

Springfield has a barrel-shaped 50-gallon-capacity tank which is installed in a sedan delivery truck, which is their regular all-purpose truck. The floor of this truck is covered with sheet metal. The can is welded to angle-iron legs attached to shoes to fit a track on the floor of the car so that the can may slide in and out on this track. When a test is being made the tank slides part way out of the car on these tracks and one end is sustained within the truck, the other end by a jack under the can.

The first tank developed by the division of standards was of 100-gallon capacity and constructed of 8-gage steel. The dimensions of the tank itself are 24 inches wide by 32 inches high by 30 inches long with a graduated neck of 120 cubic inches plus, and 120 cubic inches minus. The top of the chassis carrying the tank is 22 inches from the ground giving over-all height of 54 inches. The over-all length of the tank is 92 inches and the over-all width 64 inches. It is standard tread so that the tank readily trails behind any regular passenger car. This tank is equipped to discharge by either power or gravity, and is also provided with a suction inlet so that liquid



FIGURE 15.—*Testing truck of the city of Springfield, Mass., showing test tank for measurement of large volumes of petroleum products.*

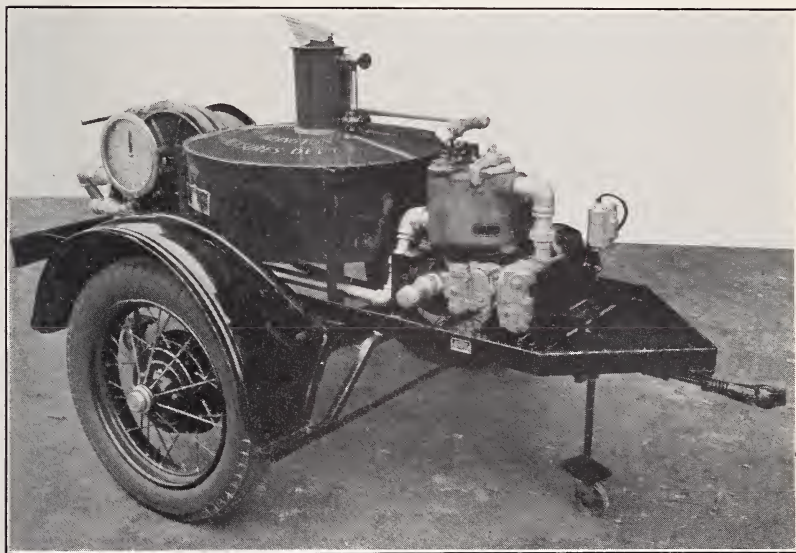


FIGURE 16.—*Portable testing equipment for large-capacity meters and vehicle-tank compartments, of town of Arlington, Mass.*

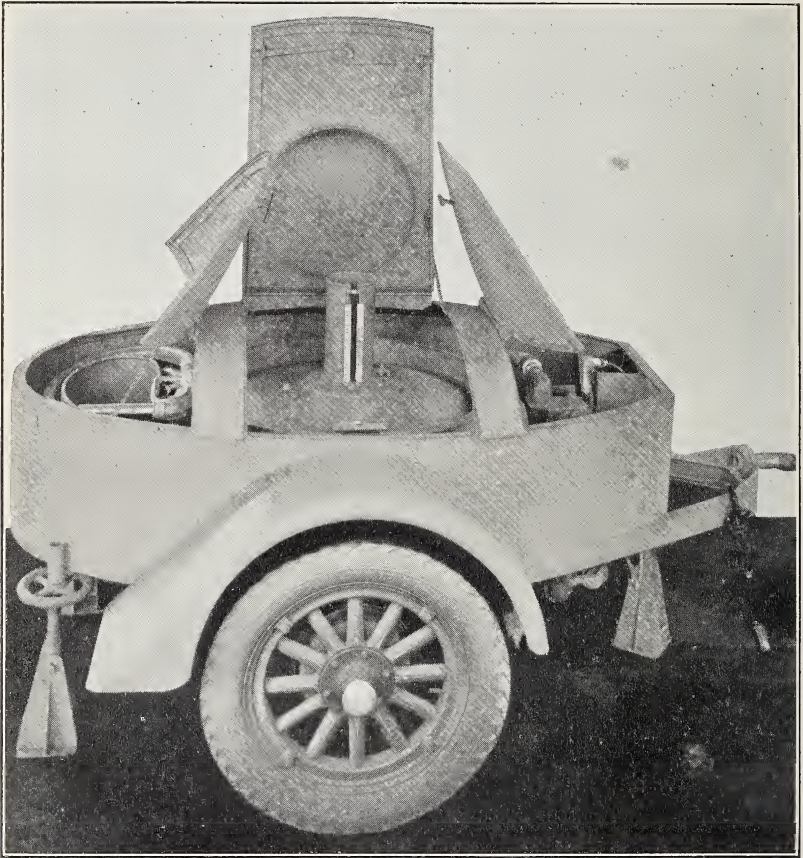


FIGURE 17.—*Another type of portable large-capacity test tank used by State of Massachusetts.*



may be pumped from household tanks for the purpose of measuring delivery. The weight of the tank empty is 1,300 pounds. The pump is operated by a  $\frac{1}{4}$ -horsepower motor and carries 125 feet of cord so that the same may be readily plugged into any lighting circuit. The device is equipped with two-way level and levelling jacks. It takes but very few minutes to put the tank in readiness for test.

The division of standards also has a 50-gallon cylindrical tank with the same features as in the 100-gallon tank except that this tank weighs 1,215 pounds empty and differs in shape and design and has no meter.

The testing equipments owned by the cities and towns are, as I have said, generally similar to those owned by the State. In some instances the test tanks are equipped with meters and air release units; however the meter is not regarded as a testing unit, the test tank itself being the sole standard. The presence of the meter and air separator on the test tank retards, of course, the speed in emptying the tank. The pumps are operated, generally, by a motor of  $\frac{1}{3}$  to  $\frac{1}{4}$  horsepower, and develop a speed varying from 10 to 25 gallons per minute, thus making it possible on the 50-gallon test to empty the test can in 2 to 3 minutes, and on the 100-gallon test in 5 or 6 minutes. Generally about 20 to 30 feet of  $1\frac{1}{4}$ -inch hose is used, and an extension of about 100 feet of cord will be sufficient to enable the motor to be plugged into a lighting circuit. The motor is 110 to 220 volts. In most cases the equipment is mounted on a trailer and the motor, pump, etc., are protected by metal housing against the weather.

The main advantages of the large test tank, of course, are the reduction of the multiplication of errors, such as errors in the 5-gallon calibrating can and errors due to temperature changes, and the saving of considerable time.

Before any test is actually made an inspection should be made of the tank-truck meter system, observing the system of discharge lines as to whether they are manifolded, the suction line, types of valves, presence of check valves in compartment lines, and the air releases and the vent therefrom as to whether or not the system is equipped with a back-pressure valve and antidrain nozzle. With the portable test tank absolutely level the usual procedure is to make a straight test of the meter with the line valve wide open. Also tests are made at both minimum and maximum speeds for which the meter is rated. Next a test should be made with all empty compartment valves open and the liquid-containing compartment line valve full open, as this is a condition which might normally develop where an operator would start delivery from one compartment and, exhausting the supply of that compartment, would proceed to another compartment without closing the valve of the empty compartment from which he had previously drawn. A test also should be made where manifold lines are involved with the empty compartment line valve nearest the suction line open. Further tests should be made to determine the possibility of manipulating the valves so as to defraud, and these tests should involve cracking the liquid-containing compartment line valve to various openings during the process of delivery, with empty compartment line valves also open. We have found by this process that shortages in varying degrees can be accomplished. In one instance on a

100-gallon draft a shortage as high as  $11\frac{1}{2}$  gallons was effected. It is contended that this latter form of test is severe, but it is justified because of the fact that it simulates a condition which may readily be accomplished, deliveries from tank trucks in most instances being in the absence of a purchaser. This form of test also shows defects in types of air releases such as inadequacy of means of separating the liquid and air and of quickly eliminating the air. All these tests are possible with the larger tank and readily show results which could not be obtained by using the 5- or 10-gallon can.

Many tests of all makes and sizes of meter systems have been made during the past year, also of all piping sizes and various arrangements, and practically all have shown errors. The tests included range oil, and fuel oils grades 1, 2, and 3. With the heavier oils on a cracked valve test the meters showed a greater tendency of error, but no seal is applied unless the device tests within tolerance. The explanation of the various tests with their resultant errors may sound like a condemnation of the meter system and manifold lines, but they are mentioned here because they are in direct relation to the portable testing equipment which the State and many cities of Massachusetts now have. Those errors have existed for some time but apparently went unnoticed with the testing equipment used heretofore; the larger capacity testing measure is, therefore, proving very satisfactory and, as I have said before, discloses conditions which no one anticipated.

It is plainly evident that, with the enormous growth in the oil industry, and the many methods of delivering being used, considerable thought must be given by weights and measures officials and manufacturers alike in an effort to offset the conditions which I have described.

(During the presentation of this paper Mr. Booth showed a number of lantern slides of the equipments described in the paper.)

(At this point, at 4:45 p. m., the Conference adjourned to meet at 9:30 a. m., Friday, June 12, 1936.)

## SEVENTH SESSION—MORNING OF FRIDAY, JUNE 12, 1936

(The Conference reassembled at 9:45 a. m., at the Washington Hotel, Mr. John P. McBride, first vice president of the Conference, in the chair.)

### REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES, PRESENTED BY F. S. HOLBROOK, CHAIRMAN, AND DISCUSSION THEREON

Mr. Chairman, ladies, and gentlemen, at the Twenty-fifth Conference on Weights and Measures the following resolution was adopted:

Whereas the National Bureau of Standards may find it possible during the coming year to republish Miscellaneous Publication M85, containing all codes of specifications and tolerances of the National Conference on Weights and Measures, for the use of officials; and the codes should thus be in as good form as possible for the convenience of the officials: Therefore be it

*Resolved*, That the Committee on Specifications and Tolerances be given authority to reword the requirements without changing their meaning and effect, to make any desirable rearrangement and renumbering of paragraphs, and to amend cross references as to applicable codes, in the interest of brevity, good form, avoidance of unnecessary repetition, and satisfactory classification.

#### SECTION ON SCALES

The codes most susceptible of that character of treatment contemplated by the resolution were the codes for scales. These codes had their inception in 1913 and grew up gradually. Specifications were added and amended, and new headings were added, from time to time, until in the various codes it was necessary, in order to determine the requirements referring to some devices, to resort to a great deal of cross referencing. For example, we may take a computing scale. Under the heading "Computing Scales" there appeared certain requirements. A computing scale is also an automatic-indicating scale in many cases. To determine the specifications applicable to such a computing scale it was then necessary to consult the specifications under the heading "Automatic-Indicating Scales." A computing scale is usually a counter scale, so specifications under this heading had to be consulted in most cases. A computing scale might be of the spring type, in which event it was also incumbent upon the reader to go to the heading "Spring Scales" to determine which of the requirements there given were applicable. Computing scales were also subject to the general specifications for scales, so under this heading were to be found additional requirements. Tolerances for a computing scale of the spring type were contained in one of two tables, while tolerances for a computing scale of the pendulum type were in still another table. To sum up, due to the manner in which the codes grew up, the difficulty involved in finding all the applicable requirements was very great, at least until after considerable experience in dealing with the subject matter.

The committee has attempted in this horrendous document, put in your hands some 48 hours ago, to reclassify and reword the specifica-



tions and tolerances for scales in order to simplify their presentation and to make it easier to determine the various requirements applicable in any case. We placed this document in your hands just as early as possible—actually on Wednesday morning—with the idea that you would look it over and study it to determine whether this form and content was satisfactory to you.

The committee is prepared to say that it is its opinion that these specifications, tolerances, and regulations impose upon scales the same requirements that have been imposed formerly, except in certain cases which will be individually called to your attention. In these cases, the committee believes that the meaning of individual specifications has been changed by new language employed, so we desire to call your attention to the changes, and, after you have considered them, we will suggest specific action looking to their adoption. Later two specifications will be recommended for repeal.

One more word may be said: Despite the bulk of this document it is nevertheless very much shorter than our present codes, as can readily be demonstrated when we tell you that in one case, for instance, six specifications scattered through the former codes become only one specification of equivalent length in the code now before you.

The code starts off with some definitions. These definitions have in some cases been assembled from various parts of the old codes and in many cases they are new. However, a definition, of course, is not a requirement, but is simply put in for clarification.

Is it the desire of the Conference that the definitions be read, or are you familiar enough with those to allow us to pass them? They are in many cases new material.

(No request for reading of the definitions was made.)

Mr. HOLBROOK (continuing). Referring to B-2b (3), this specification reads as follows:

Stability of balance condition.—When the beam or indicator of a scale is displaced from a position of equilibrium to the full extent allowed by the construction of the scale, it shall return to this position after release. When a scale is equipped with a locking device or a relieving device or unit weights, repeated operation of the locking or relieving device or repeated application or removal of unit weights shall not materially affect the balance condition of the scale.

The committee is of the opinion that the material with relation to unit weights is new. The other material is already in the specifications.

I suggest that on account of the fact that the amendments are scattered throughout the document in your hands, they be voted upon individually as read.

The ACTING CHAIRMAN. Gentlemen, what is your pleasure on the acceptance of the requirement that the chairman of the committee has just read?

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. Proposed specification B-2b (4) reads:

Interchange or reversal of parts.—Scale parts which may readily be interchanged or reversed in the course of normal usage shall be so constructed that their interchange or reversal will not materially affect the balance condition or the accuracy of the scale. *Scale parts which are susceptible of inter-*

*change or reversal in normal field assembly either shall be so constructed that their interchange or reversal will not materially affect the accuracy of the scale or the parts shall be so marked as to indicate proper positions.*

That specification presents a considerably broader requirement than originally, and it is to be considered in part as new material. The old specification referred to corner loops only. This refers to all parts that are so constructed that they are susceptible of interchange or reversal in the field assembly of the scale.

The committee proposes the adoption of that specification in its amplified form.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. Turn back just a moment. I may say that on the first page, under A-2a (1), in the first paragraph of the definitions it is provided that the fractional bar of the beam is to be included in the sum of the capacities of the remaining reading elements, only when this exceeds  $2\frac{1}{2}$  percent of such sum. The figure 2 percent was used in the old specification. Examination of a number of types made at various times has indicated that  $2\frac{1}{2}$  percent is a better figure. The change is formal, because obviously 0.5 percent on the capacity is a matter of no moment, but inasmuch as a change is made from the old requirements I present that for consideration. This will bring this requirement into conformity with other recognized specifications on scales.

(The amendment was duly adopted.)

Mr. HOLBROOK. Referring to B-2c:

Balancing means.—A scale shall be provided with a mechanical device or other means by which the balance condition may be adjusted. All loose material used for the balancing of a scale shall be securely enclosed.

The second sentence referred formerly to counter scales only. It is now recommended to be made of general application. The committee certainly believes that loose material used for balancing a scale of any type should be securely enclosed.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. Referring to B-2i (4). The last two sentences are new material. They read:

*That dimension of the tip of the pawl which is transverse to the longitudinal axis of the beam shall be equal to the corresponding dimension of the beam notches. The tip of the pawl shall be rounded off so that a small amount of foreign matter in the bottom of the notch will not prevent the poise from assuming its correct position.*

The requirement of the length of the pawl is to provide for a more secure seat in the beam notches so that it may not be slightly rotated on the beam, causing an error of indication. When the tip of the pawl is rounded off, the pawl will remain longer in good condition than when the edge is sharp and sets upon the bottom of the notch in the beam. The wear on the beam will also be less and the almost inevitable collection of dirt will not prevent the pawl of the poise from seating properly.

We propose that for adoption.

Mr. ALLEN. Is that to be construed as applying to the tip of a hanging poise? On the poise which works in notches there is a knife edge on the poise.

Mr. HOLBROOK. No. As you see, the application of this specification B-2i (4) is limited. The hanging poise does not have what is known as a pawl. If you will look two specifications below, in B-2i (6), you will find a specification for hanging poises which requires the bearing edge of a hanging poise to be hard and sharp and to be so formed as to allow the poise to swing freely in the notches.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. The next amendment is somewhat more important. A new specification, B-2n, is proposed to read:

B-2n. Damping device.—*An automatic-indicating scale shall be equipped with an effective dash-pot or other equivalent damping means whenever the incorporation of such a device is necessary in order to bring the indicating elements quickly to rest.*

We all know that a commercial scale which continues to vibrate for a long time is rather a dangerous scale to have in use because the merchant will probably either try to read the scale before it has come to rest, or arrest it with his hands in order to obtain the reading. We feel that fraud or mistake is very likely to follow.

Many scales are now equipped with damping devices. We know that many automatic-indicating scales on the market do not need damping devices because they come to rest quickly of themselves. This language is general, but it is as specific as the committee has been able to make it.

We think the specification is one which will be very valuable in practice and will discourage the manufacture of scales which may be fraudulently or inaccurately used due to excessive vibration.

Mr. TINKEY. I would like to have that word "quickly" interpreted. What do you mean by "quickly"?

Mr. HOLBROOK. Well, I am glad I said that this language was general. It necessarily is more or less indefinite. A scale should be equipped with a device which will arrest vibration provided it does not come to rest in such a reasonable time that the merchant is willing to wait for it, provided that it vibrates so long a time that the merchant will be tempted to read it before it has come to rest.

Mr. TINKEY. That is what I have in mind, but I think it is open to argument this way. I am for it, understand, but it is a matter of interpretation.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK (reading):

B-2o. Unit weights.—*The total value of all unit weights in place at any time shall be automatically indicated on the reading face. The mechanism for applying and removing unit weights shall be positive in its operation and shall provide for the rapid addition and removal of unit weights one at a time; it shall be controlled by means conveniently located and operated in a simple manner from the outside of the housing; it shall function properly irrespective of the speed of manipulation.*

That specification incorporates one or two of the old specifications, but in the opinion of the committee it adds some new requirements; therefore we present it to you for approval in toto.

(The specification as proposed by the committee was duly adopted.)



Mr. HOLBROOK. The next item is on page 10, B-2t (2) :

Built-in types.—The installation of all built-in scales shall be such as to insure foundations and supports of adequate strength, rigidity, and permanence; *all working parts of the scale shall be in proper condition as to level and vertical alinement*; adequate clearances shall be provided around all moving parts.

That specification is new in part. It has been called to the attention of the committee by a man who has carefully studied this document, that it is just as necessary for a permanently installed self-contained scale to have a permanent foundation as it is that a built-in type have a permanent foundation, and I absolutely agree with that idea. I think that the specification should be amplified, if possible, to make it apply to all scales which are permanently fixed in one position.

Perhaps the language could be made to read in this style:

The installation of all scales which are permanently installed in one location shall be such as to insure foundations and supports of adequate strength, rigidity, and permanence.

One other thing suggested by the same authority is that the word "moving" is not sufficiently inclusive. There are parts of a scale which do not move but which are nevertheless "live" parts. They should have proper clearance around them, inasmuch as the scale will be affected if binding is caused at those places. So, if I may, I will suggest that the word "moving" in the last line of that specification be made to read "live."

Mr. SWEENEY. Mr. Chairman, I move the adoption of B-2t (2) with the changes specified by Mr. Holbrook.

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

Mr. HOLBROOK. We will now turn to page 13, D-2c (2) :

Width.—*The weight graduations and the value graduations shall be clear and distinct, but in no case shall their width be less than 0.008 inch—except as provided in paragraph D-2c(4)—nor more than the width of the minimum clear interval between the graduations.*

The words "nor more than the width of the minimum clear interval between the graduations" are new. However, that language has applied previously to all weight graduations, and we think that it should apply to value graduations likewise; therefore the committee proposes the specifications as amended for consideration.

(The specification as proposed by the committee was duly adopted.)

Mr. HOLBROOK. I might call attention, on page 16, to specification F-3b. As written here, it reads:

Knife edges and bearings.—All knife edges and bearings shall be made of hardened and tempered steel, or of agate.

It has been suggested by the gentleman to whom I have previously referred, that the word "pivots" would be better than "knife edges" there, and I agree with him. The whole pivot should be of hardened steel.

It has also been suggested that the words "hardened and tempered steel" are old-fashioned language, and that under present-day conditions the material in question should be referred to as "hardened

steel." As I understand it, under new processes all hardened steel is not now tempered, nor is it necessary that it be tempered; it can be made hard without tempering. Therefore, I propose that that specification read:

All pivots and bearings shall be made of hardened steel or of agate.

That will make it new material, though it is merely a clarification of the meaning of the old specification.

The ACTING CHAIRMAN. What is your pleasure, gentlemen?

Mr. HARRISON. I move its adoption.

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

Mr. HOLBROOK. I may say that in some cases the phrase "hardened and tempered" has been used in other paragraphs; also in some places "knife-edges" may have been used in place of the word "pivots", where "pivots" is the better word. In view of the fact that you have amended this specification as noted, I suggest that the committee be instructed similarly to amend other specifications as necessary to make them uniform in these connections.

Mr. SWEENEY. I move you, sir, that the suggestions of Mr. Holbrook relative to the substitution of the word "hardened" for the words "hardened and tempered" and of the word "pivots" in place of the words "knife-edge" as they appear throughout the specifications be adopted.

Mr. HOLBROOK. May I amend that by saying "in all cases where 'pivot' is meant"? "Knife-edge" will occasionally be meant, and it should be retained.

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

Mr. HOLBROOK. Now, please refer to page 22, table II. The members will recall that we have two classes of scales, class A and class B. Class A includes scales of certain types when installed indoors; class B includes these types when they are installed outdoors. The class B tolerance is twice the class A tolerance, and these types when installed outdoors are placed in class B on account of the increased difficulty of maintaining the accuracy of a scale in an out-of-doors location. However, one or more manufacturers have contended that in so far as they are concerned in their manufacturing operations there is no distinction between a dormant or a built-in scale of class A and of class B, because when they are building the scale they very often have no knowledge as to whether it is going to be installed indoors or out. They therefore suggest that all scales of the types mentioned are adjusted to the same tolerances.

It seems that the manufacturers' tolerance on such a scale which is eventually to be used indoors and on one which is eventually to be used outdoors might well be the same. There seems to be no good reason why a manufacturer should be allowed a larger tolerance in his factory operations because the scale is eventually to be installed outdoors. Therefore, this table has been amended to provide that the manufacturer shall be allowed the same tolerance on such a scale whether of class A or of class B, that tolerance to be the present manufacturers' tolerance on class A scales. The users' tolerance—

that is, the tolerance applicable after the scale is put into use and used in an outdoor location—remains undisturbed.

While that seems to be an important change because it cuts the manufacturers' tolerance on certain classes of scales in half, it is our information that it will upset present manufacturing practice none at all. If any manufacturer here thinks otherwise, I wish that he would express himself at this time.

The ACTING CHAIRMAN. Does any manufacturer wish to express himself on this point?

Mr. ENGELHARD. Do I understand, Mr. Holbrook, that page 22 refers to manufacturers' tolerances?

Mr. HOLBROOK. It covers both manufacturers' and users' tolerances. The tabular values given are tolerances on scales in use. The manufacturers' tolerances are half of the values shown.

Now, in the case of certain class B scales we are recommending that the manufacturers' tolerances be one-fourth of the values shown here; in the case of all class A scales the manufacturers' tolerances will remain at one-half the value shown here. The result will be that the manufacturers' tolerances on all class A and some class B scales will be identical.

Mr. ENGELHARD. The heading of the table reads: "Table II—Tolerances for large-capacity scales." Are we to assume that that is for manufacturers? If class B is crossed out and not used in this table, then we only have one series. Is that to be used for manufacturers? It seems to me it is rather harsh. It is very severe to be used in actual field practice. In other words, this is for a manufacturer's guidance in the manufacture of his scale, is it not?

Mr. HOLBROOK. These tolerances are to guide the manufacturer in the manufacture of his scales, and also the weights and measures official in testing any scale, whether new or old.

Mr. TINKEY. Mr. Chairman, wouldn't it be a great deal better if this whole matter were reworded and rephrased, having only one class of scales, leaving the matter of tolerance up to the inspector, depending on whether the scale is inside or outside? He may find a scale today that is inside and tomorrow it may be outside.

Mr. HOLBROOK. The tolerance on a scale indoors today and outdoors tomorrow remains unchanged. For instance, a portable platform scale may be used in or out of doors, but portable platform scales always take the class A tolerance, in spite of the fact that they may at times be found out of doors. The only scales which are in question are scales which are permanently installed in position, either indoors or out of doors, and those will not change their position from day to day.

To clear up this matter, let us say that the present requirements are as follows: Dormant and built-in types, if they be installed indoors, take a class A tolerance; if installed out of doors, they take a class B tolerance. A portable scale takes a class A tolerance regardless of the place in which it is found, and scales of the railway track, motor truck, and wagon types are invariably of class B. It seems that is a perfectly proper distinction, because scales used indoors, of the dormant or built-in types, undoubtedly will be more easily maintained within class A tolerances than those identical scales when used outdoors.



This proposition which I have been presenting alters these requirements in one respect in relation to tolerances on some new scales of the class B type. Although some such scales may eventually be installed outdoors, during the manufacturing operation the manufacturer will not know whether the scale is going to be installed out of doors or indoors. Therefore, as I understand it, the manufacturer, in building a dormant or built-in type, adjusts his scale to comply with class A manufacturers' tolerances in all cases, in order to be safe. That is all we are requiring by the amendment proposed—that the manufacturer of a dormant or built-in type<sup>5</sup> comply with certain tolerances, to which we understand he is manufacturing at the present time.

(The amendment was duly adopted.)

Mr. HOLBROOK. If you will refer to page 23, J-1b, you will note two paragraphs which are explanatory of the application of the tolerances to railway track scales. This material has been amended to bring it into line with present-day practice. The second paragraph reads:

In order that the largest algebraic mean of any two errors, which represents the maximum error of freight-car weighing, may not differ appreciably from the true amount, a test car having a wheel base not exceeding 7 feet should be used.

It has been suggested that the standard requirement is that a load of not less than 30,000 pounds should be used in testing a railway track scale. To bring this point out, we now recommend the addition, after the words "7 feet", of the words "and weighing not less than 30,000 pounds." That simply makes this conform with good railway track scale testing practice.

(The amendment was duly adopted.)

Mr. HOLBROOK. Referring to page 25, table IV, we find that by inadvertance we have omitted the tolerances for straight-face spring scales altogether. The tolerances for straight-face spring scales under the old codes were specified as four times the values shown in this table. It is recommended that that omission be corrected by inserting within a bracket the following words after the heading of the table, namely, "Tolerances for straight-face spring scales are four times the values shown." That corrects an omission and is not new material.

(A motion was made and seconded that the insertion be made, the question was taken, and the motion was agreed to.)

Mr. HOLBROOK. Happily we have reached the last page of the document, page 28. The regulation which appears as K-4 has been amended to read:

Level condition.—All portable scales designed to be set on a counter or table or on the floor shall be maintained in level.

This regulation has been somewhat amplified as to the type of scale included within its purview. We think this is a very reasonable requirement for all of the characters of scales included.

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<sup>5</sup> Railway track scales have also been included in this class in order to make these tolerances uniform with the tolerances of the American Railway Engineering Association.

Mr. HARRISON. Mr. Chairman, I don't know whether it is important or not, but I would like to call attention to the fact that in this particular regulation the term "portable scales", as I understand it, does not mean the same thing that the term on page 22, "portable platform type", under the tolerance table, means. I would be very glad to be corrected if I am wrong.

Mr. HOLBROOK. The terms "portable platform" and "portable" are so nearly alike that they might be confused. The regulation might be amended to read:

All scales which are portable and are designed to be maintained on a counter or table, etc.

That will be in the interest of clarification, I think. I suggest that that language be adopted.

(The regulation, as proposed to be amended, was duly adopted.)

Mr. HOLBROOK. K-5 reads:

Free suspension.—All scales of the hanging type shall be freely suspended when in use.

This has been amplified to cover all hanging scales. Formerly it covered, as I recall it, spring scales alone. We think the requirement is proper as to all scales of the hanging type.

(The regulation, as proposed by the committee, was duly adopted.)

Mr. HOLBROOK. There has been one item omitted on this page. There is a general regulation on drainage reading:

Wet fish or other wet commodities shall be weighed only on scales the pan or platform of which will properly drain.

It is the opinion of the committee that that should be numbered K-7 and be inserted in its proper place. The last two paragraphs will then become K-8 and K-9, respectively. That is not new material. It is simply something that was omitted.

(The insertion, as recommended by the committee, was duly adopted.)

Mr. HOLBROOK. It is recommended that the following specifications be repealed:

Platform scales.—11. Any device for altering the sensibility of a scale shall be so limited in its adjustment that the beam can not be made unstable by the manipulation of the device.

The committee believes that this is an unfortunate specification. In platform scales the sensibility reciprocal of the beam is usually adjusted by raising or lowering the balance ball assembly. In order that the manufacturer may provide an adjustment which will be sufficient at all times during the useful life of the scale, it is believed that the device as furnished new will often be such that when it is raised to its highest point the scale will be unstable. However, we believe that that is perfectly reasonable, since, were it otherwise, we feel that during the useful life of the scale a point would be reached at which the balance ball assembly could not be raised to a point sufficient to bring the sensibility reciprocal of the scale within the requirements. Therefore, the committee suggests repeal of that specification.

(The specification was duly repealed.)

Mr. HOLBROOK. Under the heading "Counter Scales", specification 9 reads as follows:

No. 9. On scales of the equal-arm type with stabilized pans—that is, pans above the beam—the under connections and a line connecting the outer knife-edges in the beam shall form a parallelogram. These under connections shall be straight and work freely.

No weights and measures official ever determined whether a parallelogram was achieved in a scale of this type except by means of a shift test. In other words, if the shift test requirements are not complied with, the scale is condemned. It may be condemned because four lines do not form a parallelogram, but the sealer will never know whether the lines form a parallelogram or not. Therefore, inasmuch as the condition aimed at is determined by the application of the shift test, and the decision made according to the performance on such test, we believe that the specification should be repealed.

(The specification was duly repealed.)

Mr. HOLBROOK. Your attention has now been directed to all changes. The committee believes that no other new requirements are presented in this report. However, this has been a tremendous job, and the committee is by no means certain that every one of the old provisions is incorporated. Also we would like to see this code made as good as we know how to make it. There are one or two places where the committee has already seen that the language can be slightly improved and clarified. The committee would therefore suggest that the resolution adopted last year in relation to this matter<sup>6</sup> be continued by the present Conference so that we may make this check on completeness, and so that if we find anything wrong or susceptible of improvement we may make corrections and changes of language without referring the document back to the Conference. If that resolution is continued, the committee will expect to make changes of this character.

Mr. ENGELHARD. If you will refer to page 17, in each one of the various paragraphs you will find that the words "person weigher" are incorporated. Referring to pages 15 and 16, in the requirements for prescription scales and balances, you will find these words are not incorporated in the separate paragraphs. However, I find that on page 15 the entire subject under heading F applies only to prescription scales and balances.

In other words, if one picks up the sheet and looks at F-3d, he reads: "All Class B scales and balances shall be conspicuously marked with the words 'Class B. Not to be used in weighing loads of less than 10 grains', or with a similar and suitable wording conveying the same information." If we take that out of its context in F, it seems to require practically every scale on the market to have that marking. If we leave it in its context, it is plain that it refers merely to prescription scales and balances. I wonder if all paragraphs should not be in the same form, and should not all of them state the particular type of scale covered? With that thought in mind, I move that the committee be empowered to change, if necessary or if they find it advisable, the wording of this material without altering its meaning.

Mr. HOLBROOK. As I understood it, the gentleman makes a motion to give the committee the authority to change the form and phrase-

<sup>6</sup> See p. 117 for the text of this resolution.



ology of these specifications without changing the meaning. I suggest this could be accomplished by continuing the resolution which I read at the beginning of this discussion, as follows:

Whereas the National Bureau of Standards may find it possible during the coming year to republish Miscellaneous Publication M85, containing all codes of specifications and tolerances of the National Conference on Weights and Measures, for the use of officials; and the codes should thus be in as good form as possible for the convenience of the officials: Therefore be it

*Resolved*, That the Committee on Specifications and Tolerances be given authority to reword the requirements without changing their meaning and effect, to make any desirable rearrangement and renumbering of paragraphs, and to amend cross references as to applicable codes, in the interest of brevity, good form, avoidance of unnecessary repetition, and satisfactory classification.

Mr. SWEENEY. I second the motion.

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

The ACTING CHAIRMAN. Is Mr. Lang in the hall? I would like to have him assume the chair.

Mr. WOODLAND. Mr. Lang was suddenly called home and left yesterday.

Mr. TINKEY. There are two matters on which I would like to get this committee's respectful consideration during the next year. The first I have is on page 28, under K-6. There you set up a minimum-weight graduation on scales used in the sale of foodstuffs. There is added a proviso reading: "Provided, however, that this shall not apply to scales used exclusively in the sale of vegetables." I think consideration should be given to the proper minimum graduation for a scale used in the sale of vegetables. Should it be 2, 3, 4 ounces, or what? I believe that ought to be considered.

The other suggestion refers to material on page 9, under B-2m (4), all that after the word "provided", which allows the double sighting line on scales. We have deleted that in Ohio, and there is no reaction from any manufacturer. The scales are no longer made that way, and it seems to me that that could be deleted or be limited to apply to scales used for scientific purposes only. We use it scientifically, but not commercially. We find it facilitates the perpetration of fraud to have too many reading lines on the scale. The main thing is not to have the real indicator set too far away from the chart. It is difficult to control the matter. It is a better thing to have the additional indicator eliminated entirely.

Those two things I would like to present to the committee for their consideration.

The ACTING CHAIRMAN. Those are substantive changes and would be considered by the committee in regular course next year.

Mr. TINKEY. Yes.

Mr. HOLBROOK. To return to the code just considered: The committee perhaps had the right to make such a major operation as has been made on these codes. However, since it was found possible to bring the matter before the Conference, the committee would very much prefer that the Conference consider what is to be done with the document rather than have the committee proceed upon the authority granted last year. I think it would be fairer to the membership.

The ACTING CHAIRMAN. You mean we should take some action in regard to this document?

Mr. SWEENEY. Suppose that we should move at this time that all changes in the specifications which have been submitted by the Committee on Specifications and Tolerances, and which have been adopted here, together with the remaining specifications which have been changed in form but not in meaning be adopted at this time, with the proviso, of course, that further changes of the character suggested in the resolution just passed be allowed.

The ACTING CHAIRMAN. You have acted individually on those portions which appeared to demand individual action and consideration. The rest of the document presents requirements previously existing in our specifications, tolerances, and regulations. However, this comes to you as an entirely new document and in a different form. I think that if the sense of this body is to this effect, that this document as presented to you, namely, the report of the committee as of this date, should be accepted in toto. That would clear the records and probably be the proper thing to do. Is that your idea, Mr. Holbrook?

Mr. HOLBROOK. Yes; provided the Conference desires to take such action. The members have had this document in their hands for 48 hours. If they are convinced that the committee has made a good job of it, if they like the work that has been done, if they are satisfied with the present form and content, it might be adopted as a whole.

Mr. GRIFFITH. I think it is the consensus of opinion of the Conference, and therefore in order to bring the matter to a propositional form I move the adoption of the general report of the Committee on Specifications and Tolerances, as amended during the discussion.

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

Mr. HOLBROOK. I think it fitting at this time to say that we are very grateful to Mark J. J. Harrison for a very competent reading of this document and for the several very valuable suggestions which he has made, some of which have been adopted by the Conference.

The remaining sections of the report of the Committee on Specifications and Tolerances covers modification of codes for milk bottles and liquid-measuring devices.

#### SECTION ON MILK BOTTLES

The first portion of specification 3 under the heading "Milk Bottles" now reads as follows:

Milk bottles with an inside diameter of not over 2 inches immediately below the cap seat or stopple shall hold the correct capacity when filled to within one-fourth inch of this cap seat or stopple; bottles with an inside diameter of over this amount immediately below the cap seat or stopple shall hold the correct capacity when filled to within one-eighth inch of this cap seat or stopple: Provided, however, That a larger distance shall be allowed below the cap seat or stopple when the bottles are provided with a clearly defined line blown or otherwise clearly and permanently marked in or on the bottle, and extending at least halfway around it, which indicates the correct capacity, and directly over, below, or beside this line, with the words "Fill to line" or a similar and suitable inscription clearly and permanently marked in or on the bottle. The distance between the line herein mentioned and the cap seat or stopple shall in no case exceed that given in the table below.

We now are confronted with milk bottles that have no cap seats but are to be used with a closure over the top of the bottle. The committee is of the opinion that requirements should be applied to these equivalent to those formerly applied to bottles that had a cap seat. The general language of the above paragraph has also been modified to some extent, but that is the main purpose of the amendment which will be presented.

Now, perhaps you remember that last year the committee proposed an amendment to this same general effect. At that time a representative of the glass industry was present and made some objection to the  $\frac{1}{4}$ -inch filling point provided for below the cap seat or stopple or the plane of the sealing surface. In view of the fact that the objection was made at the "nth" hour, the committee recommended to the Conference that the amendment be withdrawn, and it was accordingly withdrawn.

Now we have no official recommendation from the glass industry this year. However, we do have a recommendation from the International Association of Milk Dealers to the effect that the bottle should hold its correct capacity when filled to within one-fourth of an inch of the plane of the sealing surface. They say that that distance is necessary to take care of ordinary expansion of the milk—to prevent its running over the top of the cap in certain cases of increase in temperature.

In spite of the fact that the glass industry has made no recommendation, the committee again brings forward this specification, which is in effect the same recommendation made last year, and places it before you for your consideration [reading]:

Milk bottles with an inside diameter of not over 2 inches immediately below the plane of the sealing surface shall hold the correct capacity when filled to a point one-fourth inch below the plane of the sealing surface; bottles with an inside diameter of more than 2 inches shall hold the correct capacity when filled to a point one-eighth inch below such plane: Provided, however, That a larger distance shall be allowed below the plane of the sealing surface when the bottles are provided with a clearly defined line blown or otherwise clearly and permanently marked in or on the bottle, and extending at least half way around it, which indicates the correct capacity, and directly over, below, or beside this line, with the words "Fill to line" or a similar and suitable inscription clearly and permanently marked in or on the bottle. The distance between the line herein mentioned and the plane of the sealing surface shall in no case exceed that given in the table below.

Mr. GRIFFITH. What effect has this on bottles that are used by crowning with a metal cap? In that instance the plane of the sealing surface would be across the top of the bottle. Sometimes this metal cap is used alone, and sometimes in combination with the cardboard stopple.

Mr. HOLBROOK. The plane of the sealing surface would be the lowest point at which the capacity of the bottle was limited. If a bottle had a crown cap and also a cardboard stopper, the bottle should be measured to within one-fourth of an inch of the cardboard stopper, as that would be the lowest sealing surface encountered.

Mr. GRIFFITH. That corresponds with the bottle that has been in use for years and years. What should be done when they use the crown alone?

Mr. HOLBROOK. Then the point at which the bottle should be measured would be one-fourth inch below that crown.



Mr. GRIFFITH. Then the height of these bottles would be somewhat different.

Mr. HOLBROOK. It would hardly be distinguishable, the bottles would be so nearly alike.

(The specification as presented by the committee was duly adopted.)

Mr. HOLBROOK. The following amendment is also proposed:

Tolerances.—Amend by adding to the tolerance table the 1- and 2-gallon sizes with tolerances as follows:

Capacity	Table A, tolerance on individual bottle		Table B, tolerance on average capacity		Table C, special tolerance for individual bottles in use			
					In excess		In deficiency	
2 gallons.....	Drams	Cu in.	Drams	Cu in.	Drams	Cu in.	Drams	Cu in.
1 gallon.....	18	4.1	4.5	1.0	18	4.1	9	2.0
	10	2.3	2.5	0.6	10	2.3	5	1.2

One- and two-gallon milk bottles have always been allowed under our specifications. However, we have no adopted tolerances for them. The tolerances proposed here have been obtained by extending the present tolerance curve and picking off these values direct. It was suggested last year by the glass industry that these tolerances were too small. They recommended a very much larger tolerance in the case of the 2-gallon bottles. However, it appeared to the committee that it should be possible to make the bottles within the tolerances herein given, and therefore the committee presents this to you in the same form in which it was presented last year.

(The amendment was duly adopted.)

#### SECTION ON LIQUID-MEASURING DEVICES

Mr. HOLBROOK. Your committee recommends that specification 6, under the heading of "Liquid-Measuring Devices", in paragraph 2, line 4, be amended by striking out the words "resulting from" and insert in lieu thereof the words "due solely to", to make this portion of the paragraph read as follows:

A special elapsed-time test shall be made to determine whether the device is satisfactory with respect to condition (3) above. In order to comply with this test, the condition of the device shall be such that the error due solely to the nonuse of the device does not exceed 2 cubic inches per hour in the case of a retail device and 5 cubic inches per hour in the case of a wholesale device: Provided, however, That in the case of a new device the permissible errors shall be one-half the values given above.

The committee considers that the proposed language is identical in meaning with the present language, but the change is made as a matter of clarification because it was suggested that the old language was not always understood.

(The amendment was duly adopted.)

Mr. HOLBROOK. Specification 8, under the heading "Liquid-Measuring Devices", reads as follows:

Interlocking of registering elements.—A liquid-measuring device in which is incorporated (1) a computing mechanism which indicates the total price of the amount of commodity delivered, for one of a series of unit prices for which the mechanism is set, and (2) a unit price mechanism by means of which one

*of the various unit prices is displayed on the device, shall be so designed and constructed that these two mechanisms are mechanically interlocked so that when the computing mechanism is set for a certain unit price, this unit price and no other shall be displayed on the device.*

It is recommended that the above material be amended to read as follows:

*A liquid-measuring device in which is incorporated a computing mechanism which indicates the total price of the amount of commodity delivered, for one of a series of unit prices, shall also be equipped with a unit price mechanism by means of which the unit price at which the total price is being computed at any time shall be displayed on each face of the device.*

That is a very important rewording of the old specification. The old specification did not require a unit price mechanism to be built into the pump. The present specification requires such a unit price mechanism, and it is provided that the unit price mechanism shall be such that no price may be shown except that particular price at which the device is computing at any particular time.

Also, the old specification was complied with if the unit price at which computations were being made was shown at one point on the pump. The amended language requires that that price at which the computations are being made shall be displayed on each face of the device.

In view of the fundamental nature of the changes made, it is recommended that this specification be not put into force and effect before July 1, 1937.

Mr. WHITE. Is that retroactive?

Mr. HOLBROOK. No; it is not. That is what the underlining means throughout.

(The specification as recommended by the committee was duly adopted.)

Mr. HOLBROOK. Specification 34 reads as follows:

Return of indicating element to zero.—Retail devices shall be so designed and constructed that the indicating elements used to tally sales and deliveries to individual purchasers or to indicate the amount delivered when any portion of the cycle or stroke has been completed, or the total price thereof, shall be returnable readily to a definite and clear zero indication before the next delivery is begun. *Means shall be provided to prevent the indicating element from being returned beyond the zero graduation. The indicating elements may be advanced only by the mechanical operation of the device itself:* Provided, however, That the device may be cleared by advancing the indicating elements, but in this event the registration shall be obscured and remain obscured until the zero is reached.

It is recommended that the proviso be amended to read as follows:

Provided, however, That the device may be cleared by advancing the indicating elements to zero, but only when the means employed automatically results either in a movement that cannot be interrupted or in an obscuring of the registration, until the zero position is reached.

Of course, the intent of the specification is obvious. By manual means no one shall be able to indicate on the device a greater amount of liquid than has actually been delivered, and, in general, that is prevented by requiring the indicating elements to be turned backward to zero. However, it was recognized last year that it would not do any harm, and that the pump could not be used fraudulently, if the manner of the return to zero was such that the elements were turned forward, provided during the time the elements were being turned forward the registration was obscured. That prevents the advance

of an indication for which the customer could be required to pay, because after the advance has been started no indication of delivery remains upon the device.

Now it seems that there is another way which is also foolproof by which this can be accomplished, namely, by advancing the registration, provided that when the advance is started it cannot be interrupted until after zero is reached. Obviously no one can be charged for an advanced indication while the indicating elements are spinning around returning to zero. Since this construction appears to be entirely satisfactory, the proviso is being amplified to allow such a return to zero.

(The amendment was duly adopted.)

#### SUPERVISION OVER MEATS AND MEAT PRODUCTS UNDER THE FEDERAL MEAT INSPECTION ACT

By ROBERT H. KERR, *Senior Chemist, Bureau of Animal Industry, United States  
Department of Agriculture*

Control over weights and measures of meats and meat food products exercised by the Department of Agriculture is effected under the authority of three laws, namely, the Federal Food and Drugs Act, the Federal Meat Inspection Act, and the Packers and Stockyards Act. The last two of these are administered by the Bureau of Animal Industry, the former by the Food and Drug Administration.

Under the Federal Meat Inspection Act, meats and meat food products, except those derived from farm slaughtering and those distributed by retail dealers to their customers, are required to be inspected by the Department of Agriculture if transported in the channels of interstate or foreign commerce. Before engaging in the interstate shipment of meats and meat food products, establishments must apply to the Department for inspection. After the establishment has been surveyed and found to meet the standards of sanitation, construction, and equipment, after suitable facilities for inspection have been provided, and other requirements not necessary to enumerate here have been met, inspection is inaugurated. Inspection includes ante-mortem and post-mortem inspection of the animals slaughtered, supervision over all processing and preparation, supervision of sanitation, and supervision over labeling. Meat and products found to be sound, clean, healthful, wholesome, and otherwise fit for human food, are marked "U. S. Inspected and Passed by Department of Agriculture", and may then be transported in the channels of interstate or foreign commerce. All carcasses and parts thereof, as well as meats and meat food products which are found to be diseased, unsound, unhealthful, unwholesome, or otherwise unfit for human food, are required to be destroyed for food purposes, within the establishment.

The Meat Inspection Act requires that when any meat or meat food product is placed or packed in any can, pot, tin, canvas, or other receptacle or covering, there shall be applied to such container a label which shall show that the product has been inspected and passed. The law in itself does not directly require application of any statement other than the marks of inspection but does prohibit the application of any false or deceptive name, and provides for the appli-



cation of trade names which are not false or deceptive and which have been approved by the Secretary of Agriculture. Under the regulations for the enforcement of the act, it is required that all trade labels be submitted for approval and approved before being used. To be acceptable for approval, a trade label must embody the true name of the product and the inspection legend, "U. S. Inspected and Passed by Department of Agriculture." The establishment number must also appear on the label except that in the case of canned products it may be embossed upon the can, or in the case of paraffined cartons for oleomargarine it may appear on the inside wrapper. The meat inspection regulations do not require the application of any statement of quantity but do prohibit the application of any false or misleading statement of quantity.

The application of statements of quantity by the establishments is, therefore, supervised by our inspectors to insure compliance with the regulation prohibiting false or misleading statements. This supervision is applied within the establishment and ends there. Once the product leaves the establishment properly labeled with a truthful statement of quantity, our supervision over the statement is ended. No attempt is made by the meat inspection service to follow the labeled article through the channels of trade to its destination to insure arrival or delivery with the statement of quantity correct.

Under the Packers and Stockyards Act, which is also administered by the Bureau of Animal Industry, the Department of Agriculture has authority to deal with unfair trade practices engaged in by establishments subject to the act. This authority includes authority to deal with unfair practices respecting weights and statements of quantity. Procedure under the Packers and Stockyards Act includes investigation of complaints, issuance of cease and desist orders when justified and necessary, and when necessary appropriate court action to enforce compliance.

Under the Food and Drugs Act all foods, including meat and meat food products shipped in interstate commerce in package form, are required to bear a statement of quantity. On account of this requirement of the Food and Drugs Act, practically all meats and meat food products shipped from establishments operating under Federal meat inspection inclosed in immediate or true containers are labeled with statements of quantity. As the meat inspection regulations require statements of quantity to be correct, and since precautions are taken by our inspectors to see that such statements are correct at the time the meat or product leaves the establishment, meats and meat food products moving interstate in package form may be expected to bear correct statements of quantity unless changes affecting the weight or volume have taken place after the product has been shipped from the establishment and moved beyond the supervision of our inspectors.

Meats and meat food products distributed from establishments operating under Federal meat inspection in package form and bearing statements of quantity include the following:

1. Canned meats and meat food products.
2. Wrapped and packaged hams, bacon, and other cured and smoked meats.
3. Sliced bacon, pork loin, dried beef, and like sliced cured meats.

4. Lard, compound, and lard substitute in pails, cans, tubs, and tierces.

5. Lard, compound, and oleomargarine in cartons.

6. Cooked hams, loaves, and cooked meats in cartons and wrappers.

7. Fresh and frozen meat and edible organs and parts.

Canned meats and products are not ordinarily subject to changes in weight or volume in handling, storage, or transportation. There are, however, some interesting exceptions, for example pigs feet in vinegar. This product is subject to a slow hydrolysis of the connective tissue, so that when it is stored for a long time part of the tissues become dissolved. In consequence of this change the weight of the solid material in the container slowly decreases with a corresponding increase in the weight of the liquid. The fact that such a change takes place has been cited in support of a request for acceptance of the entire contents of the jar as the true net weight. This request has, however, been declined on the ground that the changes when sufficient to affect the weight of solids to a material degree render the product unacceptable as an article of food and that in any case the food in the container consists of the pigs feet, so that the vinegar, which is used as a packing fluid and is ordinarily discarded by the consumer, ought not to be regarded as a part of the food in the package. However, in view of the fact that some alteration of the weight of the solids does in fact take place before the product becomes unsuitable for food, a moderate and reasonable understatement of weight is permitted.

In the approval of labels for cured meats and meat food products, as well as in the supervision over the application of statements of quantity, distinction must be made between products which are of such a character and are so labeled as to warrant inclusion of the entire contents of the can in the statement of weight and those in which part of the contents are not so included. An example of the first type is canned corned beef. An example of the second type is frankfurter style sausage in brine. While the proper labeling and classification of the two products cited involves no difficulty, other products are not so readily classified. For example, canned hams may be precooked, inclosed in a can, and processed in such manner that the contents of the finished can consist almost exclusively of solid meat. Such a canned ham may quite properly be labeled "Canned Ham" and bear a statement of weight inclusive of the entire contents of the can. On the other hand, an uncooked ham may be inclosed in a can and processed without precooking. In such case the can will contain a considerable quantity of juice or jelly cooked out in processing. Such a can might properly be labeled "Ham" and bear a statement of weight showing the quantity of cooked ham contained in the can, but more correctly should be labeled "Ham With Natural Juices" and bear a statement of weight including the entire contents of the can.

However labeled and whether the net weight is that of the entire contents or that of the food less a packing medium, the net weight of canned meats and meat food products found in the channels of trade should be correct if a correct statement of weight is applied in the first instance. Incorrect statements of weight, if found, are indicative of faulty practice on the part of the establishment preparing the product.



Wrapped hams, bacon, and other smoked meats contain considerable proportions of moisture and are, therefore, subject to loss by evaporation in the channels of transportation and trade. Losses of moisture may vary over a rather wide range due to variation in the quantity of moisture contained in the meat, permeability of the wrappings, and conditions of shipment. For example, a dry cured ham which has been subjected to long smoking and hanging, so that it has dried out to a total weight materially less than that of the original fresh ham, would naturally suffer little loss of weight even in a prolonged period of shipment or storage. On the other hand, a sweet pickle ham which has been lightly smoked, so that its weight is still somewhat greater than the original weight of the fresh ham, may lose weight rather rapidly unless well protected by heavy wrappings and shipped under refrigeration under conditions of relatively high humidity. In addition to loss of weight by evaporation of moisture, smoked meats may also lose weight by dripping of fat and by absorption of fat and meat juices by the paper used for wrapping. The latter possibility makes the application of gross, tare, and net weights to smoked meat at the time of wrapping unreliable unless the character of the wrappings is such that no change in the tare weight can occur.

On account of its high proportion of fat and correspondingly low water content, sliced bacon in cartons and wrappers is not subject to significant loss of moisture in storage or transportation. Sliced dried beef and pork loin are more liable to loss in weight. The wax paper, parchment paper, or Cellophane in which these products are commonly packed, does not readily absorb fats or meat juices.

The kinds of sausage shipped in package form and bearing net-weight statements include fresh pork sausage in casings and bulk, frankfurter and bologna style sausage, dry or summer sausage, and pork rolls in canvas. Fresh pork sausage usually contains a considerable proportion of fat, and on that account does not lose weight readily, particularly at low temperatures. Cartons and cups used as containers of pork sausage are usually paraffined. The wrappings commonly used, parchment paper and Cellophane, are not highly absorbent. Fresh pork sausage is, therefore, unlikely to lose much weight in transportation or storage. Frankfurter style and bologna style sausage normally contain more moisture than fresh pork sausage, and the wrappings ordinarily used for these types of sausage are not such as to limit evaporation effectively. These types of sausage may, therefore, be expected to lose weight rather rapidly in handling. However, the time period normally elapsing between shipment and consumption is ordinarily short.

Dry or summer sausage is usually well dried out in the course of manufacture. Such product is not, therefore, likely to lose much weight in the channels of trade.

Pork rolls and other sausage packed in canvas bags tend to lose weight rather rapidly. Unless paraffined, the canvas bags permit evaporation to take place rather readily. Net-weight statements applied to such product at the time of packing may, therefore, be expected to become incorrect within a relatively short time.

Loaves, cooked hams, and other cooked meats and products distributed in wrappers or cartons bearing trade labels and net-weight statements, are relatively high in moisture content. The wrappers



are ordinarily not such as to correctly inhibit evaporation. However, these products are ordinarily consumed soon after shipment from the establishment in which they are prepared.

Lard, compounds, and lard substitutes in pails, cans, tubs, and tierces are not subject to loss of weight. An accurate statement of weight can, therefore, be applied in the establishment with assurance that the quantity declared will reach the consumer.

Similarly lard, compound, and oleomargarine in cartons are not readily subject to changes in weight if properly handled. When these products are exposed to excessively high temperatures, however, softening and leakage may take place. Otherwise the quantity originally packed into the carton will reach the consumer.

Fresh and frozen meats are not frequently distributed in consumer packages. An exception is the so-called quick-frozen meat packed and distributed in small consumer packages. This product being held and distributed in the frozen condition is not subject to significant changes in weight. When chilled, unfrozen meat is distributed in packages, it is liable to rather rapid losses in moisture and to absorption of fat and meat juices by packing materials. The packaging of chilled meats must, therefore, be handled under conditions approaching ideal if the product is to reach its destination without significant losses.

It should be remembered that the food constituents of all meats are the proteins, fats, and mineral salts, none of which are lost through evaporation of moisture. A wrapped ham, for example, which is shipped from the establishment weighing 16 pounds and arrives at its destination weighing 15 pounds 10 ounces is still the same ham and represents the same quantity of food as when it weighed 16 pounds. This is not to be taken as warranting misrepresentation of weights, as an excuse for short weight, or as excusing packers, distributors, or dealers from making every effort to state the weights correctly. However, it may be taken as warranting some tolerance for such losses in weight as are due entirely to evaporation.

Losses in weight are materially affected by conditions of shipment and storage. Regulation of humidity in coolers and storage rooms is becoming increasingly common. One of the objects prompting the regulation of humidity under commercial conditions is to minimize shrink. This may sometimes mean that a part of the shrink formerly incurred by the packer or his branch establishment is now being shifted to the retail dealer or to the ultimate consumer. The regulation of humidity as a part of the operation known as air conditioning affects the changes in weight taking place in meat held in air-conditioned coolers. That evaporation of moisture from meat will take place more rapidly in a cooler in which relative humidity is not controlled and may at times fall to a lower point than in one in which the relative humidity is controlled and carefully held at the highest practicable point is self-evident. Temperatures and air circulation are also significant factors. On account of the variations in factors affecting changes in weight, it is not possible to state in definite terms the amount of change which may be expected to take place in any meat or product under conditions of commercial distribution. As previously indicated, the net-weight statement applied to packages of meat and meat food product in establishments operating

under our inspection is required to be correct at the time of application and to be kept correct until the product is shipped from the establishment and thereby passes beyond the scope of our inspection. In the case of products known to be subject to changes in weight, a moderate and reasonable understatement of weight, such as will insure correctness when the product arrives at its destination, is not objected to. Establishments are not, however, required to apply understatements in weight for the purpose indicated, neither are they permitted to apply such understatements as might constitute an evasion of their legal obligation to state the weights correctly. For example, an establishment might be permitted to apply the statement, "Net Weight 16 Pounds", to a wrapped ham weighing 16 pounds 6 ounces at the time of shipment but would not be permitted to apply a statement reading, "Net Weight 11 Pounds" to the same ham.

In conclusion, attention is called to the fact that inspection under the Federal Meat Inspection Act is directed to the prevention of violations of law rather than to the detection and punishment of offences after they have been committed. The only offense for which the meat inspection act provides a penalty is the interstate shipment of uninspected meat or meat food product, an offense which an establishment operating under Federal meat inspection is obviously unlikely to commit. Accordingly, our efforts are directed toward preventing the shipment of products which are not marked with a truthful statement of weight rather than toward discovery of incorrectly marked products in the channels of trade and subsequent prosecution of the offenders. If, therefore, our inspectors should find U. S. inspected and passed meat or product which has entered the channels of trade bearing an incorrect statement of weight, corrective action would be taken through and by the inspectors at the establishment where the incorrectly marked product originated. The action taken would be directed to the correction of the faulty practices which led to the incorrect weights, thus eliminating the incorrect marking at its source. Should products originating in establishments operating under Federal meat inspection, which are not or which appear not to be properly marked with respect to weight or volume, be found in the channels of trade, the Bureau would appreciate being advised of all the facts so that corrective action can be taken at the establishment from which the product is distributed. The meat inspection regulations provide for cooperation between inspectors in charge and local authorities. Members of this conference located at points where Federal meat inspection is maintained may, therefore, confer directly with the local inspector in charge should inspected and passed meat or product which appears to bear an incorrect statement of weight be found. Members not located at such points may bring the matter directly to the attention of the Bureau. Application of correct statements of quantity at the establishment, reasonable tolerance being allowed for the variations necessarily incident to the packing of commercial products and for the charges in weight to which such moist and perishable products as meat are necessarily subject, should leave little ground for complaint. Bureau inspectors are engaged in continuous supervision over the application of statements of weight to make sure that meats and meat food products leave the establishment correctly marked in that respect.



## DISCUSSION OF ABOVE PAPER

Mr. BOYLE. In my observation, baked ham is being marketed in a carton bearing the legend "U. S. Government Inspected and Passed", with the establishment number left blank. There is also an imprint on the ham itself. The boxes were shipped in from a neighboring State, from a branch not having Federal inspection service. They were prominently displayed in the various stores, and that legend appearing there led to the belief that that product had been inspected, which was not the case.

Dr. KERR. That sounds like a case for legal action. Perhaps an inspected branch had processed the ham and applied a misleading legend. The legend you quote is not the legend that we require.

Mr. BOYLE. It is possible that I haven't quoted the legend exactly as marked on the ham. The legend was a true legend insofar as the wording, but the establishment number was blank.

Dr. KERR. That was probably a matter of labeling, which we don't handle, but it sounds very much like a violation of law. I would suggest that you check up and, if it is still going on, bring it up.

Mr. WILHELM. There is 5 or 6 pounds of shrinkage on every 100 pounds of meat coming into Michigan from certain packers. They say you allow that shrinkage. How can we stop it? You will find meat with 3 pounds of paper and 2 pounds of shrinkage; you will find 95 pounds sold for 100. It is shipped from Omaha. Then you will find other companies that come right up to standard.

Dr. KERR. There will be no possibility of any action by the Bureau of Animal Industry so long as it leaves the Omaha establishment correctly marked. If it arrives in your jurisdiction incorrectly marked, you might handle it under your local laws, or if you have any evidence that it moved interstate incorrectly marked, that would be subject to action by the Food and Drugs Administration.

Mr. WILHELM. They mark on the bill "No allowance for shrinkage." I have sent you people a letter and I got a letter back, "Allow 2 percent", and I think that is too much. Two pounds of meat on 100 is a lot of meat. I want to know if we can't stop it some way besides bothering locally. They keep shipping it in. You can't stop every truck on the road.

Dr. KERR. That is a trade practice of billing the thing out at the original weight and not allowing shrinkage. That is a trade practice which, if it is indulged in systematically, might possibly be reached through the Packers and Stockyards Administration, or against which the dealers buying meat can protect themselves by paying only for the meat they get.

Mr. WILHELM. Isn't there some way this organization, through you people, can stop it from the other end? That is what I want to find out.

Dr. KERR. Possibly; if it is carried to such a point of business as to constitute unfair competition, the Packers and Stockyards Administration might be able to handle it under the Packers and Stockyards Act. The Meat Inspection Service can't do anything about it so long as it leaves the establishment properly marked.

Mr. WILHELM. All the argument they give me is that the Government allows it.

Dr. KERR. If you have a local law calling for correct weights, the fact that the Government lets it leave the establishment in Omaha



under certain markings doesn't relieve them of responsibility under the local law.

Mr. WILHELM. I know, but, locally, I don't think we can get at them.

Dr. KERR. That is one of those matters that the Constitution of the Republic leaves to local action. We have not the authority under the Meat Inspection Act to reach that.

We had a case that we handled not so long ago, entirely different. The State had a law against the application of artificial color to sausage casings, and one of the packers was coloring his sausage casings and he told the local authorities he was operating under Federal inspection and the meat inspection regulations of the Department of Agriculture permitted that, and he was going to go ahead and color his sausage. The inspector in charge wrote in and asked what he should do about it, and we told him that he should make himself available as a witness in case the local authorities entered prosecution, to give evidence that they did color their sausage. We did not excuse them for violating any local law.

Mr. WILHELM. Truthfully, locally I don't know what to do. They tell me the Government allows it, and they come in with about 10 lawyers.

Dr. KERR. Maybe if you took that battery of lawyers into court under your local law you would have some success.

Mr. WILHELM. They laugh at me when I mention local courts. That is why I came here, and that is what I am going to find out before I leave, because I am going to go back home there and argue.

Dr. KERR. We can do nothing under the Meat Inspection Act but see that the marking is correct when the product leaves the plant. We do not attempt to interfere with the operation of any local law, and where we can we give local authorities all the support possible in enforcing it.

Mr. WILHELM. If this meat leaves Omaha marked 119 pounds and it weighs only 113 when it gets to Michigan something is wrong. Even the boxes they ship the meat in weigh 1 or 2 pounds more than is actually marked on them. Your inspectors should notice that when it is shipped out. Then they should see them put all that heavy paper in there. Paper is 4 cents a pound and meat is 30 or 40. I see 3 or 4 pounds of paper on every 100 pounds of meat. They aren't all doing that, but certain packing houses are. I want to know why you don't stop them at the other end.

Dr. KERR. If there is any question about its being correct when it leaves the establishment, we can handle that. The question is how much meat was there when it went out of Omaha. They may have had a full 100 pounds, net.

Mr. WILHELM. I want to know if we can't, by resolution or otherwise, investigate it and try to do something.

Dr. KERR. If you will tell me which establishment it is I will investigate it.

(Mr. Wilhelm gave the names of two packers.)

Mr. WILHELM. I weighed meat from one packer the other day and it came right up. Another was short. If one can do it, why can't they all do it?

Dr. KERR. They can. Have you found this only from the Omaha standpoint?

Mr. WILHELM. All of them are doing it.

Dr. KERR. We need to know particulars. What we do is to go back to the establishment. We are particularly interested in the establishment. We look into the practices there. At the individual establishments they sometimes get sloppy in their habits and have to have a little direct action from the inspector.

Mr. WANDLING. Are you referring particularly to fresh butts and loins of pork? We have the same thing in the New Jersey jurisdiction. I have reweighed some—I guess 125 or more—packages, and found that the gross weight is labeled correctly in nearly every case. The net weight is generally missing. It runs from 1.5 to 3 pounds short on every package. I didn't get a correct net weight on a single one in some sixty boxes.

Then I go to the packing house and they tell me it is due to the chemical action of the freezing and unfreezing of the meat. I am wondering if anything like that could possibly occur, especially if the weights are branded correctly for the gross weight. Would paper absorb it and hold some of the weight?

Dr. KERR. Fresh pork is sometimes wrapped in paper that is somewhat absorbent; it will absorb fat and meat juices and gain in weight at the expense of the meat. That will happen in shipment.

Mr. WANDLING. It seems to me that we prosecute a butcher for short weight, yet these fellows get away with it. It isn't only in one instance; several packers are guilty.

Mr. ROBERTS. I would like to ask Dr. Kerr this question, whether or not the officials of the Department of Agriculture believe that these packers should be permitted to pass on to the purchaser, consequently to the ultimate consumer, these so-called shrinkages in weight? Is not the proper way to require the package to contain the full weight every time it is sold?

Dr. KERR. There is no question about that. The sale of anything that weighs other than what it is marked at the time of sale is wrong.

Mr. ROBERTS. Now, when the U. S. Department of Agriculture, or any other Government department, or my weights and measures department, begins to allow for shrinkage, who is going to determine how much the shrinkage has been?

Dr. KERR. We make no allowances for shrinkage. If the net weight is not correct at the time the product is packed and until the time it goes beyond our Department, then there is an offense against the Meat Inspection Act, and we will handle it. But after the product leaves the establishment, then it is gone beyond the control of the Meat Inspection Service, and there is nothing more we can do about it.

Mr. ROBERTS. Suppose a shipment of meat or a shipment of butter—I mention those two because they are the ones customarily of short weight—started from Chicago. The weight there is not taken by any Government official. It arrives in the District of Columbia, or in a State, and when it arrives it is short weight. Is there any action that the Department of Agriculture can take under the law?

Dr. KERR. There would be an offense against the Food and Drugs Act there for the interstate shipment of short-weight products. The interstate shipment of short-weight products is an offense against the Federal Food and Drugs Act rather than under the Meat Inspection Act.

Mr. ROBERTS. Now, suppose the Food and Drugs Administration weighs a carload of butter and they find it averages a fraction of an ounce per pound short weight. Then they undertake to calculate the amount of shrinkage that has taken place between the point of shipment and the point of destination. Isn't the true test this, that you must say to the packer, the processor, that he must put enough in his package so that it will reach the ultimate consumer full weight. Isn't that the answer?

Dr. KERR. That may be the answer, but that is a food and drugs question that I am not qualified to answer. I will say that if a packing house in Chicago, shipping a load of pork loins into the District of Columbia, wants to put 102 pounds in a box and label it 100 pounds so they can be sure that it will arrive in Washington weighing 100 pounds, we will let the packing house do that. However, if he tries to evade the requirements of the Food and Drugs Act by packing 100 pounds and marking 90 pounds, we will step in and object. We will allow him to make a moderate and reasonable understatement, to provide for arrival at destination of correct weight, or we will allow him to give the correct weight at the time of packing and take his own chances at the other end.

Mr. ROBERTS. Take his chances with whom?

Dr. KERR. With the local authorities at the other end, and the Federal Government. You are getting into a legal question that I don't pretend to talk about, but if you find short weight products in the District of Columbia, doesn't your local law cover it?

Mr. ROBERTS. Yes; our local law does, but I am talking about the Department of Agriculture. Suppose we prosecute a man under our local law and he sets up as a defense that the Department of Agriculture permits and approves it?

Mr. SWEENEY. It strikes me that the Federal Government has jurisdiction while the commodity is in transit. Just the moment it is delivered into the State it becomes part and parcel of the property of the State, and is subject to the laws and regulations of the State. If the discovery of the shortage is made during the period that the commodity is in the possession of the common carrier and on the grounds of the common carrier, then it comes within the purview of the Department of Agriculture or the Federal Government.

Mr. ROBERTS. I do not understand that to be the case.

Mr. WHITE. I would like to have that point clarified.

Mr. ROBERTS. My understanding is that so long as it is in the original package following shipment in interstate commerce it is under the jurisdiction of the Department of Agriculture.

The ACTING CHAIRMAN. I think the doctor has said that his jurisdiction is to control the product at the plant. Now, the Federal Food and Drugs Administration has frequently stepped in any time between shipment and arrival at the consignee. When the commodity has left the original consignee then we stepped in.

Mr. ROBERTS. I will tell you what I think is a rather effective way to stop it, although this allowance of shrinkage by the Department of Agriculture causes us more or less embarrassment. We say to the wholesaler here, and to the retailer, that every time this commodity is sold it must be full weight. I may say to my friend over there, if he prosecutes some of the people that handle this stuff in his State,



under local law, his local agency will see to it that it is shipped to him in full weight in the future. I will guarantee him that.

If you put some of those people in jail, they will see that the packers put enough meat in the boxes so it will reach the ultimate consumer full weight. I realize very well his situation, because they come up and say, "Here is the Agriculture Department allowing this and approving it."

**THE ACTING CHAIRMAN.** The doctor says it is embarrassing to the Department, and that even though they are prone to say that, it doesn't mean anything.

**MR. ROBERTS.** I am not sure whether it means anything or not. You understand, the Department of Agriculture does allow some shrinkage. Their principal object is to see that it was full weight at the time of shipment, and then whatever it really shrinks after that, according to what they consider it should shrink, they allow.

The point I am trying to make is that when you get into the question of shrinkage it is a question no one can decide. I can't decide how much a pound of butter should shrink between Chicago and Washington. The company comes in and puts witnesses on the stand who testify that this butter was weighed in Chicago and was full weight when it left. My answer is that that doesn't make any difference, that it is your duty to see that it is full weight when it reaches the ultimate consumer.

This matter of shrinkage is merely a scheme to pass on to the consumer all of the loss incident to merchandising and handling, and the consumer is not the person who should shoulder that.

**MR. O'KEEFE.** We can always vouch for the fact that butter or any other package leaving Chicago is always full weight.

**MR. WHITE.** Mr. Sweeney, of Massachusetts, made the statement that an original package, as soon as it left the hands of the common carrier, became subject to the laws of the State. I want to clarify that by asking Dr. Kerr if it isn't a fact that an original package originating without the boundaries of a State and shipped into a different State is interstate commerce and continues to be subject to Federal regulations so long as it remains in the original package, no matter how many times it comes to rest.

**DR. KERR.** That is a question of how the courts have ruled on interstate commerce. I know that in some cases the courts have held products subject to the Federal jurisdiction while still in the original package, even though they had remained within the State for quite a long time. I am not lawyer enough to tell you at just what point the Federal jurisdiction ends and the State jurisdiction begins, but it is my understanding that a product which has once moved in interstate commerce is subject to Federal jurisdiction so long as it remains in the original unbroken package in which it was moved interstate.

**MR. WHITE.** That is my understanding of it; and under that ruling is it possible for your Department or the correct Department of the Federal Government to send an inspector into the State and reweigh that package at the last place that it comes to rest before the retail dealer breaks it up into its several units and thereby determine the shortage and prosecute?

**DR. KERR.** If I understand it correctly the Department has that authority, but that would be exercised through the Food and Drugs Administration rather than the Bureau of Animal Industry.

Mr. WHITE. I have been through this meat proposition and I feel certain that I can show you crates of pork loins marked around 104 pounds that will be 6 pounds short.

Mr. HOLBROOK. Mr. White, I understand the rule of law to be that the commodity in the original unbroken package does not become mixed with the general goods of the State until after the first sale within the State. I think that after the first sale within the State, whether it remains in the original package or not, the State can deal with it under its own regulations.

The ACTING CHAIRMAN. I think that that is right.

Mr. ROBERTS. I wonder if I might ask Dr. Kerr one more question. It is a question of what the lawyers of the Department of Agriculture hold in regard to the question Mr. White has raised. I wonder if he is informed as to what the Solicitor's Office of the Department of Agriculture has held.

Dr. KERR. I don't believe that that is just exactly my place. It is the lawyers' job to tell where interstate commerce begins and ends.

Mr. ROBERTS. It is the lawyers' duty to inform and act as legal consultant of the various divisions of the Department of Agriculture. If you make a formal request of the Solicitor's Office for an opinion on the question Mr. White has raised, I am sure the reply will be interesting.

Mr. ACKERMAN. I think we are trying to make this question entirely too complicated. All these cross-examinations of Dr. Kerr, and so on, are too involved. It looks like the problem is up to the local administrator, as Mr. Roberts has said. There is only one handicap, and that is to get the meat dealer to complain about the packer. We have had several complaints in Minneapolis along this line, and have investigated them and found that the complaints were warranted. Then when we got to the point where we wanted a prosecution we couldn't get the meat dealer who was affected to sign a complaint, because he owed the packer so much money that he was afraid the packer would cut off his supplies, and if he is stopped by one company the rest of them will cut him off too. We have convicted packers in Minneapolis a number of times. Our ordinances are such that we don't allow any tolerance at all. We had a case on borax that shrunk 4 ounces on a pound. They came in with their high-pressure attorney and their chemist to our local municipal court and tried to prove that the stuff was 60-percent moisture, and the answer was, "If you know it has so much moisture in it to start with you can put in an oversupply so it will be up to weight in Minneapolis. Keep it up to weight in Minneapolis or keep your product out of town." We didn't get any appeal to the Supreme Court on that either.

Mr. STROBRIDGE. I think we have discussed this so-called unavoidable shrinkage pretty thoroughly. A problem that we have concerns the processing of pickled tongues and corned beef. I want to know if there is any regulation of your Department, Doctor Kerr, that allows them to pump in an ordinary-sized tongue about 4 or 5 pounds of the liquid they use in processing and sell that to the housewife as meat? When you come to cook it, it will shrink up and it will be about four or five pounds less than the original amount was. The same is true of corned beef. Is there any regulation to govern the amount of moisture they can pump into a given amount of tongue or meat?

Dr. KERR. We have taken a stand on that, that they must not pump it in in such a way as to destroy the identity of the product and make it different from what the consumer expects to buy. At several places we have tied up quite a lot of tongue and briskets for smoking out. One establishment not long ago gave up their Federal inspection and ceased doing an interstate business because our inspectors wouldn't let them pump the tongues until they swelled and thus allow them to sell salt water for meat.

Mr. STROBRIDGE. How can we reach it when it is done by local butchers?

Dr. KERR. That is subject to local regulation.

Mr. STROBRIDGE. Is there any Federal regulation that will govern the amount of brine or pickle that can be pumped into this commodity?

Dr. KERR. We haven't written into the regulations anything about the practice. We have handled it through our inspection staff by observing the weights before and after curing and by chemical analysis of extractions from the product. We have held them to gains in weight that are incident to normal curing processes. We have tied up the product that was, in our opinion, adulterated with an excessive amount of moisture or brine.

Mr. DANIELS. I have a problem in reference to casing sausages. In Michigan we have a law whereby sausage is required to be graded, and that grade shall be marked upon the sausage.

We do have quite a lot of difficulty in the administration of the sausage law due to the manufacturers evading the marking of the sausage. I would like to ask the doctor if there are any Federal requirements as to cereals, or materials other than meat, put into sausages.

Dr. KERR. The meat-inspection regulations define sausage as a spiced and seasoned mixture of meat or meat and meat by-products. The regulations permit the addition of not more than 3.5 percent of cereal, in which event the sausage is required to be marked "Cereal added." Now, if the sausage or the container of it bears any statement indicative of grade or quality, it must conform to that quality. Label statements must be approved before they can be used, and they are approved only for products conforming to the label.

The ACTING CHAIRMAN. Gentlemen, Dr. Kerr is our guest and he has delivered an able paper, and we have covered quite a general ground of questioning. I don't want to say to anybody that we should not question him, but I do want to be considerate of the doctor. If the questions are new, probably the doctor will have no objections to answering them.

Mr. BLAYLOCK. This body should go on record as approving the Department asking Congress to pass a law providing that if a ham is marked in Chicago as weighing 25 pounds it must weigh 25 pounds when the housewife buys it.

Mr. O'KEEFE. You are talking about Chicago so much. Just because a ham is marked on the outside of the wrapper "25 pounds" doesn't mean a thing to us. If it is in the store for several days the storekeeper, under our ordinance, must unwrap that ham and sell it on his scale at its true weight to the customer.

Mr. F. G. SMITH. That is true of Connecticut, too, but why should the meat dealer take the loss, gentlemen? I have tried to contest



these things with the packing companies, but merchants won't go to bat. It seems to me if they can put up pecks of potatoes in bags and put enough in them to allow for shrinkage, they can do the same thing with meat, and the individual merchant in the State where the stuff is shipped will not have to take the loss. If a man pays for a 16-pound ham and he sells it at 15.5 pounds, he is losing half a pound, or else he raises the price in order to take care of it. It seems to me it should be taken care of at the source.

Mr. O'KEEFE. That, Mr. Chairman, is entirely outside of our jurisdiction. That is between the butcher and the packer.

The ACTING CHAIRMAN. I think Mr. Roberts had a suggestion, and the gentleman from Minneapolis, that the answer is to prosecute, and the packer will comply; but you have the difficulty that the store-keeper won't testify, for obvious reasons, as was stated by the gentleman.

Mr. TUCKER. For the gentleman's information, I might refer him to a decision made several months back. The demarcation of interstate shipments was involved in that case and it is all in that decision.

Dr. KERR. I had that decision in mind when I laid down the limits that we keep within. We don't attempt to do, under the Meat Inspection Act, what we have no right to do. We are glad to do all we can, but we don't propose to overstep our authority.

Mr. WILHELM. Dr. Kerr, you say the local authorities should take care of it. Can I get a letter from you, sent to me, telling me you are not responsible?

Dr. KERR. I think you can, if you write in.

Mr. WILHELM. I think the law is wrong, and I think you people can get after it to change the law in some way or another. I don't blame you, but somebody should find out where the trouble is and correct it.

Dr. KERR. There are quite a few people who think laws are wrong. Possibly I have my own opinion about some laws that are on the books, but I am obliged, in my work, to keep inside the law that I am working under.

Mr. BOOTH. We seem to have discussed this thing pro and con and haven't gotten very far. Several recommendations are being made to several branches, and if they will take them under consideration for the next year we might get somewhere.

At this time I would move that we proceed with the next order of business by offering Dr. Kerr a vote of thanks.

(The motion was seconded, the question was taken, and the motion was agreed to by a rising vote.)

The ACTING CHAIRMAN. What we want is somebody from Food and Drugs here some time.

## THE REGULATION OF UTILITY METERS

By P. L. HOLLAND, *Chief Engineer, Public Service Commission, State of Maryland*

We are told in the Old Testament, which records the history of 4,000 years ago, that a false balance was then declared to be an abomination. Neither Biblical nor secular history records, until

3,000 years later, any constructive methods employed to prevent the injustice that might arise from the use of such instruments. Approximately 1,000 years ago King Edgar, of the Saxons, decreed that "The measure at Winchester shall be the standard." Provisions were made to check other weights and measures against the Winchester standards. Some of these units in practically unchanged form are in use today. During the last two centuries the demands of national and international trade have brought about standardization and a high degree of accuracy in weights and measures. The widespread membership and the intense activity of organizations represented here today give evidence to that effect. You furnish a considerable degree of protection to the buyers and sellers alike of practically every commodity that passes in trade. The need for such protection was realized many years ago.

The subject of this paper is the testing of meters used by the various public utilities in measuring services, or commodities, which by their nature are so necessary in our daily lives, as to set apart the vendors thereof as a specially privileged but closely regulated class of merchants. The number of such merchants is small, as compared to those engaged in other lines, but the number of customers represents a very large percentage of our total population. Approximately 75 percent of our population is served with electric energy—just one of the forms of service. When we add to this telephone, water, gas, steam, and taxicab services, all or part of which are sold on a metered basis, the magnitude of utility metering is apparent. Many of these services are new when compared to the concept of measurement by precise fundamental units, but they were developed during a period when the desirability or necessity of close supervision of other forms of measurement was apparent to all. I think it is a tribute to the public utility industry that even today the seal of approval, State or municipal, is required on such measuring devices in only a few States or cities. In three States and the District of Columbia gas meters must be tested and sealed by a State agency before being used, and, so far as I know, such testing is required on electric meters in only one State. The law of Maryland requires that no electric or gas meter shall be placed in service, or having been removed from service, shall be replaced, until approved, tested, and sealed by a representative of the public service commission. The magnitude of the task involved is indicated by the fact that up to the present time the inspectors of our commission have tested and sealed approximately 1,600,000 meters.

A large number of the States and some municipalities require the utility companies to maintain approved testing equipment and to make periodic tests, and in many States the utility commissions conduct referee tests upon application or complaint, and upon payment of a nominal fee.

Since Maryland appears to have the most stringent laws on this subject of testing, it may be of interest to recite some of the pertinent provisions. Under statutory law the public service commission is authorized to make such reasonable rules and regulations as may be deemed necessary to protect the utilities and the public and to insure safe and adequate service. The provision that all electric and gas meters be approved, tested, and sealed or stamped by a representative

of the commission is embodied in statutory law. Similar provisions relating to taximeters have been promulgated in the rules and regulations of the commission. Water and steam meters are tested only upon request or complaint.

Approximately one-half the population of Maryland is served by one utility with offices in Baltimore. Inspectors are employed full time in the electric and gas meter shops of this company, where all preinstallation tests are made. In the case of utilities operating elsewhere in the State, routine-inspection trips are made monthly, or more frequently if necessary, to central points, usually the larger cities served by the respective companies. On such trips the inspector not only makes preinstallation tests but takes care of any complaints that have accumulated.

In general, the procedure of testing is as follows: The larger companies are required to maintain laboratory equipment approved by the commission, consisting of working standards and reference standards—the latter being checked periodically by the National Bureau of Standards. The commission also maintains similar equipment and checks the equipment of the companies. Meters are approved as to type, usually after submission of sample meter by the manufacturer. In this work we have the full cooperation of all the leading manufacturing companies. Individual meters, of an approved type, are tested under two or more load conditions, and, in the case of electric meters, at varying power factor. Water and steam meters are tested by weighing water or condensate, using calibrated weights. At present we have no occasion to make volumetric measure of steam.

In the Maryland law relating to taximeters is a provision that charges shall be based on mileage only. A standard taximeter is provided with a clock constantly in mesh so that when the vehicle stops, or slows down very much, the recording device is kept in motion. Under our law this cannot be permitted, but at the same time it is realized that mechanical means must be provided for measuring and recording "waiting time" for which a separate tariff is filed. As a compromise, the clock mechanism is connected through a slotted drive, so that a period of 20 seconds elapses after the vehicle stops before the clock takes up the motion. This effectively eliminates any increase in registration as a result of delays due to stop lights and minor traffic congestion. This particular feature is cited because it complicates testing to the extent that in addition to the usual tests this delay mechanism must be checked by stop watch. In the case of taxicab fleets composed of vehicles of standard and uniform construction, meters are given a "bench test"—that is, calibrated by measured rotation of the drive shaft. However, so many various types of vehicles are used in Baltimore that, except for one fleet, the road test is necessary. This consists in riding each vehicle over a measured course. Such tests are made annually and also when equipment is changed or complaint made. This is not an inconsiderable task.

Measuring devices used by utility companies are usually machines, electrical or mechanical, or both, rather than simple standards of measure. As such, exact accuracy can not be expected. Tolerances, ample to take care of inherent errors, are permitted, but no



meter is allowed to be placed in service, or to remain in service, which is in error by more than 2 percent. As a rule, new and repaired meters are well within  $\frac{1}{2}$  to 1 percent error when installed.

A moot subject in regard to accuracy of utility meters is the length of time, or period, that a meter may remain in service without test. These periods vary greatly in the different States. The Public Service Commission of Maryland very recently issued revised rules and regulations governing gas service, which fix such periods for gas meters at 5 to 10 years, depending upon meter capacity. The periods for electric meters vary from 6 months to 5 years. Ten years is a rather long time, but data now available indicate that in the case of small gas meters, a very high degree of accuracy may be expected for that length of time. The inherent tendency of diaphragm type meters is to underregister, so whatever error creeps in is in favor of the customer rather than to his prejudice.

During the last few years the staff of the Maryland Commission has been devoting considerable time to the study of the economies of utility metering. Unaccounted for losses of gas or electric energy or water sometimes amount to alarming proportions of the total output. Work is in progress at present on one system in which the value of "lost" gas is sufficient to justify removing and testing all meters in the systems. Sometimes it is rather difficult to isolate the cause of unaccounted for losses, but if a systematic approach is made, the problem may be simplified.

An interesting fact was developed by engineers in studying the water supply and metering in New England. In a paper, presented some time ago before the New England Water Works Association, appears a curve showing the ratio at which water is used in domestic supply. Much to my surprise, nearly half the total is at the rate of 2 gallons per minute or less. Those of us who have had experience with water meters realize the difficulty of adjusting and maintaining meters in such a manner as to get accurate readings at very low flows. It is highly probable that 25 percent of water sold to domestic customers through meters is not recorded at all. Very few companies meter the supply and sales completely enough to check this loss.

Accurate metering is essential to good customer relations, but from a monetary point of view it is vastly more important to the utility concerned. This fact is appreciated by the larger companies, but in the case of small organizations, especially municipalities, its importance is often overlooked, as evidenced by one town in Maryland. Knowing that the electric meters were in need of checking, I offered the services of an inspector to assist in the instruction of the local metermen and in properly equipping the shop. A complete survey and test of meters resulted in a 25 percent increase in revenue. Needless to say, some customers were displeased, but the financial position of the town was improved.

#### REPORT OF COMMITTEE ON CONSTITUTION AND BYLAWS

MAJORITY REPORT PRESENTED BY C. D. BAUCOM, CHAIRMAN

Gentlemen of the Conference: In making my report for this committee I desire to preface my remarks by reading a motion which

created this committee. The motion was made reading "I make a motion that the Chair, or the president, appoint a committee of not less than three members of the Conference to draw up a constitution and set of bylaws for the guidance of this organization."

That motion was seconded, the question was taken, and the motion was agreed to.

This committee was appointed by the president, as required, and when we convened a certain question arose which necessitated my coming before the Conference yesterday and asking for a ruling by the Chair. In compliance with the mandate of the motion the committee therefore drew up these rules and regulations, or constitution, or whatever you want to call it. We are sorry that all of the committee could not see fit to sign the report, but we have done the best we could in compliance with the mandate of the motion which created the committee (reading):

**PREAMBLE.** Whereas the Constitution of the United States declares that Congress shall have power to fix standards of weights and measures, etc. (Section 8, Article 1), and

Whereas Congress has placed in the National Bureau of Standards the responsibility of the keeping of standards of weights and measures which are to be uniform throughout these United States and its several territories, and

Whereas the Director of the National Bureau of Standards did call a Conference of weights and measures officials of the several States of the Union in 1905 for the purpose of considering and adopting uniform weights and measures regulations, specifications, and tolerances, and

Whereas these Conferences have been continued since 1905, resulting in the adoption by the Conference and recommending by the National Bureau of Standards from time to time of reasonable uniform regulations, specifications, and tolerances for the guidance and use of officials of weights and measures of the several States of the Union, we assembled in this Twenty-sixth National Conference do hereby and herewith confirm the formation of this association and declare ourselves so constituted.

#### ARTICLE 1.

**SECTION 1.** The name of this association shall be the National Conference on Weights and Measures.

**SECTION 2. *Purposes.***—The aims and purposes of this association shall be the consideration, adoption, and promotion of uniform regulations, specifications, and tolerances for all weighing and measuring devices used commercially in the United States and subdivisions thereof.

**SECTION 3. *Membership.***—Any person employed by Federal, State, or subdivision thereof, engaged in the work pertaining to weights and measures shall be an "active member." Any person engaged in the manufacture, sale, or distribution of weights and measures and all weighing or measuring devices and/or in scientific research, and/or allied work, shall be "honorary members."

**SECTION 4. *Officers.***—Officers of the conference shall consist of the following: A president, first vice president, second vice president, third vice president, fourth vice president, fifth vice president, a secretary, and a treasurer.

#### ARTICLE 2. *Elections.*

**SECTION 1.** By virtue of his office and the confidence reposed in him by the United States Congress, the Director of the National Bureau of Standards shall be the President of the Conference.

**SECTION 2.** All vice presidents shall be "active members" and elected by a majority vote as defined by article 4, sections 8 and 11.

**SECTION 3.** By virtue of his position and his close contact with the president, the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be the secretary.

**SECTION 4.** The treasurer shall be an active member and elected by a majority vote as defined in article 4, sections 8 and 11.

#### ARTICLE 3. *Duties.*

**SECTION 1.** The president shall preside over all meetings of the Conference and perform such acts as customarily pertain to the office.

**SECTION 2.** The vice presidents shall in order of their election perform the duties of the president in his absence.



SECTION 3. The secretary shall keep a record of all proceedings and actions of the Conference and perform such other duties as customarily pertain to the office.

SECTION 4. The treasurer shall receive all funds and disburse same as may be directed by the Conference.

ARTICLE 4.

SECTION 1. The general management of this Conference shall be vested in an executive committee consisting of the "line offices" and not more than one active member from each State. This committee shall recommend dates of meeting.

SECTION 2. The president and secretary of the Conference shall act as chairman and secretary of the executive committee.

SECTION 3. No person shall be assessed with dues. However, a voluntary registration fee may be contributed by each member in attendance to defray necessary expenses, such amount to be determined by the preceding Conference.

SECTION 4. A nominating committee consisting of nine active members shall be appointed at each annual meeting by the first vice president.

SECTION 5. A resolutions committee consisting of nine active members shall be appointed at each annual meeting by the second vice president.

SECTION 6. No member shall be appointed to or serve on more than one committee at the same time.

SECTION 7. There shall be a specifications and tolerances committee of which the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be permanent chairman and, in addition, six active members elected as other officers of the Conference, elected for a period as follows: Two for a period of 1 year, two for a period of 2 years, and two for a period of 3 years. At the expiration of each period successors shall be elected for a period of 3 years.

SECTION 8. The nominating committee shall present the name of one active member for each office or position as provided to be elected by a majority vote. Provided, however, that names of active members may be presented from the floor and elected in the same manner.

SECTION 9. The resolutions committee shall prepare and offer such resolutions as may be fitting or as may be directed by the Conference.

SECTION 10. The specifications and tolerances committee shall consider, prepare, and present for action by the Conference, regulations, specifications, and tolerances for weights and measures and/or weighing or measuring devices.

SECTION 11. The election of officers and report of the specifications and tolerances committee shall be determined by a majority roll call vote of the several States, each of which shall have three votes, active members only shall exercise privilege of voting.

SECTION 12. Every member of the Conference shall have the privilege of the floor.

SECTION 13. Report of the committee on specifications and tolerances or proposal relating thereto coming from the floor, shall be presented in writing allowing reasonable time for consideration prior to action of the Conference.

SECTION 14. Amendments to this constitution and bylaws shall be proposed in writing, signed by not less than 3 active members and reasonable time shall elapse prior to action of the Conference.

SECTION 15. Except as otherwise provided, Roberts Rules on Parliamentary Procedure, insofar as they are applicable to the Conference, shall apply.

SECTION 16. This constitution and bylaws shall be in full force and effect upon adoption by the Conference.

(Signed) C. D. BAUCOM, *Chairman*,  
H. N. DAVIS,  
S. T. GRIFFITH,  
B. W. RAGLAND (by proxy),  
*Majority Members of Committee.*

MINORITY REPORT PRESENTED BY JAMES O'KEEFE

Mr. Chairman and gentlemen of the Conference, I have no ulterior motive, I have no political aspirations so far as this Conference is concerned, in presenting this report, and anything that I might say is just general and what I believe and what the rest of the men who



signed this report believe, is the best thing for the Conference. In doing so I would like to go over some of the things in the majority report, if I may have that privilege.

Mr. GRIFFITH (interposing). The report is not under consideration. It can be brought on the floor by a proper motion. Let the minority report be presented as is in order.

The ACTING CHAIRMAN. I think that the proper thing would be to hear the minority report. I allowed the majority report to preface its remarks without limitation. However, the point has been called, and if the minority committee will just submit its report in relation to their attitude on the question we will appreciate it. Discussion may occur on the other related features when the motion comes up.

Mr. O'KEEFE. The reason I was going into this was because I wanted to give you the purpose for the minority report. However, so long as it is not under discussion I will go into that later.

THE ACTING CHAIRMAN. I allowed the majority to preface their report with certain explanatory remarks. I don't intend to deny you that privilege. I don't have in mind what particular question Mr. Griffith has in anticipation of what may be in the minority report.

Mr. GRIFFITH. I haven't any, because I didn't even have the opportunity of seeing it. I merely mention the fact that no discussion of any particular phases of the majority report should be had at this time. The minority report should be presented. If you want to make a statement as to the reasons for its presentation, all right, but don't attempt to argue on the points in the majority report, which is not under consideration.

Mr. O'KEEFE (reading) :

The undersigned members of your Committee on Constitution and Bylaws have reviewed the history of former consideration by this organization of the question of the adoption of a constitution and bylaws. They have also given consideration to the progress made by the Conference up to the present without such instruments, its present flourishing condition, and the harmony existing in its membership. The above considerations have led them inevitably to the conclusion that a constitution and bylaws for this organization are not only unnecessary, but ill-advised. They accordingly report this conclusion to the membership and recommend that the Committee on Constitution and Bylaws, appointed in accordance with a motion adopted by the Twenty-fifth Conference, be discharged.

(Signed) JOHN P. MCBRIDE,  
F. S. HOLBROOK,  
JAMES O'KEEFE,

*Minority Members of the Committee.*

#### DISCUSSION OF ABOVE REPORT

Mr. O'KEEFE. Mr. Chairman, I offer that as a substitute for the original report, and I move its adoption.

(The motion was seconded.)

The ACTING CHAIRMAN. Is the body ready for action on the report of the Committee on Constitution and By Laws?

Mr. DAVIS. I rise to a point of personal privilege to state the reasons why I signed the majority report.

Mr. GRIFFITH. I think, Mr. Chairman, that now is the time for recognition of a question of personal privilege.

Mr. DAVIS. As a member of this committee I wish to state the reasons why I signed the majority report. It has been called to your

attention by Mr. Baucom that a draft was made for this body to adopt or reject. I think it is wholly within the province of this body, not within the province of the committee itself, to say to you whether there should be a constitution and bylaws or not. It is entirely up to you gentlemen, I think.

Mr. O'KEEFE. I believe the gentleman is right. It is up to you to vote on it. The committee thought we would be in a position to advise you in what we thought was the proper thing to do.

In the first place, this is not a legally constituted body. It is operating under no charter, and I do not know how you would have any right to make any bylaws. Some of the lawyers may know about that.

I am going to go over each question. I am going to be as brief as I can. The first question is, "The name of this Association shall be the National Conference on Weights and Measures." There isn't any charter, there isn't anything to show that there is such a body or organization at the present time outside of the name given to it by the National Bureau of Standards, which has called a committee meeting, as it were, each year.

Another thing, keep this in mind: This body might be all here this year. This body has changed from 25 to 50 percent from the personnel of last year, and the fact that they all belong to this organization today means nothing. A lot of us might lose our jobs tomorrow, and the organization wouldn't mean a thing.

SECTION 2. *Purposes.*—The aims and purposes of this association shall be the consideration, adoption, and promotion of uniform regulations, specifications and tolerances for all weighing and measuring devices used commercially in the United States and subdivisions thereof.

This organization, as I understand it, doesn't promote these specifications and tolerances. They come here and give their opinions as best they know how, to the Bureau of Standards.

SECTION 3. *Membership.*

I am not interested in that.

SECTION 4. *Officers.* Officers of the Conference shall consist of the following: A president, first vice president, second vice president, third vice president, fourth vice president, fifth vice president, a secretary, and a treasurer.

There are five vice presidents, but there doesn't seem to be much activity so far as those vice presidents are concerned.

ARTICLE 2. *Elections.*

SECTION 1. By virtue of his office and the confidence reposed in him by the United States Congress, the Director of the National Bureau of Standards shall be the President of the Conference.

That is only natural. That is a superfluous thing in there.

SECTION 2. All vice presidents shall be active members and elected by a majority vote as defined by article 4, sections 8 and 11.

I am not interested in that.

SECTION 3. By virtue of his position and his close contact with the president, the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be the secretary.

That is all right.

SECTION 4. The treasurer shall be an active member and elected by a majority vote as defined in article 4, sections 8 and 11.

You have that now. There is no necessity for a bylaw on that.

ARTICLE 3. *Duties.*

SECTION 1. The president shall preside over all meetings of the Conference and perform such acts as customarily pertain to the office.

That is all right.

SECTION 2. The vice presidents shall in the order of their election perform the duties of the president in his absence.

SECTION 3. The secretary shall keep a record of all proceedings and actions of the Conference and perform such other duties as customarily pertain to the office.

That is only the natural thing.

SECTION 4. The treasurer shall receive all funds and disburse same as may be directed by the Conference.

That doesn't mean anything. He doesn't collect very much to disburse.

ARTICLE 4.

SECTION 1. The general management of this Conference shall be vested in an executive committee consisting of the "line officers" and not more than one active member from each State. This committee shall recommend dates of meeting.

Well, they have to agree on that with the Bureau of Standards, because the Bureau of Standards should say when the meetings shall be. Our meeting should be held at times best suited to the Bureau.

SECTION 3. No person shall be assessed with dues. However, a voluntary registration fee may be contributed by each member in attendance to defray necessary expenses, such amount to be determined by the preceding Conference.

SECTION 4. A nominating committee, consisting of nine active members, shall be appointed at each annual meeting by the first vice president.

That is the first time in my life that I ever heard of a vice president appointing a nominating committee.

SECTION 5. A resolutions committee, consisting of nine active members, shall be appointed at each annual meeting by the second vice president.

That's something new, too.

SECTION 6. No member shall be appointed to serve on more than one committee at the same time.

That may be all wrong. We may have men here who would be good men to have on a nominating committee and who would be splendid men to have on a committee on specifications and tolerances. Why stop any man who is worth-while and who can do things from serving on two committees? You don't do it in a fraternal organization; you don't do it in any other places. That is class legislation.

SECTION 7. There shall be a specifications and tolerances committee, of which the Co-Chief of the Division of Weights and Measures of the National Bureau of Standards shall be permanent chairman and in addition six active members elected as other officers of the Conference, elected for a period as follows: Two for a period of 1 year, two for a period of 2 years, and two for a period of 3 years. At the expiration of each period successors shall be elected for a period of 3 years.

I don't believe there are more than 10 men who have been at this Conference for 3 years in a row. Maybe there are; I don't know. This personnel changes every year. You elect a man for 3 years as a member of this committee and he will probably be on some other job next year. Not only that, but how can you tell what he knows about tolerances? I couldn't tell you any more about proper toler-



ances than the man in the moon. The men you want on that kind of committee are men like "Cap" Griffith, or John McBride, or "Joe" Rogers—fellows who have had a lot of experience, years and years of experience. You get out here and just because some fellow is a good fellow on the job you elect him to the committee on specifications and tolerances and he will not know a thing about the subject. It is entirely out of line.

SECTION 8. The nominating committee shall present the name of one active member for each office or position as provided to be elected by a majority vote; provided, however, that names of active members may be presented from the floor and elected in the same manner.

SECTION 9. The resolutions committee shall prepare and offer such resolutions as may be fitting or as may be directed by the Conference.

They can do that anyhow. You don't need a bylaw for that.

SECTION 10. The specifications and tolerances committee shall consider, prepare, and present for action by the Conference regulations, specifications, and tolerances for weights and measures and/or weighing or measuring devices.

That's all right. It's just a recommendation.

SECTION 11. The election of officers and report of the specifications and tolerances committee shall be determined by a majority roll call vote of the several States, each of which shall have three votes. Active members only shall exercise the privilege of voting.

I would be in a fine fix, and so would John Levitt, coming from Illinois, if we had 10 men from Illinois representing different cities in that State. There are only two of us here now. Supposing we had brought seven other fellows down here and we said, "John Levitt has a vote, and you other six fellows are just here on a vacation."

I don't see why or how you should discriminate against anybody and have any man come into this Conference and say he can't have a vote in discussion. Supposing they do outvote you 14 to 3? You have their 14 minds against your 3, and my old Irish mother and father used to tell me that two heads were better than one. I don't know; maybe they were wrong. But if you have 10 or 20 or 50 minds saying anything, that is better than 1 or 2. Why say you can have only one or two? I wouldn't even go to such a Conference.

I can tell you another thing along that line. If a communication came to the city of Chicago saying that the National Weights and Measures Conference was going to have a meeting, and the meeting invitation was extended by Baucom, Griffith, and O'Keefe, I couldn't get the Mayor of Chicago to send me. But when a communication comes in on Government stationery signed by the National Bureau of Standards, the mayor says to me, "I want the city of Chicago represented there." I think that the Bureau of Standards will have a lot more weight in sending out invitations to have you men come here than any committee would.

SECTION 13. The report of the committee on specifications and tolerances or proposals relating thereto coming from the floor, etc.

I guess that's fine.

SECTION 14. Amendments to this constitution and bylaws shall be proposed in writing, signed by not less than three active members, and reasonable time shall elapse prior to the action of the Conference.

Well, we can skip that. I don't believe in these bylaws.

SECTION 15. Except as otherwise provided, Robert's Rules on Parliamentary Procedure, insofar as they are applicable to the Conference, shall apply.

Robert's Rules are applicable to the chairman in enforcing the rules of procedure, and I think the chairman does that now; any change will be unnecessary.

That is my story. I still move the adoption of the minority report.

Mr. GRIFFITH. I didn't rise to a point of order, which should probably have been maintained against the reading of that report, because I presumed Mr. O'Keefe was using that as an argument for supporting his motion. I am very glad, however, that it was read again, so as to give those who did not hear it when it was first read another opportunity.

First of all, I would like to say that this is a very important question. It should receive the most careful consideration that the members of this Conference can give it. There isn't any doubt in my mind, from participating in Conferences since 1924 thereabouts, that there is need for some method of procedure. We proceed and perform remarkably well. I am surprised at Mr. O'Keefe, who, as I understood, said that only chartered bodies could have bylaws. The associations to which I belong, the Christian Endeavor and some little neighborhood clubs, always had a constitution and bylaws. It is a method of guidance for the operation of any deliberative body.

This report signed by the majority of the Constitution and Bylaws Committee is merely a recommendation. There may be, and probably are, a great many changes and additions that can be made to make it a more perfect document. However, personally I feel that I would be very disrespectful to this Conference in having been appointed as a member of the committee to do certain things, and I myself would have felt very derelict in my duty, if we had not drafted a constitution and set of bylaws. Whether you accept them or not is in your hands. The motion is as to whether we need them.

I can recite from memory in several Conferences moments of confusion and how they were settled I don't know. Last year, after a lapse of four years, the Conference convened and the membership was approximately 50 percent new members, unacquainted with how to do things in this Conference. Progress was slowly made, amidst a lot of discussion that was unnecessary.

Mr. O'Keefe is a member of this Conference. He attended it here for the first time last year. In other words, he is just a year and a half old. He is one of the signers of the minority report. Mr. Holbrook is our genesis and foundation and keystone. Mr. McBride is a man of proven merit and recognized ability as a vice president. They are the minority.

The majority report was signed by Baucom, a member of this Conference for some years and of some standing, and a State commissioner. Mr. Davis has been a member of this Conference for about 20 years. It was signed by Mr. Ragland, of Virginia, and by myself, a member for about 12 years. Certainly the experience that we have in recommending the need for plans of operation, rules, and regulations—a constitution and bylaws—is based on actual knowledge of the results that we have seen.

There is no attempt and, if there were, I would be the first to oppose it, to usurp any of the prerogatives, authority, or responsibility of the Bureau of Standards. Our sole aim in conferring here annually or from time to time is to arrive at uniformity of regulations,

specifications, and tolerances for weighing and measuring devices so that this great Union will not have a conglomeration of various codes affecting devices, handicapping a great manufacturing industry and exposing weights and measures officials in several jurisdictions if not to ridicule at least to little credence. The prime object is to secure, to consider, and to promote. I don't know why we can't promote. We may not do anything about it, but we certainly can promote a good idea or a good design for uniform regulation.

Naturally, in our work we have got to be dependent upon the National Bureau of Standards. In the provisions in the majority report, as read again by Mr. O'Keefe, an attempt has been made to keep the authority and the guidance in the hands of the National Bureau by naming as our permanent heads of the important and functioning activities those men who are in the National Bureau of Standards.

We all have ideas. In my State I think this is so and you, in your State, think that is so. I am quite sure you will all agree that if we could have regulations that were universal and general this Conference would have accomplished the duty which we are assembled to perform.

Mr. SWEENEY. Mr. Chairman and gentlemen, I have had the happy privilege of attending several meetings of the Annual Conference on Weights and Measures, beginning back as early as 1912, and I feel almost certain that any success that has marked the progress of this organization has been the result of its present construction. I hold no enmity and do not desire at this time to oppose the privilege and right of any man or any committee to present to this organization their viewpoint upon the construction and conduct of this organization. But, in view of the fact that we are in our construction a very peculiar organization, owing to the fact that we are far removed from our scene of operation, I feel that the ordinary procedure of a constitution can not be directly applied to obtain the best results.

Now, as Mr. O'Keefe said, I feel certain that my attendance at this Conference is due to the fact that annually the Mayor of Boston receives from the National Bureau of Standards a request that their director of weights and measures, Mr. Sweeney, represent the city. I feel certain of that because of the knowledge on the part of the Mayor of Boston and public men in general that the National Bureau of Standards is a universal organization performing wonderful and splendid work for the uplift of the people of the United States in general in all scientific branches and, because of that realization, the fact is brought out and it is driven home that it is essential that the city of Boston be represented.

I therefore, Mr. Chairman, sincerely hope and trust that the majority report will not prevail.

Mr. GRIFFITH. May I ask the secretary a question?

I think the reply will be enlightening. Do the invitations to this Conference come from the Director of the National Bureau of Standards?

Mr. HOLBROOK. State invitations, letters to Governors, and so forth, ordinarily go out signed by Dr. Briggs as Director of the National



Bureau of Standards and President of the National Conference on Weights and Measures. Other invitations go forward on Bureau of Standards stationery signed by me as secretary of the Conference.

While I am on the floor I might make a statement, inasmuch as I have signed this minority report. I have been connected with this Conference for some 26 years. Looking back over those 26 years I envision a very friendly and useful organization which has had a tremendous effect for good in relation to weights and measures in this country. I have never seen a situation arise where a formal constitution and bylaws would have been of any help in the Conference.

On the other hand, I have seen attempts made by this organization to adopt a constitution and bylaws. Ill feelings and animosities have been caused by the attempts to adopt such documents. At one time this Conference was well nigh disrupted by the dissatisfaction of one group after a constitution and bylaws had actually been adopted. That was in 1911. A constitution and bylaws was adopted. So many men came to the then Director of the Bureau of Standards, Dr. S. W. Stratton, that he personally, from the Chair, asked that some man who had voted for the adoption of the instrument move for its reconsideration. When its reconsideration was granted he strongly advised that the constitution be rescinded, and that action was taken. At the following Conference a great deal of valuable time was spent in debating the new instrument. A majority and minority report were filed, as in this case, and it ended by the proposed constitution and bylaws being laid upon the table.

At a Conference a few years ago, perhaps the Twenty-first Conference, a committee appointed for the purpose of drafting a constitution and bylaws brought in a report that in their opinion no constitution and bylaws were necessary. As I recall it, Mr. Griffith was a member of that committee, and, if I am not in error, made the motion that the resolution that no constitution and bylaws were necessary, be adopted.

We feel that the more informal this organization is the better the organization is going to be. We feel that the more you hamper this organization by restrictive rules and regulations the more politics you are going to bring into it. I do not mean Republican and Democratic politics, but I mean the formation of cliques and of groups who desire to put something across at the meetings.

As I see the instrument, State caucuses must be provided for. I think that caucuses in a meeting of this character, where a number of thoughtful men assemble for the purpose of gaining information that will be of value to them in their official duties, are entirely out of place.

From my experience of 25 or 26 years with this organization, I strongly recommend that the organization be kept as informal as possible. To this end I think the Conference should go on record that it is not necessary to govern itself with a constitution and bylaws.

**MR. GRIFFITH.** You did not answer me completely. You mentioned that I was chairman of the committee at what date?

**MR. HOLBROOK.** I do not think that I said you were chairman. I think I said you were a member. I referred to the Twenty-first Conference on Weights and Measures, held in 1928, when a report of the

special committee on constitution and bylaws was introduced. The concluding paragraph reads:

"In view of these considerations we find no constitution and bylaws which will be conducive to the best interests of the Conference, and recommend that the Conference continue as it is now operating. Further, we are of the opinion that the committee can not be of benefit to the Conference in any other report, and request you to dismiss the committee."

The report is signed by J. Harry Foley, chairman; H. L. Flurry, S. T. Griffith, William F. Cluett, as the Committee on Constitution and Bylaws, and Mr. Griffith's remark is, "Mr. Chairman, I move that the report of the committee be approved and adopted."

Mr. GRIFFITH. I really want to call attention to the membership of that committee—Mr. Foley, a State commissioner of long standing; Mr. Cluett, a member of long standing, and the other gentlemen. I was the baby. In other words, I was the goat, and was influenced by their activities. It was lack of knowledge—knowledge that I have obtained in these 12 years—that caused me to make that motion.

Mr. O'KEEFE. I rise to a point of order and say that if anyone says I am making this motion at the suggestion or advice of anybody else—

Mr. GRIFFITH. I did not.

Mr. ROGERS. Mr. Chairman and members of the Conference, Captain Griffith makes certain references to length of time he has been coming down here. I don't think that has any relationship to the question at all; however, I have been coming here for 18 years.

The captain pointed out that there have been times when there have been situations where the present procedure did not provide means for dealing with problems arising. I would like the captain to cite one specific instance, in the 18 years I have been here, where the Chair was not able to deal with any question of parliamentary procedure that has been brought up. Possibly he may have said that in a general way. There may have been times when a question of parliamentary procedure has arisen. That is perfectly all right.

I think that, after all, the trouble here is that there is no clarification in the minds of some of the men proposing this, as to the relationship between the National Bureau of Standards and this Conference. We have considered in New Jersey, in all the years that we have been coming down here, that we were the guests of the United States Government. We came here at their invitation. They could, if they cared to, just assume a "take it or leave it" attitude. They could say, "We are going to hold a Conference for the betterment of weights and measures of the United States and we invite the various representatives of the States to attend." They could leave it up to you to attend or not, and when you came here the Director of the Bureau of Standards could say, "I am the chairman." He could appoint a secretary. He would receive our recommendations and any proposals we might have to make.

He did not have to pay us, and the Bureau did not have to pay us, the compliment of setting up what might be termed an organization. I have never viewed this as an organization. It hasn't the title of an organization, it hasn't the title of an association. It just has the title of a Conference, and I think it should stay like that. I think it was just the courtesy of the National Bureau of Standards

that enabled States to come here to have this little recognition that can be granted—to receive recognition as vice presidents or as members of committees.

I must take issue with Captain Griffith on another point that he raised. He speaks of keeping the authority in the Bureau of Standards under the terms of this proposed constitution and bylaws. Gentlemen, to my mind, it is nothing but a rank usurpation of the prerogatives of the Bureau. Under this, as I see it, you make the Director of the Bureau of Standards a figurehead. You take from him the appointment of all committees. You put the appointment of committees in the hands of vice presidents and, as John O'Keefe, from Chicago, aptly said, he has never recalled in his association with organizations an instance where any vice president was ever empowered to appoint committees. I never heard of anything like that.

I think these things in the way of prerogatives as to the best conduct of these meetings should be left entirely in the hands of the Bureau of Standards. I consider myself the guest of the Bureau of Standards when I come down here and I feel myself in the same relative position as if I went into the home of a person who had invited me, whether to a feast or for a friendly talk. If I tried to usurp any of his prerogatives or violate any of my responsibilities as a guest, I would certainly be out of place.

I resent the remark of Captain Griffith wherein he said he was made the goat when Harry Foley (God bless his kindly soul!) and Bill Cluett, of Chicago, were on the committee. I don't believe either of those men ever made any man a goat. They believed that every man could think for himself. They were good analysts. No one has ever accused Captain Griffith of not being able to think for himself. He seems to have clarity of thought.

I am opposed to this myself, and I believe the Jersey delegation is opposed to it. I do not think there is any necessity for it.

Mr. GRIFFITH. I don't want Mr. Rogers to sit down with any idea that I offered any slight to Mr. Foley, whom I treasure in my mind as one of my very good friends, or to Mr. Cluett, of Chicago, who was a most venerable and kindly gentleman, but I merely mentioned the fact that I was young and inexperienced. I didn't know as much as I do now.

The ACTING CHAIRMAN. The question is your action on the motion to adopt the minority report. Those in favor signify by saying "Aye", [after a pause] opposed "No." The Chair declares that the report of the minority of the committee has been accepted.

Dr. BRIGGS. Members of the Conference, in view of the fact that I have to leave early in the morning and that there are a good many matters that I have to attend to this afternoon, I regret very much that I shall not be able to be present with you in this final afternoon session. I simply wanted to take this opportunity to say to you how deeply we appreciate your coming here, how satisfactory the meeting has been, and that we are looking forward to seeing you all, and many more of your friends, next year. Thank you.

(At this point, at 1:38 p. m., the Conference took a recess until 2:30 p. m.)



EIGHTH SESSION—AFTERNOON OF FRIDAY, JUNE 12,  
1936

(The Conference reassembled at 2:35 p. m., at the Washington Hotel, Mr. John P. McBride, first vice president of the Conference, in the chair.)

The ACTING CHAIRMAN. Now gentlemen, we are ready for the afternoon session. The first item is the report of the secretary of the Conference, which will be presented by Mr. Holbrook.

Mr. HOLBROOK. The report of the secretary was intended to develop the consensus of the members on several points upon which information was desired. To save time this afternoon, I think that we will submit a letter ballot to all the members in attendance and allow them to answer the questions at their leisure. In this way we will obtain a much more representative vote.

CITATION BY OFFICIALS OF IMPORTANT COURT DECISIONS IN  
THEIR JURISDICTIONS

Mr. HOLBROOK. Mr. Chairman, I have one thing under this program item, submitted by wire, signed by R. E. Meek and addressed to Martin L. Lang:

Indiana Supreme Court yesterday (June 9) upheld decision St. Joseph County Superior Court and ordered Inspector Charles Burns reinstated and back salary paid. This was first Supreme Court test of constitutionality of 1925 act. Thought you might wish to report this decision to Conference under heading important court decisions.\*

REPORT OF COMMITTEE ON NOMINATIONS, AND ELECTION OF  
OFFICERS

The ACTING CHAIRMAN. Is the Committee on Nominations ready to report?

Mr. LEVITT. The secretary of the committee will make the report.

Mr. BOYLE. Mr. Chairman, as secretary of the committee, I make the following report:

For president, Lyman J. Briggs; vice presidents, John P. McBride, John J. Levitt, C. D. Baucum, C. J. P. Cullen; secretary, F. S. Holbrook; treasurer, George F. Austin, Jr.

For members of the Executive Committee, Martin L. Lang, John W. Bates, William A. Jones, Edward K. Strobbridge, Howard E. Crawford, H. N. Davis, W. S. Bussey, J. B. Fink, George E. Roberts, Russell S. Ackerman, Edward R. Fisher, S. T. Griffith, James O'Keefe, B. W. Ragland, C. J. Reynolds, Louis G. Waldman, George Warner, Walter G. White, S. H. Wilson, Seth L. Lightfoot, C. L. Jarrett, J. M. Daniels.

(Signed) JOHN J. LEVITT, *Chairman*,  
MARTIN L. LANG,  
HARRY S. PROVOST,  
S. H. WILSON,  
JAMES A. BOYLE,  
S. T. GRIFFITH,  
LOUIS G. WALDMAN,

*Committee on Nominations.*

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\*SECRETARY'S NOTE.—Further details of this decision are as follows: Mr. Burns is city inspector of weights and measures of South Bend, Ind. The mayor, contending that the 1933 governmental reorganization act gave him the power to remove Mr. Burns as city inspector, dismissed him in January 1935. The decision of the court upheld the 1925 weights and measures act, which provides charges must be preferred against a county or city inspector before he can be removed. These charges must be sustained, before removal, in a hearing before local authorities and by the State commissioner of weights and measures. As a final recourse the inspector can carry his appeal to the circuit or superior court of the county in which he resides.

I move, Mr. Chairman, that that report be accepted.

Mr. WHITE. I second the motion.

The ACTING CHAIRMAN. It is moved and seconded that the report of the Committee on Nominations be accepted as read by the committee. Is there any discussion on the motion?

Mr. HARRISON. To clarify the matter, I call the attention of the Chair to the fact that ordinarily the president, secretary, and vice presidents are members of the Executive Committee. I believe they should be so included.

Mr. BOYLE. Mr. Chairman, that point was mentioned and it was said that it was not necessary to have them included in the list, as they were automatically on the Executive Committee by virtue of being president, vice presidents, and secretary.

The ACTING CHAIRMAN. Is it the intention of the Nominating Committee to include those officers, Mr. Boyle?

Mr. BOYLE. Yes; it is the intention, Mr. Chairman.

The ACTING CHAIRMAN. Then your report will be that you submit these names and include on your Executive Committee the president, vice presidents, and secretary as members of the Executive Committee. That is the sense of the motion.

(It was moved and seconded that the nominations be closed, and that the secretary be directed to cast the ballot of the Conference for the officers and members of the executive committee, as nominated, the question was taken, and the motion was agreed to.)

(Accordingly the secretary cast the ballot of the Conference for the officers and members of the executive committee, as nominated by the Committee on Nominations, and they were declared duly elected.)

#### REPORT OF COMMITTEE ON RESOLUTIONS, PRESENTED BY WALTER G. WHITE, CHAIRMAN, AND DISCUSSION THEREON

Your Committee on Resolutions presents the following resolutions for your consideration:

##### RESEARCH ON AIR ELIMINATORS

Whereas from experience it has been shown that in the use of meters in the dispensing of petroleum products, both of the wholesale and retail types, the factor of air is the cause of serious inaccuracies in the use of same: Therefore be it

*Resolved*, That the National Bureau of Standards be requested to conduct a research into the use of air eliminators, with meters of the wholesale and retail types, and report the result of their findings at the next meeting of this Conference.

(The resolution as presented by the committee was duly adopted.)

Mr. WHITE (reading):

##### MEANS FOR CALIBRATION OF METERS USED AS STANDARDS

Whereas many States have adopted the use of meters for the purpose of calibrating vehicle tank compartments and many other States are considering this method of calibration; and

Whereas at the present time no provisions are made for the calibration of this type of meter by the National Bureau of Standards: Therefore be it

*Resolved*, That the Bureau of Standards be requested to provide suitable means for the proper calibration of meters designed for the use of petroleum products and that a suitable testing medium be used.

Mr. ROGERS. Isn't that already covered in our specifications? We prescribe methods of test and tolerances and variations for meters.

Mr. WHITE. We, in that resolution, are asking the National Bureau of Standards to make provision for the calibration of our test meters. At the present time they use water for that purpose and it is not advisable to use water as a testing medium in a meter used on petroleum products.

Mr. ROGERS. Is it necessary to saddle the Bureau of Standards with that responsibility? You have the facilities to make it possible in your own State to calibrate your own meter. Standards are available to make such calibration possible. I am not adverse to this. It is perfectly all right with me if we adopt meters as a calibrating unit to have the Bureau calibrate them, but whether it would be absolutely necessary to have it done by the Bureau is a question.

Mr. HOLBROOK. I think Mr. White misspoke himself or was not entirely familiar with our practice. The Bureau has never used water in the testing of gasoline meters, nor would we do so. The Bureau uses water in connection with the testing of some large-capacity meters, but they are for the purpose of measuring beer. If we test large-capacity meters for the States, for use with gasoline, we will use gasoline or some substance which will be of approximately the same viscosity as gasoline.

If there is a demand for the test of standard meters the Bureau of Standards will try to meet that demand, so I think that the resolution is entirely in order and the Bureau will see what it can do in this connection.

(The resolution as presented by the committee was duly adopted.)

#### SPECIFICATION FOR MANIFOLDING SYSTEMS ON VEHICLE TANKS

Mr. WHITE (reading) :

Whereas during the present Conference it has been brought out that under certain circumstances the manifold system of vehicle tanks is not satisfactory: Therefore be it

*Resolved*, That the Committee on Specifications and Tolerances of this Conference give this question consideration and make recommendations to the next Conference.

(The resolution as presented by the committee was duly adopted.)

#### APPRECIATION TO HEADQUARTERS HOTEL AND TO EXHIBITORS

Mr. WHITE (reading) :

*Resolved*, That the Twenty-sixth National Conference on Weights and Measures express its warmest appreciation and thanks to the Washington Hotel for its careful provision for our comfort, and to the several exhibitors for their educational and instructive displays.

(The resolution as presented by the committee was duly adopted.)

#### APPRECIATION TO THE PRESS AND TO THE SCALE JOURNAL

Mr. WHITE (reading) :

*Resolved*, That an individual expression of appreciation be sent by the secretary to the press of Washington and to the Scale Journal for the generous and eminently satisfactory way in which these papers have reported the Twenty-sixth National Conference on Weights and Measures.

(The resolution as presented by the committee was duly adopted.)



APPRECIATION TO MR. R. J. TRUMP

Mr. WHITE (reading):

Whereas Mr. R. J. Trump, Controller, Standards Department, Board of Trade of England, prepared and submitted to this Conference a scholarly paper on the administration of weights and measures in Great Britain: Therefore be it

*Resolved*, That we, the Twenty-sixth National Conference on Weights and Measures in meeting assembled in Washington, D. C., do hereby express our deep appreciation; and be it further

*Resolved*, That the secretary of the Conference be instructed to forward a copy of this resolution to Mr. R. J. Trump.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO EXHIBITORS OF EQUIPMENTS FOR THE TESTING OF LARGE-CAPACITY SCALES

Mr. WHITE (reading):

Whereas the Department of Weights and Measures of the State of New Jersey and the Department of Markets, Weights, and Measures of the city of New York sent to this Conference, at their own expense, their new testing equipment for large-capacity scales; and

Whereas by such action on their part much information was imparted to the delegates in attendance at the Conference: Therefore be it

*Resolved*, That we, the members of the Twenty-sixth National Conference on Weights and Measures, do hereby express to them our grateful appreciation.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO COOPERATING OFFICIALS

Mr. WHITE (reading):

Whereas the Governors, county and city officials of the various States, counties, and cities, through their manifest interest in weights and measures work have made it possible by their cooperation for their jurisdictions to be represented at this, the Twenty-sixth National Conference on Weights and Measures held in the Nation's capital at Washington, and

Whereas such cooperation and attendance have made it possible to adopt uniform regulations for the various jurisdictions, and in other ways facilitate the improvement of Weights and Measures Departments: Therefore be it

*Resolved*, That a letter of appreciation, with a copy of this resolution, be forwarded to these various officials by the secretary of the Conference, thanking them for their cooperation.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION TO DIRECTOR AND STAFF OF THE NATIONAL BUREAU OF STANDARDS

Mr. WHITE (reading):

Whereas Dr. Lyman J. Briggs, Mr. F. S. Holbrook, and Mr. Ralph Smith, and their able and efficient staff, have extended valuable assistance and guidance to this Conference: Therefore be it

*Resolved*, That this Conference go on record in sincere and grateful appreciation of their cooperation in making this Conference a success.

(The resolution as presented by the committee was duly adopted.)

APPRECIATION FOR RECEPTION TENDERED BY NORTH CAROLINA DELEGATION

Mr. WHITE (reading):

*Resolved*, That special thanks be tendered the North Carolina delegation for their cordial reception to the ladies attending the Conference.

(The resolution as presented by the committee was duly adopted.)

## AUTHORIZATION OF A COMMITTEE ON PUBLICITY

Mr. WHITE (reading) :

Whereas this Conference realizes the important relationship of proper publicity to the work of weights and measures, we believe it essential that this Conference have a permanent and duly authorized committee whose express duty would be to see that the news agencies are furnished with information of interest and importance in connection with our Annual Conference: Therefore be it

*Resolved*, That the President of this Conference be authorized to appoint a committee of not less than three members of the Conference to perform this important duty.

(The resolution as presented by the committee was duly adopted.)

## APPROVAL OF MERIT SYSTEM OF APPOINTMENT OF OFFICIALS

Mr. WHITE (reading) :

Whereas this Conference realizes the importance of continuity of service of weights and measures workers: Therefore be it

*Resolved*, That this, the Twenty-sixth National Conference on Weights and Measures go on record as approving the merit system for every position in the weights and measures service.

(The resolution as presented by the committee was duly adopted.)

## IN MEMORY OF OUR DEPARTED MEMBERS

Mr. WHITE (reading) :

Whereas during the past year we have lost through the plan of Divine Providence several members of this Conference; and

Whereas our associations with these gentlemen have been an inspiration in prompting us to go forward with a greater determination to carry on the ideals set by them: Therefore be it

*Resolved*, That we of the Twenty-sixth National Conference on Weights and Measures, in meeting assembled, do hereby draw up this resolution as an expression of our sincere sorrow at their passing.

Mr. GRIFFITH. Is it possible to get the names of those members?

Mr. WHITE. We were unable to procure the names. We will be glad to have this amended to include the names if they are available.

Mr. ROGERS. Might I propose as an amendment to that a rising vote, in silent testimonial?

Mr. FISHER. I would like to pay my respects to my former sealer, who passed on since the last Conference.

Mr. GRIFFITH. Probably the secretary will have more contact than anybody. I see from time to time in the Scale Journal some names, but I doubt if you can get them all. For those you can get I think it will be a graceful gesture to send the families a copy of this resolution.

Mr. BOOTH. In view of the practical impossibility of procuring all names, I feel it might be better to follow the suggestion of the gentleman from New Jersey that we stand in silence for, say, thirty seconds.

The ACTING CHAIRMAN. The amendments to the motion to adopt this resolution are that the secretary shall obtain the names of the departed members, and shall forward to the families of those deceased members a copy of this resolution; moreover, that the body shall rise for a moment of silence in tribute to the departed members.

(The resolution was adopted by the members rising and standing in silence for a time.)

Mr. WHITE. All resolutions submitted herein were unanimously approved by the committee.

(Signed) WALTER G. WHITE, New Hampshire, *Chairman*,  
 W. S. BUSSEY, Texas,  
 J. M. DANIELS, Michigan,  
 J. B. FINK, Washington,  
 C. P. SMITH, New York,  
 EDWARD K. STROBRIDGE, California,  
 JAMES A. SWEENEY, Massachusetts,  
*Committee on Resolutions.*

Mr. O'KEEFE. I think the Committee on Resolutions did a splendid job, and I think they are entitled to a vote of thanks, because it took a lot of hours to get up those resolutions. I move you, therefore, that the Committee on Resolutions be extended a vote of thanks by this Conference.

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

Mr. HARRISON. I have had the pleasure of attending a great many of these Conferences. One very hard-working committee in your Conference I have yet to see thanked. I would like to offer at this time some modicum of appreciation to the Committee on Specifications and Tolerances, who at the present Conference to my certain knowledge labored hard for 4 days prior to the Conference and practically every moment of their spare time evenings during the Conference, and have done a very, very wonderful job.

I offer that in the form of a motion.

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

# REPORT OF THE TREASURER, GEORGE F. AUSTIN, JR.

## Receipts:

Balance on hand June 1, 1935	\$209.39
Dues from delegates	147.00
Interest received	6.50
Total receipts	362.89

## Disbursements:

June 1, 1935. Receipt book (500 page)	\$1.80
June 15, 1935 { Telephone calls	.40
{ Printing stickers	3.50
{ Messenger, mimeographing, and clerical service	25.00
Total disbursements	30.70
Balance on hand June 1, 1936	332.19

(Signed) GEO. F. AUSTIN, Jr., *Treasurer.*

(The report was duly accepted.)

The ACTING CHAIRMAN. The next item is the selection of hotel headquarters for the Twenty-seventh National Conference.

Mr. STROBRIDGE. Most of us are from out of the city, and I would move you that the selection of hotel headquarters for our next Conference be left in the hands of the president and the secretary of the Conference.

Mr. BOOTH. I second the motion.



Mr. HOLBROOK. I would like to amend that motion to put it in the hands of the Executive Committee. We can get schedules of rates some time before the next Conference, and ask the Executive Committee to express its choice.

Mr. STROBRIDGE. I will accept that as the original motion.

Mr. BOOTH. I assent.

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

The ACTING CHAIRMAN. The next item is "Unfinished Business."

Mr. ROGERS. We often hear so much of the "forgotten man", and I think that sometimes there are forgotten women, too. In the conducting of this Conference there is a tremendous lot of clerical labor. I think some little token of material appreciation should be extended to these girls for this extra work.

Mr. SWEENEY. Well, Mr. President, I think it is a very good thought, and, considering the solvency of our treasury, I would respectfully move at this time that the secretary be empowered to spend from the very solvent treasury of the Conference the sum of \$10 to take care of any appreciation that we want to show these girls.

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

Mr. GRIFFITH. Last year we had several interesting discussions on the question of beer; barrels, I think, were particularly under discussion. Now, the method of dispensing beer has developed, and I think it might be of some interest to a great many of us to have a paper on that subject. It came to my attention this morning that a brewery in Baltimore is offering for sale a case of beer, called the family size, containing four half-gallon bottles. The usual twenty-four 12-ounce bottles in a case represents an amount sold to the consumer of 288 ounces, whereas these 4 half-gallon bottles give you only 256 ounces. There is a difference there of a considerable amount.

Anyhow, the development of the trade of handling beer I think might be of interest to us and might be included in the program.

The ACTING CHAIRMAN. These suggestions will be taken down by the reporter, and I believe no further action is necessary.

(A motion was made and seconded that the Conference adjourn, the question was taken, and the motion was agreed to.)

(Thereupon, at 3:15 p. m. the Twenty-sixth National Conference on Weights and Measures adjourned sine die.)





