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Report of the 56th National Conference on Weights and Measures 1971

U.S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

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Office of Standard Reference Data—Office of Technical Information and Publications—Library—Office of International Relations.

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[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.
[2] Part of the Center for Radiation Research.
[3] Located at Boulder, Colorado 80302.

Report of the

56th National Conference on Weights and Measures 1971

Sponsored by the National Bureau of Standards
Attended by Officials from the Various States, Counties, and Cities, and Representatives from U.S. Government, Industry, and Consumer Organizations
Washington, D. C., July 12–16, 1971

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National Bureau of Standards
Lewis M. Branscomb, Director

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Abstract

This is a report of the proceedings (edited) of the Fifty-sixth National Conference on Weights and Measures, sponsored by the National Bureau of Standards, held in Washington, D. C., July 12–16, 1971, and attended by state, county, and city weights and measures officials and representatives of the Federal Government, business, industry, railroads, and associations.

Key words: Conference, weights and measures—laws; weights and measures—regulations; weights and measures—technical requirements; weights and measures--administration; weights and measures.

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MORNING SESSION—THURSDAY, JULY 15, 1971

AFTERNOON SESSION—THURSDAY, JULY 15, 1971

(The Thursday afternoon session was devoted to reports of the Conference committees, which will be found beginning on page 147.)

OFFICERS OF THE CONFERENCE

President: Lewis M. Branscomb, Director, National Bureau of Standards.
Executive Secretary: H. F. Wollin, Assistant Chief, Office of Weights and Measures, National Bureau of Standards.
Chairman: M. Jennings, Director, Division of Marketing, Tennessee Department of Agriculture.
Vice Chairmen:
A. T. Anderson, Sealer of Weights and Measures, Cambridge, Massachusetts.
M. L. Kinlaw, Supervisor, Weights and Measures Division, North Carolina Department of Agriculture.
F. D. Morgan, Supervisor, Weights and Measures, Utah Department of Agriculture.
J. L. O'neill, State Sealer, Division of Weights and Measures, Kansas State Board of Agriculture.
Treasurer: C. C. Morgan, Sealer of Weights and Measures, Gary, Indiana.
Chaplain: R. W. Searles, Inspector of Weights and Measures, Medina County, Ohio.

EXECUTIVE COMMITTEE

J. A. J. Bovie, Jr.
N. Bucur
C. O. Cottom
F. P. Gallo
R. W. Glendenning
L. D. Holloway
J. V. Pugh
H. E. Smith
W. J. Tusen
S. F. Valtri

(All officers of the Conference are, ex officio, members of the Executive Committee.)

(Officers and Executive Committee members elected by the 56th National Conference to serve the 57th National Conference on Weights and Measures will be found in the report of the Nominating Committee, page 216.)

STANDING COMMITTEES

(The remaining term of office for each committee member, in years, is shown in parentheses following each entry. H. F. Wollin, Executive Secretary of the Conference, is ex officio nonvoting secretary to each committee.)

EDUCATION

E. Prideaux, Colorado, Chairman (3)
G. E. Mattimoe, Hawaii (2)

J. I. Moore, North Carolina
D. I. Offner, St. Louis, Missouri (4)
B. A. Pettit, District of Columbia (1)

(R. T. Williams, Texas, was appointed for a five-year term to replace J. I. Moore, whose term expired. J. C. Stewart, Virginia, was appointed to serve out the one-year unexpired term of B. A. Pettit, who retired from public service. Mr. Mattimoe replaced Mr. Prideaux as chairman.)

LAWS AND REGULATIONS

S. D. Andrews, Florida, Chairman (3)
G. L. Delano, Montana (1)
M. R. Dettler, Seattle, Washington
R. M. Leach, Michigan (4)
R. L. Thompson, Maryland (Interim member)

(R. L. Thompson was appointed for a five-year term to replace Mr. Dettler, whose term expired. M. R. Dettler was reappointed to serve out the two-year unexpired term of R. W. Richards, who resigned from public service. Mr. Andrews was reelected as chairman.)

LIAISON WITH THE NATIONAL GOVERNMENT

L. D. Holloway, Idaho, Chairman (4)
M. Greenspan, New York City, New York (2)
R. C. Primley, Cities Service Oil Company
A. Sanders, Scale Manufacturers Association (3)
E. E. Wolski, Colgate-Palmolive Company (1)

(W. N. Seward, American Petroleum Institute, was appointed for a five-year term to replace Mr. Primley, whose term expired. Mr. Greenspan replaced Mr. Holloway as chairman.)

SPECIFICATIONS AND TOLERANCES

D. E. Konsoer, Wisconsin, Chairman (1)
W. C. Hughes, Massachusetts (3)
J. C. Mays, Dade County, Florida (2)
R. Rebuffo, Nevada
W. S. Watson, California (4)

(K. L. Simila, Oregon, was appointed for a five-year term to replace Mr. Rebuffo, whose term expired. T. F. Brink, Vermont, was appointed to serve out the three-year unexpired term of Mr. Hughes, who retired from public service. Mr. Konsoer was reelected as chairman.)

ANNUAL COMMITTEES

Nominations: S. H. Christie, Jr., New Jersey, Chairman; J. E. Bowen, Newton, Massachusetts; R. H. Fernsten, Alameda County, California; J. H. Johnson, Louisiana; C. C. Morgan, Gary, Indiana; R. W. Searles, Medina County, Ohio; R. T. Williams, Texas.

Resolutions: K. J. Simila, Oregon, Chairman; M. Dennis, Nebraska; G. L. Johnson, Kentucky; E. Keeley, Delaware; E. P. Nedrow, Ithaca, New York; L. A. Rick, St. Louis County, Missouri; C. S. Zmudzinski, St. Joseph County, Indiana.

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Associate Membership: E. F. Wehmann, Neptune Meter Company, Chairman; C. Campbell, Reliance Electric Company; M. S. Godsman, Bennett Pump Incorporated; L. J. Moremen, Single Service Institute; A. Sanders, Scale Manufacturers Association; J. F. Speer, Milk Industry Foundation; B. Wasko, Voland Corporation.

IN CHARGE OF LADIES' ARRANGEMENTS

Mrs. H. F. Wollin, Mrs. T. M. Stabler

IN CHARGE OF REGISTRATIONS

Mrs. F. C. Bell, Mrs. E. M. Burnette, Mrs. B. A. Davis, Mrs. D. L. Rich

OPEN COMMITTEE MEETINGS

Monday, July 12, 1971

Monday was set aside for meetings of the Conference committees. Notices of these meetings were carried in the Conference Announcement booklet, in all pre-Conference publicity, and in the printed Conference program.

The Conference committees that met on Monday were the Executive Committee, the Committee on Education, the Committee on Specifications and Tolerances, the Committee on Liaison with the National Government, and the Committee on Laws and Regulations.

Many delegates participated in the committee meetings, which were very well attended and informative to all. The discussions which took place in these meetings were particularly helpful to the members of each committee and played an important role in guiding the committees in their deliberation and preparation of their final reports.

The final reports of the committees will be found beginning on page 147 and will reflect the discussion that took place during the open meetings and the actions taken by the Conference at the time the final reports were presented to the delegates.

REPORT OF THE FIFTY-SIXTH NATIONAL CONFERENCE ON WEIGHTS AND MEASURES

MORNING SESSION—TUESDAY, JULY 13, 1971

(M. Jennings, *Chairman*, Presiding)

Mr. R. W. Searles, Medina County, Ohio, the Conference Chaplain, delivered the invocation and led the delegates in the Pledge of Allegiance.

PROGRESS THROUGH UNDERSTANDING AND COOPERATION

by M. Jennings, *Conference Chairman*, Director, Division of Marketing, Tennessee Department of Agriculture

As I look over this assembly of persons dedicated to the cause of weights and measures, I am fully aware of the seriousness and importance of my responsibility to this Conference and to you. For the honor of the position which I hold, I am most humbly grateful.

It is my happy privilege, as Chairman of the National Conference on Weights and Measures, to extend to all of you a most cordial greeting. On behalf of your officers and committees, I welcome each and every one of you to this our 56th National Conference. It is our sincere hope and desire that you will find this Conference both interesting and informative and that it will prove to be most worthwhile.

During the process of formulating the program for this Conference, it was decided to adopt the theme of "Progress through Understanding and Cooperation." Then it was suggested that I use the theme as a subject on which to say a few words. I was not told how few or what few, so I brought along a few words of my own.

I make that latter statement to illustrate a specific point. My observations through the years have indicated that we have been provided with exceptionally good leadership under the sponsorship of the National Bureau of Standards and its Office of Weights and Measures. We have looked to the National Conference for guidance,

and through this sponsorship we have found it. The point I stress is that we have received appropriate and constructive guidance and not dictatorial commands. Those jurisdictions following the recommendations of the sponsors and the guidelines of the Conference are receiving the greatest dividends from their weights and measures activities and, at the same time, rendering a greater service to the public.

One of the real challenges of our times, in government, trade, business, or profession, is to give the people—our public—an efficient and effective service that provides them with more service per dollar and does this with a smile.

The National Conference on Weights and Measures is one of the nation's most successful and progressive organizations of its type. There is a good reason! The reason for its success and progress to date has been the attendance, participation, and support of state and local weights and measures officers, federal officials, representatives of business and industry, and the continuous sponsorship by the National Bureau of Standards.

As of now, much credit is due Dr. Branscomb, Director of the Bureau, and his staff, and particularly the Office of Weights and Measures and the personnel in that division for their work in behalf of progress in weights and measures. Under their continued leadership, I visualize much progress in the future.

The success and progress of the Conference is not confined to the duration of one week, but the value of results is reflected throughout the year. These imperishable hours of this week will be recorded in history. It is up to us to write the appropriate pages of that history.

All of us should have the vision to discern the horizons in our assignments, our responsibilities, and our work, and the resolve to strive toward them. Such discernment and such resolve must rest upon a clear awareness of past, present, and future. For the past, a sense of history is needed to know the contributions toward progress and their values. The values found important in the past still retain their validity. For the present, a sense of perspective is needed to detect the challenges to these values, as well as their relation and application to the issues and problems of the day. For the future, a sense of mission and realistic dedication is needed. Through such a vision, through understanding and cooperation, further progress is possible.

From the first National Conference to this one, the prime objective and purpose has been uniformity—uniformity throughout all the states and local jurisdictions with respect to specifications and tolerances, methods of test, laws, regulations, and administration. Uniformity of requirements is a necessity. Uniformity of compliance is desired. Uniformity in action is desperately needed. It is not enough

to think uniformity. We must continually move toward uniformity in all facets of weights and measures. Oliver Wendell Holmes once said, "The great thing in this world is not so much where we stand, as in what direction we are moving." The effectiveness of the Conference in achieving uniformity depends upon understanding. From our deliberations on the issues and problems confronting us, the decisions reached are based on judgment, and judgment is certainly affected by understanding. An honest and insightful contribution to the understanding of what is required in the weights and measures area can help us to solve the problems in both preparation and administration.

Another requirement in achieving uniformity is the cooperation of many—weights and measures officials, manufacturers of weighing and measuring equipment, the users of their equipment, and in fact industry in general.

In addition to understanding and cooperation, there should be a spirit of tolerance and an open mind that is willing to listen to the other fellow. This will enable us better to understand, more clearly to comprehend and appreciate the good motives and earnest desires of those with whom we work, men with whom we may sometimes disagree, but men who deserve our respect and admiration equally as much as we merit theirs.

The composition of the Conference includes enforcement officials, federal officials, industry representatives, trade organizations, consumer groups, etc. It is natural that any group of this composition and size, with diversified interests, will encounter periods of difficulty. There will be differences of opinion, which is indeed proper, in order to bring out all angles of the problem. Heretofore, all problems have been worked out by cooperative action and by maintaining mutual respect for each other, with the public interest always in mind. I will encourage that any differences of opinion be presented in orderly discussions during the Conference. It is my desire that all official discussions be conducted in constructive tune and without argumentative tone. In this philosophy, support me if you can, oppose me if you must, but, above all, participate.

It is my hope that you recognize the program for this Conference has been very carefully planned and arranged. It will include important subjects on management, measurement, and merchandising. An impressive group of speakers will be presented, and the selection of each speaker is in keeping with the importance of the subject. I am certain their messages will be interesting, informative, and educational. Personally, I appreciate their time and effort to be helpful to weights and measures administration in the United States. Not only do we owe them our sincere gratitude; we owe them our undivided attention and our presence at all formal sessions of the Conference.

It was my privilege and pleasure during the year to attend the interim meetings of all the standing committees. Previously, I had served on the Laws and Regulations Committee for five years, during that time when there was much confusion on the Fair Packaging and Labeling Act concerning its requirements, exemptions, and application. It was also during the time when the ad hoc committee from industry was active and so helpful. While serving as chairman of the committee, numerous revisions in the Model Law and Model Package Regulation were necessary in order to conform to the requirements of the new legislation enacted. While attending the interim meetings, I was familiar with the proceedings and responsibilities of the Laws and Regulations Committee. But the opportunity to attend the meetings of all the standing committees was an education in itself, an inspiration to cherish, and an experience to be long remembered. It gave me a broader concept of the purpose and scope of the Conference, and a deeper realization of its value and importance.

I wish that all of you could have the same opportunity. I heartily recommend that all future Conference chairmen be afforded the opportunity to attend the interim meetings of all standing committees.

It is necessary to update our laws, regulations, and requirements at various intervals, in order to keep pace with progress and changing conditions.

Just think that for many years man was, literally, chained to the earth. But in 1903 a couple of daring individuals took off from the ground at Kitty Hawk, North Carolina. In the short 60 years from that time we were exploring outer space and eventually and successfully landing men on the moon. Change accelerates change, and our ability to be adjusted and progressive is our ability to change with the changing times.

The revisions or changes recommended by the committees are proposed not merely for the sake of change, but because of need. It was pleasing to note the unselfish approach on the part of all committee members and their careful and constructive deliberations on all items which involved change.

Ruskin once said that, when we fail to praise those who deserve praise, two sad things happen. We deprive the person or persons of deserved recognition, and we deprive ourselves of one of the very happiest of our privileges, the privilege of rewarding labor that deserves a reward.

The standing committees have worked long, hard, and efficiently in the preparation of their tentative reports. They are to be commended for their interest, honest concerns, and endeavor in fulfilling their obligations.

I greatly appreciate the cooperation I received from members who promptly accepted appointment to serve on other committees and

from members who are serving in certain other positions. I wish to express my sincere appreciation for the cooperation I have received from the officers and members of the Conference during the past year. Also, my sincere appreciation to Tom Stabler, Chief of the Office of Weights and Measures, and his staff for their splendid support during the year.

The lion's share of credit is due Harold Wollin, Assistant Chief, Office of Weights and Measures, and Executive Secretary of the National Conference, and to Mrs. Bell, his secretary, in covering the many complex and sometimes vexing problems and the many minute details that are necessarily attached to the planning and operation of a Conference of this size and importance. And to them, my special thanks! From a humble heart, I extend sincere thanks to all who are contributing to the success of this Conference.

You have a copy of the program. The place and time for all sessions are listed. I assure you that all sessions will begin on time. I urge you now to be present at the beginning of each session. With your attendance, full cooperation, and participation, this 56th Conference will be a success. We can have a great Conference, and I am confident that it will be a success.

While we are making the Conference successful, let us, during this week, take as much advantage of this opportunity for friendship as we are able. I wish to conclude my remarks with these words by Longfellow:

> Let us, then, be what we are, and speak what we think, and in all things keep ourselves loyal to truth and the sacred professions of friendship.

ADDRESS

by the Honorable James T. Lynn, Under Secretary of Commerce

I am very honored to make my first appearance before this assembly. It is difficult knowing what to talk about. I have decided that I am not going to talk about the law. It took me over 20 years to get into the law, and it took me over 20 years to get out of it. It is difficult to resist the temptation at a meeting like this to discuss such issues as what room is left for voluntary action under the antitrust laws today, whether by trade associations or other groups interested in consumer or environmental matters. These were favorites of mine when I was General

Counsel of the Department. It is not easy to relinquish interest in them, and I do not think I will, but I am not going to talk about them.

What should I talk about? Well, I am going to take advantage of my position now as Under Secretary to get into something a little bit more broad brush. My subject is Government—how government is organized and what the proper relationships are between the federal, state, and local units.

This Conference represents the prototype of the federal, state, local relationship. In our weights and measures administration, every level of government fulfills its proper function. Every level of government accepts and executes its appropriate responsibility. The result is one of the best working marketplaces in the world.

I think I can say on behalf of the administration that, if we could make the entire structure of the United States Government work as well as it does now in weights and measures, our responsibility to posterity would be pretty well fulfilled. We are trying. And what I would like to discuss with you today are the exact ways we are trying.

Staying with a couple of the most important aspects of our attempts, I want to talk about two initiatives—one, government reorganization, and the other, revenue sharing.

The President's Reorganization Plan has to be ranked as one of the boldest initiatives of this century. It strikes directly at a problem that people throughout the political spectrum have been decrying for quite a while. Many Americans today are concerned that the Federal Government is too complex and unresponsive. The President shares this concern. In the State of the Union message this year he said, "The time has come to match our structure to our purposes; to look with a fresh eye; to organize the government by conscious, comprehensive design to meet the needs of a new era."

Secretary Stans has described the President's plan as a businesslike approach. He said, "I think the fundamental responsibility of the Federal Government should be to protect our system of economic activity and build upon it—revising it, modernizing it as circumstances change, as scientific and other developments evolve."

But I would hope that the Federal Government would always see that its basic mission is to preserve for the people of the United States the great advantages that our government and our system have brought to the people, and to build upon that as the years go by. And this philosophy is directly to the point. President Nixon's Reorganization Plan is an important step in bringing the American Government into step with the 20th Century.

Why is rebuilding necessary? Let us look at how the government has grown over the past 20 years. The number of cabinet departments

has gone from 9 to 12. The number of major independent agencies is even more dramatic, having gone from 27 to 41. Some departments are organized around functions like health and transportation. Others focus on special interests of constituencies, like farmers, students, workers, or, in our case, businessmen. There are more than 1,400 federal domestic programs today—ten times as many as there were two decades ago. And there are some—this is the one that staggers me—850 interagency committees.

The glaring fact is that the power and the responsibility to act on problems are widely scattered in the maze of federal bureaus and offices, departments, and agencies. There is fragmentation of responsibility in matters ranging from business loans and manpower programs to public land and water resources. The result is overlap, confusion—a piecemeal approach to social and economic problems at a time when we urgently need comprehensive, coordinated action. How did we get into this jumble? The government has grown in a random fashion over the years. As new needs arose in our changing society, new offices were established to deal with them. One new structure after another was simply piled on top of those already in existence, and very little attention was given to the question of how the new would fit in with the old.

This is not to say that the organizational problems created by this haphazard growth have been ignored in the past. From 1937 on, every president has established committees, commissions, and task forces to make studies and recommendations for executive reform. The newest group is the Ash Council appointed by President Nixon. Some of the government's structural weaknesses have been corrected, but we have never come to grips with the total problem until now. The President has concluded that a sweeping reorganization of the executive branch is needed if the government is to keep up with the times and with the needs of the people.

Under the Reorganization Plan which was sent to Congress on March 25 of this year, four new cabinet level departments would be created, each designed to perform a specific governmental purpose, to replace seven existing cabinet level departments. Those that would go out would be the Department of Agriculture; my own department (Commerce); Health, Education, and Welfare; Housing and Urban Development; Interior; Labor; and Transportation. The Reorganization Plan would replace all seven of these present constituency-oriented departments with four new mission-oriented departments. The four are the Department of Natural Resources, the Department of Human Resources, the Department of Community Development, and (where we as a Department of Commerce go, in main) the Department of Economic Affairs.

The new Department of Natural Resources would be concerned with our physical environment. It would provide for coordinated policy and management in five interrelated areas—land and recreation resources; water resources; energy and mineral resources; oceanic, atmospheric, and earth sciences; and Indian and territorial affairs.

The Department of Human Resources would be concerned with the well being of individuals and family—health, human development, and income security.

The Department of Community Development would have a broad mandate to assist in the development of sound physical and social settings for the nation's rural, suburban, and urban communities—community-oriented transportation, housing, and community facilities and services.

The Department of Economic Affairs would bring together major parts of four existing federal departments—Agriculture, Commerce, Labor, and Transportation. It would also include the Small Business Administration, along with parts of a number of other existing agencies. The Department of Economic Affairs would consolidate the government's various programs and activities directed toward economic growth and development. It would have a single mission—to keep the American economy productive, growing, and competitive.

Business and industry, labor, agriculture, and transportation play closely interrelated roles in the United States economy. Although they are economically interdependent in the present federal structure, each is represented by a separate department as if it were a separate and distinct piece of a jigsaw puzzle. This is why we have as many interagency committees as we do. Under the President's plan, these interrelated interests would be coordinated in the same department.

Enough of a quick look at reorganization. I would like to turn now to revenue sharing. You hear the word, you see it in the papers, but I wonder just how much focus there has been with regard to what we have in mind. The proposal makes use of the Federal Government's superior revenue-collecting powers to support state and local government. The plan for general and special revenue sharing will provide an annual total of $15 billion in more flexible funds for states and localities. Nearly $6 billion of this is new money above and beyond what the states and localities are now receiving from the Federal Government.

There is currently some confusion over what revenue sharing is and what it is not. The key is the distinction I have mentioned between general revenue sharing on the one hand and special revenue sharing on the other. General revenue sharing will involve distributions by the Federal Government to states and localities with no strings attached. I say no strings, but there are a couple. First,

the states will be required to comply with federal civil rights laws. Second, the states will be subject to post audit reviews by the Federal Government. The amounts of such monies will be established by a formula based upon population and upon the efforts of the states to raise their own revenues. In the first year it will amount to nearly $6 billion. States and localities will be able to spend this money according to their own priorities.

On the other hand, special revenue sharing will take narrow, categorical grant programs and replace them with new grants which are far less restricted. In place of 130 separate grant programs, nearly $11 billion of shared revenue will be grouped under six broad headings, and the state and local governments will be permitted to spend them as they see fit, provided they stay within the assigned broad purposes. State or local governments then can decide for themselves whether or not specific activities carried on under the categorical grant programs should be continued. Thus, no present program deemed desirable at the local level need be terminated. In fact, it can be greatly expanded with shared revenue. Furthermore, no state or community will receive less under revenue sharing than under the existing categorical grant program. The special revenue sharing fund is, in fact, a billion dollars bigger than the sum of the old programs folded into it. This extra one billion dollars is to be used to hold each local community harmless against the possibility that new revenues might not equal the old ones.

I should also stress that existing federal programs not folded into revenue sharing will not be cut back to provide revenue sharing funds.

Taken together, these programs do the following: They should alleviate the fiscal problems of state and local governments by providing unrestricted additional funds through general revenue sharing, and eliminate the present matching requirement and narrow purposes of categorical grants-in-aid which will be absorbed into the new special revenue sharing fund. The program should allow more spending priorities to be set at those levels of government closest to the problems and the people. And it should reinforce both the responsibility and responsiveness of government by providing state and local officials with both the flexibility and the funds to carry out their duties effectively.

The reason why the sharing of federal revenues with state and local governments is so urgent is the need to alleviate the present fiscal crisis at the state and local levels. I might add that this is a point where there are many in the room that could say Amen and do a lot more of specific talking than I on this subject.

State and local expenditures have increased faster than their revenues—15 percent faster during the last two decades. These gov-

ernments rely mainly on property and consumer taxes which generate revenues that do not grow as fast as the economy. New taxes and substantial increases in rates for old taxes have, therefore, been necessary to raise the required revenue. State and local government debt has also risen rapidly from $19 billion in 1948 to $135 billion in 1969. During the last two decades, new taxes or rate increases have driven state and local taxes from $105 per capita to $380 per capita. As a result of all of these forces, states and localities face an estimated revenue gap of $10 billion in 1971, despite increasing federal assistance and despite more than 450 major tax increases which have been adopted in the past dozen years by state governments alone.

The general revenue sharing proposal provides a sound solution to this problem. In sharp contrast to the growth pattern of state and local tax revenues, federal revenues respond quickly to economic growth, increasing almost 1½ percent for each 1 percent increase in gross national product. The size of general revenue sharing program will be determined by taking a fixed percentage, 1.3 percent, of the federal individual income tax base. Initially, this will provide a full year outlay of $5 billion, and this sum will grow with the future growth of the economy.

Federal aid has already risen from $1.8 billion in 1948 to $30 billion in 1971, but primarily in the form of narrowly focused categorical grants. These restricted forms of federal assistance have had an adverse effect on the nature and structure of American government at all levels. This approach has produced a welter of programs which are poorly coordinated and are often in conflict, and I suspect that a number of you have found that on many occasions it has meant a great deal of program delay and uncertainty. Most seriously, it has resulted in an erosion in the authority and responsibility of governors and mayors. It has overcentralized decision making and created nearly autonomous government bureaucracies, especially at the federal level.

The principle behind President Nixon's revenue sharing program is that, given sufficient resources, our states and localities can be more responsible in the exercise of power than can the Federal Government in Washington, D. C.

The goal of revenue sharing is to restore a proper balance for our federal system. This program recognizes that the assistance which the Federal Government has long granted the state and local jurisdictions has been given in a highly restrictive manner which has hamstrung the development of healthy government in a healthy community.

Revenue sharing will help change this situation and restore initiative, creativity, and citizen involvement in government closer to

the people. In the words of the President: The time has come for a new partnership between the Federal Government and the states and localities—a partnership in which we entrust the states and localities with a larger share of the nation's responsibilities and in which we share our federal revenue with them so that they can meet these responsibilities. So let us put the money where the needs are, and let us put the power to spend it where the people are. I have faith in people. I trust the judgment of the people. Let us give the people of America a chance—a bigger voice in deciding for themselves those questions that so greatly affect their lives.

Our feeling in Washington is that we have the compulsion to treat everybody exactly the same way. Broadly speaking, money flows out in massively detailed categories with all the regulations exactly the same way, all over the country. At the same time, there is great diversity in the nature of problems across the country. The problems of Chicago may be very different from the problems of Sacramento. The problems of New York City may be very different from the problems of Raleigh. If we loosen the constraints on federal money and provide more of it to the states and localities, then the people have a chance to use the money in a manner that fits their needs as they perceive them.

However, the advantages of revenue sharing go a great deal farther than that. We all feel much better and much more competent, we commit more energy and have much more zest to make things work when we work things out for ourselves. Then we are not doing something because we are told to do it, but because we decided for ourselves that it was a good idea. When an achievement is made, we can say that it is our achievement, not the achievement of some distant manager. In a nutshell, it is important that people have some control over their own destinies.

George Shultz, the Director of the Office of Management and Budget, put it this way: "The thing that struck me is that, when you say to the worker on the lathe, 'We want your ideas about how the work place should be arranged, how it can be made more productive, how it can be made more suitable, and how the company can prosper more,' you turn up all kinds of people who were not thought of as having any ideas. Lo and behold, they have ideas. They have energy. They have capacities that the management never gave them credit for."

If we could only get the people of America to take a greater interest in local government, then the tremendous energy and intelligence of our people will make revenue sharing a great success.

Well, there you have it—two major programs that the President has proposed, the modernizer in terms of government structure and functioning. You will be hearing much more about these proposals in the months ahead as they are debated.

I believe in government reorganization and revenue sharing. Times are changing, and we must do what we can to see that government continues to serve us in the years ahead. The proposals I have discussed here should help make that possible.

Take back to your people this message: We seek a balance of powers and a balance of resources which will enable the American form of government and the American economic system to fulfill their promise. There is a misapprehension abroad that the American revolution is a historical event. No way, as Snoopy says. The radical can point out that we have not accomplished more than any other people in the history of this planet and use that as an excuse to rest on somebody else's laurels. Both of these approaches are excuses to avoid the bona fide challenges. We have a revolution to complete, a responsibility to fulfill.

It is most rare that a government is established which is truly responsive to all the people. We are close to that goal. We have at hand the means to fulfill the promise of this country. The extent to which we allow outmoded structures and institutions to deter us from our duty will be the limiting factor in our fulfillment of our responsibility. This administration seeks to eliminate those limitations and free the American spirit and energy for greater involvement in the destiny of the nation. We ask your support.

INFORMATION: THE CONSUMER DILEMMA

by Dr. T. M. Brooks, President, American Council on Consumer Interests, and Dean, School of Home Economics, Southern Illinois University

It has been said, "A man's judgment is no better than his information." If the information on which a decision is based is complete, appropriate, and unbiased, we are generally confident that the decision, and our judgment as well, will be indicative of the quality of that information. If, however, the decision is made on distorted, incomplete, deceptive, or misleading information, a man's decision, and again his judgment, will reflect the quality of that information. This can lead to trouble. But even the search for quality information can lead a man into trouble. Consider the man who, with his wife, visited showroom after showroom for weeks, carefully scrutinizing and studying new automobiles, comparing prices, performance data, comfort, and styling. "My good-

ness," the wife said finally, "it did not always take you this long to make up your mind. Why, you married me three weeks after you met me." "Listen," said the husband, "buying a car is serious business."

Contrary to the view of the authors of the Pentagon papers, the healthy and effective functioning of a democratic society rests heavily upon the existence of quality information among its citizenry. Professor Booth of the University of Chicago states, "It is a commonplace to say that democracy depends for its survival on an informed citizenry. . . . Democracy depends on free choices, and choices cannot be in any sense free if they are made blind. Free choice is, in fact, choice that is based on knowledge—not just opinions, but knowledge in the sense of reasoned opinion" [1].

I would add that the effective operation of our mixed capitalistic market economy is no less dependent on well informed consumers. If the information available to consumers is incorrect, inappropriate, or deceptive, consumers will be misled into making the wrong decisions. The extent to which misinformation distorts individual decisions will determine the degree to which the patterns of choice in our ecenomy reflect this distortion. The direction of our economy is dependent in large measure upon the multitude of consumer decisions. Any decision which the individual consumer makes will ultimately affect the overall economy, although its effect may be very minute.

The late Mildred Brady eloquently expressed the relationship between the individual and his economy. She wrote, "From the point of view of consumer economics, the individual failure of a family to spend wisely has market significance to the degree that that failure has contributed to bad practices, has rewarded the inefficient, dishonest, high-priced, or low-quality product. The overall effect of poor spending in a market so large and so varied as ours is glacial in action, hard to detect at any given moment. On the individual family, the result of a failure to spend wisely can be dramatic. The direction of the slow, massive movement of the market as a whole is determined, however, by the multiplication of the million tiny economic acts of the family functioning as a spending unit [2]." Thus, in the long run, we are all involved, whether individual consumers spend vicariously and foolishly or with wisdom and prudence.

We must ask ourselves what kind of society do we wish to live in. Is it to be a society based on the frivolous or on solid value? Is it to be a consumption-directed society or a consumer-directed society?

Although the information available to consumers has a significance far beyond the decisions made by the individual, the individual consumer is likely to feel the confusion and frustration of inadequate information. If, for instance, through erroneous information, consumers are led to believe that product A is better than product B,

when B is really better than A, the producer of A will benefit through this deception. He benefits not only at the expense of the producer B, but also at the expense of the additional satisfaction which the consumer would have received from product B. Consumer satisfaction is the basic motivator to consumer decisions. It is the reason why consumers even bother to acquire the needed information.

Information may be thought of as the raw material which feeds into the decision-making process. Quality information leads to better decisions. It leads to more consumer satisfaction. Decision making is a productive process in which the amount of consumer satisfaction is as dependent upon the quality of the raw materials as it is with any other productive process, whether it be automobile production, steel making, or appliance manufacturing.

Moreover, just as there are criteria for determining the quality of goods and services, there are likewise quality standards for information. I would like to suggest three for your consideration. They are reliability, validity, and communicability.

When we say reliable, we usually mean that something or someone can be depended upon repeatedly. The opposite—unreliable—means that we cannot have much faith in the performance of the subject. What are reliable sources of consumer information? What sources can be depended upon for information which is of consistent quality? Is it advertising, labeling, the Better Business Bureau, Consumer Reports, or government publications?

In regard to advertising, the following item appeared in today's Washington Post: "The U. S. Chamber of Commerce asked its members yesterday to do more to spotlight consumer health and safety in advertising. 'Advertising is the consumer's principal source of information about products and services. The business community and consumers alike are the losers when advertisers use tactics and appeals which impeach the good standing, repute, and credibility of the business world,' the Chamber said [3]."

Unfortunately, time will not permit an analysis of each source. I can only ask from your experience what sources of information do you find reliable?

Validity is the second attribute of quality information. By validity, we mean information which is appropriate—relevant to the decision being made. There is a wide "gap" in validity in the information available on many goods and services. Instead of receiving information on the properties, characteristics, and durability of the goods on the market, consumers are told how much the product will do for them socially and sexually—information which far too often is totally irrelevant and incredible.

The third criteria for quality information is communicability.

We may ask the question, How well is the message transmitted and received? Communication is a sharing process. The sender and the receiver must be on the same wavelength.

The following letter received by Consumers Union may illustrate the point. The letter, sent by a subscriber in regard to CU's testing and reporting on contraceptives, went as follows: "Some weeks ago, I filled out a blank establishing my eligibility to receive your pamphlet entitled A Report on Contraceptive Materials. I enclosed 25 cents. Yesterday, I received a form postcard informing me that instructions on how to attain high fidelity reproduction would be ready in about three weeks. While I appreciate the language in the open mail would necessarily have to be somewhat guarded, I wonder whether there has not been some misunderstanding. Please let me again make my needs and wishes clear. I do not, in this instance, want high fidelity reproduction; in fact, it is my wish to avoid reproduction altogether."

Obviously, what had happened was that her order for the contraceptive report had by mistake been acknowledged as an order for Consumers Union instructions on how to build a high fidelity radio-phonograph combination.

Professor Bymers of Cornell University states, "Knowledge is the product or output of a successful communication effort, and it is also a key variable in the enterprise system. Many buyers, many sellers, knowledge, and mobility are the minimum essential conditions of the free competitive market. These conditions alone do not insure the existence of the competitive market. They only make its existence possible [4]." Is it not our goal to see the establishment of a consumer-oriented free competitive market?

I believe the major thrust of the National Conference on Weights and Measures is toward providing consumers and businesses with reliable, valid information on weights and measures which can be readily understood. This information, of course, is fundamental to the marketplace. We simply could not conduct business without it. It is, however, a job that is never completed. Continued abuses and technological developments in marketing require constant surveillance and continual updating of procedures and techniques. Throughout history, reliable, valid, readily understood measures and weights have been a prerequisite for orderly consumer-oriented marketing.

In recent years, however, legislative attention has been drawn more and more to the critical information needs existing in other areas directly affecting consumers. The truth-in-lending and truth-in-packaging laws were landmarks in the road toward providing consumers reliable, valid information. The prominent disclosure of quantity and other packaging data and credit terms was long over-

due. These laws provide additional testimony to the long list of laws that support the consumer's "right to be informed."

The present concern with unit pricing, product composition disclosure, octane rating display, nutrient and performance labeling, guarantee and warranty declarations, and see-through packaging, to mention only a few current problem areas, attests to the continuing search for quality information.

It is unfortunate, I believe, that more and more laws must be passed to require the disclosure of the information which consumers need to make intelligent decisions. Is there not some way in which business can be encouraged to provide this needed information without resorting to new laws to force this disclosure?

I predict that, as consumer education programs spread across this country and grow in effectiveness, the demand for quality information will increase significantly. The pressure will increasingly arise directly from consumers themselves rather than from leading consumer advocates and those with professional interest in consumer affairs.

We believe "caveat emptor"—let the buyer beware—to be an archaic concept. When will "cognoscat emptor"—let the buyer be informed—become the order of the day?

The American Council on Consumer Interests and the National Conference on Weights and Measures have a continuing and growing responsibility in providing the consumer with quality information. The health and direction of this nation's economy and marketplace rest on our accomplishment of this objective.

What is The American Council on Consumer Interests, you may ask. The American Council on Consumer Interests is the only professional group in the United States having as its principal concern the consumer's interest. It is professional in the sense that it seeks to analyze consumer issues, to promote research, and to disseminate information about the consumer interest. Our group seeks to understand the problems and conditions which affect consumers regardless of the direction in which the analysis may lead. We are not out to bury business, or anyone else for that matter. The consumer is our focal point. We seek to delineate the conditions affecting his decisions and behavior. We seek to understand the effects of business practices and conditions on the consumer. Ultimately many of us are concerned with that somewhat vague and largely immeasurable concept of consumer welfare.

The existence of ACCI is largely attributable to one individual. I am sure that you either know him personally or are acquainted with his name. He is Dr. Colston E. Warne, President of Consumers Union of the U. S. In November 1952 Dr. Warne inquired of some of his fellow consumer educators as to their interests in launching an

association for consumer educators. His idea was enthusiastically received and resulted in a meeting of 21 educators at the University of Minnesota in April 1953. The necessary steps were taken at this meeting which eventually led to the founding of an organization under the name of the Council on Consumer Information. In 1969 the name was changed to the American Council on Consumer Interests to reflect growth and development in the organization's breadth of concern.

Considering ACCI's limited financial resources, its productivity through the years has been amazing. The productivity of its early years was marked by a series of consumer information pamphlets. Some of the early titles were "Consumers Look at Fair Prices," "Consumers Look at Fair Trade," "Consumers Look at Burial Practices," and "What You Should Know about the Law of Estates."

Dr. Leland J. Gordon, our mutual friend, prepared one of our best sellers in 1957 under the title "Watch Your Weights and Measures." "Consumers Look at Federal Protective Services" was published in 1958. The pamphlet series was finally terminated in 1966 after reaching a total of 18 pamphlets since the beginning of the series. The final three pamphlets, which were published in 1966, were on the topic of consumer credit.

Concurrent with the development of the pamphlet series, a highly informative newsletter has been one of the most significant benefits of membership. Originally issued four times a year, this popular publication is now published nine times a year.

Other important benefits which have accompanied the growth in membership (now standing at nearly 3,000 members) are the "Journal of Consumer Affairs" published semiannually, winter and summer, and a newsletter, "Consumer Education Forum," which is designed expressly for public school consumer educators. Also, an annual 2½ day conference is held each year to hear reports of research on consumer matters and to discuss and analyze current consumer issues.

In April we held our 17th Annual Conference at Indiana State University at Terre Haute. Reports on unit pricing, consumer credit, and life insurance, just to name a few of the topics, were presented to the conference participants. One development which occurred at this conference, and of which I am especially proud as president of ACCI this past year, was the establishment of the Colston E. Warne lecture series. The lecture series, in perpetuity, was established to commemorate Dr. Warne's continued support and contribution to the growth and maturity of ACCI and to his contribution to the consumer cause generally.

This lecture series will feature each year at our annual conference an outstanding authority on some aspect of consumer affairs. An

honorarium will be provided to the speaker out of a fund which has been established for this purpose. We are presently seeking contributions to this fund from members and friends in order that it may grow to the point where the annual interest earned from this fund may be used for the speaker's stipend.

Other ACCI benefits which are presently under development are the publication of an annual conference proceedings and the establishment of a job exchange. The job exchange will assist our members in taking advantage of the opportunities in the field of consumer interests. These new benefits are scheduled to be in effect this coming year.

Personally and on behalf of the executive committee and membership of the American Council on Consumer Interests, we are indeed grateful for your interest in our organization. I especially welcome the opportunity to talk about and to invite you individually to join ACCI.

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ADDRESS OF CONFERENCE PRESIDENT

by Dr. Lewis M. Branscomb, Director, National Bureau of Standards

It is a great pleasure for me to be back with you at the National Conference. I want to wish you well for another successful and productive session this year. I would also like to thank Under Secretary Lynn for his kind remarks about the Conference as a model for federal-state relations. I think sometimes we feel that few recognize the full importance of what weights and measures officials do. His recognition is gratifying.

In that respect, I would like to tell you about an experience I recently had in Mr. Jennings' home state of Tennes-

see. I had the honor to go to Nashville to talk to the Centennial Club of Nashville, which is a gathering of blue-ribbon citizens of the town. I talked to them about consumer matters and other things. As an experiment I showed them a slide of the state weights and measures laboratory building and asked if they knew what this elegant but modest structure was. I will confess to you that I was surprised when a great many hands went up. They knew that this was the weights and measures laboratory which had been named for Matt Jennings and they were familiar with its activities. Now, either more people know about their weights and measures people than I would have expected, or else Mr. Jennings must be doing an unusually good job in the State of Tennessee.

The Under Secretary has recognized this Conference as a model for intergovernmental relations. Certainly it is, and it is rapidly becoming a model for other things. In the past few years, the National Bureau of Standards, building on our experience with this Conference, worked together with the governors of a number of states to encourage the formation of a National Conference of States on Building Codes and Standards. That conference, of course, is designed to bring some uniformity into the building regulatory system, where regulatory responsibilities are diffused among state and local jurisdictions, just as they are in weights and measures, but with a difference. In the weights and measures field we have an integrated national market. A mass-producing manufacturer in this country can make a product, package it, and put the weight on the package and be confident that his product can be sold in every state in the Union. Not so with the manufacturer of industrialized housing. He may make factory-built modules but he has to face the fact that there are over 6,000 separate jurisdictions which have regulations different in at least some respects that govern the acceptability of his product.

I have confidence that the National Conference of States on Building Codes and Standards, which is now about four years into its history, will long before its 56th birthday be demonstrating the kind of service to the country that you have long provided.

The spirit and philosophy of this Conference is finding its way, and not by accident I assure you, into the thinking of the Bureau of Standards in many measurement fields. It does not do any good for a standards laboratory to operate in splendid isolation, lacking contact with the everyday problems of those who actually do the measuring in the market, on the production line, and in the laboratory. The National Conference on Weights and Measures serves one of its main functions in providing a forum where men and women who work in all steps in the measurement chain can make their special problems and their clever solutions known to workers on all

other levels in the chain. Certainly we at the Bureau can do a better job of providing services if we know what the people in the field need, if we know where we are doing a good job, and if we know where we are not providing the support people really need.

If I had to point out one quality that makes this Conference great, I would have to say honesty. There is little reluctance among you to reveal problems, or to state in no uncertain terms, dissatisfaction with the performance of other people in the measurement chain on whom you depend.

In this connection, the Bureau of Standards comes in for its share of comments, and we welcome them. We have been together for more than half a century in this Conference. NBS and the states have developed the kind of relationship that permits us to discuss our successes, our problems, and even our failures. We have done this in an open forum, open to any interested citizen, open to people from industry and from other organizations that have a shared interest in the problems that we face together.

Now, we have to have this sort of exchange in our system if we are to learn and grow. Every group providing services needs this sort of feedback. I am sure you know what feedback is. Jim Bouton in the celebrated baseball book "Ball Four" quotes outfielder philosopher Steve Hovely as saying, "To a pitcher, a base hit is negative feedback." The National Conference on Weights and Measures is a good arena for receiving feedback of all kinds. Among old friends, talk can be plain and honest. And I think that this is the main factor in the success of the U. S. weights and measures system.

We are trying to bring these advantages to other areas of our operation. We have come to realize that we must have a strong and direct interaction with the people who use measurement every day if we are to be able to provide them the services they need. Many of you are probably familiar with the NBS Measurement Analysis Program, or MAP. In fact, some of you may be tired of hearing about it, since I know my colleagues and I have talked about it before. In this program, we recognize that it is not sufficient to provide a set of calibrated weights to a laboratory and then to assume that all their problems are solved. The MAP scheme provides a continual feedback to NBS of the measurement process in a participating laboratory on a voluntary basis. We can advise them of systematic errors in their procedures, deficient procedures on the part of their personnel, and so on.

MAP is a complete calibration of a laboratory, not only of its standards, but of its people, its procedures, its environment. I think that it is to date the most complete feedback process developed in the measurement system. We began it in mass measurements with a set of

secondary level standards laboratories, and we are now extending it to many other areas of management. With an eye to the future, we must realize that in MAP we have an embryo process for objectively certifying laboratories. This is a subject about which we will be hearing much in the years ahead. We are going to hear more of this idea in weights and measures laboratories, in clinical laboratories, and in laboratories that conduct tests on consumer products, particularly in regard to safety. Certainly we will regard this Conference as a model and a source of wise advice as we move or are moved into these new areas.

As the Conference considers the concept of feedback, and specifically the usefulness of objective procedures for qualifying measurement capability, many possibilities come to mind. Is it useful for each state laboratory to know how effectively its everyday operations tie to the national standard? Is it practical for the state inspector to ask more of the retailer than the possession of a well-calibrated scale in a shop? Should not the store clerk demonstrate his ability to make a measurement of adequate accuracy? Would it not be useful for the states to share with one another your experiences with respect to effective compliance in the marketplace?

Some may say that such things might be taken to imply criticism of performance of well intentioned, hard working people in and out of government. I look at it the other way around. With openly disclosed objective information that you yourselves obtain, you will have the proof of how tough your job is and can show what benefit would flow to the people in your state by increased resources for your work.

NBS would like to help wherever we can to bring your story to the people and to public authorities. We need your help to point up our own problems so that we can plan to remedy them too.

Another new area in which the Conference will have to give us counsel and support is in the U. S. participation in the International Organization for Legal Metrology. I think that U. S. participation has been delayed too long. In this connection, it is important that we examine the nonparticipation of the United States in OILM. It is understandable that our federal government has not given the same attention to national regulations governing type approval and certification that European countries have. For we are dedicated to two principles—state responsibility for weights and measures regulation and, within that framework, maximum freedom for innovation by private industry. But so long as we do not even belong to the OILM, we cannot influence the inevitable growth of legal requirements for metric based measuring equipment in commerce. Worse still, bad technology is being adopted in their criteria for accuracy and design rather than performance as they write the recommendations.

I have recent information that indicates that the State Department has approved U. S. participation. It remains for the Congress to act on the State Department's recommendations when they are made. We are not sure whether all of this action could be completed in time for the U. S. to participate in the next OIML conference in October 1972; but in any case, I think we can say that U. S. participation will depend heavily on the Department of Commerce, and the Department will turn to the National Bureau of Standards, and we, of course, will want the active participation of the National Conference on Weights and Measures.

For my main topic this morning, I would like to talk briefly about the U. S. Metric Study. We are less than one month removed from the date when the Secretary of Commerce is due to make his recommendations on the basis of the recently completed NBS study. I cannot, unfortunately, tell you what the Secretary's recommendations will be, but I can give you some general background which I believe will help you interpret the recommendations when they are made public in the next few weeks.

The Congress asked the NBS to attempt a thorough and rational analysis of the impact on the United States of present world trends with respect to measurement language and practices. We were not to accept the goal of metrication as an act of faith, nor were we to reject it as an alien influence in our culture. We approached this very complex subject with open minds, determined to attempt what no other nation has yet achieved—a comprehensive and rational evaluation of the nation's alternative courses of action.

Opinions differ on whether customary or metric units are intrinsically superior. Which, for example, is the more natural system for people? Those favoring the customary system note that it is more natural to man in the sense that he carries his measuring gages with him all the time. He carries his yard and his foot and his inch, and with 2,000 steps he carries his mile. Yet, on the other side, those who favor the metric system note that the most unique feature of man, physiologically speaking so far as measurement goes, is his having ten fingers—thus, the natural base for a system of decimal arithmetic. It is on this basis that most people count and for which metric measures are designed. However that argument might turn out (and I believe that it would not be revealing any secrets to tell you that we do not have any way of deciding which system is more natural for man in that philosophical sense), I think the fact of the matter is that the main issues are so much more practical and so much more important to the everyday lives of our people and the overall interest of the country that the decision will not turn on such a philosophical basis.

All modern industrial nations assure the compatibility of their scientific measurement systems at the highest level of precision through international metric measurement standards and their intercomparison. To that extent the United States has been metric for nearly a hundred years. The measurement standards maintained at the National Bureau of Standards are all international metric standards.

In 1866, the United States, by Act of Congress, made metric units legal in commerce and in other uses. The customary pound-yard-second system standards are exactly defined by specified numerical ratio to fundamental metric standards. Thus, the United States is formally and legally bilingual with respect to measurement systems.

If our national measurement system in science has long been on the metric system, our industry is getting there. Certain U. S. industries—pharmaceuticals and ball bearings, for example—have switched to metric measure for their own convenience and efficiency. Across American industry, our measurement schizophrenia is apparent. The width of photographic film is given in millimeters; the spacing between the sprocket holes is given in fractions of an inch. Spark plug threads are metric, but the plug heads and wrenches are specified in inch standards. This is what we mean when we say that use of the metric system is increasing in the country all the time.

This also brings me to the point where I must make a definition and, I hope, lay to rest a misconception. There are two dimensions to the idea of going metric, and in many circles there is confusion between the two. Worse, in many places the two, where the two are properly distinguished, are thought to be inseparable. And neither of these ideas is realistic.

Let me draw the distinction between two facets of metrication—measurement language and engineering practice and design. The idea of changing a measurement language is a simple idea and fairly well understood, although not very easy to do. Insofar as pounds and ounces are concerned, scales can be converted to metric by changing the dial plate alone. Only a language change is involved. This is not always the case. Engineering practices and standards are a different thing entirely. They involve the arbitrary sizes, shapes, and configurations in which we choose to make our goods. They derive from a natural inclination to try to simplify design and to show a preference for even numbers wherever design parameters are arbitrary. Industry has been carrying on this practice of standardization for many years, and it has brought great benefit to both manufacturer and consumer.

Now, industries in a country which uses the metric system will be inclined to standardize on sizes that more often involve even

numbers of metric units. Where our industry may choose to make a fitting that is two inches in diameter, the metric company might prefer 5 centimeters. The two resulting parts would be tantalizingly close in size, but completely incompatible. How do we meet such incompatibility? In the extreme case, we can try to keep most of our customary practices, domestic and industrial, even if we adopt measurement metric language. Just what hardware would we have to change? Obviously if we change measurement language, we must surely change our measurement tools.

The metering and scale industries have an unavoidably central role in any change. Their capabilities and customers' cooperation will largely determine the pace. But how about pipe sizes, construction materials, automotive parts, land measurements, or the heights of ceilings? In this area of decision making lies the major part of our dilemma and the major part of the metric uncertainty. We are part of the world market economically. The United States is not self sufficient economically any more than any one of our states is independent economically. Our economy could not function if products from Connecticut were not acceptable in California. Since 1900 you have solved this problem in the weights and measures area. Even more, our economy cannot expand if products made in America are not acceptable to other countries.

It is a grave mistake to think that we must give up totally our accepted engineering standards in order to deal with metric countries. First of all, many U. S. engineering standards are so technically superior to those of other countries that they are used abroad even though they may not be formally adopted as the national standards of those countries. Automobile wheel rims, for example, are in standard inch sizes; oil drilling equipment is based on inch designs throughout the world.

In addition, there are established procedures for countries to get together and write engineering standards acceptable to all. In these deliberations through the International Organization for Standardization (ISO) and the associated International Electrotechnical Commission (IEC), we have every reason to expect that our technology will receive the recognition it is due if we participate vigorously in standards negotiation. But our interim metric study report on international standards, published last December, shows that U. S. participation in international standards deliberations is less than fully effective. If we are effective in obtaining international agreements on standards based on superior U. S. technology, then metrication, if it comes or when it comes, will be that much easier.

The international standards report considered this such a pressing problem that it made specific recommendations to strengthen the contributions of both American industry and American government

to international standardization. These steps, the report said, must take precedence over our consideration of the metric problems, must be met no matter what action we take on metrication; and the Administration's recently introduced International Voluntary Standard Cooperation Act is a response to those recommendations in part and a step in that direction.

But the main immediate impact of the metric study, at least for most of us, will be domestic and not international. In writing the metric bill, the Congress was careful to avoid reference to schemes for accomplishing conversion to metric usage, lest the impression get abroad that the possibility of an instantaneous mandatory conversion was contemplated. That is, we were not charged with making a complete national plan for metric conversion, and we did not do it.

We do not believe that instantaneous mandatory conversion is a policy alternative that even merits serious study. Nothing would justify the enormous cost or confusion that such a crash program would, in my judgment, entail. Instead, it is likely that, if the U. S. should decide to go metric, it would be done through a coordinated national program based on governmental leadership and voluntary cooperation of all sectors of the society. But a real question arises: How completely voluntary could that process of conversion actually be? Any broad-based voluntary cooperation among members of an industry raises complicated antitrust questions, as Under Secretary Lynn mentioned earlier. There is a question of what form and intensity the federal leadership in such a voluntary program might take. Even if the Congress should decide that no action is needed now, there is still going to be increased metric usage based on voluntary action, and I think that the voluntary principle is the one that is most in keeping with our economic philosophy.

But there is one place where some sort of legal and mandatory considerations would be inevitable, and that is in retail trade and the regulation of weights and measures. Should that day come that this Conference finds itself deeply involved in guiding these legal requirements, the response of the average consumer to any degree of metrication will depend to a large degree not on what he learns in school, not in what he hears on the radio and television, but what he encounters in everyday life; and for everyday life, read "marketplace." His acceptance of metric usage will depend on two distinct factors of everyday life. First would be how often and how intelligently metric measures are used in the marketplace; and second, and far more important, would be the honesty with which metric measures are used in the marketplace.

If the merchant takes the introduction of metric measures as a cover for raising his price per unit weight or price per unit volume to an unfair degree in relation to the cost involved, any metrication pro-

gram can become a public relations disaster for the free enterprise system. Here you would have, under those circumstances, a lot to do with this aspect of whatever approach is ultimately taken to metrication. You have had your great influence over the years on public confidence in the marketplace. Your influence on manufacturers, wholesalers, and retailers, during whatever adaptation is coming, could be decisive in maintaining the hard won public good will that you have painstakingly built up.

The really relevant question that we had to pose for ourselves in the study was not so much what will automatically happen that benefits the country the day we go metric, but, if we did go metric, what bad would happen or what good. But what would be the nation's measurement language needs in the 1980's, 90's, and the next century? What should we do to prepare for the future?

Now, some cynics may say, "Why should I do this for posterity? What has posterity ever done for me?" But we are not even in the position of the little Dutch boy who could put his finger in the hole in the dike. It is as if we were in a rowboat in the middle of a swift river. There is no question that the river is flowing from English to metric. The choices we have are to row upstream as long as we can, to drift with the current, or to pick up the oars and row vigorously downstream. This is a determination of national policy. It is for the Congress and the President to decide, and they have to decide whether there are waterfalls and cataracts downstream or whether there is some peaceful body of water around the bend. We only hope that our study will provide the tools that they need to make that decision intelligently.

No matter what national approach the Congress may adopt, the members of this Conference are going to have to play a central role in the way the American people adapt to the coming increase in metric usage, which seems inevitable at least at some rate of change, no matter what the official action of the government. And I suspect, therefore, that this is not the last time you will hear of the problem of metric measurement usage.

Now if I may, I would like to turn to some Conference business. By now, most of you know that the National Conference on Weights and Measures has decided to hold the Conference in different areas of the country, away from Washington, every other year starting with the 1973 meeting. This decision was made mainly as a result of the proposal by your Executive Committee last year in Salt Lake City and was strongly supported by the Conference membership.

We at NBS are pleased that such a move is possible, and it should prove to be a major step toward strengthening the interest and involvement of weights and measures officials throughout the United States in the affairs of this National Conference, as well as all others

who desire to participate in the Conference. It is important to bring this Conference to the states and to the people. In fact, I am looking forward to attending the Western Regional Conference in Hawaii next month.

This leads me to a few other general thoughts that I have had concerning future directions of the Conference. I believe that it would be advisable for your officers and your Executive Committee to continue to explore new ways and means by which the National Conference can serve the growing needs of the states and the many people that look to the Conference for guidance. This in no way means to imply that the Conference is not fulfilling the purposes for which it is held, for it has compiled an outstanding record of success throughout the years. However, we know that those who work in the field of weights and measures continue to experience problems brought on by changes in the science of measurement, in our system of government, and in the aspirations and needs of the people in commerce and in technology. Thus, we must plan for and be prepared to adapt to these changes and to take such action as is necessary to structure our organization and procedures to solve the problems that confront us and meet the challenge of the future. It may be necessary and desirable for Conference members to share more fully in the leadership. I personally would welcome such increased participation. More and more, the burden of work resulting from your expanded service to the people will fall on you together with our weights and measures staff.

The content of the Conference program this year and the many constructive recommendations that are being proposed by your committees reflect the progressive nature and work of this organization. Obviously, one has to be impressed with your efforts, and I wish to assure you that the National Bureau of Standards will continue to lend its support and assistance to the states and to the National Conference in every way possible.

We call on you to let us know how our partnership can be improved, and we urge you to use this Conference as a forum and a means to achieve an even greater system of weights and measures in our country. I hope to take advantage of the opportunity to meet with the Executive Committee on Friday morning to discuss with them more specifically some additional steps that might be taken to strengthen the Conference and its mission.

And now I come to the time when, as your President, I have the privilege to announce the appointment of individuals to serve on the Conference standing committees. I am sure you are well aware how important the work and contributions of these committees are to the success of the Conference. For this reason, considerable care

is taken in the selection of committee members, and we take great pride in their accomplishments.

I would like to thank those members who have served on committees for their valuable service, and I wish to extend my appreciation to those who are taking on new responsibilities. Before making the appointments, I wish to point out that the number of appointments is greater than usual this year, due to the recent retirement or termination from public service of several officials whose term on a committee would not normally have expired this year.

For the Committee on Laws and Regulations, Mr. R. L. Thompson, State Superintendent of Weights and Measures, State of Maryland, is appointed for a five-year term to replace Mr. Dettler, whose term is expiring.

Mr. Dettler is reappointed to serve out the unexpired two-year term vacated by Mr. R. W. Richards, who resigned from public service. I wish to point out that Mr. Dettler has served on the committee for only two years, having originally been appointed at the 54th Conference to serve out an unexpired two-year term.

For the Committee on Specifications and Tolerances, Mr. K. J. Simila, Assistant Chief for Weights and Measures, State of Oregon, is appointed for a five-year term to replace Mr. Rebuffo, whose term is expiring.

Mr. T. F. Brink, Director, Division of Standards, State of Vermont, is appointed to fill the unexpired three-year term of Mr. W. C. Hughes, who is retiring from public service.

For the Committee on Education, Mr. R. T. Williams, Director, Consumer Service Division, State of Texas, is appointed for a five-year term to replace Mr. J. I. Moore, whose term is expiring.

Mr. J. C. Stewart, Assistant Supervisor, Weights and Measures Regulatory Section, State of Virginia, is appointed to serve out the one-year unexpired term of Mr. B. A. Pettit, who retired from public service.

For the Committee on Liaison with the National Government, Mr. W. N. Seward, Assistant to the Senior Vice President, American Petroleum Institute, is appointed for a five-year term to replace Mr. R. C. Primley, whose term is expiring.

PRESENTATION OF HONOR AWARDS

Dr. Branscomb presented Honor Awards to members of the Conference who, by attending the 55th Conference in 1970, reached one of the five attendance categories for which recognition is made—attendance at 10, 15, 20, 25, or 30 meetings.

Award Recipients

30 Years

R. M. Bodenweiser	Mercer County, New Jersey
C. C. Morgan	Gary, Indiana

25 Years

W. S. Bussey	Former Executive Secretary
S. H. Christie	New Jersey
E. R. Fisher	Rhode Island
R. D. Thompson	U. S. Dept. of Agriculture

20 Years

Mrs. F. C. Bell	National Bureau of Standards
J. I. Moore	North Carolina
G. L. Johnson	Kentucky
M. Rapp	Detecto Scales, Inc.
C. E. Wagner	Glass Container Manufacturers Institute, Inc.

15 Years

K. G. Hayden	District of Columbia
A. J. Komich	Rockwell Manufacturing Co.
R. V. Miller	Toledo Scales
R. J. Silcock	Vigo County, Indiana

10 Years

E. W. Ballentine	South Carolina
R. C. Baumgartner	Livonia, Michigan
E. H. Black	Ventura County, California
W. T. DeLoge	Fitchburg, Massachusetts
R. H. Fernsten	Alameda County, California
M. S. Godsman	Bennett Pump Incorporated
L. J. Gordon	Weights & Measures Research Center—Denison University
M. Jennings	Tennessee
J. F. Lyles	Virginia
L. Prendergast	Chicago, Illinois
E. A. Vadelund	National Bureau of Standards

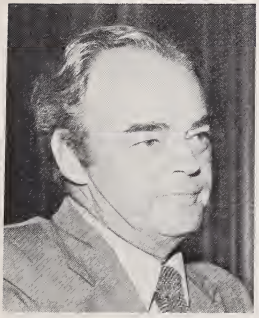
M. Jennings presents R. W. Searles with plaque embossed with special resolution of appreciation passed by the 56th National Conference on Weights and Measures. (See also report of the Committee on Resolutions, page 30.)

AFTERNOON SESSION—TUESDAY, JULY 13, 1971

(F. D. Morgan, *Vice Chairman*, Presiding)

MANAGEMENT AS A MODERN APPROACH

by Dr. M. L. Shotzberger, President, Catawba College



Before we talk about the general field of management, I would like to comment about a number of trends that are going on in the society and that are having a very great impact on the practice of management. There are six of them, and I will mention them generally and then have a comment about each. These trends are as follows: Government policy, education, enterprise, technology, urbanization, and secularization. I want to suggest to you what each of these six things are doing within our society in very general terms, but first I would like to suggest to you what they are doing to those of us who have what we call managerial responsibility.

There has always been in this nation a high level of philosophic freedom for all of us. You are all familiar with it; there is no need to trace it in any detail. We talk in terms of free individuals and free institutions. However, in the early days of our society, given these six trends, the tendency was only for the very rich to have what we call practical freedom. In other words, you were free to go to the West Coast, but you probably could not get there. You had to spend a lifetime doing so, or at least our families and predecessors did.

Today, however, due to these critical organic trends, most of us as individuals are freer than we have ever been. Since most of us work for institutions, this freedom has put a tremendous constraint on the institutions and on managers. And managers, by the way, are institutional decision makers. The generalization very quickly is this. Since the people who are working for and with us are more free, we as institutional decision makers are less free. Yet it is interesting, in spite of these two basic developments, we are still required, as institutional managers or institutional decision makers, to produce with great quality and at low cost; yet we have a group of people working for us who no longer may be bullied around because of their personal freedom.

Now let us see how these trends fit in. Since probably the middle 30's the emphasis at the level of government policy, particularly with

regard to the federal government, has been that people are, after all, more important than institutions. Your very professional aspects of life suggest that this is right.

The idea of a sound pound, a sound gallon, a sound foot, a sound yard is to assure that I, as a consumer, get a fair break. It also is to assure, as you well know, that the manufacturer and the purveyor of certain things deals with me honestly.

The essence of the policy has been to say that people, individually, are more important than institutions, and also more important as individuals than as institutional decision makers. What this has done actually is to free us as individuals from the autocracy of our boss. In other words, we cannot be shoved around any more, as was the case perhaps in the 30's and prior to that.

The second trend that I mentioned was education. The actual accomplishment of the educational process, particularly since the turn of the century, has been to free most of us from ignorance, all but about 15 percent in terms of the adult population. The Blacks, the ghettos, the urban Black, and the rural White are still not free from the tyranny of ignorance, as we call it.

For those in the age bracket of 25 and over, the quantity of education has gone up better than 50 percent since 1940. No one really knows how to measure the quality of it except to say that it is better. Most of you who have high school students know that most of your offspring know more in the tenth and eleventh grades than all of us did when we were seniors in college. So the quality of their education is better too.

An educated person is in a position to measure the decisions of all leadership, be it political, professional, social, or managerial. The enterprise system interestingly has freed all but about 15 percent of our society from the tyranny of poverty. The handmaidens of slavery, as perhaps you know, are ignorance and poverty. If you want to keep someone unfree, you keep him stupid and ignorant and poor.

But most of the people with whom you are working and most of the people with whom I am working are protected by government policy. They are rather well educated and they have control over economic resources. All this, of course, means that we, in turn, have a great capacity to take advantage of technological development, and there is not much question about what technology has done. Its general characteristic has been to reduce almost our entire society and much of the world from the mechanics and the nastiness of drudgery. One way of putting it, as the census data now indicate, is that since 1960 and as of 1970 the control of energy output that each American has at his command has increased by 25 percent in a decade.

A simple way to measure the force is by what technology has made available to us, such as immense production capacity. Many

of your functions are within the department of agriculture in your state and local area. No one has to tell you what has happened in regard to food output on this continent, and particularly in regard to the man hours that it takes to produce a given quantity of food since 1900. It is almost unbelievable. Consider also the shear output in the production of physical goods. About six percent of our working population produces everything we need, at least in our society. This is just amazing.

Technology has been the handmaiden to this development, as you well know, but at the national level it has made the world so small it is almost unbelievable. At the personal level, it took me less than four hours to get from little remote Salisbury, North Carolina, into the Shoreham Hotel just yesterday. The day after tomorrow my dear wife and I will leave Salisbury at 11 o'clock our time, and at about 4 o'clock our time the next morning we will be in Rome. That is about 6,000 miles. Technology has made the world a smaller place. It is interesting because your education tells you all about it, and your economic resources let you take advantage of it. All of these things indicate that people are enhanced and that they are much better off than they have ever been before.

You can listen to all of the Butlers and Kilpatricks that you want to who say the number system is destroying society. It simply is not so. Just let me give you one number—1–704–636–7136. That is a lot of digits, but that number is more unique than my name. Martin Luther Shotzberger is quite a lot of name, but I know six other people who have my name, but nobody else in this world has that number. What I am suggesting is that the number system has helped me to be more unique than even my name. My social security number is all mine and nobody else's. What I am suggesting is that technology and the computer have made you and me and all of our millions of colleagues in this country eminently more important individuals, freer individuals.

You are the manager, and here is an individual who is covered by government policy and who has a good education and can command a good salary and is free to use technology to his greatest advantage. He does not have to bother too much with what you think, because he is employable elsewhere. So his freedoms now are eminently greater than they ever were. In addition to that, he has an organizational base, and this is the function of urbanization and urban structure. It has given us the markets by which weights and measures can really become meaningful. It has given us the social structure by which I and all of you are free to enjoy all of our newly found freedoms.

How well does the concept of secularization fit in with all of these five developments? Actually, what it ends up being is this.

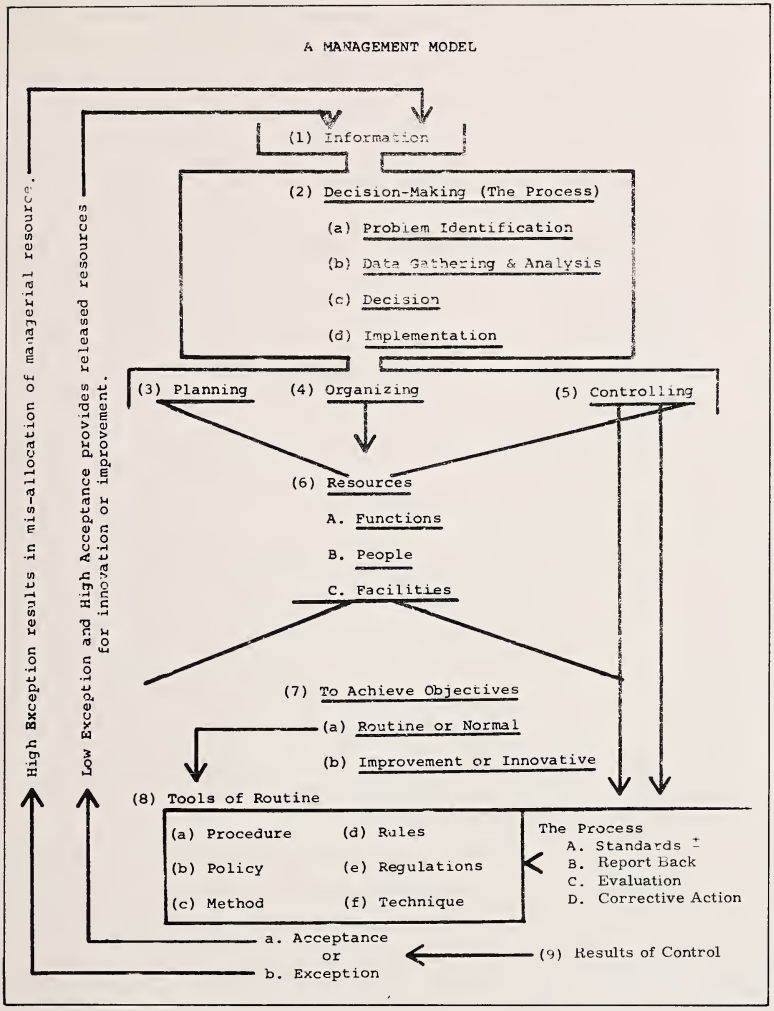
Through all of these developments, we are so free now, we have an urban structure under which to enjoy our freedom, and we have a sense of values that does not cause us to feel a deep sense of immorality. In short, in 1900 it was almost sinful to be rich and free. Today it no longer is that. And the younger generation has caught on to this. They have accepted the freedoms of the society without the great remorse that we had at the turn of the century. I think, and many others think, by the way that they are better off than we are because they have this appreciation.

I think it would be significant at this point to tell you that we know these things in large part because of the nature of your work. We can weigh and measure almost every one of these statements. You are all familiar with the level of education. We can measure it. You are familiar with the level of economic wherewithal—$8,400 per family unit in the United States now. All of these things are measurable—the average income and the speed of technological development. This now lets us move to some extent into this area of management.

Let us refer now to the chart entitled "A Management Model." We can take this model and we can generally define the field of management as involving the use of information around which or from which we will make decisions. And then we would know automatically that a decision all by itself is really pretty sterile. It is not much more, if you will, than a process of mental games, riddles. So once we get a decision, we then have to think in terms of planning the implementation of the decision, organizing the institution so as to achieve and implement this plan, and developing the control factor so as to make certain that the decision itself is implemented through the plan and through the organization. So, in a conceptual sense, we say that management involves the use of information, arriving at decisions, planning the implementation of those decisions, constructing an organization to implement the decision, and setting up control processes to make sure the various decisions are accomplished.

Then the next question is, obviously—With what? Well, resources is our word; and we say functions which might be translated as jobs. We want to plan, organize, control functions, people, and facilities. And many people argue that, if you are planning, organizing, and controlling any one of these three, you are a manager. But we know that, if you are planning, organizing, and controlling all three of these, you are a manager. Like it or not, you are one.

We know also that it is a bit foolish to plan, to organize, and control even a decision without purpose, and so we do all of these things in order to achieve objectives. In this model, the first statement of objectives uses the phrase "routine or normal" objective.



We will, for the moment, disregard item (b) under objectives, because at this point the control function becomes critically important and we develop tools of routine. We want to make certain that the normal functioning of the organization does get achieved, and here we use such language with which you are familiar—procedure, policy, method, rules and regulations, and technique. All of this is to make certain that the normal decisions and the normal operations of the institution go on constantly. We do this basically by means of control process (on the lower righthand side of this model). We establish standards with which you are quite familiar, such as a pound, plus or minus a tolerance, a foot, and so forth. We get a report back on performance, and then hopefully we will make an immediate evaluation.

If this is out of kick, then we go to corrective action. But the purpose of control in this instance, and the purpose of routine is to make certain that we have a very narrow degree of exception. If we can have low exception and high acceptance of our work, then we get a great deal of released time, and this permits us then, as managers, to turn our attention to the improvement or the innovative function of management.

There are a couple of things that I want to say about the process rather than this model, and the first thing that I would like to say is that it is not a discipline that is to be learned by doing. It is actually an intellectual process, and if it is an intellectual process you have to know what you are doing before you practice it. For instance, if you develop computer programmers just by letting them learn computer programing by doing it without having first been taught, the computer industry stock is going to go up in value, because ignorant people will jam up the computer so that they cannot use it. This is what we are really trying to say about the management process. What do you have to know in order to manage effectively? We can use the model, for one thing. We can say that you have to know a great deal about decision theory, and there is a great deal to be known here. You should know a great deal about planning theory, about organization theory, about control theory, and about managing by routine, by exception, and by innovation. Then, even before you can do that and learn much about it, you have to know a great deal about economics, sociology, psychology, mathematics, political science, human relations, and communication.

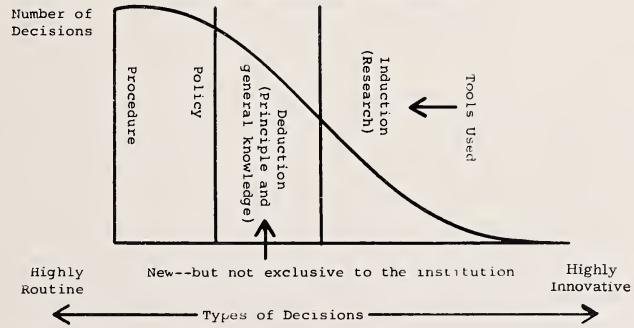
What we are really suggesting here is that the field of management now is beginning to be an immensely elaborate process, and the ignorant cannot work in it effectively. It is also interesting to say that it is almost the only peculiarly American discipline to have been developed. Even with all the scarcity of jobs and space in technical and scientific research, we are still importing into this country from foreign nations such as India and Germany high technical brain power. The only real discipline right now that we are exporting in great quantity is the managerial discipline. When they get ready to set up a business school in Beirut, where do you think they go? They go to the United States and get people out of Wharton, Harvard, or Ohio State. When they get ready to set up a business school at the University of Turin in Italy, where do they go to get their knowledge? To the United States. It is about the only discipline that we have developed in and of our own right. And yet it is a fascinating discipline, and it is rapidly developing into a discipline of its own.

Referring now to the chart entitled "Criteria of Decision" and also back to the "Management Model," you find out, by going down the four items (a), (b), (c), and (d) under Decision Making, where the

CRITERIA OF DECISION

	Speed	Consistency	Quality
Pure Rationality	Absolute - slow Relative - fast	High	High
Deductive (if the principle(s) is (are) sound	Fast	High	High
Inductive (if, in the research sense, the criteria are met as in rationality and deduction if sound principle results.)			
Policy and Procedure	Fast	High	High
Value Premises	Fast	High	Questionable (especially if all value premises are not accepted within the organization)
A Priori Analysis (Fast, consistent and qualitative if the assumptions are truly sound, otherwise, only fast.)			
Intuition	Usually fast	Low	Low
(Intutition is viewed as a form of induction without research, which may well result in an unsound generalization which may serve as a decision base.			
Emotion	Fast	Low	Low

A MODEL OF MANAGERIAL DECISION-MAKING



manager is most important and where the organization is more important. It is startling to find that, of the four, the organization (that is to say, your colleagues and your peers) are more important in (a), (b), and (d) than is the manager. But when you get to the point of decision, it is the manager's job. It is rather interesting that in the process now the manager is important at making or choosing the decision; but in terms of getting at the decision, everybody in the organization is important. One way to say that is that, three to one, the organization is against you; and that means that you have to work pretty well with them.

But in this area of decisioning, the measures in which we have great interest are, first, speed. We want the decision made quickly. We want the decisions to be of good quality and of consistency.

As an individual consumer, how long do you want to spend buying a can of peas? When you get a can of peas, you want your decision to be made quickly, and you want a good quality decision with regard to the peas, and also consistency. This, of course, means that brands have some role, but it also means that your function of weights and measures is important, because, when that thing says 24 ounces avoirdupois, I want it to mean that, and it is your job to make certain that it does. So, as weights and measures people, you help me in my decision process; and also, of course, you let me make it with rationality, with knowledge, and with certainty.

The extreme of decisions is down at the bottom of the sheet. Most of the decisions in most any organization are going to range from the highly routine to the highly innovative. Most of us are going to make more routine decisions than innovative decisions; yet it is important to know that the innovative decisions may have more impact on the organization than any combination of routine decisions. What this scale indicates here is the direction of the curve, and that is accurate. We do not really know about the slope. There are a high number of routine decisions and a relatively low number of innovative decisions. But the generalization is that, the more we know what we are making decisions about, the more likely we are to make good ones. If the decision is a new one, a primary tool is, of course, research. This is new in terms of the societal trends or devices. It can be new to our organization, but a great deal can be known about it by other people. This moves us into the middle, and here we look at what is known about the decision and we try to translate it there.

Over on the left we are talking about the routine process, and here we are going to base our decisions on knowledge, and so the generalization is this. The nearer we are to pure rationality, the more likely our decisions are to be right. The further we get from rationality (that is, toward emotion and intuition), the less likely our decisions are to be right, although it is possible to get a great decision under conditions of emotion and sometimes under conditions of intuition.

When you talk with people who are not well trained or well educated in the field of management and the field of decision making, you find the good decision maker being described as highly intuitive. I take personally great disagreement with this premise. I think you will find that most everyone with whom you are familiar who is a great decision maker is not intuitive. He is extremely knowledgeable, and he operates at the analogous level, like the computer. He sees certain symbols and certain symptoms, and he begins spinning his tape—his knowledge, if you will. He sifts, he sorts, and he plants it, until he identifies the problem for what it is out of his knowledge framework; and he does this all so rapidly that we figure he cannot think that quickly and we ascribe to him great intuition. But intui-

tion is not much more than hunch. So if you have to rely on hunch, the chances are pretty poor that you can make decisions of quality speedily and with consistency. There is a possibility that you might make a great decision somewhere along the line, but for us to rely on you to make consistently good decisions is probably not going to work.

The same can be said, of course, with respect to emotion, and we know why you do not make good decisions there.

So let me suggest to you that we have these six great trends—government policy, education, enterprise, technology, urbanization, secularization. All of them are working if you will make individuals more and more free. Conversely, as the personal freedom line goes up, the institutional freedom line comes down. Yet we are under severe pressure to perform better and better and better, institutionally and professionally, and we are dealing with people, though, that do not have to take our guff.

This means then, in turn, that we have to know a great deal more about the management process in its general term. I have found in my own years of teaching and of studying that, when I ask someone to define management, he does as the American Management Association does—which says getting things done through others. And that is a sentence—one sentence to describe, if you will, 70,000 pages of discipline. It does not make any sense.

You cannot describe management with a sentence, just as you cannot describe it adequately and fully with a model. It is an immensely complex thing about which we have to know a great deal. But yet, you as the manager are responsible for the effective and efficient performance of your institution—the effective and efficient performance of the individuals who work with you. So we suggest that the management approach is a new approach—not in the sense of the last ten years, but certainly in the sense of the last half century. The first business school in this country was not founded until right after World War I. The first Ph. D. in the area was not given until 1930. So we are talking about a relatively new discipline, a very rapidly developing one, and you have to know a great deal.

FORUM ON MANAGEMENT

T. M. Stabler, Office of Weights and Measures, *Moderator*

It is my pleasure to be a participant on the panel of the Forum on Management and also to moderate the discussion which will follow. First, I would like to introduce the other participants on the panel.

Mr. George Mattimoe is Deputy Director of the Division of Weights and Measures, Hawaii Department of Agriculture. He has spent four years with the Department and is responsible for the immediate success that it is experiencing. Prior to that, Mr. Mattimoe served 17 years with the Mantes Scale Company.

Mr. David Edgerly is a fellow worker in the Office of Weights and Measures. He came to the National Bureau of Standards in 1967 with major responsibilities in the area of fair packaging and labeling. For the past year he has been project leader for the OWM Management Information and Assistance Project.

Mr. Robert Williams is Director of the Consumer Protection and Service Division in the Texas Department of Agriculture. He has been with the Texas agency for 18 years and is currently President of the Southern Weights and Measures Association. Prior to state service, he was a staff writer for the San Angelo Standard Times and the Amarillo Globe News, and later served as state editor of the San Antonio Express and Evening News.

MANAGEMENT OF A WEIGHTS AND MEASURES PROGRAM

by T. M. Stabler, Chief, Office of Weights and Measures, National Bureau of Standards

As managers of weights and measures programs, there are four questions that concern you most.

1. What is the mission of my department?
2. What is my job?
3. How do I obtain resources?
4. How do I allocate resources?

Let us look at these separately.

What is the Mission of My Department?

First, before any government group, organization, branch, or department can function effectively, it is necessary to define the program and identify the contributing elements. This is not unlike the exercise one must engage in in industry, as the manager of a private firm or company. There, the object is to maximize profits. You have to decide what to produce, for whom, how the product will be used, and what will be the demand over a period of months or years. Will the demand be constant, fluctuating? To state the problem simply, how do you most effectively serve the public? What do you aim to accomplish by your activities in the weights and measures program?

We say that we guarantee "equity" in the marketplace. Is that enough? Let us carry it further. Our aim is to see that buyer and seller and recipients of services receive just rewards for amounts produced, purchased, or sold. I am sure you can think of other statements.

How about the objectives on a short-term (1 year) and long-term (5–10 years) basis? You say, "I know my objectives."

1. To make more money.
2. Work an 8-hour day, or less.
3. Lengthen vacations.
4. Satisfy the boss.

But these are personal objectives. We need to establish objectives for the weights and measures department, and means by which the mission can be accomplished. The list should perhaps include:

1. Adoption of the Model Law.[1]
2. Adoption of the Model State Packaging and Labeling Regulation,[2] H–44.[3]
3. Obtaining adequate field standards.
4. Acquiring resources (dollars and people).
5. Long-range plans for program growth.
6. Active participation in the city, county, state, nationwide weights and measures system through the National Conference on Weights and Measures.

There are many more.

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[1] Model State Weights and Measures Law, National Conference on Weights and Measures.

[2] Model State Packaging and Labeling Regulation, National Conference on Weights and Measures.

[3] NBS Handbook 44, Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.

Before we can successfully plan realistic objectives, we have to make a careful, thorough study of the existing situation. First, let us identify the people we serve. They include industry, wholesalers, retailers, consumers—everyone who pays taxes and some who do not! Second, let us identify the scope of our task; how many industries, how many producers, how many buyers and sellers, how many scales, meters, packages, and how many consumers. What is the projected growth rate for the jurisdiction? In order to serve the public effectively, you must determine the composition of your jurisdiction. You should consider a survey the most important initial step in identifying the problem. Certainly, the same considerations would not be appropriate for Wyoming and New York, for example. The size and characteristics of a given area dictate in large part the kinds of programs needed to cope with the problems in providing effective weights and measures supervision.

Now that you have identified the population, the next step in the objective-setting procedure is to determine the existing level of compliance with the laws and regulations. How bad is the noncompliance? If every weight and measure were perfect, you could abandon your efforts and look for another job. There would be no need for a public protector. However, this is probably not the case. Noncompliance will be as high as 80 percent in areas of ineffective weights and measures control.

You have a good idea of how good or bad the situation is with regard to the level of compliance, and you are now in a position to establish realistic goals for the first year and for subsequent years—dollars, people, time, equipment—and to coordinate a program that will effectively solve the problems you have identified. At this point, you may be prepared to tender your resignation.

What is My Job?

In the event you do not quit, what is your job?

Your job is to conduct investigations. True or false?
To test weighing and measuring devices. True or false?
To check packages. True or false?
To answer telephone calls and letters. True or false?
To make reports to your supervisor. True or false?

You probably do some, or all, of these things; however, your primary job—responsibility—is management. You are primarily concerned with the overall planning for the organization, obtaining resources, allocation of resources, preparation of budget requests, and effectively keeping your peers informed. You are responsible for establishing policy for your organization. Do you do these things?

The manager of a program must give due consideration to administrative matters. Take time to sit back and look at yourself, your job, and your program. Although you may have these other duties I mentioned earlier, such as investigations and testing, your greatest influence and contribution is in management. [To the established veteran in weights and measures: Things are changing fast in this profession with the introduction of new management techniques such as cost-benefit analysis, EDP, and an ever-increasing competition for resources, so tomorrow may be too late to compete successfully.] Look at the new, young faces that have appeared recently in weights and measures throughout the nation. To these new managers: Learn your lessons well, and do not be saddled by tradition or the "system." You are responsible for the successful operation of a weights and measures program that responds to the "Challenge of the 70's," last year's theme of the National Conference on Weights and Measures.

What makes the job so different today compared with 10, 15, or 20 years ago? New devices and the introduction of electronics in weighing and measuring, the emergence of every conceivable commodity in package form, and the advent of the "age of consumerism," to mention a few new influences in weights and measures. Also, with the dramatic growth of our population, industry, and general economy, our responsibilities have increased in proportion, in kind and numbers—odometers in thousands of rental cars, packages of every kind, taximeters by the thousands, scales for every purpose, millions of gasoline pumps and fuel-oil meters, and new consumer interests involving special investigations and reports.

Hod Do I Obtain Resources?

If you now have your jobs in perspective and are thinking like managers, you might ask, "How do I get the dollars, people, and equipment to do the job?"

There are many avenues open to the manager. An effective way is to solicit the support of the consumers, industry, and government we serve. Establish an advisory committee, composed of leaders in their fields, to meet semiannually to discuss your program and how it can effectively serve the public. The group also can recommend new programs, additional personnel and equipment. Recommendations can be obtained from state weights and measures associations and the National Conference on Weights and Measures.

Include all supporting information and survey evidence in your annual report and budget request. Describe your needs in terms of dollars and cents, and bury the age-old "numbers game." Numbers

of gas pumps tested, scales tested, and packages checked are boring statistics and really impress no one. What is the economic impact of your efforts? What is the loss to buyer or seller, to the state (county or city), if the existing level of compliance is not improved?

To effectively relate your activities to economic benefits, you will need data concerning the population, total number of quarts of milk sold, total consumption of commodities (meat, cheese, produce, canned goods), and translate these figures into dollar benefits, losses, and economic impact. These data are available from industry associations, census and tax bureaus, state and federal sources such as departments of agriculture, commerce, etc.

What tells the more complete story? That 10,000 packages were checked and ordered off sale, or that the value of packages checked during a period of time was $10,000 and the public saved $500? That 470 vehicle scales were tested, or that certain manufacturers have saved $85,000 in the purchase of raw materials because of the department's vehicle-scale testing program? If prepared carefully, this will be an interesting, valid, and convincing story.

The budget request should contain data resulting from studies and surveys that demonstrate the need for additional people and equipment. Again, the need should be expressed in dollars (losses to manufacturers, packagers, consumers) and reflect actual levels of compliance—50 percent, 65 percent, and so forth. The needs become obvious to your budget analyst and budget committee, who understand well the language of dollars and cents. The recommendations of your advisory committee will lend support to your request at this time. In effect, you have now done your job. You have presented the facts, informed your bosses of the conditions that exist. They must now be prepared to provide the resources that will correct the problems, or accept the responsibility for allowing noncompliance to continue—in violation of the law! In industry, managers report in units produced, costs, and profits. In weights and measures, for so many years we have been concerned only with units produced or number of devices tested. Let us think in terms of costs and profits. With escalating costs, today's government must be concerned with the expenses associated with production and the profits resulting from our activities.

How Do I Allocate Resources?

How do I distribute available resources to maximize the benefits? There are many avenues open to the manager. First, what are the resources available to me? They include dollars, time, and people. To do the most effective job, we must place the resources in the proper slot in the proper amount. How do you select the proper slot? It is necessary to review your completed survey of all commercial

weighing and measuring devices, random and standard-packed items (food and nonfood), and consumer impact areas that relate to weights and measures. The list includes:

Devices.—Retail meters, wholesale meters, slow-flow and LPG meters, vehicle tanks, farm milk tanks, measure containers, linear measures, wire and cordage meters, taximeters, odometers, timing devices (parking-lot meters, parking meters, car wash), food store scales, monorail scales, platform scales, vehicle scales, and railway track scales.

Consumer Interest.—Auto warranties, tire warranties, appliance warranties, advertising by weight and measure, packages, food products, tobacco, textile mill products, apparel (textile), lumber and wood, furniture and fixtures, paper, chemicals (agricultural paints), petroleum, rubber, stone, clay, glass, metal (screws, bolts), electrical equipment, instruments, cameras, miscellaneous (golf balls, zippers, matches, and candles).

This is not a complete listing, but it does give you some feel for the vast extent of weights and measures influence. Obviously, there is no way to check all of these items, yet most exist in every jurisdiction of the United States. Perhaps we had better establish program parameters in keeping with our mission and program objectives. Let us categorize weights and measures and non weights and measures responsibilities.

Is the "hot line" or consumer complaint a weights and measures responsibility? The answer is an emphatic NO, with certain exceptions. Certainly it is imperative that weights and measures identify as a consumer service. In certain jurisdictions, weights and measures activities have been placed in departments of consumer affairs. This is where the action is, the political interest, and where the dollars go. If you say No to consumerism without reservation, you are dragging your feet and digging your own grave. Your epitaph might read, "He was a good weights and measures official in the horse-and-buggy days." On the other hand, over-emphasis on consumerism could well destroy a weights and measures program. Investigations of complaints relating to advertising claims are time consuming and costly. For example, it could cost the jurisdiction $250 to investigate and conclude that panty hose "guaranteed not to run," in fact, did run, and that a "long-life" battery costing $1.25 did not actually have a useful life double that of an "ordinary" 75-cent battery.

There are many other kinds of consumer complaints that do not relate to a weight or measure. Officials will forget their weights, their scales, meters, and packages, and other technical responsibilities if this activity is not kept in proper perspective. The key to law enforcement—and our programs are law enforcement programs—is

the neutral approach. We must enforce the law impartially and not become consumer advocates. In turn, we cannot lobby for industry. Both parties require a "third man" to mediate the buying and selling process.

You may decide that new programs in the consumer area should include new car warranties that relate to odometer accuracy, tire warranties, accuracy of household measures in such products as carpeting, draperies, zippers, golf balls, and clothing sizes. Inquiries of the "hot line"variety should be referred to consumer associations, better business bureaus, and similar organizations.

Concerning the extensive list of weighing and measuring devices, can you test them all annually? Impossible with limited funds, personnel, and equipment. There are several options:

1. Selection of certain devices for universal testing.
2. Selective testing of all devices.
3. Selective testing of certain devices and package control.
4. Selective testing, package control, and consumer investigations.

The last option presents a good balance if the selection process is carefully conceived. The basis for selection should be the economic impact in the market—the value of the product sold and location of the producer. Products of local manufacturers and packers should be tested so that full compliance is achieved before commodities and devices enter interstate commerce. The cost of testing and its benefits are important considerations.

The testing of gasoline pumps is one of the most misunderstood activities. What is the cost of testing a pump? Four to five dollars? Who benefits most, the station owner or purchaser? Think about that. To build a successful program, the responsibility for accuracy of devices must rest with the owner-operators, and the weights and measures laws must permit selective testing, and not restrict testing to universal, annual inspections. Scale company and meter company service personnel can maintain this equipment accurately, or should (they are getting paid for it), so that nine times out of ten the scale or gas pump will be found "correct" when tested by an official. Ninety percent compliance level is not an unrealistic goal for any jurisdiction.

You have chosen the classes of devices to be included in your enforcement program, based upon the cost of inspections, benefits, and economic impact, and now the problem arises as to what constitutes an adequate, reliable sample. The sample cannot be selected at random and be meaningful. It must be based on a well-conceived program, with controls and built-in bias! EDP, although not essential, assists greatly in this procedure. In gasoline pumps, for example, the selection process must be based upon manufacture of meter,

brand of product, total gallons metered (totalizer readings), and geographic location. Device history will be an important factor after the program has been in existence for a year, two, or three. With this information, you can select the itinerary, determine the duration between tests, and still maintain 90 percent compliance level (if, in fact, that is a realistic target).

Resource allocation is now possible in our reorganized program. We have the information at hand to make sound management decisions: How much time, money, personnel, and equipment should be vested in the various selected areas of activity, using the cost and benefit of inspections, and the expected level of compliance as the criteria.

Without adequate, reliable information, an essential tool of management, weights and measures managers are faced with the impossible task of providing business, industry, and the general public an equitable climate where buyer and seller are on even ground.

The employment of modern management concepts and techniques will enable the administrator to meet the requirements of today's technology, expanding economy, and population. Weights and measures can respond to the need for effective, economical, and flexible programs within government.

A MANAGER'S VIEW OF ELECTRONIC DATA PROCESSING IN WEIGHTS AND MEASURES

by G. E. Mattimoe, Deputy Director, Division of Weights and Measures, Hawaii Department of Agriculture

The Spanish-American philosopher, George Santayana, once said, "Those who do not remember the past are condemned to relive it again." It would be nearly impossible for me not to remember our past, particularly before we acquired a computer to assist in managing our program.

I should like to preface my comments by identifying the proper agency and personnel who, at great expense and much personal sacrifice, were the true prime movers behind whatever achievements may have been accomplished in weights and measures in Hawaii. My warmest thanks go to the National Bureau of Standards in general, and specifically to Dave Edgerly of the Office of Weights and Measures and Walter Urban of the Technical Analysis Division, who made our program an operating reality. I say

this without detracting one iota from the monumental efforts of our chief metrologist, George Yokotake, and his staff.

In 1966 the Hawaii State Legislature transferred the then existing multi-county weights and measures operations to the state. Included was a hopeless polyglot of records, equipment, and different base systems—if such a term may be so loosely used. We inherited five manual record-keeping systems, which were replaced as rapidly as our resources would permit. Constraints incident to being a new state, the lack of trained personnel, and our peculiar position of being situated in the Department of Agriculture for administrative purposes only added to our early frustrations. We soon recognized that the county records were irreconciliable one to another, so we put them in storage and set about taking a new inventory of the state population of commercially used measuring equipment.

With these data as a base, we developed what we thought must be the greatest computer program in the world. In reality, all that we had done was to re-invent the wheel or, more factually, the addressograph. We soon modified this into what must have been the most expensive inventory list in the nation. Not quite convinced that we were not the greatest do-it-yourselfers in the business, we continued to make about every mistake possible, including the proposed use of high-speed optical scanning equipment which had not yet been developed. We published our efforts in a document at which, when we presented it to our statewide information service (our computer capability), they took one look and said, "Forget it!"

Wounded, we regrouped and discussed our dilemma. We had developed and designed this obviously great computer system, which we had to operate by hand. Certain that the fates were against us, we made our first sound management decision and sought outside help. Even here we did the wrong thing. We enrolled in computer classes and ingested huge amounts of general information. Then back to the printing press, and out came HI–MARK–S, a copyrighted document on the weights and measures program in Hawaii. When our SWIS people rejected it the second time as being too grandiose, we thought about restoring the monarchy.

We were saved from banishment into oblivion by enactment of our state odometer statute, which gives us the responsibility for checking 120,000 odometers per year. This law called for an odometer correctness analyzer (which is a sneaky name for a desk-top computer) and provided funds for purchasing. Through this unit, we were able to batch-process enough data to prove the validity of our program. Only then did SWIS come to our rescue. But we had learned a valuable lesson about attempting to circumvent or encroach upon the sacred domain of the computer people.

With 27,000 metrological devices in commercial use in Hawaii, our data base represented equipment the manufacture of some of which

had long since been discontinued. Generally speaking, if somebody made one, we got it.

Such a divergent population caused us to look hard at our desired output. What did we want or need to develop an effective inspectional system that was subjectively unbiased? We decided upon consideration of the following factors:

1. Inspectional requirements.
2. Optimizing internally scheduled inspections.
3. A management information system.
4. Measures of effectiveness.
5. Cost/benefit ratios.

To implement this overall plan, we took the following action: We established the inspection requirements of NBS Handbook 44 through adoption of its examination procedure outlines (EPO's). To optimize inspectional scheduling, we analyzed our data and plotted them in the form of histograms. By overlaying each succeeding histogram on the previous one, we were able to observe any general change in our population, or at least to observe a trend if one started. We noticed that monthly, semiannual, and annual inspections did not necessarily reflect any change in the condition of accuracy of the units tested. (These observations were within the additive limits of uncertainty involved.)

We felt that we had a clue, and that usage, not time, seemed to be the more important factor of the two; so we amended our statute to eliminate time-frame inspections in favor of inspecting as often as deemed necessary. We were not quite certain of the definition of "as often as deemed necessary," but we had hopes that we could develop one.

I say this regarding usage data: It is not always easy to come by, and it sometimes has to be generated in devious ways! Copies of weight certificates is one approach. These might be forwarded to the Director within 72 hours of issue, and keypunching this information to update unit histories is no great problem. (We do this on a limited scale in Hawaii.)

Another might be fitting electronic equipment with totalizers which help establish accuracy decay.

Gasoline dispensers and meters in general are "naturals" for this usage approach to reinspections. Their built-in totalizers have been staring at us for years just begging to be read. If your jurisdiction was much like ours, you probably just stared back or ignored them entirely.

Under our new administrative law, gasoline dispensers must be tested for correctness compliance on a monthly basis by the user. These test results must be submitted to the Director in a monthly compliance report, which also includes the totalizer readings for each

pump. In addition, the dealer must include the total amount of gasoline delivered during the same period by individual drop. This information is entered into the individual gasoline dispenser history and the station history, along with the computer-generated X, R, and σ.

The computer analyzes the total gallons received versus the total gallons sold, and prints out these data, citing any gain or loss. The computer identifies the dispensers that are within tolerance, that are losing money, or that have progressed far enough along the frequency of use baseline that their probability of falling in the grey area of uncertainty is imminent and should be serviced/inspected.

As each new monthly compliance report is received, it is additive to the existing pump(s) file, so the dealer has a running record to date and a yearly record for reconciliation of profit and loss, most of which is actually a serendipity to our record keeping.

We continue our practice of random-sampling the total population, and this sampling program has a definite effect upon the validity and quality of the individual operator's test data.

Factually, we conduct a perpetual school in proving gasoline pumps through proper use of a prover, and this has probably been our most important single educational program. There is no numbers game necessary for annual reports to the legislature. We have the facts and the consumer gain or loss, either actual if there is one, or prevented if there is not.

These concepts are now being expanded to other devices throughout our operation.

The statistical approach to optimum inspection would not be reasonably possible without the aid of the computer. After sufficient data is compiled, the "beyond tolerance" or accuracy decay point can be projected with amazing results. Computer-suggested inspectional programs should be tempered by management experience and knowledge, but the use of data processing to establish the parameters for such suggested inspection cannot be overemphasized. Graphically, the statistical basis for our optimum inspection scheduling looks something like our "accuracy decay curve." Generally speaking, each type of metrological device will show a higher failure rate during the early portion of its service life. This is represented as "new equipment failure" on the chart and is rightfully a part of management's area of concern, particularly should we go into self-certification of device by company representatives.

As the metrological device enters the useful accuracy life span, failures that occur during this period are usually not predictable; they randomly happen to happen. The "used equipment failure" portion represents a sharp increase in inaccuracy to the point of illegality and beyond, to total failure. Such a curve may be generated for

any type device, and will permit establishing the optimum inspection frequency for a regulatory body. Savings incident to such a program are obvious in the reduction of overinspections, which would normally fall between the uprights in the useful accuracy life span area anyhow.

Although we have not explored the possibilities, it appears that such a program would be adaptable to service contract type of work outside the realm of regulatory effort, with a maximum return for the firm utilizing such a program certainly assured, over a competitor operating on a time-frame schedule.

Our statewide information system, which, much like weights and measures in the beginning, had a tough time trying to figure out what was being done—much less, manage information. However, time and tremendous effort by those individuals who believed in the basic concept resolved the early shortcomings, and we now have an operable SWIS or, for our purpose, a management information system.

We had initial difficulties in defining our measures of effectiveness. Those of you who have suffered with PPB are familiar with this problem. Those of you who have been more fortunate and have escaped it should reflect upon such questions as: (1) Why am I in the regulatory business? (2) What are my major areas of responsibility? (3) Could my budget be more beneficially spent in more meaningful endeavors?

These questions are good for many hours of soul searching, and you will set a new time record for turnaround documents that are rejected and graded "F" if your answers are like the following: (1) Statute laws require a weights and measures division. (2) I am responsible to see that commercial measuring equipment is accurate, and that package weights and their labels are correct. (3) No, nobody can spend my money any better than I can. Why, we have had weights and measures since Biblical times.

These are not acceptable justifications under PPB; and since you are in competition with every other agency for your tax dollar budget, you rapidly find effective ways to express your reason for being in business, or it will be expressed for you.

In Hawaii, we accepted President Kennedy's definition that "we are all consumers"—industry, business, and the individual alike. So the established program objective of "reducing consumer losses" is palatable to us. More important, it is measurable and quantifiable, both of which are necessary to support our contended effectiveness and which naturally constitute the elements for cost/benefit analysis.

While we are still struggling in our infancy with this program, we have made progress, which I would have said was impossible five years ago and, in fact, was impossible without the aid of the computer as a management tool.

THE INFORMATION CRISIS

by D. E. Edgerly, Weights and Measures Coordinator, Office of Weights and Measures

If we pause to consider the significance of much of our progress during the past 150 years, we will single out as perhaps one of the most influential advances, vastly improved and sophisticated communications media. From the first telegraphic message in 1844, to our present day experimentation with laser borne communications, man has placed increased importance upon the need for rapid and accurate dissemination of information.

Television, radio, and the telephone have largely transformed this country into a position of prominence among the informed nations of the world. By definition, inform implies the imparting of knowledge, especially of facts or occurrences necessary for an understanding of a pertinent matter or as a basis for action. However, the extent to which we are informed varies with the different communications media. Certainly, the news medium is an information network designed to offer an unbiased accounting of world, national, or local affairs. On the other hand, we have the entertainment medium which, though often informative, is more actively engaged in playing on our emotions during our leisure hours. Then, of course, we have the advertising medium concerned primarily with campaigns and slogans slanted to gain the acceptability and dollar support of goods and services.

It often seems highly contradictory to me that a nation capable of achieving a moon landing and finding cures for dreaded diseases can at the same time be motivated by such titillating phrases as: "Let us put a tiger in your tank." "Is it true that blondes have more fun?" "Make peace with grease." Yet, the American consumer manages to cast billions of dollar votes for these campaign ads of marketplace products and, of course, the list of these slogans is endless as you know. From this behavior pattern, then, we learn that the motivation factor can be affected by various stimuli. Understanding these stimuli provides us with the tools to cause a person to act in a predictable fashion.

We come to understand, therefore, that the information process is better understood if approached as a science. In light of such, management science is emerging with a new concept of information, or, if you like, management theory, which differentiates between data, information, and knowledge. Learning to employ data, information,

and knowledge to motivate persons to act in a predictable manner is the crisis we face.

"Information is conventionally defined as obtained knowledge, facts, data, or news" [1]. The main inadequacy of this definition is that an assemblage of facts or the imparting of knowledge may or may not represent information depending upon the judgment of the recipient. For example, a collection of data showing the number of devices inspected over a period of time represents facts. Such facts or data may or may not be classified as information, depending upon the significance being given to these assembled characters by the transmitter of such data and its eventual recipient. If your objective is to inspect 10,000 devices in a 12-month period, and the data before you have the significance of substantiating your objective, your information needs are fulfilled. If, on the other hand, you transmit these data to your superior and he comes back asking what percent of the devices inspected were rejected, you have not fulfilled his information needs and the data you have supplied were of little significance to him. "Significance is defined as a measure of the net value obtained from matching the needs of a specific problem with appropriate elements of data" [2].

I am not suggesting that facts or data play no role in our management process. Certainly, they play an important role, just as facts are the agent of the newscaster. There are times when we will need to broadcast data or facts. However, there are going to be times when, as in the case of an entertainer, we need to add significance to the facts to play on emotions. There will also be times when we will need to advertise. Knowing how and when to employ these techniques in our day-to-day management process may decide our success or failure as a manager. "The distinction between information and data is that information is concerned with the use of evaluated data for a specific problem and for a certain individual at a certain time to achieve a definite goal. As problems vary, persons change, or time passes, the value of information differs. That is, the value of information is not detached and permanent in itself. Its value is a function of its uses" [3].

Knowledge is essentially information which has been stored away for future use and its value is such that it is the ultimate conclusion of the information process. How many times have you come away from a briefing feeling that your delivery of the subject matter was adequate and, yet, you wonder how well those in attendance perceived what you said? In short, this may be classified as the "I know you believe you understand what you think I said, but I'm not sure you realize that what you heard is not what I meant" [4] syndrome.

In the awareness that differences do exist among data, information, and knowledge, we, as weights and measures managers, must learn how to use data and how to generate useful information from data that will reflect how well we are achieving our program goals. Certainly, there is no shortage of data in any weights and measures department. As a matter of fact, the mountains of data being collected by field personnel represent a significant management problem in terms of what to do with these data. I submit to you, however, that there is a very real shortage of information in most weights and measures departments. The problem we now face it, I think, twofold:

1. We tend to believe that the information needs for everyone in our organization are the same. As a result, inspectors, supervisors, and superiors alike are offered the same information whether or not they want it, need it, or understand it. Most of us have children. Consider for a moment a situation where a father gathers his three sons together and says, "Boys, I think I'll tell you all the facts of life." After his discussion, his three-year-old son yawns and says, "Dad, what's a girl?" His six-year-old sticks out his tongue and says, "I hate girls," and his 13-year-old says, "So what's new!" Information, to be effective, must be useful to the recipient.

2. We do not understand how to use information to effect a desired conduct. If top level department decisions are being made on the importance of various programs, and you are asked for input, how much consideration do you think your program will receive if you simply submit a record of devices inspected and rejected by your department. "According to information theory, the more uncertain the decision maker is in selecting a certain course of action the greater is the amount of information supplied by useful data" [5]. I underline and emphasize the term "useful data." To be useful, they must satisfy a need for information, and this means that we, as managers, must recognize that need and know something about the person to be affected by the information before we can structure the information to produce the desired conduct we want from the recipient. When we achieve an understanding of the information process and learn how to employ it effectively, then we can begin to predict the forces that affect our programs and plan around them instead of reacting to them.

The information crisis is not confined to weights and measures administration. It cuts through nearly every discipline known to modern man. As a result of the need for fast, reliable information, we are experiencing the growth pains of an entirely new industry in this country devoted to the science of information. As a concept, this is perhaps best explained by one of the most perceptive management experts of our time, Peter Drucker.

There is a great deal more to information and data processing than the computer; the computer is to the information industry roughly what the central power station is to the electrical industry.

The electrical industry became a certainty when Ernst Werner von Siemens invented the first practical generator in 1856. But the electrical industry only became a reality twenty-three years later, in 1879, when Edison designed the electric light bulb. In between there was furious activity with a host of highly talented inventors at work. If it had been fashionable then to speak of "first-generation," "second-generation," or "third-generation" computers, there would have been a "fifth-generation" or a "sixth-generation" generator before there really was any widespread use of electric power. Practically every single one of the major electric-apparatus companies (like Westinghouse) that are still household words today was already founded by 1879 in every industrial country, including small ones as Sweden, Switzerland, and Hungary. But it was only Edison's light bulb that made possible the use of electricity as a universal form of energy.

Without the central power station there would be no electrical industry; without the computer there would be no information industry. And yet most of the money in the electrical industry and most of the engineering and technical ingenuity as well have been invested in the equipment to transmit and to apply, whether power lines, lights, motors, or appliances. Similarly most of the money and most of the ingenuity of the information industry will go into the transmission and application of information rather than into its generation and storage, that is, into the computer. And most of the profit will come from transmission and application too.

Since the computer first appeared in the late 1940's, the information industry has been a certainty. But we do not have it yet. We still do not have the effective means to build an "information system." This is where the work is going on, however. The tools to create information systems may already exist: the communications satellite and other means of transmitting information, microfilm and the TV tube to display and store it, rapid printer to reduce it to permanent record, and so on. There is no technical reason why someone like Sears Roebuck should not come out tomorrow with an appliance selling for less than a TV set, capable of being plugged in wherever there is electricity, and giving immediate access to all the information needed for schoolwork from first grade through college.

Yet though IBM is now shipping computers at the rate of a thousand a month, we do not have the equivalent of Edison's light bulb. What we are lacking is not a piece of hardware like the light bulb. What we still have to create is the conceptual understanding of information. As long as we have to translate laboriously every set of data into a separate "program," we do not understand information. We have to be capable of classifying information according to its characteristics. We have to have a "notation," comparable to the one St. Ambrose invented 1600 years ago to record music, that can express words and thoughts in symbols appropriate to electronic pulses rather than in the clumsy computer language of today. Then each person could, with very little training, store his own data within a general system, that is, what the computer engineers call a "routine." Then we shall have true "information systems."

Twenty years hence it may be as unlikely for individual users, even big companies, to have their own large computers as it is today unlikely for an individual manufacturing plant to have its own power station. Sixty years ago, a plant had to have its own power station if it wanted electricity. Now it gets power through "time-sharing" from a central station. Similarly, information a few years hence may be primarily on some "time-sharing" basis, in which a great many users have their data on one and the same computer, with complete privacy but also with complete and immediate access at all times. Already the cost of information is going down drastically. A few years ago one hour of computer time cost several thousand dollars. It now costs perhaps one hundred to two hundred dollars. Ten years hence it may cost as little as a dollar or two. Eventually it should cost no more than an hour of lighting, that is, a penny or less.

In one important respect the computer differs greatly from the electric generator: an information industry can function without a computer. This shows clearly in the field of education.

Learning and teaching are going to be more deeply affected by the new availability of information than any other area of human life. There is great need for a new approach, new methods and new tools in teaching, man's oldest and most reactionary craft. There is great need for a rapid increase in the productivity of learning. There is, above all, great need for methods that will make the teacher effective and multiply his or her efforts and competence. Teaching is, in fact, the only traditional craft in which we have not yet fashioned the tools that make an ordinary person capable of superior performance. In this respect, teaching is far behind medicine, where the tools first became available a century or more ago. It is, of course, infinitely behind the mechanical crafts where we have had effective apprenticeship for thousands and thousands of years.

We need a new concept of information and a new understanding of learning and of teaching. But while the "information revolution" will have its most dramatic impact on education, teaching and learning may not use computers at all or may use them only marginally. The materials, while certainly quite different from what we have been using—as different as the printed book of 500 years ago was from the oral tradition of the earlier schools—probably do not need to be big machines with huge memories. The amount of information needed throughout all the years of formal schooling is actually quite limited and hardly requires anything as complex as an electronic memory. "Programs" can be a great deal simpler than anything the computer uses. An ordinary desk calendar is, after all, also a "program," and a highly effective one. Information systems without computers, in others words, are perfectly possible and may indeed be as important as the systems built around the computer.

Yet without the computer we would not have understood that information, like electricity, is a form of energy. Electricity is the cheapest, most plentiful, and most versatile energy for mechanical work. But information is energy for mind work. This is indeed the first era when energy for mind work has been available. Information through the ages has been all but completely lacking. At best it has been expensive, late, and quite unreliable. Most people in responsible positions today, whether in government, in hospitals, in research labs, or in business, spend most of their time scratching to get a little incorrect and unreliable information on what happened yesterday.

The impact of cheap, reliable, fast, and universally available information will easily be as great as was the impact of electricity. Certainly young people, a few years hence, will use information systems as their normal tools, much as they now use the typewriter or the telephone. Yet the telephone eighty years ago evoked somewhat the same panic the computer now does. In another generation, it is safe to predict, people will have learned that the computer is their tool and not their master, and that it enables them to do the mind work they want to do and are unable to do today for want of cheap, reliable, and fast information.

The information industry will create tremendous employment opportunities. The United States needs, for instance, around a million computer programmers between now and 1975—as against the 150,000 to 200,000 we have had to date. The computer programmer is to the information industry what the worker on the assembly line was to the mass production industry of yesterday: the semiskilled but highly paid, highly productive worker. But at the same time, the information technology also creates a great many more highly skilled and demanding jobs, systems engineers, for instance, of whom we might need up to half a million or so within the next ten years. Yet these are only beginnings [6].

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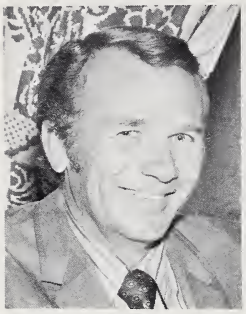
THE ACCREDITATION OF WEIGHTS AND MEASURES JURISDICTIONS

by R. T. Williams, Director, Consumer Service Division, Texas Department of Agriculture



Within the past four years, most of our states have received valuable equipment and standards to develop and maintain weights and measures laboratories. Texas received this equipment only last year, and the program in the remaining states is in its final stages.

This has made possible the establishment or upgrading of first-class laboratory facilities in all our 50 states. These laboratories can provide a standard of services for the benefit of consumers and industry alike. And the public has the right to expect and demand a high level of performance from these facilities.

But perhaps something is lacking at this stage. While we have the equipment to do the job, do we have a measure by which to gage our own excellence in the performance of these duties? We deal in weights and measures every day. By what means may we measure ourselves?

Perhaps this void can be filled by a self-devised program of accreditation of our weights and measures jurisdictions. Now, accreditation is not a word we frequently use in everyday conversation; but it is a process by which we recognize and judge competence in many endeavors. Accredit, in its simplest terms, means "to give credit to" or "to have confidence in." It further means "to authorize or stamp with authority." From whom may we, as state and local weights and measures officials, obtain this stamp of approval? The logical answer is "from ourselves, operating as an organized body on a national level."

Accreditation of weights and measures jurisdictions has been considered in past years; but the press of other duties and obligations has pushed its serious consideration into the background. Now that nearly all the 50 states have the facilities and new standards on which to build up a comprehensive program, is it not time to give another look to the possible accreditation of our efforts?

The idea has immense appeal to me personally; and I cannot take any credit for the revival of the proposal at this time. It was submitted to me shortly after I took over as President of the Southern Association last year, in a letter from Marion Kinlaw of North Carolina. Marion made a simultaneous inquiry of the National Bureau of Standards, asking, in effect, "Why is this not possible?"

And I am here today to ask you, as representatives of weights and measures jurisdictions throughout the nation, "Why not?" Why cannot we devise an accreditation plan as a means for the evaluation of our programs with respect to laws, regulations, standards, test methods, equipment, and performance? Could not this be the vehicle by which we can promote and encourage uniformity and excellence of weights and measures administration and enforcement throughout the United States? What better way to create motivation and incentives among jurisdictions and officials? If ever the need existed, and if ever the time was ripe, I believe it is now!

I recognize that perhaps not every jurisdiction is ready immediately to launch a self-evaluation and improvement plan by reason of budgetary limitations or other considerations. To shoot for goals takes time and money. Yet, it is not too early to establish these goals. And may I stress that this would be a voluntary program which a jurisdiction could enter into at any time it appeared to be ready. But the goals must be set and the plans established beforehand.

Certainly I do not have a full-blown structure of national accreditation to present to you this afternoon. This is a project for all of us to delineate in a methodical, practical fashion. Basic to such a plan, however, is the establishment of a model weights and measures program to which other programs may be compared and rated by an impartial organization or body. Criteria must be developed which would serve as guidelines to weights and measures administrators for evaluation of their own program structures and operations.

Now, a Certificate of National Accreditation on my wall in Austin can be just another piece of paper in a nice frame if it does not have some real meaning behind it. I do not need another piece of paper on my wall. But I would like to earn a certificate, awarded by my professional peers, which indicates that certain standards of professionalism have been met. Or if our Texas activities do not quite conform to certain proposed standards, I would like to be able to go before my superiors in Austin, or before the Texas Legislature, and say, "Look! Here are the national recommendations by which my work is judged. In order to render this maximum service, I need additional funds, a more adequately trained staff and field force."

I believe that a universal accreditation program would be an excellent lever in helping me obtain my needs. And certainly it could eventually help elevate the reputation and status of all of us in our profession.

Well, by whom will we be judged? When I received Marion Kinlaw's letter, my first reaction was that this would be a good plan to put into effect within the Southern Weights and Measures Association. Let the accreditation come from the Association itself, and be awarded to the member states who qualify. But on reflection, it

was immediately apparent that it has greater potential and is more meaningful if it is national in scope.

It seems more logical to have the program centered within the National Conference on Weights and Measures. A committee of qualified men with good regional distribution could study the feasibility of such a program and lay the groundwork. Or perhaps much of the administrative burden and detail could be shifted to the Office of Weights and Measures, which has the physical capability to handle much of the evaluation work which would be necessary.

I have no set plan to recommend, nor suggested procedures to offer. I think this properly belongs with this body if you agree that we can benefit from an accreditation program. I merely lay the subject open to you, and I invite and encourage your discussion and suggestions.

FORUM DISCUSSION

Mr. M. Greenspan (New York City, N. Y.): Mr. Stabler, most of us here, I believe, can be considered middle management. The biggest constraints placed upon us in the management process is that many of our superiors are political appointees or elected officials and, in some cases, are not experienced managers. How can we develop the kind of information we have heard about today in a meaningful manner so that our superiors can provide greater assistance to us in the management process?

Mr. Stabler: That is a problem that is faced by nearly everyone in weights and measures administration. Every weights and measures jurisdiction is a separate entity, and each has its own peculiar set of problems. However, it is a necessity for each jurisdiction to develop and compile effective and complete information concerning its program and to show the benefit of its operations in relation to economic impact.

Mr. Greenspan: In recent years consumer protection has overshadowed weights and measures. The keyword today is impact. I have made presentations, not on the basis of the number of devices tested or the number of condemnations, but on the economic impact upon the consumer due to lack of increased weights and measures enforcement. And yet, these reports have had literally no effect, and the feedback that I get is, "It has little or no impact."

Mr. Stabler: There is no guarantee of a certain or immediate success. However, the percentages for success are greater with the type of operation and management information that was suggested by the panel speakers.

Mr. D. I. Offner (St. Louis, Mo.): Mr. Mattimoe and Mr. Edgerly both made reference to the fact that savings to the consumer

were quantifiable. I feel these data can get you into a "numbers game."

Mr. Greenspan: I would welcome assistance on the use and interpretation of such information, as I would not want to be open to the charge that I am only involved in the numbers game.

Mr. Edgerly: This is the basic problem that we were first faced with in terms of developing some type of assistance for you as a manager. First of all, to find what it is that you do, stating exactly the number of devices and types of prepackaged commodities that are subject to your jurisdiction. This has been completed. At the same time, we also found that it was possible to quantify the relative value of commodities and services subject to your jurisdiction on the basis of dollars and cents that are publisted through the Bureau of the Census.

It is true that the complete accuracy of figures has a tendency to be more nebulous as you develop information from the data acquired. We have used a computer, because of its high speed and accuracy, to record actual errors in dollars and cents for both devices and prepackaged commodities. We can then come up with a cost of error per device or per prepackaged commodity, and extend this error to the total retail sales for the device or commodity in a particular state.

The important thing is that we now have a mechanism for allowing us to show the kind of impact weights and measures operations have on the economy of a jurisdiction. We really do not know whether dollars and cents and consumer loss or manufacturer loss are going to be the answer that will bring innovations and greater support to weights and measures programs. We think that possibly they may be. In the very near future we hope to publish a file of commodities and devices, based on a standard industrial classification code, that will give you dollar values for each commodity and device inspected in your jurisdiction. The use of such data in your inspection program should allow for more effective allocation of resources.

Mr. C. Wooten (Florida): I believe Mr. Mattimoe said that he had checked 120,000 rental car odometers during the year. What percentage of these did not meet the requirements, and, of these, where was the correction made?

Mr. Mattimoe: I said that we are required to check 120,000 vehicle odometers in Hawaii, whether or not they are commercially used. The law requires that, every time a vehicle is sold, the odometer accuracy must be verified by a state agency or a state-licensed agency. That program is being implemented now. We are using what is tantamount to a three-turn test procedure. It is the responsibility, under the statute, of the manufacturer or sales agency of the vehicle to correct any that are not accurate.

Mr. Wooten: With respect to your selective testing program in Hawaii, do you place any type of approval sticker on a device when it is inspected?

Mr. Mattimoe: At this particular time we do. We plan to phase this out probably in the beginning of next year.

Mr. M. L. Kinlaw (North Carolina): I hope that the incoming Executive Committee will consider making a study on the accreditation program as suggested by Mr. Williams. Also, is it intended to accredit only a weights and measures laboratory or the entire program of the jurisdiction?

Mr. Williams: We could begin with the laboratory program and enlarge it later to include the entire program of a jurisdiction. This is an important factor that must be studied.

Mr. Stabler: Most of you are familiar with the current laboratory accreditation program conducted by the Office of Weights and Measures. This is called the laboratory auditing program, and the state laboratories are certified if they meet certain performance criteria for standardization. There is a very important reason for NBS to certify the state laboratory creditability: NBS has custody of the national standards, and it is very appropriate for standards activity in the states to be traceable to NBS.

An overall accreditation program could include the present laboratory auditing program. A criterion for the accreditation of a state program would be for the state to be a satisfactory participant in the NBS laboratory program. Another criterion would be for the state to have at least the essential features of the Model State Weights and Measures Law as adopted by this Conference. Other factors would be to have adequate field standards for testing commercial equipment and also adequate personnel based upon proper training and professional capability.

Dr. L. J. Gordon (Weights and Measures Research Center, Denison University): The changes that I have seen in my tours of the various states since I was a member of the NBS Advisory Committee 15 years ago have been dramatic. I can see in a few years ahead, with the potential of accreditation, a tremendous uplift in quality of the performance in the several states with respect to their programs.

Mr. H. E. Smith (San Mateo, Calif.): In California recently the State Department of Agriculture upgraded the qualifications of inspectors to require a college degree. Has any thought been given to the accreditation of experienced inspectors who have completed the NBS training courses?

Mr. Williams: The accreditation of personnel could very well be a vital part of the overall program. The completion of training courses would be one way for personnel to achieve accreditation, but this is only one detail that must be considered in the proposed study.

Mr. L. O. Leenerts (Purex Corp.): I do not think that weights and measures personnel are alone in their mid-management problem in not being able to convince their superiors. In industry, many managers are sent to management training courses, only to find when they come back that they are up against a stone wall when they try to implement new activities or practices. While some may think that weights and measures is not a very glamorous profession, you people certainly have a lot of power, and we respect it very much. Our company has had very good relationships with you officials, and I can say nothing but good about our contacts with weights and measures officials.

Mr. Stabler: I think one of the real reasons for an accreditation program or for the employment of modern management techniques is the realization that perhaps weights and measures is not as uniform as we would like to think. If you look at it from our position, from the National Bureau of Standards, where we have intimate contact with many, many officials, we recognize that there is a long way to go to achieve uniformity throughout our nation, and accreditation may be the vehicle.

Mr. R. W. Searles (Medina County, Ohio): I am management in Medina County, and I am also labor. I think I have over the past 33 years upgraded the work of weights and measures somewhat. How in my small jurisdiction can I prove loss or gain by my work in actual dollars and cents? I would like to be able to make some kind of a report to leave so that my successor will be able to get more money, more help, and more equipment than I have. How can I boost the fellow that is going to take my place?

Mr. Edgerly: There are very many jurisdictions that, because they are small, will never have the advantages of what the computer can bring. I think there is a very crucial need, therefore, that the material we are putting into the computer be in some way transcribed for use on a manual basis. The mathematics that we have in the computer can be done by hand. I think that the formulas that we have developed could be included in a publication. When we feel that our figures actually work, then I think we should publish something for use by all weights and measures officials on a manual basis as opposed to the computer.

Mr. Mattimoe: Somewhere between the devices that are available to the Bureau and the small desk top calculator that is available to us, which we usually call a computer, there may be a field where you might land. These are not quite as expensive as they sometimes appear to be. They are peripheral equipment which are great little support items. In our case, we were able to get off the ground on a semiautomatic basis with such equipment. That represented an investment, without the printout device, of only $2,700. With the printout device, it was double that. But certainly you could do your own writing if the device would do the calculating for you.

Mr. J. E. Bowen (Newton, Mass.): For several years I have been trying to dramatize my figures so that they are not merely statistics of so many items checked. From the Department of Taxes at the State House, I have found out how many gallons of gasoline are sold in the state during the year and how many gallons of fuel oil are sold. Assuming that we are an average community, I point out that a 2 percent error on 5 gallons of gasoline comes out to about 22 cubic inches. We try to hold all of our gasoline pumps to 3½ cubic inches of tolerance. So then a 2 percent error would amount to so many hundred thousand dollars for gasoline and so many hundred thousand dollars for fuel oil.

I have done the same thing with food. I take the state population and divide it to get a proportional effect for my locality. These three items totaled up come to about a million and a half dollars. I think that makes a rather dramatic picture and is a pretty fair estimate of the importance of the work I am doing. I point out that what I am doing is probably saving about that much and perhaps considerably more.

Mr. Stabler: You are certainly on the right track. These figures can be related to actual compliance levels which effectively dramatize the situation. We see, of course, many annual reports from the states in which they do report compliance levels. For example, in some of the jurisdictions with very well established large-capacity scale testing programs, the compliance level ranges 70 to 95 percent. Based upon the 25 percent noncompliance or whatever the figure is, you can then translate this into hard, cold dollars!

Mr. J. R. Kalkman (Canton, Ohio): Mr. Stabler, did I understand you to say that you want to have nothing to do with consumer protection in the weights and measures field?

Mr. Stabler: No, I did not. You must respond. How you respond is the important consideration. If you are technically competent officials and get involved with pantyhose and long-life battery guarantees, and other things that are nontechnically based, then you will, in very short order, lose your technical capabilities. You will no longer carry test weights, will no longer be an expert in meters, weighing equipment, or whatever it takes to do your technical job. You will no longer have the capability to do the technical work if your emphasis is too heavily on the nontechnical.

I think in the State of New Jersey weights and measures has become a division within the Department of Consumer Affairs. We emphasized in our discussion with the Commissoner from New Jersey the necessity of maintaining the third-person stance and permitting the Weights and Measures Division to function technically. We said that "hot-line" complaints and investigations should go to different people who do not need to be technically trained. It takes

four years to thoroughly train a competent weights and measures inspector. A hot-line artist can be trained in a few weeks to do his job. This is the concern of the National Bureau of Standards, and I know it is also the concern of weights and measures.

Mr. J. C. Mays (Dade County, Fla.): I wonder how many consumer representatives we have at this meeting. I was with the City of Miami until 2½ years ago, when I was expanded to the county. We now have the Consumer Protection Division, so I have been able to get more money for my division. I certainly agree that weights and measures should receive emphasis in the work, and we can arrange our programing so as to have one day set aside for consumers and bring them more into our plans.

Mr. Stabler: That was the substance of my remarks. You have to respond in order to get a piece of the action, but be careful how you respond.

Mr. J. M. Chohamin (Middlesex County, N. J.): Mr. Mattimoe, you commented in your presentation on an experimental monthly compliance report having to do with gasoline inspections. You said it was only a temporary thing to gather information that was necessary for your computer.

Mr. Mattimoe: At this moment I do not have the authority to perpetuate it. Hopefully I will get the authority when I get back. Interesting information is being generated out of the data that we are collecting, particularly when we reduce it to cost and value.

Mr. Mays: Mr. Edgerly, how important is this dollar impact above something else?

Mr. Edgerly: I think people generally understand dollars and cents above tolerances and noncompliance, and to this extent this is primarily why we think it will have a significant impact. Getting into the area of devices, though, you get into a very nebulous area, and that is, "How do you compute the value for checking the scale?"

Mr. Mays: In other words, if you are going to make a presentation, rather than making it on errors or compliance figures, transpose these figures into dollars.

Mr. Edgerly: I find in a lot of cases that peop'e seem to be apprehensive about using their imagination in coming up with these reports. Maybe it is because they want to be absolutely sure that these data are correct.

Mr. Mays: I would like to encourage the recommendations that Mr. Williams presented on laboratory accreditation and bring it into jurisdictional areas on personnel and performance, and to encourage it to be done almost immediately if this is feasible.

Mr. W. I. Thompson (Monmouth County, N. J.): Mr. Stabler, you were recently quoted in the Wall Street Journal with a sum of money that represented the average savings to a family of four over a period of a year's activities of the weights and measures depart-

ment. That figure approximates the same one that I heard when I came to work 31 years ago. Has not inflation changed it somewhat and how did you arrive at that figure?

Mr. Stabler: We estimate the average savings per family to be about $150 at today's costs.

Mr. R. L. Thompson (Maryland): Mr. Williams, Gene Smith from California mentioned college degree requirements. I would prefer that, if we are talking about accreditation of personnel, some consideration be given to other items such as attitude, moral character, and on-the-job training.

Mr. Williams: Most of the things that we have discussed here this afternoon are discussed in great detail in the regional seminars for weights and measures directors and supervisors. I would recommend that you attend one of these, and you will get some answers to a lot of questions that are in your minds right now. They are well worth attending. .

Mr. Stabler: For those who are not familiar with these seminars, we are holding seminars for weights and measures directors and supervisors. The course content is considerably different for the two.

Mr. L. A. Rick (St. Louis County, Mo.): Has there been any comparison of jurisdictions where there is a fee charge and jurisdictions where there is no fee charge so far as operations, efficiency, and so forth, is concerned?

Mr. Stabler: None that I am aware of. A study of the effectiveness of enforcement programs in fee versus nonfee jurisdictions would be very interesting.

Mr. Rick: As I keep getting jurisdiction over more municipalities, I am having trouble in getting enough personnel. I keep contending that weights and measures should be classified the same as police, fire, and health departments, and should not have to carry its own weight. In St. Louis County, it would cost 6½ cents per year per capita to cover the expenses of my office without any fees coming in. If I could convince the people what they could expect for their 6½ cents per person, I think we could do a much better job.

Mr. J. R. Bird (New Jersey): Several years ago Mr. J. R. Roberts from Manchester, England, was here, and I had quite a discussion with him about accreditation and licensing. In England, weights and measures people start when they are about 18 years old, and they have a study curriculum that they have to go through. They take examinations and consider themselves professionals. In the past few years since I have come to these forums, I have seen the upgrading of the programs to what I would call professional status, and I think that many of us are beginning to feel that we are professionals. The approach that has been suggested here is a milestone in weights and measures in the United States, and I think that it should be pursued further.

MORNING SESSION—WEDNESDAY, JULY 14, 1971

(J. L. O'Neill, *Vice Chairman*, Presiding)

THE CONSUMER CHALLENGE: WHAT IS IT ALL ABOUT?

by S. E. Cohen, Washington Editor, Advertising Age

As we enter the 1970's, the people of the United States are confronted with a great national debate which questions our most fundamental political and economic assumptions. Hanging over us are social and environmental problems of the most pervasive gravity. I do not believe I overstate the case when I say that many serious people—people who are by no means revolutionaries—wonder whether the political and economic institutions which have been so productive for so many of us will cope with the world of the 1970's.

I am sure it is not necessary for me to recount the blessings which have accrued to us in terms of individual liberty and opportunity for self fulfillment. Nevertheless we are discovering that our institutions, like all others, have shortcomings, and these shortcomings are catching up with us.

The concentration of unskilled and under-employed people in our urban ghettoes is a product of our institutions too, and so are the clouds of smog hanging over our cities, the contaminated clams and oysters, and the desperate race to find burying space for our garbage. Henry Ford II recently cautioned us against attributing these problems to scapegoats—to the government officials and businessmen who have been making the big decisions. But in a sense he merely dramatizes the seriousness of what we face. For if these problems are not the doings of evil men—which they certainly are not—then they must represent a normal side effect of our system. Since the problems are here, and very real, it is obvious they will continue to get worse if we continue to leave our public decisions to the kind of happenstance we have tolerated in the past.

The debate over the adequacy of our institutions confronts the advertising and marketing world through the phenomenon we designate as "consumerism." Consumerism says we have been giving businessmen too much freedom to determine what is marketed and how it is promoted. In a thousand and one different ways, the consumerists press for ground-rules imposed by society which seek to insure that the competitive process remains within perimeters that preclude

the marketing of products and the use of selling techniques involving potential harm to the individual, the environment, and the values of our nation.

It is too soon to speculate about the degree of change the consumerists expect to achieve. Two important articles, one by John Cabot Lodge in the Harvard Business Review and the other by Prof. Charles Reich of Yale Law School (the controversial book, "The Greening of America"), offer something of an overview. Both say, in effect, that we must find some new balance between the public and private sectors if we are to muster the muscle we will need to deal with such problems as the renovation of our cities and the restoration of our environment. In the pragmatic way of the politician, President Nixon seems to be addressing himself to the same problem. Through revenue sharing, for example, he seeks to revitalize state and local government as additional centers of power to improve the performance of the public sector.

Behind these discussions, regardless of the vocabulary used, is the growing fear that our political and economic institutions produce waste, both human and material, on a scale which is no longer tolerable. An analogy is drawn between the way we temporary residents of this globe treat the earth's resources and the way we expect the trust officer of a bank to manage an estate. If the trust officer dissipated the estate with the abandon that we use the earth's resources—which, after all, are the heritage of posterity—that officer would be jailed.

Consumerism and environmentalism, two of the major forces which have moved into the political scene during the past decade, come from a common root and have common purposes.

The people who have been raising these issues inevitably begin to question the most basic assumptions which marketing people have held about the social utility of the process of competitive product innovation itself. These critics are not necessarily ungrateful for the material comforts that have come their way as products are refined and improved. But they are applying cost-benefit factors which indicate some so-called progress may be beyond the means of our society.

Ultimately, we reach the heart of the dilemma: How can we retain the vast potential good of competitive free enterprise as a provider of goods and services, while at the same time assuring that the public's safety and welfare—and the resources of this globe which are the heritage of posterity—are not left to chance?

In a moment I will move on to the next segment of this discussion. Meanwhile I urge you to keep in mind this crucial fact: As a nation we have profound confidence in the proposition that our needs for goods and services are best served when left to the creative force of the private sector. The incentive for the private sector is, of course,

the opportunity to profit and personal gain. But society's interest is solely the goods and services it needs.

Private enterprise will remain the mainstay of our economy only if society is satisfied with its performance as a supplier of goods and services. And society will remain satisfied only so long as it believes the price is right, not only the price in dollars, but also the price in terms of the impact on our resources and our values.

Until now I have been describing the deepseated forces for change which are at work. When consumerism first emerged in the early 1960's, many businessmen were certain it was a gimmick contrived by political opportunists, and it would go away if only Esther Peterson was driven from the White House staff. In view of what I have just described, I trust you can see why this was a case of wishful thinking on the part of people who were refusing to see the world around them.

Consumerism is deeprooted, involving millions of poor and underprivileged people who may not be articulate, but who know when they are being cheated, and tens of millions of affluent suburbanites (the kind who do not normally look to government for help) who are weary of the insults and indignities of an impersonal and opportunist society. Automation, affluence, mass merchandising, and urbanization have changed the quality of life in America, and not always for the better. In this transformation, the individual finds the competitive marketing system a mixed blessing which brings unmatched material possessions to all of us, but sometimes exacts a price in other than money.

Consumers have found themselves frustrated by machines too complicated to service, and frustrated by reports that they have been eating foods containing chemicals of questionable safety. Even the multitude of product choices becomes a mixed blessing as the consumer struggles to make value comparisons and maintain his possessions.

Beyond this, there are the environmental catastrophes that can develop from competitive product innovation. The marketer does his thing in terms of what will sell, and the consumer, no less materialistic, contentedly indulges himself. Consider, for a moment, the one-man, one-car phenomenon, as millions of sovereign suburbanites migrate bumper to bumper into our cities, spewing their trails of hydrocarbons and lethal lead behind them. The motor titans did not plot to smother our cities in smog. They simply kept outdoing each other with bigger and fancier and more powerful cars because their record books showed that was the way to improve their market share and their earnings. Consumers found this an agreeable way of life; and we were deeply involved before we sensed that unpleasant, and forbidding, implications had been overlooked.

Consumerism and environmentalism is insisting that we reappraise our assumptions about the rights and obligations of businessmen in general and marketers in particular. For the next few moments, let us explore some of the points of contact.

Friction Point No. 1: Product safety—safety for the individual and safety for the environment.—Next week the Senate Commerce Committee will begin hearings on product safety legislation. There is a substantial amount of agreement in principle about what needs to be done. There will continue to be problems galore. But we are equipping ourselves to prevent the mass merchandising of products which become hazardous under normal conditions of use, and we are improving the prospect that the tested and properly engineered product will not be displaced by shoddy and carelessly made products offered at attractive discounts.

In the regulation of drugs, and in the control of water and air pollution, we are often dealing with problems which are on the frontier of knowledge. Often the public may be demanding a certainty which human experience is unable to provide. Nevertheless, someone has to try. So we are going to have more laws and regulations in these areas. Moreover, we are going to find the public temper getting shorter and shorter with opportunists who complicate the incomprehensible with self-serving advertising that misstates problems and their solutions.

Friction Point No. 2: The technological gap between the ability of sellers to sell and the ability of consumers to comprehend what they are buying.—This is due in part to the products, which are often incredibly complicated. But it is also due to selling techniques, which are often designed to compound the confusion.

Advertising is less blatantly deceptive than in the past. But it may be more subtle in implying more than it really says. Congress and the FTC are both responding by demanding that advertisers be prepared to disclose documentation behind their performance claims. This fall, in an effort to update itself on the psychological tricks that are used in fashioning ads, the FTC will be conducting a hearing that will look into what we call "the second level of communication," the hidden message visible in neither the picture nor the words when the ad is parsed or examined.

The technological gaps would exist, however, even if there were no deception as such. Marketers rightly recognize that values are often subjective and may not be measurable solely in dollars. So cars are sold as sex symbols, and teenagers are told hair goo enhances their chance to "make it."

It does not stop at that. Food is differentiated by packaging, pricing comparisons blurred by odd-ounce packages and tie-in promotions. Common chemicals, rechristened with fancy names, are peddled

as miracle ingredients that whiten teeth, give better gas mileage, or stop a headache twice as fast without churning the stomach acid. It is hardly surprising that consumerists should be pleading for help and that government should be responding.

Truth-in-packaging legislation and truth-in-lending legislation were passed because Congress feels consumers need help in making product comparisons. Regulatory agencies feel the same way. That is why FTC adopts rules requiring the disclosure of the light output of bulbs and the octane rating of gasoline. That is why FDA is giving top priority to demands for improved forms of food labeling to provide more useful information about ingredients and nutrition. Virginia Knauer has scored her most important successes in this area too. She has been influential, for example, in promoting better labeling for cosmetics and fruit-juice drinks. And she maintains pressure for the disclosure of "how to buy" information accumulated by government in its capacity of purchaser of consumer goods.

Sellers like to argue that there is ample information already available for consumers who seek it. But Richard Holton, Dean of the School of Business, University of California, Berkeley, replies that this begs the question. Our marketplace consists of full-time professional sellers pitted against part-time amateur buyers, he explains. Many buy with but little thought about comparative value much of the time; but almost everyone ultimately faces situations where he longs for facts. Consumerism speaks for millions who do not want to make careers out of shopping. They want shopping made more rational, and the politicians are getting the message.

I suspect that some of the marketers who have been defending the informational razzle dazzle are beginning to discover that there is another side to it. Millions of consumers despair when it comes to an intelligent buying decision for a major appliance or for clothing staples, so they turn to private branders like Sears or J. C. Penney, confident that their buyers know how to pick the best values. As this reality becomes more apparent, I suspect that more and more businessmen will begin to recognize that improved information systems are in their interest, as well as in the interest of the consumer.

Friction Point No. 3: The impact of selling on our physical, social, and moral environment.—Modern marketing practices are often intrusive to the point of rudeness. So FTC responds with proposals to ban negative option selling. Congress protects consumers from unordered merchandise and the mischief of the credit bureau computer. And Warren Earl Berger, in his first opinion as Chief Justice, goes out of his way to declare that a man's mailbox is part of his castle.

Beyond this, there are numerous controversies which relate to the impact of selling on our values. Environmentalists contend adver-

tising promotes a materialism which leads to senseless destruction of natural resources and mindless poisoning of air and water. They are in court arguing that broadcasters be required to offset ads for cars and gasoline with antipollution messages which discuss the impact of big cars in terms of traffic jams, smog, and the environmental carnage triggered by highway grading.

National Citizens Committee for Broadcasting recently presented the Federal Communications Commission with a worldwide study of children's TV, which suggests American kids are victims of unbridled greed. The survey shows twice as many commercials on children's TV here as the next most commercialized nation, and many more commercials than on nighttime adult shows. Broadcasters seek to maximize their profit from every time segment of the day, so a child's program which fails to attract sponsors is yanked, regardless of quality. Networks which are the centers of talent and resources in our system provide specific children's programs only one day out of seven, though kids are watching TV all seven days.

Robert Choate touched a raw nerve when he discussed breakfast cereals last year—less because of his ratings of the cereals than his comment on the sales techniques. He found that the cereals most heavily promoted to children were often highest in sugar and lowest in food value. Parents are uneasy about this cynical exploitation of their children. Recently FCC asked the public how it feels about children's TV, and it has received an outpouring of 80,000 comments, almost all of them hostile. Clearly something has to change here.

There is concern about the sheer volume of advertising, particularly for certain types of products which are of doubtful value at best. Senator Frank Moss is among those who fear that the torrent of ads for headache remedies, wake-up and slow-down pills, and stomach relievers is making us a nation of pill addicts. His newest idea is an Institute of Advertising, Marketing, and Society to try to determine how advertising changes people's habits and life style.

Well, these are the kinds of issues that are being raised; and as you know, the marketplace of ideas (in Congress, in the regulatory agencies, and in the courts) is overstocked with proposed remedies. Some, such as new laws on product safety and new forms of consumer representation in government, are likely to pass in this Congress. Others, particularly some of the recent FTC cases, keep the business community uptight.

We are witnessing the evolution of a new balance of influence in our society. And the survival of free institutions depends on our success in achieving the kind of balance which will permit us to deal with our social and environmental problems before they overwhelm us.

I want to conclude with these observations:

1. Our social and environmental problems are getting worse, and the critics are becoming more demanding. In Los Angeles last January, there were two smog alerts in a single day—not routine ozone smog, but deadly carbon monoxide smog. I have seen estimates that highway traffic will double by 1986 and redouble by 2000. Imagine what that can imply in terms of environmental carnage, urban and suburban sprawl, and patients for the psychiatrists.

2. Consumerism is not just another name for big government. It is a new element in the interplay of conflicting forces in our society, and it is here to stay. Consumerists try to use government, just as other special interests do. So they fight for a consumer advocate within the government, and they shower the regulatory agencies with proposals. But they are equally concerned about policy makers and business, and they have been reminding us that businessmen often function as judge, jury, and prosecutor in approving products or selling methods that become hazards to our lives and our values. Consumerism forces more accountability from government and business, and in this sense it becomes a positive force, helping us grope our way toward a safer and more equitable society.

3. Consumerism functions as both the antagonist and ally of the public servant. The consumer advocate confronts government with still another demanding form of oversight. He is often unmerciful, and occasionally unreasonable. But his goal is essentially unselfish; and he can be a source of strength for those who battle in the public interest. In the absence of mechanisms that provided a true, independent advocate for the consumer view, government, by default, has surrogated to itself a special obligation to present the consumer's case. The emergence of competent professional advocates for the consumer can leave government people free to consider with greater objectivity the broader public interest, apart from the desires of consumers.

4. Business faces closer government control as a result of defeats it is suffering in Washington and in state capitols. But it suffers these defeats because it is losing a much bigger struggle—the struggle for the confidence of the public. One survey after another shows the public resents and distrusts much that has been happening in our marketplace. The public knows something is wrong, and it wants change. Only by becoming its own most critical critic, can the business community preserve its essential freedoms and help our nation meet its most fundamental obligation—the preservation and perfection of the society we fashion for those who will follow.

FORUM ON MERCHANDISING

E. A. Vadelund, Office of Weights and Measures, *Moderator*

We have on our merchandising panel four people, four topics. I will introduce them and each will make a presentation, after which we hope to have a dialog in the form of questions and answers.

Our first speaker this morning will be Mr. Harold H. Smith of the Cannon Mills Company. Mr. Smith is a member of the Cannon Legal Department, and his topic will be of concern to this group inasmuch as the Conference is currently considering amendments on textiling labeling. His subject will be Textile Package Labeling.

Our second panel member is Mr. David Levine, Market Manager of the Plastics Products and Resins Division of the Monsanto Company. Of great concern to weights and measures over the past twelve months has been polyethylene film, and Mr. Levine will take us through the thick and thin of that.

Our third panel member is Mr. Ed Wolski, Manager of Quality Control for Colgate-Palmolive Company. He is currently a member of the Liaison Committee of the National Conference on Weights and Measures and will speak on the topic "Does Equity Prevail."

Our fourth member is Mrs. Esther Peterson. She has been very active in government, first in the Department of Labor and later as Special Assistant to the President for Consumer Affairs and Chairman of the President's Committee on Consumer Interests. She is at present Consumer Advisor to the President of Giant Food Incorporated, and will speak on a topic that is being considered by the Committee on Laws and Regulations, "Unit Pricing."

THE UNIQUE ASPECTS OF TEXTILE PACKAGE LABELING

by H. H. Smith, Attorney, Legal Department, Cannons Mills Company, Kannapolis, North Carolina

The title of this paper may be slightly misleading—a mislabeling, if you will, of its contents. There is really nothing which deserves to be designated or considered unique in the technology of the actual labeling of the package of a textile product. There is no problem with the commodity or product being so extremely delicate or supersensitive to pressure that unusual care is required in the application of the package or the label thereon. No variation to an abnormally high or an abnormally low temperature at the time of packaging and labeling of the finished product is required. There is no problem of absorption of odors or aromas from the packaging areas or from the conventional materials utilized in the package or the label, or in the application of either. Being a dimension product, so far as measurements are concerned, textiles heretofore have not been and presently are not confronted with the problem of humidity control at the time of packaging or with the problem of dehydration after packaging and labeling; but mindful of the technique of "watering the ropes,"* manufacturers of goods from natural fibers must never be saddled with such limited variations from stated measurements as to cause measurement taken after exposure to high humidity to result in nonconforming goods.

Rather I wish to devote my remarks to the peculiar production characteristics of a few of the major classes of packaged textile products required to be labeled in most jurisdictions in the United States. These peculiar production characteristics are wholly or in large part the reasons for the Committee on Laws and Regulations of the National Conference on Weights and Measures recommending the adoption of revisions in the Model State Packaging and Labeling Regulation as published in the Announcement Booklet of the 55th National Conference on Weights and Measures.

Only a few specifics will be dealt with. The first of these will be bed sheets and pillowcases. The rationale behind any required labeling of a package thereof should be to inform the purchaser of the product's measurements in terms of what it will fit and the total amount of fabric for value comparison.

*This is the application of water to ropes and hawsers so that there will be movement or tightening as a consequence of the shrinkage resulting from the effect of water on the fiber.

The industry is called upon to mass produce in order to make available to the consuming public a commodity the price of which does not prohibit its use. If sheets and pillowcases could be made by trimming cloth of excess size down to the particular dimensions desired in the manner that the custom tailor places his pattern on cloth and cuts away the surplus, there would be little problem in labeling the finished item.

Under the limitation of consumer economics, such practice cannot be followed. Instead, part of the dimensions must be established in the weaving process in order to obtain a price-acceptable product. The housewife has recognized this for the several generations that sheets have been utilized. She would purchase from the dry goods store unbleached or grey goods 72 inches in width, including both selvages. Initially, the customary purchase was of 2½ yards of cloth per sheet or 5 yards of sheeting per bed. The merchant would cut or tear off the unrolled cloth, the housewife would halve the five yards of cloth, whip a hem in the ends to prevent raveling, and have a pair of sheets. Why the particular choice of length of 90 inches or 2½ yards per sheet, unless it be the easy fraction for multiplication of price per yard, appears unclear. In any event, as the average person tended to become taller and the length of beds was increased, the sheeting requirements were increased by a quarter of a yard per sheet, not by half a foot (6 inches), but by 9 inches per sheet or an additional half a yard per bed. This is the story as related to me by the textile people.

The width of mattresses was also expressed in terms of quarter yards. A mattress for a single bed was a four-quarters mattress (4 quarter yards) or 36 inches wide. A full bed or double mattress was a six-quarters mattress (6 quarter yards) or 54 inches. A like inquiry as to whether chicken or egg was first can be made with respect to loom sizes and the width of cloth woven. Which dictated the other? The question will not be readily resolved, but it is interesting to note that loom manufacturers normally modified their machines for width of output in quarter-yard increases from the normal or 36-inch width to 45 inches, 54 inches, 63 inches, etc. Most everyone has heard the expression of comparative excellence of "all wool and a yard wide."

As fashion in bed linens gained in importance with our increasing affluence, the utility-whipped hems gave way to hems of various but increased widths. The length of cloth for each sheet was increased to three yards or 108 inches. Since, in use, a substantial portion of both a top sheet and of a bottom sheet is tucked under the mattress, the matter of precise length of the finished item is not critical. Despite much mechanization, the hemming of sheets is still accomplished by the individual hemmer personally making the turnunder for every

hem, top and bottom, and hand-guiding every sheet through the sewing machine. These turnunders are each supposed to be one-fourth of an inch. With volume operations, individual operators are bound to have variations in their own work, and these variations for a plant's production are subject to increase with the number of individuals performing the hemming operation.

The introduction and acceptance of fitted sheets, together with the continuing importance of fashion in hem widths, hem styles, color, and design spawned the concept of a sheet being a garment for a mattress. Under this concept, the most important question relating to size is: What measurements mattress will the garment fit? For fitted sheets, accurate answer to this question is critical. For flat or unfitted sheets, the accuracy of the answer is not critical, but it is both relevant and material. However, accurate answer as to the size mattress a flat sheet will fit in its finished measurements affords no ready value comparison with another sheet of the same finished dimensions selling for the same or a different price, because the one having the greater finished dimensions may actually contain less cloth than one with smaller finished dimensions. Skimpy turnunders and narrowing of hem width at either or both ends allow delivery of a given finished size containing less cloth than another sheet having the same finished size but having more cloth by reason of wider hems and generous turnunders.

The garment concept, applicable equally to sheets and pillowcases, appears to be a sound and hopefully an accepted solution to the problem of labeling these textile items. By stating the before-hemming size, there is actual quantity of cloth disclosure to permit a quantity-price-value comparison. The traditional multiples of yards, expressed in inches, handed down from preceding generations of housewives and homemakers can be retained, and every purchaser has information at the time of purchase as to what the "garment" he has bought is manufactured to fit.

The manufacture of pillowcases presents, ordinarily, two steps differing from what I have related about the preparation of sheets for packaging and labeling. The first of these is that the cloth as woven by the loom is not intended as the width of the product, as in the case of flat sheets. The loom width of cloth, after further processing and usually as a continuous mechanical operation, is folded and stitched along one side to form a tube before the manual hemming is begun. After flat sheets have been hemmed, they only have to be inspected and folded before they are ready for packaging. Except for limited production items requiring additional manual efforts, the pillowcase, upon completion of the manufacturing step, is wrong side out. Before inspection, folding, and packaging of it, it must be turned right side out.

Another specific with which I wish to deal is the necessity for providing realistic variations from declared dimensions in the labeling of textile products. This need is most strikingly recognizable after comprehending the manufacture of cotton towels and cloths, particularly those which are terry woven.

Although the word terry is derived from the French verb *tirer*, which I am told means to draw or to pull, the procedure of making a fabric so that the surface loops forming the pile are drawn from loosened warp threads was an art known to the ancient Egyptians and the Incas of ancient Peru. Specimens of linen terrycloth believed to have been woven before 4000 B. C. have been exhibited in the Metropolitan Museum of Art. The terry bath towel so familiar to all of us today had its rebirth less than 125 years ago, and attained adolescence only during World War I.

Terrycloth was first made by machine in England in 1848, after an Englishman had observed the handweaving of terrycloth in a Turkish harem. In 1851 the first machine-made terry towel was exhibited at the London Exhibition. Upon the towel's being presented to Queen Victoria, she granted permission for the production thereof to be called "Royal Turkish Towels." For one reason or another, Americans generally continued to use linen crash or plainweave (huck) towels of linen or cotton until government requirements during World War I used all the smooth towels for the military. Civilians were obliged to utilize terry towels, and by war's end the merits of the softer, more absorbent terry were so widely recognized and preferred that today terry is the accepted bath towel in this country.

I believe it will be helpful in establishing the necessity for realistic variations from declared measurements of textiles to describe very hurriedly the steps in the manufacture of a cotton terry towel. To begin with, a cultivated plant product, an organic material which in the natural state has varying physical properties, is the raw material. The properties of the raw material vary with climatic conditions, soil fertility, growing husbandry, maturity, and care in harvesting, and even with the genetic makeup of the seed. These variable factors all affect the fiber contained in and surrounding the seed in the seed pod of the maturing cotton plant. They bear upon the length of the fiber, referred to as staple, its quality or grade, and its cleanliness. The longer the fibers, the finer the yarn which can be spun from it, and the stronger the fabric which can be woven therefrom.

The ripe bursting cotton pods or bolls are picked and the seeds are separated from the fiber in a ginning process, after which the fiber is baled into bales approximately 500 pounds in weight. These bales of cotton are the raw material for the production of cotton

textile products. About eight different processes are involved in converting the baled cotton into the yarn from which a fabric will be woven.

Before these processes, there will have been a sampling of the cotton in each bale, so that it may be classified as to its properties and characteristics for later blending, and in some instances the desired color may be attained by dyeing the bale of cotton.

The first process is removing the protective bagging and steel bands with which the cotton has been baled, and blending a bale of one class with bales of other classes as they are run through machines called openers, so named not because they open the bales, which is otherwise done, but because they open the fiber by beating it, to the end that dirt, seed pieces, and other foreign matter fall out. Then the cotton enters a picker for further cleaning. Here, machine blades revolving at high speed beat out dirt, seed, and other plant particles, and any foreign matter, and the fiber is delivered from the machine in laps or rolls about 18 inches in diameter and 40 inches wide. These laps resemble the large rolls of absorbent cotton which can be purchased at the drug store.

The third process is carding, where cleaning of the lap is completed by the more than a million small wire teeth per machine. These teeth also remove short, fuzzy fibers, and pull the remaining fibers into parallel order, disentangling them to some extent and shaping them into a thin filmy web. The next three steps are drawing, combing, and roving. The filmy web delivered by the carding machines is processed through a drawing frame, which molds the web into a round, rope-like, untwisted strand called a sliver (pronounced sly-ver), which is coiled into large cans. Combing is then done to remove all short fibers, so that finer, longer-wearing, smoother yarn can be produced. The fine-toothed comb arrangement continues to straighten and parallel arrange the fibers, and another drawing frame combines several slivers without twisting, further straightens the fibers, and reduces the combined slivers to about the same diameter as one of the original strands. Then these slivers go to machines called roving frames, the operation of which further draws out and parallels the fibers, reduces the cotton strand to a smaller and smaller diameter, gives it a slight twist, and winds the roving onto bobbins. The importance of the fibers being parallel before they are twisted is that, otherwise, the yarn will have no strength. The strength of yarn depends upon tightness of twist, evenness of spinning, and, as before mentioned, the length and quality of staple.

The process of spinning completes the drawing out of cotton roving. On the spinning frame, the large bobbins or spools of roving are drawn into a single smaller strand, given the right amount of twist to give it strength and make it into yarn of required size. If

colored yarn is desired and the baled cotton has not been dyed (stock dyeing) the yarn may now be dyed. The technical name for even the finest kind of thread is yarn. Among manufacturers, thread usually refers to the spinning of linen or silk, and yarn refers to cotton or wool. I am about to come to the specifics of weaving terry towels, and may use the word thread interchangeably with or in lieu of yarn.

Most simply described, weaving is the interlacing of two systems of fiber to produce a fabric. Standard cloth weaving is the interlacing of two systems of threads (crossing each other) at right angles. The lengthwise threads form the warp or foundation; the horizontal threads are called the filling or weft. In plain weaving, the longitudinal and horizontal threads are tightly interlaced. In terry weaving, as the shuttle is driven over and under the warp yarns in alternate rows, a second set of warp yarns is loosened or slackened to form loops on one or both sides.

After the spinning operation which has been described, the yarns which are to constitute the warp have had sizing applied to them and have been wound parallel to each other on a large cylinder called a warp beam. Several thousand yards of each warp thread may be wound on one of these beams. The warps may or may not have been dyed at this stage.

Imagine now the weaving of a cotton terry towel of a specific construction and of a given intended size. Once weaving is begun, there will be a continuous piece of cloth. The decision as to construction will include the size yarn to be used, the number of warp threads per inch, and the number of filling threads or ends per inch of fabric. The length of the warp threads does not determine the length of the fabric, because, as one warp beam is emptied, the warps on another beam are tied in and the operation continues until the quantity requirement for the particular item is satisfied. So there is produced a continuous piece of cloth comprised of a series of individual towels which must be desized, bleached, possibly dyed, dried, softened, possibly sheared, cut apart along lines determined in the weaving, and, except for fringed towels, be hemmed. In addition, there may be the affixing of the manufacturer's or customer's label, and patterns or designs are often printed on the completed towel.

The intended size and construction were decided upon and were the basis for determination of price before weaving was begun, but the dimensions of the finished products having identical construction (that is to say, they have the same number of warp-wise threads and the same amount of filling threads) may differ due to the interplay of many variables. It is because of these many variables, which the best manufacturing technology has not reduced to constants, that allowable variations from declared dimensions of a minus 3 percent and a plus 6 percent for items with no declared dimension less than 24 inches, and a minus 6 percent and a plus 12 percent for items with

a declared dimension less than 24 inches, are essential. Hastily reviewed, some of these variables are:

1. The nonuniformity of the individual vegetable fibers.
2. Minor variations in the amount of twist applied to the fibers of yarn of the same size.
3. Variations in the tension on the warp threads as the beam decreases from full to empty, and as a new full beam is tied in.
4. Variations in the tension on the warps as the takedown rolls of fabric increase from empty to full.
5. Variations in tension from the interlacing of the ends or filling as the weaving progresses.
6. Variations due solely to mechanical wear and increases and decreases in tension due to the state of lubrication of mechanisms.
7. Differences in stress on various towels constituting a segment of the fabric, depending upon the segment's relative position in the continuous strip as it is pulled or conveyed through desizing, bleaching, dyeing, drying, fluffing, shearing, cutting, etc. (The beginning end will be stretched by the unsupported weight of fabric behind it and the terminal end will be unstretched because of the absence of unsupported weight.)
8. The human inconsistencies in the hemming operation.
9. Stretching or shrinking in decorative printing operation.

The list might be extended, but this should suffice to indicate the problems in the technology. These variables are present in greater or less degree in the manufacture of practically every household textile item industrially mass-produced, be it a towel, washcloth, sheet, pillowcase, bedspread, curtain, bathmat, or whatever.

I submit that the textile industry does a remarkable job in keeping its production reasonably within the 3–6 percent and 6–12 percent variations previously mentioned. I say reasonably, because there are instances of items being beyond these variations, and they properly are not identified or labeled as the intended product, but are downgraded or converted into other products. The alternative to the stated variations is hand-measuring of the finished item, resulting in soaring costs and prohibitive pricing of American-made items. Further, I would be remiss if I did not emphasize one more aspect of the dimensions of textile products such as towels, washcloths, bathmats, etc. This is that, once the construction of such an item is decided upon and production is begun, in a modern plant items having that particular construction will contain the same quantity of cotton fiber and will equally perform their intended use; namely, to dry or to absorb moisture, regardless of the precise dimensions of the item as stretched or shrunk in production.

Finally, let me observe that the matters herein discussed are widely known within the textile industry, and no impression of originality of thought by or with me should exist. For the contents hereof, I am indebted to innumerable persons and sources, to all of whom and which, unnamed, I give credit.

PRODUCT STANDARDS AND POLYETHYLENE FILM

by D. Levine, Market Manager, Film and Pipe, Monsanto Company

As a member of the plastics industry, I am pleased to be a part of this forum. My talk and the following discussions will center on product standards and polyethylene sheeting.

The Bureaus of Weights and Measures in the past decade have been instrumental in creating a greater awareness on the part of the consumer. Consumerism, Truth-in-Lending, and Fair Packaging and Labeling have become household words.

Manufacturers, packagers, and sellers of products are labeling their items in understandable language. Some took the initiative; others were prodded by groups such as weights and measures. The packers of people food have joined the ranks of the packers of pet foods and now list the ingredients of their products. The movement toward consumerism has brought forth large numbers of people who want to know what they buy. They not only want to know what they buy, but why it costs what it costs.

The consumer is always interested in what the product costs. Consider that the accelerating costs in the construction industry, higher wages to the worker, increased transportation costs, higher interest rates, as well as increased material costs are reflected in the eventual cost of the product—in this case, the home. Regardless of the industry or the product, the consumer eventually pays. Reluctantly, he accepts the constant increases, for various media continually inform him of wage and transportation settlements and cost of living indexes.

Along with those things that directly affect this cost of living, what about those things which are not evident to him but that indirectly affect his purchasing power? He knows that, when he buys a pound of butter or a gallon of fuel, he is getting what he is paying for. You and your people have seen to that. However, what recourse does he have against a seller who, in many ways, can increase his profits at the expense of the consumer by misleading labeling or by

manufacturing products that may be at the low end of specifications or tolerances (if there are, in fact, such specifications and tolerances)? Polyethylene sheeting has fallen into this category.

This morning I would like to discuss some of the background which led to the development of standards for a segment of the polyethylene film sheeting industry. Polyethylene is that magic plastic which everyone uses and cannot do without. You find it in the home as food wrap, in bag form for freezer wrap, or as trash-can liners, still larger bags for spring cleanup time, as bags to cover your purchase of new shirts and sweaters, as a wrapping around the loaf of bread you buy and the suit you have cleaned. It is a magic material, and literally billions of pounds are sold every year. Remember that the cost of a polyethylene wrapped sweater or any other product similarly wrapped includes cost of this wrapping or cover.

Along with these items familiar to all consumers, polyethylene sheeting is sold and used by the hundreds of millions of pounds every year in the construction, industrial, and agricultural markets. Being a magic plastic, it is lightweight, a good moisture-vapor barrier, chemically inert, relatively inexpensive, and available in a myriad of colors and widths, even as wide as 480 inches or 40 feet.

In the construction market, polyethylene sheeting is used under concrete slabs to prevent moisture vapor from entering the house, for the covering of building materials, and to close in unfinished buildings so construction can continue in inclement weather. In the agricultural markets, polyethylene sheeting is used as a cover in the fumigation of fields prior to planting of fruits and vegetables, as a mulch to retain moisture in the ground, to prevent weed growth, to keep fruits and vegetables free from ground dirt and diseases, and for covering greenhouses. Naturally, the cost of these materials is reflected in the price of the finished product that the consumer buys, whether it be $2.00 worth of vegetables or $20,000 worth of building.

Many thicknesses are used. Most common are 0.004″ and 0.006″. 0.004″ (4 Mil) is 4/1000 of an inch, and slightly thicker than an ordinary piece of paper. It is usually sold by the roll or by the square foot. In the early days of the industry, for want of standard specifications, some manufacturers created their own. There seemed to be as many specifications as there were manufacturers. So long as they were selling by the roll or by the square foot, the contractor, or the farmer, or the industrial user, and eventually the consumer did not know the quantity of that material. Allegedly selling material as 0.004″ (4 Mil), a few companies produced polyethylene sheeting as low as 0.0025″ to 0.0035″ thick. One-hundred-foot rolls of sheeting were often only 85 to 90 feet in length, creating an overall shortage to the user of as much as 10 to 35 percent.

Gentlemen, this costs the consumer the same as if he had bought a carton of butter weighing 10 to 14 ounces that was marked 1 pound, or a carton of milk that contained anywhere from 20 to 30 ounces and marked 1 quart.

Some years ago, many responsible manufacturers of polyethylene sheeting recognized the need for an understandable standard, and in 1961 the Department of Commerce and the industry developed and published Commercial Standard 238–61. This standard, a voluntary one, was fairly broad. It was the first attempt by a relatively new industry to arrive at a common ground of understanding. The specifications were too loose; it was voluntary and not subject to regulatory actions, and left the door open for misinterpretation of the standard. The result was a market flooded with lightweight material. Again, recognizing the looseness of this standard and the need to protect the buyer, this group developed and had published a new standard, now known as Product Standard 17–69. This voluntary standard, which superseded Commercial Standard 238–61, had much tighter although achievable specifications. It clearly spelled out for both the manufacturer and user exactly what was packaged. To further clarify the specification, it called for the label to show a net weight that would be the sum total of width, length, and thickness.

There are two ways for a buyer to check the quantity of a roll of polyethylene sheeting. One, by using a finely calibrated micrometer, making sure that the pressure is constant, the length of dwell time is adequate, and that sufficient measurements which can be averaged are taken. The second way, and much simpler, is to weigh the package. To repeat, a net weight, by a simple formula, is the sum total of width, thickness, and length. For example, a roll of clear polyethylene sheeting 0.004″ X 10′ X 100′ (or 1,000 square feet) weighs 19.1 pounds. It does not weigh 17 pounds, or 15 pounds, or 14 pounds, or even 18¾ pounds—but 19.1 pounds. Other sizes, of course, are proportional. There can be no misintrepretation by anyone. The manufacturer and the buyer both know exactly what is in the package. All that is needed for a check is a scale, which is normally readily available. By initiating and following Product Standard 17–69, responsible members of the polyethylene sheeting industry have made a sincere and conscientious effort to assure the buyer of full value.

We know you and your people are making a sincere effort to stop the traffic of underweight, mislabeled polyethylene sheeting. We know you still believe 16 ounces equal 1 pound, and that 12 inches equal 1 foot. We thank you for the interest and dedication you have shown. Our industry, my company, and I stand ready to assist you in any way possible.

DOES EQUITY PREVAIL?

by E. E. Wolski, Manager of Quality Control, Colgate-Palmolive Company, New York, New York

Does equity prevail? In my opinion it does. At least it has survived up to now. And in the long run, equity will prevail. But I fear that to some degree we are perhaps redefining it, and redefining it in such a way that it will ultimately cost the consumer money. Let me explain.

First, as an individual my views are a little different from those of most of the delegates to this Conference, because I represent a national packaging company. In my company I manage the quality control function, which includes the administration of the company's internal policies, methods and controls over net fill. Like most, we are a responsible and honest company. But at the same time, we operate in a highly competitive economy and must accomplish our responsibility in these matters efficiently and at a minimum cost. In other words, there is no acceptable excuse for failure to meet our company's obligations, nor is there any acceptable excuse for excessive cost to play it safe. My own company has been in business now for 165 years and has a reputation for quality products, fair dealing, and value. At all levels of the corporate structure there is the requirement that every employee discharge his responsibilities so as to protect that reputation. But it will come as no surprise to you that every employee's performance as to cost is also measured. That is a fact of life in our economic climate.

My views are perhaps a little different from those of most of the other associate members of the National Conference on Weights and Measures, because I have served for four years as a member of the Committee on Liaison with the National Government and know full well that not all sellers comply. Some are no doubt dishonest. They need to be ferreted out, and more power to you. Some simply do not know what is required and operate in accordance with control policies which either tag them as violators or needlessly cost them money. Either way, it is my deep personal conviction that no company can withstand either the bad publicity of citations for illegal practice or the economic disadvantage of excessive overpacking to avoid trouble. To a large extent, all packagers, large or small, are concerned about their reputation on the one hand and about profits on the other hand. The Conference should consider educational sessions offered for sellers. A better understanding of their obligations and their rights

would go a long way to resolve all but the problem of possibly dishonest or incompetent operators.

You will note that I said "rights," because we are talking about equity here. Webster defines "equity" as "a free and reasonable conformity to accepted standards of natural right, law, and justice, without prejudice, favoritism, or fraud, and without rigor entailing undue hardship." This means a fair and impartial regulation of transactions involving weights and measures. Put another way, it means that the buyer gets what he pays for. Everybody knows that means he does not get less. Unfortunately, it is forgotten by many that it also means he does not get more.

There have always been real problems. Centuries ago, in the middle ages, the seller reigned supreme. Transactions were made on the basis of a system which was clearly and simply defined as Caveat Emptor—Let the Buyer Beware. Now apparently there have always been more buyers than sellers, and with the passing of a few centuries the Baker's Dozen became the basis of commerce. As you know, a baker's dozen is 13. The term originated when the buyers obtained such strict controls over short measure that bakers gave high count (13 per dozen) to avoid the harsh penalties for offenders. The buyer had succeeded in turning the tables. Caveat Emptor was dead. The rule was Caveat Vendor—Seller Beware. The only side of the story that history has not recorded is the obvious one that prices must have increased as quantity did. Dishonest operators were, in fact, brought under control, but the basic laws of economics and price competition most certainly must have forced a price rise when overage became the rule.

There is an old saying that history repeats itself. As one who has been interested in this Conference, in its goals, and in the progress you all have achieved, I am, as a packager, very conscious of a trend which exists. And I feel concern because of what I see.

Let us review what has happened. I do not think anyone will be so naive as to even suggest that an elimination or reduction of inspection or enforcement would result in anything other than a return to the situation which made the need for them so apparent. It is a well known fact that where enforcement drops off, so does compliance. I once asked the state director of one of the last states to initiate weights and measures enforcement what he encountered initially. I was informed that the average gallon was about a half pint short and that an average pound had been a little less than an ounce short. He further stated that the shortages had been statewide and were almost universal. He was firm in his conclusion that everybody, literally everybody (and that includes you and me), needs to know that someone is there watching what he does.

In our operations, for example, the inspections are performed by personnel who are not members of the production force. They are members of the quality control staff and have no personal stake in the problem the production department faces if its goods do not comply. And although we would like to think that we at Colgate are a special breed of people not subject to the temptations of the average man, I will never recommend that the final evaluation be made by the people responsible for producing an item. In fact, to the contrary, we follow up by also making an additional independent warehouse evaluation to verify that the goods correspond to the reported results tabulated during the production run.

Now, let us look at what this means. My company is honest. Of course it is. But there is nothing unusual in that. Think for a minute how literally impossible it would be, with various financial laws and regulations, accounting audits, and other controls, to standardize on an illegal practice. Also, consider how literally impossible it would be to hide an actual cost result which differed from the standard cost performance, which in turn must have been based upon compliance with legal responsibilities. We are concerned that mistakes might not be caught in time. We are concerned that they might sometimes not be reported. We are concerned because the reputation earned in 165 years of fair and honest dealing represents an asset which we must protect.

I would be less than frank if I did not say that, what with being honest, with financial laws and regulations, auditing and all the other controls, we are also influenced by the fact that effective weights and measures programs are maintained. And we design our equipment and our controls to assure compliance.

Let us go back to the comment that history repeats itself and that the current trend is a matter of personal concern to me. Today's effective weights and measures enforcement programs in cities, counties, and states all exist because of the insistence of the public. History had repeated itself, and Caveat Emptor (Buyer Beware) again demanded correction. It demanded supervised and enforced correction. The result is the equity that has existed with reasonable regulations defining the buyer's right to fair measure, the seller's responsibility, and the reasonable error which is to be expected above or below the labeled quantity. Equity has prevailed.

But let me tell you why I am concerned by what I see. I observe a trend for weights and measures enforcement to be incorporated into broad consumer protection or consumer affairs agencies. The trend further places the emphasis upon the label quantity often being considered the minimum. We find ourselves in an expanding situation where on the one hand we all profess to recognize that the seller, if he exercises care to operate within the limits of reasonable

plus or minus error, has earned the right to average the label quantity under our equitable system. We provide him with the economic incentive to improve his operations and control so as to reduce variation and thereby profit by the reduced overpacking this permits. This is his reward for his work, and in some instances the reward justifies expenditure for better equipment and design. But as he reduces variation and is able to reduce his average quantity target, the number of underpacked units will increase. That is a mathematical fact of life and simply follows the mathematical law of probability. In fact, if he continues in his efforts to improve, he would ultimately eliminate overfilling cost, would average the label quantity, and would produce units within variations of reasonable error. That is what we all want. It is the stated goal of packers and enforcement officials alike. But look what happens.

The law of probability tells us that half will be above the label quantity, and half below, as he achieves this ideal we all want. As he improves his control in accordance with his share of the equity which prevails, his problems with enforcement inspection actually tend to increase. It is a fact that the packager is entitled to operate with effective controls, averaging the label quantity, with only one unfortunate additional requirement. That one requirement is that he has the right to average the stated quantity provided he is always equal to or above it on a sampled lot. Now just as individual units will usually fall half above and half below the average (I say "usually" because some processes or operations tend to skew to one side, and for many reasons), the average of samples will also tend to fall half above and half below the average. That is another manifestation of the mathematical law of probability. The only thing different about sample averages is that they will always vary less than the individual units do, and the skewness of the process will tend to reflect itself less in the average values. Now it really is not equity to require only that a seller maintain control and average and then consider up to one-half the sampled lots in violation. But even so, it is not a major problem for a packager who has a good program effectively administered. It does not take long to recognize that the apparent problems are relatively small and that he does, in fact, do a good job when compared to others who do not. For the packager who does the job, equity does prevail, because reason also prevails.

But will reason continue to prevail? I hope it does. But there is no denying there are those who would see history again repeat itself and once more replace equity with the Baker's Dozen. Remember, we do already have a fair and equitable system. You all have a long record of effective administration to achieve vastly improved conformance.

Perhaps these are misguided souls who believe that, in the freest and most competitive economy the world has known, the seller can somehow be forced to give something extra for nothing. He cannot. His price will increase. If he could give more, charge less, or make it better for the same price, he would do so to obtain the advantage all that would give him relative to his competition. If he gives the consumer more, he will charge for it. He must.

If those who profess that "if it says a pound it should contain a pound" are only objecting to the current equitable system based on the average, let them seek revision of the system. As a packager, I do not care what law we have, provided it is uniformly and equitably enforced and is applied to all. If the desire of the consumer is minimum regulations, fine; but change it to reflect that. Do not tell me "average" and then enforce "minimum." And do not expect some packagers to somehow set a precedent for actually packaging minimum while the system is still based on the average. They cannot survive the economics. And do not select sellers to serve as precedent-setters. It has to apply to everybody.

I have observed another pressure applied—unusually precise, close-tolerance inspection weighing, so precise that it can sort out into several brackets units that are within one division of the almost universally accepted commercial weighing device. Unless the packager increases his weight and sacrifices his share of the benefits of our equitable system, he is automatically off sale 50 percent of the time, just due to the probabilities of sampling. Would you believe that the field inspection I mention will differentiate between the tare values of individual toilet soap wrappers? This would seem, to me at least, to fall outside the definition of equity which includes "without rigor entailing undue hardship."

I have tried to show you both sides of the coin here today. As an active participant and supporter of the Conference and its objectives and as a member of industry, I will be the first to say that effective, equitable weights and measures regulations and their enforcement have brought benefits to the consumer and the seller alike. The consumer has assurance of fair measure, and the seller has protection from unfair practices by dishonest or incompetent competitors. I am firmly convinced that equity does prevail. But we of this Conference must recognize that this will continue to be true only so long as we all do our part to see that reason also prevails. There can be no equity without reason.

UNIT PRICING—A GIANT STEP FOR CONSUMERS

by Mrs. Esther Peterson, Consumer Advisor to the President of Giant Food Inc.

I am delighted to speak to you once again, this time as a private citizen. I know you as old and dear friends with whom I share a common cause. You stood up for us on the packaging bill and supported many of our proposals when I served as Assistant for Consumer Affairs to President Johnson. I found you to be a cooperative and knowledgeable source of expert advice when we consumer advocates were still thought of as crackpots who would go away if ignored.

This group is so respected that we often take the protection you guarantee for granted. No consumer group ever challenges your honesty or your accuracy, and you guard a key consumer protection without which business could not be conducted in this nation.

You are on the frontline of consumer protection, and therefore your support for some new consumer breakthroughs would be invaluable. I hope to tell you about some of the exciting, innovative things we are now doing at Giant, and enlist your help in making them a reality across the nation.

We have already introduced comprehensive programs of unit pricing and open dating. Both programs are meeting with overwhelming consumer support. Everyone is not using these aids as much as we wish they would, but an increasingly large number of shoppers do. We are planning a greater educational effort, especially among young people, to make unit pricing and open dating part of the shopping habit. And that is not all. Soon we will introduce the nation's first experimental program of nutritional labeling, which we have developed in cooperation with the Food and Drug Administration.

These programs are designed to give shoppers the information they need at the point of purchase. We want her family's dollars to be spent on the best quality, the best value, and the greatest nutritional content possible. We do not think that is too much trouble for the retailer. We are committed to the consumer's "Right to Know" the full facts about the products she buys. My experience at Giant has confirmed what I have always believed. You cannot lump businessmen together and call them "the bad guys." Many businessmen understand the legitimate demands of consumers and want to reform the

marketplace. They know that these reforms will be as good for business as they would be for the public.

These are the businessmen who will bring the desired "Progress through Cooperation and Understanding."

But there are still too many powerful forces within the business world who are forever tilting spears at monsters and hobgoblins. They paint the consumer as the "enemy" of the poor, beleaguered, and misunderstood American businessman. This is nonsense. It is an unreal view of the word, and does a disservice to our nation. We can ill afford additional polarization and conflict in these distressing times. Business and consumers do not have to be enemies. Like the plaintive cry from "Oklahoma,"—"Why can't the farmer and the rancher be friends?"—I would like to show that the grocer and his customer can be friends. Indeed we have demonstrated at Giant that they are friends.

Perhaps the most exciting thing that has happened since I came with Giant has been the breakthrough in communications that has occurred. We have all been in our little boxes so long—welded to the conventional wisdom for so many years. Businessmen have been telling each other, "You cannot talk to those consumer people; they are just close-minded nuts." We consumer people, on the other hand, have tended to lump all businessmen together as ogres, and have refused to negotiate with what we regarded as "the enemy." Both groups have been wary and suspicious of government, which, in turn, has often had a very paternalistic and patronizing attitude about the effort of outsiders to meddle in what they regarded as their affairs.

At Giant, one of the first things we did after I came aboard was to start knocking down those artificial walls. We called in all the consumer people who had been complaining so loudly about the inaction of business over the years. Giant's top executives listened to them. They learned that some of the suggestions they received were not so crackpot after all and that the people making the suggestions did not have horns. The consumer people, on the other hand, were greatly impressed by the receptivity and the progressive attitude of Giant's management. We found wide areas of agreement where we could work together. Today, those same Giant executives ask me to be sure that we have some of those erstwhile "consumer nuts" in before making key corporate decisions. All our Giant consumer programs, and they are many, have resulted from this kind of ongoing dialog.

These dialogs, I should add, are not complete without representatives of the key federal and state government agencies. It is fascinating to watch Jim Turner, the Nader group's expert on the FDA and author of that indictment of FDA, "The Chemical Feast," working diligently with key FDA people at our Giant meetings on nutritional labeling and ingredient labeling.

The experience has convinced me that, despite all our miracle communications media, the terrible polarization this country is undergoing today is not due to any basic division among our people, but to an incredible failure of communications. Our experience at Giant has convinced me that most of our national ills are capable of solution if we can only put our rhetoric aside and sit down together in an honest and open fashion and sincerely try to work out our differences.

One of the programs that resulted from such a dialog was the Giant program of unit pricing, which I have come to discuss with you today.

We were not the first in the nation to institute unit pricing, but I would like to believe that we were the first to make it really useful to the consumer, the first to make it more than a promotional gimmick. We were the first to install the system throughout the store and throughout the chain.

A great deal has been made of an industry survey which showed that only 20 percent of America's shoppers even look at labels. I am frankly unimpressed by that figure. First, because I do not believe it. Second, because it is irrelevant, even if it is true. We have a responsibility to provide the customer with all the information she needs to make an intelligent decision, whether she chooses to use that information or not. There are many citizens who do not vote—many more than the 20 percent cited in the industry survey—but no one is suggesting the end of elections.

Now, with your indulgence, I would like to tell you how we developed Giant's unit pricing system, what our costs were, and what problems and benefits we discovered.

All methods of unit pricing were considered before we decided on one that we considered most efficient and effective. We quickly decided against stamping the unit price on every can, for several reasons. First, the customer would have to pick up each item to find its unit price. Second, we thought it would be too costly and might raise food prices. Third, we found that the technology to do it simply did not exist yet. So that put an end to that thought.

Next, we considered the possibility of posting the unit prices by categories on large signs. We discarded this method as too cumbersome and inconvenient for the customer. The signs would often have to be placed some distance from the point of purchase, and would therefore not be used as often as we would want them to be.

The least effective method, we decided, would be to give the customer a mechanical device, such as a paper slide rule, and urge her to compute the unit price herself. This is time consuming, often complicated, and places the burden of action on the consumer.

Giant instead chose the method which is easiest for the consumer to use and is fairly easy for the company to maintain. We use shelf labels. We like them because they give the customer the unit price of each product at a glance. And she reads it in the unit most familiar to her. As one shopper exclaimed after learning that she was paying over $3.00 a pound for boneless and skinless sardines: "This really is full disclosure!"

To make the units of measure as simple as possible, we decided to list:

Price per pound.
Price per quart.
Price per 100 count (paper napkins, etc.).
Price per 100 square feet (aluminum foil, etc.).
Price per pint (health and beauty aids only).
Price per 30 cc. (health and beauty aids only).

Our executives then ran several pilot tests to see which type of labels and which type of display counters were best suited to this method of unit pricing. We appraised more than 10,000 grocery items and determined which unit of measure would be used for each. After checking and verification, we converted each item size into a factor for the computer. The data were then submitted to our Data Processing Department for transmittal to the computer. The final printout was made, and all items were again checked for consumer acceptance, value, and proper size.

The Data Processing Department set up systems to handle the ordering of new labels for new counter setups, price changes, new items, and soiled labels. After a few months of operation, we discovered that the initial paper labels were not practical. They became soiled and easily torn. So we have just switched over to a plastic insert type of label. This has added somewhat to our costs.

Initially, the estimated cost of maintenance for our unit-pricing program was $15,000 a year, or approximately $150 per store. It now costs more than that—$22,000, or approximately $230 per store per year. The reason for the increase is the changeover to the plastic labeling which I just mentioned. Once the installation is complete, we expect the cost to drop again.

Today, we are unit-pricing about 9,100 items. And contrary to some industry nay-sayers and doom prophets, it has not raised either our costs or our prices.

The other day our executive in charge of groceries told me: "Esther, if you asked me to drop unit pricing tomorrow, I would not do it. It is an invaluable management tool. It helps us run a tighter ship." This came from a man who had not been terribly sold on the idea at the start.

Is not that ironic? We are all sealed into our tight little boxes. We are so suspicious of a suggestion when it comes from an unfamiliar source. Management just assumes that a consumer reform will be uneconomical. Consumers assume that any program which business initiates contains some hidden device to take advantage of him. And both are so wrong.

Unit pricing has been a marvelous aid to Giant. It has given the store much better inventory control. And since unit pricing was adopted, pricing errors have dropped dramatically. There are some problems, but they are mechanical ones. If an error is made, it is a universal error and appears in every store. Some peculiar packaging, cents-off deals, and two/fors or three/fors require special computing.

I recently appeared on a Baltimore TV talk show and was using some examples to explain unit pricing. Just before we went on the air, a TV camera man—a union man who knew me from my days with organized labor—loyally reported an error in one of my examples. A six-pack of Libby's grapefruit juice was listed as $3.68 a quart. "Why, that can't be right, Esther," he said.

What had happened was this. Our usual formula for computing the unit measurement of a quart is:

$$\left[\frac{\text{retail price}}{\begin{array}{l}\text{package ounces}\\ \text{ounces per quart}\end{array}}\right] = \text{unit price per quart}$$

In the case of the six-pack, the formula should have been:

$$\left[\frac{\text{retail price—69 cents}}{\begin{array}{l}\text{package ounces—36 cents}\\ \text{ounces per quart—32 cents}\end{array}}\right] = \text{61 cents unit price per quart}$$

Instead, the package ounce factor was set up at 6. It should have been 6 × 6, or 36.

But do you know that, out of 8,827 grocery items in stock at that time, there were only three such errors. As our data processing man told me: "Esther, you picked a 2,942-to-one shot!"

One of the complaints about unit pricing is that the consumer will overlook quality in pursuit of the cheapest product. This is not true. We find that customers are trying less expensive brands and then switching to them only if quality is comparable. For example, we are seeing increasing sales of Giant brand products—products which are often packed by the same canners and processors who label more expensive brands, but at a savings to the consumer. With unit pricing,

the customer is better able to decide which size of a particular brand is most economical for her needs. For example: Six ounces of V–8 vegetable juice sells at 6/57 cents, which comes out to 51 cents per quart. The 12-ounce size at 2/27 cents is 36 cents per quart. The 24-ounce size at 2/49 cents is 33 cents per quart. The 46-ounce size at 41 cents is 29 cents per quart.

That is how unit pricing works at Giant. Now let me comment briefly on your proposed Model State Unit Pricing Regulation. Naturally, I think the effort to standardize unit pricing laws is extremely important, and I support it. However, section 3, which provides an exemption for packages in quantities of one liquid ounce or less does the consumer a disservice. It is exactly those small items—many of them toiletries—which hide their true cost from the consumer.

The same is true for section 4, which exempts the store from unit pricing "when only one brand in only one size appears in a particular retail establishment." The customer can still benefit from the knowledge of the pound price of sardines and compare its relative value with a pound of ground beef. She is comparing the same basic nutrient—protein. I think that, if we want a better nourished America and better informed shoppers, we will need this information.

I have already commented on the merits of the various unit-pricing systems, and why Giant chose a label scheme. I feel strongly that the other systems do not do the job. I also believe that a proliferation of systems in the marketplace will confuse the shopper and hope that, after examining the various possibilities, you will support the shelf label method as a requirement. A regulation which fails to specify this system will not do the job in my opinion.

There are many ways that unit pricing has helped both the consumer and the retailer. One result may be the end of fractional ounces, and to that I say Hooray!

With unit pricing, there is no longer any benefit to be gained from complicated package sizes. It means less proliferation of brand names of equal quality, often manufactured by the same company. When the housewife has the facts at her finger tips, she can make up her own mind. She does not have to take the word of the Jolly Green Giant (that is not to be confused with Giant Food!) or the Man from Glad, or some other authority figure.

In closing, I would like to quote a few words by Mr. Danzansky, the President of Giant Food:

> We are finally realizing the truth of the biblical admonition that we cannot serve God and Mammon. A business has no inherent right to exist; it must serve a socially useful and responsible function if it is to justify its continued operation . . . Businessmen, young people, the minorities, and yes, even the often complacent middle Americans have come to the realization that this is

no longer a time of materialism, but a time of the spirit—no longer a period of self-seeking polarization, but a time of cooperation and dialog and partnership. Consumerism is here to stay and, frankly, I welcome it. Any force that keeps business on its toes, stimulates competition, and elevates standards of quality and service is good for America.

These words will perhaps give you some insight into why I am so proud to be associated with my third President—in this case, with Joseph Danzansky, President of Giant Food, and with his very fine company.

FORUM DISCUSSION

Mr. L. O. Leenerts (Purex Corp.): Mrs. Peterson, are you working on the labeling of the nutritional value of composite products, such as pastries with fruits and vegetables in them?

Mrs. Peterson: Yes, we are working on that. I want to emphasize that it is in the test stage. I will not recommend to my firm to go into a big labeling program until we know it is the right program. I think it is very important that the consumer know, for example, what is new and what the nutrients are in these new foods.

Mr. E. Prideaux (Colorado): Mr. Levine, can the density of polyethylene sheeting significantly change the weight?

Mr. Levine: Films for the end use discussed here are made from low density resins, which are normally in a 0.92 range. The lowest commercially available density is 0.915. For the products that we are talking about today, 90 to 95 percent are produced with a density between 0.918 and 0.920. The weight differential between densities is measured in just fractions of a percent. According to the formula in Product Standard 17–69, the width times the thickness, times the length, times the density equals the weight. The differentials between the normally used resins are very, very fractional and measured in fractions of a percent. I have the information on a sheet that I would be delighted to pass on to you or to anyone else that has need for it.

Mr. S. J. Darsey (Florida): Mrs. Peterson, is unit pricing going to prevent the store operator from putting on a weekend special?

Mrs. Peterson: Unit pricing has not affected the number of specials that Giant Food has had.

Mr. Darsey: Can a store manager lower the unit price if he is overstocked with perishable items?

Mrs. Peterson: Every manager has the right to lower it, but he cannot raise it.

Mr. Darsey: How is the flow of unit pricing information from the computer center to the store handled? Do the tapes from the machine come along with the delivery of a grocery order to a particular store, and does the grocery boy then put this on the shelf?

Mrs. Peterson: Yes.

Mr. M. D. Havercamp (Ethyl Corp.): As a manufacturer of polyethylene film, I would like to say that we certainly agree with the thoughts so ably expressed by Mr. Levine this morning. The weights and measures people are also due a lot of thanks and gratitude from the industry for the dramatic input they have had in a relatively short period of time in giving some regulation to this business.

Mr. L. D. Holloway (Idaho): If polyethylene film is bought for purposes other than for resale, how does that affect the end user, that is, a builder? Would you put "not for resale" on your label?

Mr. Levine: No. As I mentioned in my brief talk, the cost of film used in mobile homes, for example, or in a building is reflected in the ultimate cost to the consumer. So whether or not it is for resale at that moment, it eventually winds up in the consumer's hands.

Mr. Havercamp: I would like to make a point relating to the use of film in mobile homes. Not all mobile home film is sold direct to the manufacturer. Much of this goes through a distributor, who, in turn, resells it. Whether it is for resale or for consumption by an industry or whatever, I think that everything produced by a manufacturer should be labeled, because at the time of manufacture you do not know the ultimate hands through which it might pass. Therefore, any film product should be labeled to give the width, the thickness, and the length, and the weight should correlate to the thickness.

Mr. S. D. Andrews (Florida): I would like to pursue this discussion on "not for resale" because of an incident. At the request of the Ethyl Corporation, we made an investigation of a quantity of polyethylene sheeting being used by a contractor in a certain part of our state and were informed that he bought this polyethylene sheeting for use in his jobs and that we had no right to inspect it—that if he could buy it in thicknesses of 1 mil a little cheaper than 4 mils, he would do so. Does the new product standard recognize any thickness lower than 4 mils?

Mr. Levine: Yes, it does. However, the end use also dictates the thickness needed. I mentioned in my talk that one of the purposes for polyethylene sheeting is the prevention of moisture vapor transmission through a concrete slab. A 4 mil, according to various specifications by the FHA and other agencies, will have a certain transmission rate, and the rate increases rapidly the thinner you go. Therefore a 1 mil or a 2 mil, to be used for the purpose of what a 4 mil was designed for, is the same as not using anything.

Mr. Andrews: This particular film was being used as a vapor barrier for concrete forms in building sea walls, and the contractor said it was not that critical and that if he could get a 1 mil thickness, this would be sufficient. Is this an accurate statement?

Mr. Levine: Sir, in my opinion it is not.

Mr. Andrews: May I say also at this point that it was not labeled.

Mr. Vadelund: Well, if it was not labeled at all, it should have been. I think it is a general weights and measures principle that, whether you sell a product one time, two times, or a dozen times in the distribution chain, it has got to be appropriately labeled, and a statement such as "not for resale" has no real meaning.

Mr. M. Greenspan (New York City, N. Y.): Mrs. Peterson, you indicated that you are using electronic data processing equipment and that the cost was only $250 per year per store and did not result in any increased cost to the consumer. How will unit pricing affect the very small chain of self-service stores that do not have access to electronic data processing equipment?

Mrs. Peterson: The question for the smaller enterprise is an extremely difficult one. I don't know whether their suppliers can have the use of a computer. A very cooperative system might be worked out if this is possible. They may want to do it on a hand basis. I am quite sure that the legislatures will have to work out some kind of accommodation for small retailers.

Mr. Greenspan: As an adjunct to unit pricing, would package quantity standardization help the situation?

Mrs. Peterson: I do not think that is necessary if you have unit pricing. As a consumer, I just want to be able to know and make price comparisons. If we had standardization, that would be another story. We tried to get that in the packaging bill and lost.

Mr. Vadelund: I think I should comment here. The Laws and Regulations Committee's report is not for mandatory unit pricing, but for a standard method of presenting the information when a retailer chooses to use it.

Mr. H. Elseth (Land O' Lakes): Mrs. Peterson, is a product such as eggs unit priced by the pound?

Mrs. Peterson: That is by count. A dozen is a dozen. The information is clear there. You have the sizes marked, and the point is the consumer has a basis for valid price comparison.

Mr. Leenerts: In regard to unit pricing, Mrs. Peterson, the motto of the National Conference is "that equity may prevail." If we cut off the concept of unit pricing for the small corner store, a lot of people who do not have the transportation to go to a large market or a large shopping center would not have unit pricing and, therefore, would not have the same equity that more affluent people have who can get in their cars and go to the larger market.

Mrs. Peterson: You have touched on something that is beyond unit pricing. It is very difficult to have big chains in a lot of the intercity areas. I have gone into that very deeply with Giant because I felt that poor people, above all, should have the advantage. But I have found in my own investigations that the small stores do not

have the mass production and they rightly have to charge more. I think our society is wrong. If we want to keep those little stores, then we have to give them some kind of assistance, or else we have to make it possible for the one-price store to come into the area. I do not think unit pricing is the answer here. The answer is to look at what the problem is and to get into these deeper questions that relate to it.

Mr. Darsey: Mr. Levine, Product Standard 17–69 has been in effect now for quite some time. In our testing of polyethylene film, we found one over 4 mils, but all the rest have been less than 4 mils, and only two were within variations specified in Product Standard 17–69. We also found that some companies who agreed to the standard in the beginning and whose names are listed as acceptors are producing polyethylene under several different names, several different qualities, and a dozen different ways of labeling the same product. Are the companies that got together on the product standard really adhering to what they promised to do?

Mr. Levine: I believe that the major responsible manufacturers who have declared that they are producing in accordance with the standard are, in fact, producing to it. If they are not, I think this is a matter for you people to exercise your powers.

Mr. Havercamp: I would like to go back to the comment made by the gentleman from Florida on evaluating film from several different manufacturers and getting poor results. Most manufacturers, and certainly the major manufacturers, for a long period of time have been producing to the new PS 17–69, but prior to that, and during the transitional period, there was tremendous inventory in all manufacturers' warehouses which was in compliance with Commercial Standard 238–61.

As Mr. Levine said this morning, that standard was pretty loose, and many manufacturers interpreted it to their own benefit. The amount of film produced under that standard that could be found in warehouses, customers' inventory, and manufacturers as well, would be minimal. I think that we can gain more progress faster if we concern ourselves with the new PS 17–69, because film should be produced in full compliance with the standard and what the weights and measures people accept as good product.

Mr. Levine: I would like to comment on this situation. The Federal Government has a specification written around some polyethylene film. It is called LP–378C. Along with many quality requirements, it has a thickness specification which, when analyzed, permits the manufacturers to satisfy the government with film measuring in thickness up to 10 percent under, in turn creating a weight shortage of 20 percent. Bear in mind, please, that the government purchases material for its own use and not for resale. I want to show

you a slide showing this 20 percent deficiency and how it is arrived at. Please also bear in mind that the government agency admits that it will settle for a 20 percent light material. It also advised, however, that changes are being made.

As you can see, part of the specification says that, for thicknesses ranging from 1½ mil to 9 mil, a tolerance of plus or minus 20 percent shall be permitted when tested as specified in 439. I show that paragraph 439 says, "Five specimens at least 2″ X 2″ in size are taken uniformly across the width of the roll and are tested." I use a 4 mil example because that seems to be a standard of measurement, or lack of same. Now, if we take measurements, allegedly 4 mil, and one measurement is 2.8 mil and another 3.2, another 3.0 mil, another 3.6, and another 3.4, and you average them, they come out to 0.0032, which is 20 percent less than 4 mil. That will pass the military specifications. Now, I just wonder if the government will buy a yardstick that is 28.8 inches long, or a quart of milk that is 25.6 ounces, or permit a pound of butter in their commissary weighing 12.8 ounces. I think that this is where a lot of confusion is coming in, perhaps in Florida, and perhaps in many other states.

Mr. Andrews: This is what has puzzled us, Mr. Levine. Even the cartons that are labeled with the new PS declaration consistently run under 4 mils. We are just wondering if the trade practice is to take advantage of the 20 percent tolerance, or some tolerance, because, if we base our decision on the polyethylene film we have tested, meeting an average thickness of 4 mils, we would have condemned every sample we have examined with one exception. This has been done according to the techniques recommended in Handbook 67 to determine if the average is 4 mil. Is it going to be the stated purpose of the polyethylene industry, in meeting the new PS 17–69, to average the labeled thickness?

Mr. Levine: I, of course, speak for my company and the Society of the Plastics Industry. When producing to the new standard, they are producing to meet the average, to be equal to the average or above. There is no thought, and there is no way, according to the standard, where there can be a 20 percent light figure.

WEDNESDAY AFTERNOON, JULY 14, 1971

CONFERENCE LUNCHEON

Conference Luncheon, Regency Ballroom, Shoreham Hotel

Introduction of Virginia Knauer by Dr. Lewis M. Branscomb

It is a pleasure for me to make an introduction which I will make in short and personal style, because the proper formal introduction of the Honorable Virginia Knauer would, I think, take considerably more time than she plans to give in her remarks to this group. You know Mrs. Knauer as the Assistant to the President for Consumer Affairs. You know that, previous to her present position, she provided outstanding leadership in the State of Pennsylvania in behalf of the consumer. We are fortunate to have someone as accessible and capable as Mrs. Knauer to look after the affairs of consumers.

REMARKS

by the Honorable Virginia Knauer, Special Assistant to the President for Consumer Affairs

Good afternoon. It is a great pleasure for me to be with you again. I recognize some familiar faces in the audience today. And I want to take this opportunity to thank each of you who attended the regional conferences on consumer problems my office held in the spring. You provided valuable information and expertise, making a significant contribution to the overall success of those meetings.

The responsibilities of weights and measures officials have an important impact on America's consumers, and your performance of those responsibilities play a vital role in the progress of the consumer movement.

I understand, for example, that at the February meeting of your Study Committee on Education, consumer education was discussed. Since my earliest involvement in consumer protection, I have promoted consumer education as an imperative for all consumers, young and old. There has been some progress, but we have a very long way to go before consumer education is as familiar a part of the curriculum as mathematics is today.

I, therefore, urge you to give vigorous support to new consumer education programs, for your knowledge can be invaluable in creating a marketplace characterized by informed consumers capable of making wise purchasing decisions based on full information.

I am pleased, too, that some consumer issues have been incorporated into your National Conference discussions here this week. I would encourage you, not only at the national level, but at your state organization level, to increase your consultation with consumers and increasingly seek their input in your policy program planning before you take definitive positions. And should this not also be the case with your state and county offices? After all, if it is the consumer you serve, you should have more contact with him to know his problems as he sees them, so there may be maximum effectiveness in your program and policy implementation. There are a growing number of consumer organizations at the state and local levels now. Even if there are no formal consumer organizations in your state or at the county level, you can seek out community leaders for discussions and consultation.

I would also urge the widest possible consumer input into any proposed model rules and regulations before their adoption by this group. And naturally, I would hope you call on fellow professionals who have had experience at the state level on subjects for which you are considering model regulations.

Certainly, federal departments and agencies are increasingly aware of the consumer desire to be consulted in policies which directly affect him, his desire to be alerted of proposed regulations and hearings, so that he may participate. This is equally true at the state level.

I would also urge your increased coordination with other state offices which already have consumer protection responsibilities, such as the offices of the Attorneys General. As you consider the expansion of weights and measures offices into broader consumer protection offices, it is essential that they be not name-only offices or ones with limited power, which would lead the consumer to believe they can provide more than they actually can.

If my office can be of any assistance to you, do not hesitate to call on us. The Director of our Division of Federal-State Relations, Mrs. Betty Bay, has already been in contact with some of you, and I know she would welcome the opportunity to increase communication between our office and the 50 states. In short, our door is always open.

Introduction of Jean Nidetch by Mr. Matt Jennings

The National Weights and Measures Conference through the years has enjoyed much success with a purpose of administering accuracy of weights and perfection of measurement. It seems appropriate to have as our speaker today the founder and president of the world's largest weight control organization. This organization is also enjoying success by controlling weight and achieving proper and desired measurement. The membership of this group is known as Weight Watchers, while membership in our group may be recognized as Watchers of Weight. As watchers of weight, we put on weight to determine the accuracy of devices on which you may weigh to determine the amount of weight you have taken off. And each one is important to the other.

It is a privilege to introduce and welcome Mrs. Jean Nidetch as our guest speaker at this luncheon. She is in part Virginia Graham, an enthusiastic talker, she is part Ethyl Merman, you will certainly be privileged and able to hear her, and she is part Joan Rivers, amusing.

ADDRESS

by Jean Nidetch, Founder and President, Weight Watchers International

Equity does prevail. Some time ago, when I was privileged to be invited to this very esteemed Conference, I thought, "What am I going to say to those people?" I have experienced the same feeling so very often in these past ten years. I have been invited to talk to very distinguished groups about a thing that is so close to my heart that it takes me at least an hour to get around to the words that I know best. How do you get around to being "fat" when you are talking to a convention of podiatrists or to a convention of chiropractors? But eventually you have to get around to the reason for your existence.

Five years ago I was invited to appear before Weight Watchers in London, England, at Westminster Theater, and for a whole month prior to the appearance I told everybody, "Come to Westminster Abbey; that is where you will find me." You see, I am from Brooklyn. What do I know about London?

When I got there, I discovered that they do not even lose pounds in London. They pay pounds to go into our classes. They lose something called stones. It would not be a problem if a stone was equal to a pound, but it is equal to 14 pounds, so then I had to become a mathematician. As I walked up on the stage at Westminster Theater that afternoon and looked out at the faces of some 3,500 people, I thought, "How will I ever be able to communicate with them?"

I stood up and said the only thing I had memorized prior to the appearance, "Ladies and gentlemen, I weigh 5 stone and 2." From that point on, I was lost, until I looked at their faces, and then I recognized something. All over the world it is the same expression when you get right down to it. People are either skeptics about the thing that I am involved with, or they are believers. They fall into two categories. They are with us, or they are not yet aware of all of it.

Well, when I was invited to appear at the National Conference on Weights and Measures, I said, "I am so grateful for the powers that be. They have brought me to an organization that at least I feel I have something in common with." The word, ladies and gentlemen, is weight.

I have been hearing the word weight all my life, but it was not always spelled with a "w". It used to be plump, it used to be pudgy, it used to be pleasingly. Then it became something called glandular. I am not even sure what glandular is, but I used to say it to anybody who would ask. And then they did not always ask; they used to just look and say "Why?" Then people used to say, "With a face like yours, how did you let yourself go?" Cute little things like that. And I would say glandular. The remarkable thing about the word glandular is that nobody ever knows what you mean, but they say "Oh you poor thing, eat something."

And so we who were fat discovered that the word weight can be spoken about in inner circles in so many ways. You say glandular. Then you say something like heredity. You have to eliminate all your thin relatives, and you find a fat cousin somewhere. She is the one you take after. And then you discover that you are talking about a thing called weight. And you are a liar. You do not tell anybody that you get up in the middle of the night to raid the refrigerator. You do not talk about what you eat after midnight. And you say things like "if I only could, but I can't, it's glandular," or "it's the air that I breathe," or "it's that cousin of mine that I take after."

And so for those of you who do not know too much about who we are and what we stand for, I am delighted for this privilege to tell you that Weight Watchers is a thing that has touched more than three million people individually and, through them, hundreds of thousands of their families and friends. And it has brought an answer to a very interesting question. Can I really do this thing? And this thing is, believe it or not, lose weight.

You at this Conference have been watching the fractions. We have been watching the pounds and complaining about them, and making all kinds of excuses and telling stories. I think back to 1961, when I weighed 214 pounds. Of course, on my driver's license, it said 150. That is part of the lie, you know. I was one of the people, and there are many of us, who said, "I wish I could, but I can't."

Statistics tell us, ladies and gentlemen, that there are 79 million overweight Americans. And shall I tell you the sad thing about them? They think they can't. That is what is so sad.

Somebody said to me earlier, "Do you object to us having the ice cream?" By the way, the difference between the pink tablecloths and the yellow tablecloths is the dessert. The pink got ice cream and the yellow got fruit cup. For those of you who don't know, there are two rows of tables on my right with yellow tablecloths. They are Weight Watchers. In that group there is a missing individual. The individual that is missing weighs 2,100 pounds, because that is how much has been lost collectively by that little group seated over there.

I should like to tell you that losing weight has a great significance. Because of those who said we can't, we have discovered that we are capable of doing this thing by the very virtue of picking up our own hands. You see, we used to blame the waiter. We blamed our mother. We blamed our husbands. We blamed our wives. We blamed everybody in the world for a problem that we felt we could not correct.

Obesity has been known to be one of the major killers in our world, and I have been privileged enough to discover that it was no accident that those of us who have suffered obesity found each other. In 1961 I went to the New York City Board of Health, and there I was given a diet. The diet was written by a physician, and that is to answer so many of you who have questioned me as to where did it all begin and why did it start?

The diet was written by Dr. Norman Joluf. I had seen it many times before. You see, part of the illness of fat people is that they save diets. We collect them. Very often we paste them in albums. We save them in shoe boxes. We have dresser drawers filled with diets. All our lives we are great collectors. We are also pretty good at rewriting. So it occurred to me in 1961 that the one thing you cannot do is sit in judgment of.

Very often people say to me, "What is it that makes this thing work?" "Why is it that so many things fail and this thing works?" Well, I must tell you in all honesty I do not know what makes it work. But then there are lots of things we do not know. I do not know what makes Chanel No. 5 smell so good either. I simply hope they do not change the formula. You see, we are not sure whether it is the fish, the bread, the fruit, the milk, the female today, or the lecture every week. We simply hope that nobody changes the formula.

And so we decided on two very strong rules. First, don't do it if you don't want to. Don't do it because somebody stands in front of you and says, "It would be nice for you to lose weight." Nobody ever lost weight for somebody else in his whole life. Do it if you want to prove to yourself that you can. If you have an overweight spouse or an overweight child, by all means my advice to you is to leave him alone. The worst thing in the world you can do is tell him to lose weight, because he eats something every time you remind him he has a problem. We suggest that you don't do this thing unless you want to. The second very important rule is to check with your own physician.

I think I talk the way I used to eat—compulsively and constantly —and I love to do it, especially to people who are interested in what we have to say. I started to talk to my friends about losing weight. I took the diet that was given to me by the New York City Board of Health. I said, "Look, it is working for me. I am eating three meals a day." Not because I approved, may I tell you, but because

I was afraid not to. You see, at a clinic, if you don't follow the rules, they terminate you. That is the word they use, and the thought of being terminated from a free clinic. . . .

And so, when I gave the copy of Dr. Norman Joluf's very fantastic and very simple diet to fat ladies, nobody believed. In those days, it was only the ladies that came. You see, fat ladies did anything just to prove you were wrong. Fat ladies joined any organization in the world just to prove that it wasn't correct, that it wouldn't work. And when those ladies succeeded in losing weight, their husbands and their brothers, their cousins and their nephews came, and so we discovered something at Weight Watchers—that obesity does not belong to women; men can be afflicted too.

In 1963 Weight Watchers Incorporated was born, primarily because I discovered there were many of us. I lived in Queens, in New York. So on May 15 Weight Watchers was born. Four hundred people attended the first meeting. We had 50 chairs, and that is what started the three classes a day. We took the first 50 and sent the rest of them to go window shopping. Of course they went to eat something. Everybody eats before a meeting, you know that. It is always a pleasure to talk to a group that has just eaten. At least you know they are not hungry. From that point on, the rest of it is history.

We are proud to tell you that we are located in 47 states in these United States and in five foreign countries. We have never brought Weight Watchers to a place where we have not been invited. I have had the extreme privilege of hearing our program given to interested people in French, in Spanish, in Hebrew, in Braille, if you will, for classes that have only the people who are blind, and in the sign language for the deaf. We have classes for teenagers, classes for men only, co-ed classes.

I have experienced joys that I cannot begin to tell you. But I would be remiss if I did not share with you three incidents that have occurred to me in this past year. The first one took place in Phoenix, Arizona. I was in a department store in Phoenix, and a lady walked up to me with a Weight Watcher cook book and asked me to sign it. She had crutches under her arm. I did not look at her legs, but I noticed her Weight Watcher pin. By the way, this is the pin that we all wear. It is significant of what we have lost. I asked her if it was difficult to lose the weight, and she said, "No, I have a manually controlled car." As she walked away, I looked down and saw that she had two wooden legs, and it occurred to me that she could have worn slacks that day, but she did not. Obviously I had to have seen that here is a lady in Phoenix who made it to class with a manually controlled car because of the devotion and dedication that is needed to do this thing.

A month later, in Dallas, Texas, a woman came up to me and wanted me to meet a Weight Watcher—a lady who had lost 47 pounds and joined Weight Watchers in order to get a seeing-eye dog. She had not been able to get one because she was overweight.

The third experience that I remember vividly was in New Haven, Connecticut. A young girl came up and said, "I am 21 years old, Mrs. Nidetch. I am computer dating. I have lost 96 pounds." It occurred to me that to be 21 and to be 96 pounds overweight is as handicapped as the blind lady in Dallas and the lady with the wooden legs in Phoenix.

For those people who have come to Weight Watchers, even in spite of all their handicaps, I can tell you that I am proud and privileged to bring our story all over the world to anybody who is interested in hearing it.

My next visit, as I was telling Mr. and Mrs. Jennings, will be in Memphis, Tennessee. We will be talking to groups, free to the public, open to the audiences who wish to come.

Many of you today have stopped me and asked questions about your families. I should like to let you know that I would be more than happy to answer whatever questions time will permit. I have been asked to be as brief as possible, but I would be remiss if I did not introduce the lady who is the director of Weight Watchers in Washington, D. C. She is with us today. She has lost 53 pounds, and has been instrumental in leading a group of people to teach the rest of that yellow tablecloth group in how to do this thing. I should like very much to have Rose Friedland, 53 pounds lighter, stand up and take a bow.

This morning there was a knock at my door here at the hotel. I opened the door, and there stood a young man. He asked me to sign something for him and said, "I have lost 17 pounds and I live in Washington. I heard you were in town so I just came over to say hello." His name is Vincent Cullen, and he is 15 years old, and I invited him to lunch today.

He brought with him, at his request, his sister. His sister, ladies and gentlemen, is what we at Weight Watchers refer to as a civilian. Civilians are people who are not fighting our war. When they have a situation that they cannot cope with, their throats lock, they cannot swallow. At the same time, the compulsive eater is eating anything that does not move. Ladies and gentlemen, if you are a compulsive eater and you are married to a civilian, don't stop loving him, just stop competing with him. The civilians are sleeping all night while we are checking that refrigerator.

We have learned that people need each other. Weight Watchers has become somewhat of a love-in. All over this world I have greeted people, I have shaken hands, I have said hello, and I have read all

the dreams and the hopes that are written across their faces. If losing weight can bring people together where they can walk in dignity and say "I can do it," then maybe they can live together. Maybe they can ask the boss for a raise. Maybe they can learn to make problems smaller and solve severe situations. I think we can.

There is a lady in New York who checked into Weight Watchers weighing 749 pounds. She came to us and said, "I can and I will." And she is doing it. Thus far, 250 pounds are gone. She has an army of people behind her. You see, we discovered that people need each other. Together we can move a mountain, even a mountain of fat. So, as a consumer, may I say thank you for helping to bring us together once again.

INDUSTRY DISPLAY OF NEW DESIGNS, APPLICATIONS, PRACTICES

Industry Display, Executive Room, Shoreham Hotel

A new feature of the Conference program this year was an educational display which was held on Wednesday afternoon in cooperation with industry. The informal display of equipment and material by manufacturers and organizations that have an interest in weights and measures activities was very well attended and received.

The following organizations participated:

Arkstrom Industries, Inc.
Berkel, Inc.
Brookline Instrument Co.
Cannon Mills Co.
Colt Industries
DeLaval Separator Co.
Empro Products Co.
Henry Troemner, Inc.
Hi-Speed Checkweigher Co., Inc.
Hobart Manufacturing Co.
Howe Richardson Scale Co.
Liquid Controls Corp.
National Scale Men's Association
National Technical Information Service.
Neptune Meter Co.
Ohaus Scale Corp.
Revere Electronics
Rucker Precision
Sanitary Scale Co.
Seraphin Test Measure Co.
Southern Weights and Measures Assn.
Thurman Scale Co.
Toledo Scale Co.
Veeder Root Co.
William Wilson's Sons, Inc.

MORNING SESSION—THURSDAY, JULY 15, 1971

(A. T. Anderson, *Vice Chairman*, Presiding)

MEASUREMENT IN A CHANGING WORLD OF TECHNOLOGY

by Dr. F. K. Willenbrock, Director, Institute for Applied Technology, National Bureau of Standards

Since all of you attending the Conference today understand your relationship with the Office of Weights and Measures, I thought you might be interested in the relationship of the Office of Weights and Measures to the Institute for Applied Technology and the relationship of the Institute to the National Bureau of Standards, and the fit of all this in the context of our time, past and present.

I wonder if your image of the Bureau is similar to the one presented to me a short while ago—as a home for faceless individuals wearing green eyeshades. In the last nine months I have learned that this is far from the truth. The very goal of the National Bureau of Standards belies bureaucratic, dreary role-playing. The goal is this: "To strengthen and advance the nation's science and technology and to facilitate their effective application for public benefit." This is no mean goal. Embodied in it are a number of responsibilities, and I would like to indicate what a few of these are.

First, there is an obligation to science and technology in areas in which NBS has been assigned sole responsibility, particularly in the development, maintenance, and improvement of national standards of measurement. Another is to respond to emerging social problems—equity in the marketplace (which is your concern and also ours) and the protection of the public from specified hazards.

Let me endeavor to impart a sense of what the first responsibility is all about. Why are these measurement standards necessary? In the early part of the century, industry had little need for working measurements closer than a few thousandths of an inch. But time would, and has, come when industry has needed standards to a millionth of an inch and, in scientific measurements, to even greater accuracies. The NBS had to be out in front of these needs and, indeed, has developed a worldwide reputation for continually being in this advanced position. It has to stay there.

The time came, for example, in 1957, when the space race began and NASA (the National Aeronautics and Space Administration) and also industry looked to NBS for new precision measurements. High temperature measurements and the combustion of high energy missile fuels were needed; so were accurate thrust measurements in the million-pound range instead of the hundred-thousand-pound range previously available.

Measurements were needed on the effects of sudden and violent changes of temperature and pressure on the thousands of components of a missile system, and on the materials and mechanisms of rocket engines, air frames, and guidance systems. As appropriations for basic research rose, the Bureau's efforts and measurements increased, and in time we reached the moon and, I hope, also an enduring respect for the need for engineering standards.

Meanwhile public sentiment, always veering in one direction or another, has moved toward the down-to-earth concerns. Among these is the protection of the consumer.

Permit me to interject a historical observation at this point. The history and progress of weights and measures in the United States is in a sense the history and progress of the National Bureau of Standards. I consider the National Bureau of Standards as a spin-off of the Office of Weights and Measures.

That history goes back to the first official document of the United States, the Articles of Confederation, a clause of which stated that the United States Congress would have the power to fix the standards of weights and measures throughout the nation. When the Articles of Confederation were superseded by the Constitution, this authority was given to the Congress in Article I.

Such statesmen as Washington, Jefferson, Madison, and John Quincy Adams, and businessmen and scientists throughout the first quarter century of the Republic, repeatedly called for legislation establishing uniform and reliable weights and measures standards. Congress gave the Secretary of Treasury responsibility for developing the first standards, and a miniscule Office of Weights and Measures was set up within the Coast and Geodetic Survey. That was in 1836. In the next 60 years, as the nation grew, the need for a variety of standards grew with it. The Office of Weights and Measures was unable to cope with the creation of a whole galaxy of entirely arbitrary standards which affected almost every measurable quantity required by farm, factory, or laboratory. And so on April 18, 1900, in a letter to Congress, the then Secretary of Treasury Gage recommended that the Office of Standard Weights and Measures be reorganized as a separate agency to be designated the National Standardizing Bureau, and that it remain under the Secretary of the Treasury. Secretary Gage's recommendation was translated to legislation which the Congress enacted on March 3, 1901.

Rexmond C. Cochrane, in his History of the National Bureau of Standards, observed that, "Beyond anything its proponents could have contemplated, the coincidence of the founding of the Bureau with the Age of Reform shaped its history for the next 30 years. Weights and measures was to be the trigger."

The Bureau of Standards was not given regulatory or police powers. These were most appropriately left to the states. But it was assigned responsibility for the establishment of standards, standards instruments, tests, and analytical procedures, all of which made its scope of research in the physical sciences virtually unlimited.

The Bureau was lodged in the Treasury Department until the creation of the Department of Commerce and Labor in 1903, when it was transferred to that Department. When, in 1913, the Department of Commerce and Labor was divided into a separate Department of Commerce and a separate Department of Labor, the Bureau was assigned to its present location in the Department of Commerce.

As you well know, it was in 1905, that year when President Roosevelt took after the meat-packing industry, that the Director of the National Bureau of Standards called a meeting of the several states to "bring about uniformity in state laws referring to weights and measures and also to effect a close cooperation between the state inspection services and the National Bureau of Standards." This was really a call for cooperative state-federal enterprise, which got off to a rocky start, but which seeded your organization, the National Conference on Weights and Measures.

Now let me say a few words about the National Bureau of Standards and my major concern, the Institute for Applied Technology. The IAT, as we call it, is one of the three institutes into which the programs of the Bureau were regrouped in 1964. In the IAT we have brought together the technology-oriented programs. The names of the other two institutes, the Institute for Basic Standards and the Institute for Materials Research, disclose their missions. There is also a Center for Computer Sciences and Technology.

One of our advisory panels once called the Institute for Applied Technology a collection of disparate activities; and actually, as you look at the IAT, its goals are really somewhat disparate also. These goals are (1) to facilitate more effective government and industry use of technology by addressing those technological problems that require national attention because of their complexity; (2) to provide a common technical basis for a fair exchange between sellers and buyers with minimum regulation at the federal level; and (3) to provide standards, test methods, information, and specialized services as required by law to protect the public from specified hazards.

We include in this Institute an Office of Fire Research and Safety, an Office for Engineering Standard Services, an Office for Flammable

Fabrics, an Office for Invention and Innovation, a Product Evaluation Technology Division, a Building Research Division, an Electronic Technology Division, a Technical Analysis Division, and a Measurement Engineering Division. And, of course, we also include the Office of Weights and Measures.

The Office of Weights and Measures has the responsibility of making improved measurement technology work for industry and the consumer by assisting the states in attaining their objectives of providing for commercial equity between buyers and sellers. As part of that responsibility, I can assure you that the Bureau is happy to support the National Conference on Weights and Measures as a forum in which industry, government, and the consumer can play a vital role in lending direction to the weights and measures programs of the United States.

In his remarks at the opening of this Conference, Dr. Branscomb referred to the start a few years ago of the National Conference of States on Building Codes and Standards, which has been in many ways modeled after your Conference on Weights and Measures. The analogy between these two organizations is worth pursuing, since it illustrates the importance and value of the National Conference on Weights and Measures. The situation in regard to building codes in the United States today is, in a number of ways, similar to the weights and measures situation before 1901, only worse. There are more than 13,000 distinct jurisdictional entities in the United States and more than 6,000 differing building codes. Thus, a building process or material acceptable in one jurisdiction may or may not be acceptable in the next. Finding out whether it is, is a costly and time-consuming operation.

As one result, the building industry has not been able to make optimum use of the new technologies available today, and the many economic advantages of large-volume production in the construction of housing, hospitals, schools, buildings, hotels, and so forth are denied to the American public. We need to pull this pathwork into a coherent system, not by a federal building code any more than a federal regulatory system for weights and measures is needed. Rather, we should follow the weights and measures model. The legal authority for the building regulation lies with the states, although many have assigned their responsibility to more local governmental agencies.

The states need to work together to develop a compatible system of building regulations, so that there is a nationwide market for building materials and systems. They need to develop a means of encouraging the introduction of new and improved techniques and materials in the construction process. To carry out these functions,

the states need technical support; and through the IAT building research program, that support is being supplied.

Thus, the analogy between the National Conference on Weights and Measures and the National Conference on Building Codes and Standards is quite a complete one. The states have the regulatory authority, and the National Bureau of Standards supports their efforts to make the applications of that authority compatible within and among the states. In this way we hope to achieve a market uniformity in the United States in the building field similar to the market uniformity in the weights and measures area. The results will benefit both the consumer and the producer. We are working very hard in the building regulatory area to reach the level of performance that weights and measures has achieved during its many decades of service.

I think that this analogy is a particularly interesting one, because it has been very apparent to us in the Bureau that the example set by the Weights and Measures Conference—the relationship which exists between the state officials and members of the Bureau staff—has been cited over and over again as the work of the National Conference on Building Codes and Standards has developed.

The close cooperation between the Office of Weights and Measures and the state and local weights and measures officials has been one of the major factors in the success achieved in the past. But our expanding society continually poses new demands. We should, then, find new avenues for increasing our communication at the local, state, and federal levels to learn how we might be of even greater assistance in the future.

To this end, I met yesterday with your Committee on Liaison with the Federal Government to discuss your present concerns, such as the railroad track scale program, inspection of federally controlled activities such as the Post Office and military resale stores, and the need for new laboratory facilities for the major cities. Our meeting was very valuable, and I learned much from our discussion. In the weeks to follow, we will be considering these recommendations of the Liaison Committee in order to determine the best means available to address these problems.

The problems we face today most certainly require new technological advances. Achieving that technology, whether in measurement science or in the tools of management planning necessary to implement an effective weights and measures program, is the challenge we all face. I am confident that, through our continued cooperation, commercial equity will prevail in an increasing degree in this country.

FORUM ON MEASUREMENT

O. K. Warnlof, Office of Weights and Measures, *Moderator*

The intent of this morning's session is to provide a forum on measurement, or, more precisely, technical information based primarily on the mechanical activities of weights and measures enforcement. We are in a technical age. Although it has not received much attention these past several years, the mechanical activity is still a vital and essential part of any weights and measures enforcement program. It always has been and always will be the responsibility of weights and measures enforcement to secure to those in business the possession of properly designed and accurate weighing and measuring equipment with which to carry on trade. And this can only be accomplished with an appropriate standard—NBS Handbook 44—uniformly interpreted and uniformly enforced. And here at the National Conference is where H–44 is developed.

The objective of the standard, "that equity may prevail," should be expressed in performance terms generally, and the question of how to meet that performance is left as open as possible. As you know, the pholosophy expressed in the requirements of Handbook 44 are principally performance—not design. Wherever specifications of performance rather than design are possible, it permits industry to use its full innovative capability to solve the problem which is expressly described in the standard. Performance-based standards, however, put a tremendous burden on the ability to measure, because measuring performance is much more difficult than measuring design, which can often be done by inspection alone rather than periodic examinations and some supervisory activity.

Weights and measures is now confronted with a complex technological change in commercial measurement and in commercial devices. It is somewhat easier to argue about these changes superficially, calling upon subjective judgments and insufficient knowledge, than to do the hard work necessary to produce the needed technical facts in the development of the standard—H–44. It is our responsibility, the responsibility of all in weights and measures, to produce the needed technical facts and to maintain this performance philosophy in the development of and amendments to the standard—H–44.

With the application of ADP to a weights and measures enforcement program, the examination of devices becomes more significant.

From the data obtained in this examination, determinations will be made as to which devices will be tested in the future and at what intervals. To provide a workable solution in this area, the data must be reliable and the test procedures uniform.

With these thoughts in mind, the Office of Weights and Measures will sponsor a technical seminar in weights and measures enforcement, directed to field supervisors, at the National Bureau of Standards November 15–19, 1971. An announcement and application will appear in the next Tech Memo.

The forum this morning presents four topics of immediate interest to all involved in weights and measures—prototype examination, cryogenic liquids, trucking industry and weighing, and state laboratories. To present these topics to you, we have four distinguished gentlemen, each leaders in their fields. They are: Mr. Landvater, Vice President of Engineering, Ohaus Scale Corporation, and President of the Scale Manufacturers Association; Mr. Douglas Mann, Chief of the Cryogenic Metrology Section of the NBS Institute for Basic Standards, who has been working on a wide range of problems involving cryogenic systems and instrumentation; Mr. Edward Kiley, Vice President of Research and Technical Services, American Trucking Associations, who is a member of several professional transportation organizations and is the author of many articles on transportation economics; and Mr. Ronald Roof, Laboratory Metrologist, Pennsylvania Bureau of Standard Weights and Measures, who is the coordinator of the Pennsylvania Bureau's State Measurement Center utilizing the new state standards and equipment supplied by the National Bureau of Standards.

A MANUFACTURER'S VIEW ON TYPE APPROVAL

by J. H. Landvater, Vice President, Engineering, Ohaus Scale Corporation

As a scale manufacturer, prototype approval of weighing devices is a two-edge sword. To have it is both a blessing and a curse.

As I expand on my feelings on this subject, I will, of course, be expressing in many cases my personal feelings, I will be expressing the feelings of my company, Ohaus Scale Corporation, and I will also be expressing the feelings of the Scale Manufacturers Association. I will try throughout my discussion to make clear to you when I am expressing an opinion of the

Scale Manufacturers Association and when my comments are those of Ohaus Scale Corporation and myself personally.

Why do I say prototype type approval is both a blessing and a curse? First, let us look at the conditions that make manufacturers consider it a blessing to have prototype type approval. Probably the most important reason for wanting it is to "remove the gun from our heads." Let me trace a typical new product design project to illustrate what I mean. Let us assume, for illustration only, that there is no prototype examination of any type. In order to illustrate my point, I am going to describe the sequence that led up to a new product by Ohaus Scale Corporation over the last several years.

Figure 1 shows the product that I am going to use as the illustration. It is a conventional mechanical over-under checkweighing scale.

FIGURE 1

Before deciding to design this product, we of course did some market research. We knew there was a need in the marketplace for this particular device, we knew what the customer wanted in new features and performance characteristics, we knew what the price should be, and we knew how well the product should perform.

We also had access to the basic standards which generally apply in all jurisdictions where we will sell this product. Let us assume for the moment that we will only sell the product within the geographical limits of the United States and, therefore, we only need concern ourselves with the specifications for design and performance found in National Bureau of Standards Handbook 44. If we meet all those criteria, we will have a product that should be acceptable by each of the weights and measures jurisdictions.

The first step is to turn designers loose on the project to work out the basic design specifications. They take into account all the specifications as they interpret them from Handbook 44, and the first step is to build a very simple working model to validate any new concepts. Figure 2 shows that first working test model.

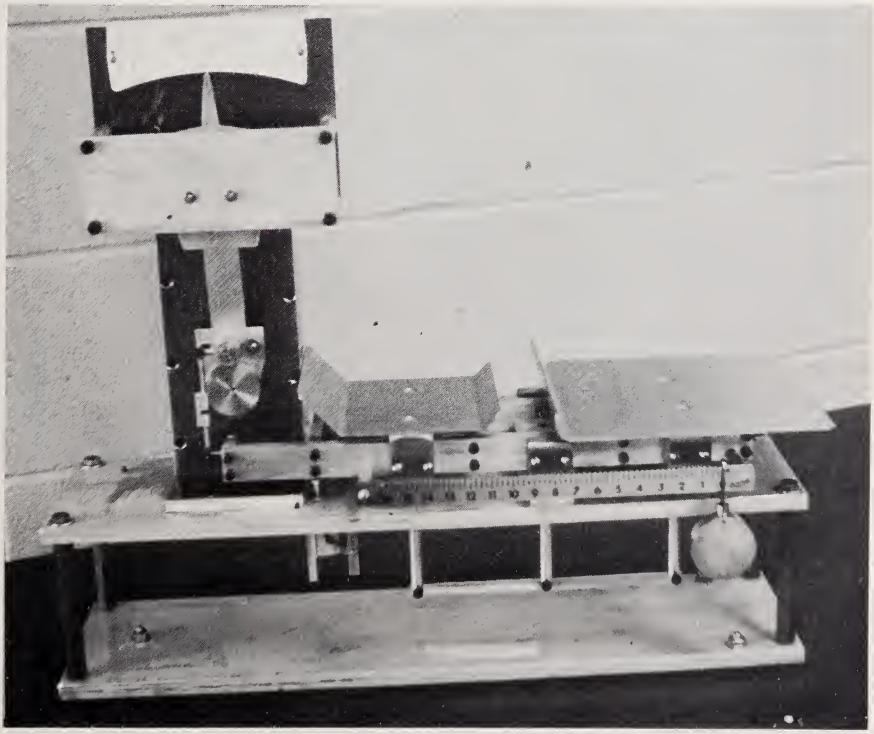


Figure 2

I find there is generally a misconception in the minds of most people about the amount of engineering effort required in designing a rather straightforward mechanical weighing device. After all, it is not very greatly different from similar devices that we have designed and manufactured in the past, so why the big deal? Actually, any deviation from an existing established design requires very careful attention to detail in order to design the best function at the best manufacturing cost.

Our next step after a careful evaluation of the first very rough model is to do an actual detailed product design, do some styling, and build some samples which now look very much like the finished product will eventually look. Figure 3 shows one of those working prototypes.

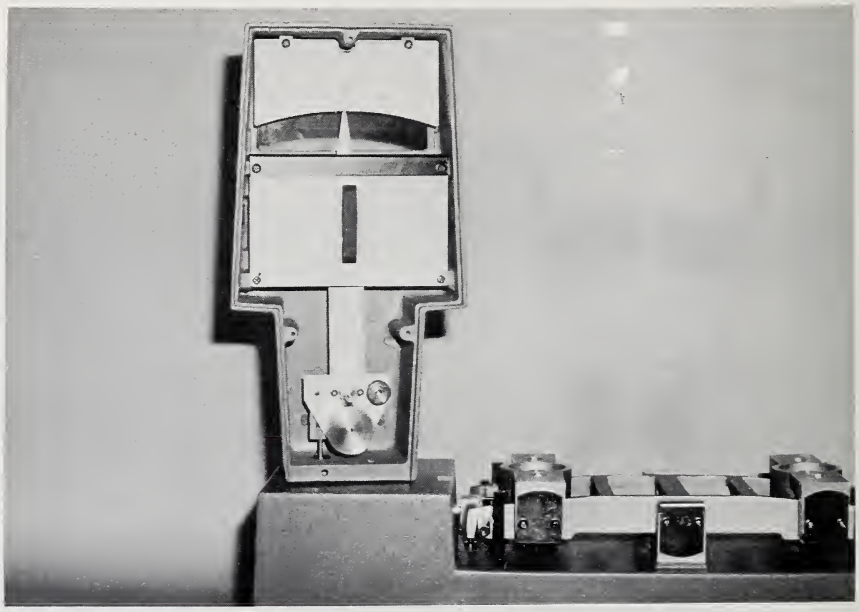


FIGURE 3

At this stage, these prototypes are handmade by tool and model makers. Every part is cut from solid stock to the exact detail drawing dimensions, and the product again is carefully tested and evaluated. Only at this point, after the engineers have satisfied themselves and the management of our company that they do, in fact, have a satisfactory design, are we ready to proceed with preparation for production.

At this point we do not yet have a prototype suitable for submission for type approval evaluation, because the handmade prototypes shown on the last slide will be changed in several ways, as a result of the testing and evaluation performed at this time before the product goes to its final production design. There will also be some changes as we prepare for production—that is, as we design the tools, determine the manufacturing methods, adapt the manufacture of parts to certain machine tools, etc. Submission of a prototype at this point would be premature, since the product will change in some ways, and could change in ways that would affect the validity of the prototype examination.

After anywhere from one year to five years of engineering efforts, a product of this type is tooled, and the first pilot production lot is completed. By this time the company may have invested anywhere from a few thousand dollars to hundreds of thousands of dollars in getting ready to produce the product. Somewhere along the line they have also spent considerable time, effort, and money in preparing the promotional materials that go along with advertising the product, setting up their marketing plans for the product, and in general preparation to get it into the hands of the buying public.

Now let us make one basic assumption and say that the engineers and the company have, in fact, correctly interpreted all of the specifications found in Handbook 44, and they do in fact have a piece of equipment that meets all of those specifications. We are also working on the basic premise, as you remember, that there is no prototype type approval examination in existence. As these new products begin to reach the marketplace, they will be inspected for conformity to H–44 design specifications, as well as conformance to tolerance of performance from H–44. This will be done by the local weights and measures inspector in the jurisdiction in which the product is to be used.

Since no one legislative body will have said to those individual inspectors, "This product does meet all of the design and construction requirements of H–44," the company will always feel as though it has "the gun at its head." Any one of the individual inspectors could at any time question whether this scale does, in fact, meet all the specifications. He may question things as subtle as hardness of pivots, or relationship between pivot hardness and bearing hardness. He may question whether, while this product is at that moment being used for a particular purpose, it could at some other time be used for some different purpose and, therefore, some construction feature not meet H–44 specifications. He could wrongly interpret the code and decide that the product was in violation of the code, whereas, in fact, it may be in complete conformance to the code, but sim-

ply because of his interpretation cause a condemnation of the product in a particular case. This could result in the company's need to repeatedly defend the conformity of its product to applicable specifications.

Let us look now for a moment, however, at the situation as it actually exists. We do, in fact, have type-approval examination, and, at least until a few years ago, that type approval was handled by each individual jurisdiction which had such type approval written into its code. I must be honest to admit that this has been good. In general, some 26 jurisdictions have required prototype submission for type-approval examinations before marketing new products within their jurisdictions. The extent of their examinations has varied from jurisdiction to jurisdiction, as is to be expected. However, this has not been without problems from time to time. The basic problem that has existed has been nonuniformity of interpretation of H–44.

In the past, it has been my experience, and the experience of other manufacturers, that interpretations based on H–44 by different jurisdictions will differ from jurisdiction to jurisdiction, and will also differ within a jurisdiction from time to time. We will find ourselves in some cases building in certain design features to the product required by one jurisdiction but not by others. We will find changes in philosophy and interpretation as personnel changes within a jurisdiction over the years. I am sure everyone here can look back at the changing interpretations of H–44 within your own jurisdiction over the years as people come and go within your weights and measures office. This is only natural, since everyone is an individual and will see things differently.

When the National Bureau of Standards suggested a few years ago that it would take on the responsibility of conducting prototype examinations as a service and make reports of their examinations as a service to the various states requiring prototype examination, we at the Scale Manufacturers Association endorsed their plan. It is not that we believe the people at the National Bureau are so much more competent in evaluating prototype designs, not that we believe they will be more favorable in their decisions toward the manufacturer's product, but only that we believe one interpretation of the code is preferable to many interpretations of the code.

This is one reason for our endorsement of the prototype examination service. Another is that the Bureau does have excellent laboratory test facilities and technicians available to perform the testing and evaluations of the prototypes. This is really one of their major reasons for being—the maintenance of primary standards, test procedures, etc. It is only logical that they should be well equipped to perform the technical aspect of the prototype evaluation.

Still another reason is their intimate knowledge of the development of the H–44 code. The people of the Office of Weights and Measures are intimately associated with the basic philosophy which goes into the revisions and development of the code from year to year. Who else would be in a better position to keep completely up to date on the intent of the various provisions of the code?

Now that I have told you why we think prototype type approval is important to a manufacturer and why we endorse the NBS prototype reporting concept, let me tell you why we object to some of the phases of a type-approval program, why we consider this a two-edge sword, and, while we are in favor of the blessings we receive from type approval, what we consider to be its curse.

The curse is time. Time is money. Money, and thus profit, is our reason for being in existence as a manufacturer. Unfortunately, the NBS examination service lengthens the approval cycle and costs us money.

When I discussed the design cycle earlier of one simple mechanical weighing device, I am sure you recognized that there is a large amount of money invested in a project of this sort before we are ready to submit a prototype for type-approval examination. I explained that we really need to have the product tooled up and take one of the products from our pilot production lot for submission for examination. At that point we are very close to being ready to deliver products to customers. We do not want any additional delays at that point that prevent us from beginning to get a return on our investment.

Just so you have some frame of reference, a normal return on investment of any manufacturing operation is considered to be 20 percent. That is, if there is an investment of $100,000 in design development and tooling of a new product, there should be a return of $20,000 per year to pay off the invested money and give the investors a reasonable return. This breaks down to $1,633 per month return needed for every $100,000 invested. It is obvious, then, for every month we are held up in making delivery of products waiting for type approval, it will cost us $1,633 for every $100,000 invested.

While the Scale Manufacturers Association and we at Ohaus Scale Corporation are wholeheartedly in favor of the NBS prototype examination service, we recognize that this adds one additional area of lead time into the total approval cycle as it now stands. In order for us or any manufacturer to get type approval of a new product, we must first submit it to the National Bureau of Standards for their examination. After they have examined the product, if they find it acceptable we then must submit it to those other jurisdictions which require submission of a prototype for their examination.

What can we do to solve that problem? From a manufacturer's point of view, we would like to see all states accept the National Bureau's examination and report of test as a report on which they will base their type-approval certification. Up to this time, that situation does not exist. Some jurisdictions will accept the Bureau's report and base their decision on that report. Other jurisdictions require a submission of a prototype to their jurisdiction, a repeat of the testing which has already been accomplished by the National Bureau of Standards, and then a report of their findings and acceptance or rejection of the product.

I have looked into the background of what has actully happened in the last several years since we have had NBS type-approval examination and reports. Table 1 shows the number of requests that have gone to the Bureau for prototype examination since 1966. Essentially it has been an increasing number from year to year as the prototype service has progressed.

Table 1

REQUESTS FOR PROTOTYPE EXAMINATION

YEAR	NUMBER
1966	6
1967	10
1968	13
1969	16
1970	38
1971	16 (To Date)
TOTAL:	99

Table 2 shows the results of the type-approval examinations conducted by the Bureau. It is interesting to notice that scales and indicators—products of our industry, the weighing industry—make up 78 of the total of 99 products submitted. It is also interesting to note that not all of the products, by any means, have met H–44 requirements, which is an indication that the Bureau examination is saying to manufacturers, "We have examined your product and it does not shape up. Try again."

I also polled the Bureau, as well as various manufacturers, on their experience with the acceptance of the National Bureau's prototype report by the various jurisdictions. The Bureau made a survey a few years ago and was advised by all but two jurisdictions that they would accept the NBS report in lieu of examination of the product themselves. The two jurisdictions who declined to accept the NBS report were California and New Jersey.

TABLE 2

RESULTS OF PROTOTYPE EXAMINATION

TYPE OF DEVICE	MET H-44 REQUIREMENTS	DID NOT MEET H-44 REQUIREMENTS	IN PROCESS
SCALES & INDICATORS	47	18*	13
GAS PUMPS	1	1	
GAS PUMP INDICATORS & INTERLOCKS	4	2	
SLOW FLOW METERS	1	1	
VEHICLE TANK METER INDICATORS	1	1	
FABRIC & CORDAGE MEASURING DEVICES	4	2	
TAXIMETERS		1	
BERRY BOXES	1	1	
TOTALS:	59	27	13

*OWM RECOMMENDED TEMPORARY APPROVAL PENDING CONFERENCE ACTION ON 6 OF THE 18.

However, in polling manufacturers who have had actual experience with the type-approval reports of the Bureau, we find that in some cases several other jurisdictions will, when the chips are down, ask to see a sample of the product rather than accept the NBS report. These jurisdictions who have vacillated are North Carolina, New York, New York City, and Massachusetts. Other jurisdictions have stated that they will accept the NBS report subject to an examination of the first product installed in their jurisdictions. These have been Pennsylvania and Illinois.

In polling the National Bureau of Standards and the scale manufacturers, I can find no case, however, where any jurisdiction has disagreed in any major point with the findings of the NBS examinations. Understand clearly what I am saying. The manufacturers who have submitted their products to the National Bureau of Standards for their examination and report have found that a subsequent submission of the same products to all jurisdictions that requested to see the products has resulted in approval by those jurisdictions essentially in accord with the NBS report.

I make this point as strongly as I can, because I think it is only prudent management on your part to test a new system before accepting it. I think it has been prudent of you to have required your own examinations of new prototypes after receiving the report from the National Bureau of Standards to confirm their examination

and report. However, I think the history of the unanimous acceptance of each individual jurisdiction of those products found acceptable by the National Bureau since 1966 is sufficient proof that the NBS examination and report is a valid standard on which to base your acceptance of the products.

Of course, at this point I am speaking primarily to the delegates from the States of North Carolina, California, New Jersey, Massachusetts, and New York, since these jurisdictions have not yet really accepted the NBS examination service. I believe that you would be well served to accept the NBS report on prototype examination of new products as your official examination and the basis for acceptance of those products for sale in your jurisdiction.

When I say this, of course, I am speaking to you with an ulterior motive—profit. By accepting the NBS report, you will not only be shortening the total time cycle for approval of a new product, which I explained earlier is expensive for manufacturers when the approval cycle prohibits us from delivering new products, but you will also reduce our cost in the separate submission of prototypes to your individual jurisdictions. While this may seem like a small thing to you, from a manufacturer's point of view the submission of prototypes to various jurisdictions, the subsequent followup, demonstration of the product to you, and subsequent consultations get to be expensive items in each new product placed on the market.

We believe the successful history of the past five years of NBS prototype examination and reports speak for themselves. It has been successful. We believe it can be more successful. And we hope it will become the accepted method of testing and evaluating new products in the future.

THE FLOW MEASUREMENT OF CRYOGENIC FLUIDS

by D. B. Mann, Chief, Cryogenic Metrology Section, Cryogenics Division, National Bureau of Standards

Introduction

The question could reasonably be asked why the weights and measures officials are now being subjected to the problems associated with the measurements of cryogenic fluids. Traditional cryogenic fluids are generally extremely pure (impurities are of the order of parts per million), and the quality suffers if care is not exercised in maintaining this purity. These fluids are extremely cold, generally existing at less than 120 K (−244 °F) and requiring special material and structures for containment and handling. For example, carbon steel at these temperatures has many of the characteristics of glass and can shatter during cooling or use at these low temperatures. Lubricating oil is solid at these temperatures and, therefore, useless in reducing friction and wear of moving parts of valves and meters. Special materials, such as stainless steel, brass, copper, and specially prepared alloys, must be used in place of the more conventional materials. Lubrication must be accomplished by using bearings of special materials or by using the lubricating qualities of the fluid itself.

To carry the adverse characteristics of cryogenic fluids a step further, many of these fluids are highly reactive as oxidizers or fuels. As a matter of fact, two of these fluids (hydrogen and oxygen) are used extensively in high performance rocket vehicles and have played an important role in the Apollo program.

There are, of course, a number of redeeming characteristics of these fluids. This can be shown by referring to table 1, which lists some selected properties of the more important cryogenic fluids as compared to water. In addition to the low temperatures and viscosities associated with the liquids, there is a remarkable increase in the density of the liquids as compared to their normal gaseous state. Therefore, traditional cryogenic fluids are attractive from the standpoint of purity, of high density, and as a stable source of low temperatures.

Table 1. Selected Properties of Cryogenic Liquids Compared to Water

	T(°F) (NBP)*	Specific Gravity	Density Liq. (NBP)* / Density Gas (NTP)**
Water	212 (373 K)	1.0	1603
Methane	−259 (112 K)	0.42	632
Oxygen	−297 (90 K)	1.14	860
Argon	−303 (87 K)	1.39	842
Nitrogen	−320 (77 K)	0.81	696
Hydrogen	−423 (20 K)	0.071	848
Helium	−452 (4 K)	0.125	753

*Normal boiling point.
**Normal temperature and pressure (70 °F, 1 atmosphere).

These are important characteristics and are the basis for most of the widespread uses of these fluids. Table 2 lists a number of uses for these fluids and the list is increasing at a rapid rate. The quantity of cryogenic fluids produced is also increasing rapidly. It is estimated [1, 2] that in 1970 over $600 million worth of these fluids were produced. By extending the present rate of growth to 1985, the industry will produce, at that time, products worth $2.5 billion.

Table 2. Uses of Cryogenic Fluids

Oxygen:	Steel making, welding, nonferrous metal refining, aerospace rocket oxidizer, breathing atmosphere, treatment of sewage.
Nitrogen:	Food freezing; inert atmosphere in metal, chemical, electronic, and aerospace industry; deflashing of molded rubber and plastic parts; vehicle refrigeration (aircraft, railroad, highway); livestock branding; heat treatment of metals (cryoquenching); explosive forming of metals; freezing of water-logged soils; cryo embalming; infrared detectors; cryosurgery.
Helium:	Aerospace inerting and pressurant gas, welding, superconductivity, nuclear reactors.
Hydrogen:	Aerospace fuel, hydrogeneration of edible oils, heat treatment of metals, atmospheric control in electronic industry.
Argon:	Welding, continuous casting of steel.

The fact that cryogenics is a large and growing industry does not make it necessarily of interest to weights and measures officials. The fact that the uses of the fluids are increasingly diverse and that larger amounts of these fluids are changing ownership in the marketplace does make it of interest to weights and measures officials.

The argument may be offered that only a few highly industrialized and urbanized states are concerned with measurements of cryogenic fluids. The reply is that the diverse uses of the fluids does not limit use within these states. In many transactions, cryogenic measurement problems exist, but perhaps to a lesser degree than other problems which are considered of more urgent immediate interest by the weights and measures officials. This situation is changing as the uses and quantities of cryogenic fluids increase.

I wish to bring to your attention a measurement program involving the cryogenics industry, state weights and measures officials, and NBS. The program is, we believe, solving existing problems, as well as providing a basis for future developments in both metering technology and the increasing responsibilities of state regulatory agencies in assuring good and useful measurements.

Cryogenic Flowmetering at NBS

The Cryogenics Division of the NBS Institute for Basic Standards has been involved in cryogenic measurements since 1952 [3–6]. A number of attempts have been made by the Division during this time to coordinate and develop a program on flowmetering. Until recently, these efforts have not been sufficiently intensive. In the period 1966–67 this situation changed quickly because of a number of culminating events.

1. *The CGA Proposed Model Code.*—In June 1967 the Compressed Gas Association (CGA), a producer-oriented trade organization, proposed to the 52d National Conference on Weights and Measures a model code for flowmetering of cryogens. Although the Conference on Weights and Measures found that cryogenic measurement problems were, at that time, centralized only in a few states, the proposal by the CGA was shown to be a significant step in the national recognition of cryogenic flow measurement problems.

2. *The California Code on Cryogenic Measuring Devices* [7].—In the fall of 1967, the State of California Bureau of Weights and Measures began hearings on its own proposed code for cryogenic liquid measurement devices to be used within the State of California. The Cryogenics Division was asked to participate in these hearings. We provided technical information and were asked by the State of California and the Compressed Gas Association to provide standard

density data for the gases hydrogen, oxygen, argon, and nitrogen to be incorporated in the code. Values of these densities were made part of the code. A reference document gives information on precision and accuracy expected in the code tabular data [8].

After several hearings in the fall and winter of 1967–68, the code was adopted and made law in the State of California on July 1, 1968. The code itself followed very closely the recommendations made in NBS Handbook 44 [9] for similar codes. One of the most significant code specifications was the tolerance specification, reading as follows: "The maintenance tolerance shall be four percent (4%) of the indicated delivery on underregistration and two percent (2%) of the indicated delivery on overregistration. The acceptance tolerance shall be one-half the maintenance tolerance." It was felt that, at that time, this accurately represented the capability of meters used in commerce.

3. *Instrument Society of America Ad-Hoc Committee Report on Cryogenic Flow Measurement* [10].—The Ad-Hoc Committee was composed of industrial, government, and university representatives with a broad experience in cryogenics. The report returned to the ISA Conference in June 1967 represented an extensive review and definition of the broad national needs for cryogenic measurements and standards, and provided suggestions for the economic justification for meeting these national needs. In the abstract of the final report, the Ad-Hoc Committee recommended (a) a national standard and transfer standard for cryogenic flow, (b) an accepted measurement methodology for cryogenic flow, (c) a national authority to develop the standards, transfer standards, and methodology, and (d) a state of the art education of all personnel using cryogens and flow measurements. For those interested in the work of the committee, it seemed to indicate that an extensive program was required.

In addition to these four recommendations, the Ad-Hoc Committee report did point out that there were two separate and distinct applications of cryogenic flowmetering. The first utilizes a moderate flow rate totalized metering of commercial cryogenic fluids. This would be the type of metering encountered on a trailer truck type application, where a producer is servicing a number of separate customers and is metering and billing on the basis of meter reading. The second application of cryogenic metering is typified by the aerospace application of high flow rate measurement of fuels and oxidizers. Rates as high as hundreds of pounds per second would be an example.

Since the NBS Cryogenics Division participated in all three of the above actions, we were requested to make recommendations on a definitive program. In the fall of 1967, we suggested a flow research facility and program be initiated that would have three primary objectives:

1. Conduct a basic cryogenic flowmetering study to determine and evaluate the performance of the traditional metering methods as applied to cryogenics. This portion of the program would determine present status.

2. Provide the methodology necessary to preserve the accuracy and precision of meters as demonstrated in 1 for measurements made in the field.

3. Investigate new measuring methods.

Details of the progress of the program to date are available in the literature [11–14]. In summary, we at NBS have enjoyed exceptional cooperation with the cryogenic industry as represented by the Compressed Gas Association and regulatory agencies as represented by the State of California Bureau of Weights and Measures. The CGA has provided funding for a joint government-industry venture which has resulted in a cryogenic flow facility unique in the U. S. and in the world. There has been considerable international interest and support. This joint venture includes a coordinating committee meeting three to four times a year to review and plan program objectives and results. The Bureau of Weights and Measures of the State of California is represented during the meetings and provides valuable input in defining program objectives and in the transfer of technological information.

The committee provides a forum for the exchange of views and procedures in the methodology of cryogenic flow measurements. NBS in its traditional third-party position has provided guidance and assistance to both parties, as well as becoming knowledgeable of the practical problems of field measurement.

In addition, NBS has attempted to fully disclose the procedures used in evaluating meters under test and the methods of indicating precision and accuracy of the meters. In short, we recognize the fact that metering devices may be rated as to precision and accuracy in a number of ways. We have provided a recommended method in sufficient detail to allow other methods of interpretation of the basic data.

At the present time, the four types of flowmeters used in commerce have been evaluated as to the ability of the meter to make and to maintain a measurement. We are presently involved in evaluating new flow measurement devices submitted by both foreign and domestic suppliers for the purpose of determining if a transfer standard can be selected or developed for use in certifying meters in the field.

A portion of the program involves the interlaboratory comparison of the test standards. Such an evaluation has attracted considerable interest nationally and internationally because of the expense of building and maintaining cryogenic flow facilities.

As to possible future developments, we are looking to the development of a uniform code for flow measurements of cryogenic fluids and a continuing program of methodology to sustain and support such a code. Developments in the growing liquefied natural gas (LNG) industry must be followed closely as the possibility exists that this industry could, in the next few years, overshadow the traditional cryogenic fluid industry in the area of production, distribution, and measurement activities. It would be worth while to consider integrating the measurement requirements for LNG into the uniform cryogenic measurement code.

In conclusion, we at NBS feel fortunate in being involved directly in the measurement activities represented by this Conference. We hope that we can continue to provide industry with useful measurement techniques and services and to "cooperate with the states in securing uniformity in weights and measures laws and methods of inspection."

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THE TRUCKING INDUSTRY'S STAKE IN ACCURATE WEIGHT DETERMINATION

by E. V. Kiley, Vice President, Research and Technical Services, American Trucking Associations, Inc.

I would conclude from looking at some of the slides here this morning that the subject of my talk is a rather pedestrian subject. However, the weight I am going to talk about is not the difference between the weight of an empty truck and the weight of a loaded truck. I am going to talk about the problem that the trucking industry has, and that is the weight of the truck itself on the highway.

We are the only transportation agency that has over us a limitation on the weight of the equipment with which we do business. Doing business, as we do, on the nation's highways, we naturally must abide by state weight limitation. We understand this, we promote it as a matter of fact; it is sound, and it should be done. But when we compete with railroads, and now with airlines, who face no similar restrictions, then we do have a stake in accurate weight determination. This has always been the case, but it is more critical now than ever before.

A type of vehicle very popular in the western part of the country as a major hauler of freight is what is known as a double bottom. This vehicle consists of two 27-foot semitrailers in tandem with a power unit, and the one of which I am speaking has five axles. This vehicle usually is about 65 feet in overall length. I am going to use this particular vehicle as an illustration of the subject that I want to get into.

For years the trucking industry has operated on the nation's highways under state size and weight regulations. We recognize that this has to be done. Our only concern is that these regulations be arrived at in a technically sound manner and be reasonable and in line with actual public need. Over the years, these size and weight regulations have always been centered around the needs of the individual states. This is a very important thing from our standpoint. The trucks today

are the nation's major haulers of freight. Trucks haul more freight today in this country than the railroads. This is not recognized often in the public press because, unlike the railroads, the trucking industry does not have a national labor organization. We are not subject to a total strike of all trucks hauling freight, such as the railroads are. Therefore, we never have a total shutdown of truck service.

The regulations covering truck sizes and weights have developed over the years according to each state's needs, its evaluation of its highway capabilities, and what was needed in the economy of each individual state. A very close identification between what is permitted and what is important to the economy of the several states can be amply illustrated by reading the size and weight laws in these states and the variations from the legal limits in the way of tolerances over and above what is otherwise legal.

An important factor long recognized by highway engineers in terms of stresses in the highway pavement has been the amount of weight carried in a vehicle by each axle of the vehicle. Each axle carries a certain part of the total weight of the vehicle. In order to protect the pavement, highway engineers in the states have long had regulations, and the state legislatures have gone along with these regulations and have passed legislation imposing limitations on what each actual axle can carry. Theoretically, this means that, if there were no structures and no bridges on the highway system, the regulations covering axle loads would be sufficient. The highway engineer would not care too much, from the standpoint of the safety of the highway itself as a structure, what the total weight of a vehicle was, so long as the weight on any one of the axles did not exceed a set limit.

This axle-load limit, tied as it was to the highway itself, varied from state to state in many cases. It was not always the same. Gradually over the years, a regional pattern developed, and, in essence, what we have today and have had for several years is lower axle-load limits in the western part of the country and higher axle-load limits in the eastern part. This stemmed not only from the fact that in the eastern part of the country the highways are recognized as being a little stronger because of better subsoil, but in addition to that the congested eastern part of the country required higher axle loads to lead to economical and sound truck transportation. The western part of the country could have longer vehicles because of the lack of congestion, and therefore the tendency there was to keep the axle load a little lower and have longer vehicles.

This is a situation that existed for years. There were no federal regulations of any kind covering truck sizes and weights. In 1956, with the passage of the Federal Aid Highway Act, the Federal Government for the first time got into this field. In the federal law of

1956 the government set a limit on the sizes and weights of motor trucks using the national interstate system of the highways.

This was not a completely preemptive piece of legislation. What it did was to set maximum permissible limits that the states could have in their laws for vehicles using the national interstate highway system. The states could come up to the federal limits, but could not go beyond them. If the states had limits higher than in the federal law, they could keep the higher limit, but could not go beyond that. The federal law has remained unchanged since 1956. Despite studies and recommendations leading to suggested changes, the law has stayed the same.

The main point that I want to emphasize is that the state size and weight determinations had almost without exception gone to the question as to how much should be carried on each axle. In this case, the steering axle never presented a problem because it never did get that heavy. However, the tandem axle would have a limit on how much it could carry. A portable scale could easily determine the weight of this axle. But there we get very seriously into the question of accuracy. The other axles were then weighed individually, and then the gross weight of the vehicle itself was determined on a platform scale. If the vehicle in total did not exceed a certain weight as measured by a platform scale and if each axle did not exceed a certain weight as measured perhaps by a portable scale or another scale, then the vehicle was legal and could proceed on its way.

But over the years and prior to the passage of the 1956 Act, the highway engineers became concerned about the fact that the tests they were conducting were inadequate. To adequately protect bridges and structures on any highway system, in addition to checking the weight that might be carried on a vehicle so that the entire vehicle did not exceed a certain weight, they found that stresses on bridge members required that another check be made. It was not only important, they said, to be sure that each axle did not exceed a certain weight or that the gross weight did not exceed a certain figure, but it was also necessary to determine the weight that was being carried on each group of axles in that combination—in other words, what was being carried on axle group 1–3, on axle group 1–4, on axle group 2–4, on axle group 2–6, on and on. You can see how many combinations of groupings you could have of axles within this combination.

In a multimillion dollar road test conducted in the State of Illinois and completed in the middle 1950's, the American Association of State Highway Officials and the Federal Bureau of Public Roads jointly concluded that these tests showed to their satisfaction that weight controls had to include a weighing of these axle groups. So the vehicle, then, had to pass three tests of weight if the state weight

laws were what they were recommending, (1) the weight on each axle, (2) the weight on the overall vehicle, and (3) the weight of each axle group.

When legislation was proposed to change the federal law from its present flat maximum gross weight limit to a new more reasonable weight limit, the highway officials and the federal officials themselves recommended higher limits, but insisted that the legislation that they would approve and could enforce would have to include provisions for weighing each of these intermediate axle groups. I think you can immediately see the problem this presents. What this means, of course, is that, if the federal legislation continues in effect as part of the Federal Aid Highway Act, it will include, unless the highway officials or engineers change their thinking, the type of weight controls I have discussed.

Now, this is a rather complicated and very technical method. They say it can be done, and I am sure it can be done. But I think you can immediately see the problems it does present. It would mean that not only would the states have to provide for this type of weight control, but the carrier himself, before his vehicle has left the terminal, would have to be certain before he sent a vehicle on the road that he did not violate any part of this three-pronged control on vehicle weights.

The theory that they advance (and it is a technically sound theory so far as the relationship of the vehicle to the highway is concerned) actually results in a vehicle whose gross weight will increase as it gets more axles under it, but whose average axle weight will decrease. Now this follows a proven theory that the more axles under a vehicle, the greater the spread of the load on the highway and the less the pressure on the bridge members; but, of course, you could not have an accumulation of the individual axles. So we now face, as I mentioned, if we have a continuation of federal limits on sizes and weights, a new approach to truck weight determination.

This is a critical matter for the trucking industry. As I mentioned earlier, we have these limitations within which we must live, have lived, and will have to live in perpetuity. But we have reached the limit, of course, at this stage of the game in the techniques and technology of the truck manufacturer as to tare weight. So if we are to increase our pay load (and, as we say, pay load is the payoff), then the only way to do this is with a higher gross weight in order to get the pay load, and the higher gross weight comes only to this type of weight determination and weight control. Therefore, the stake of the trucking industry in the accuracy and technology of weight determination is paramount. I do not think we need much imagination to say that, if the highway engineers say that the only

way we can go with increased vehicle weights is to be sure the vehicle does not violate the accepted weights for a highway structure, then we can go, but it automatically follows that we must have a technique of being sure that we do not do this, and that these things can be measured and can be determined.

Now that is the first and the most serious part of this problem of accurate weight determination, but then there is another.

Virtually all of the states (there may be one or two exceptions) have and have had in their size and weight laws what they call tolerances. In other words, the law may say X pounds, but then it says that you may have 5 or 10 percent above this before you are operating illegally. Now, most of these tolerances are what have been called statutory tolerances. Let us say, for example, that the State of Virginia has an 18,000-pound single axle-load limit and a statutory tolerance of 10 percent. What this means is that a motor carrier who is carrying 19,800 pounds is not in violation of the law. He would be reprimanded and be told to "watch it," but he has not committed a violation in the sense that he would be fined.

Other states have what are known as administrative tolerances. These are leeways that the states have given. Recognizing the fact that a motor truck may start out completely legal (this is particularly true of axle weights, for example), but, in the course of operating in snow or ice, it will accumulate additional weight and therefore be over the weight limit, or its load may shift, or other things can happen that will change the weight on an individual axle and on the gross weight during movement of the vehicle, administrative tolerances are allowed. But when it was proposed to change the federal ceilings and include new limits, attention was called to the fact that these tolerances, if they were allowed to exist in the state law, would actually result in axle-load limits higher than the federal authorities thought should be permitted. The reasoning was that, if a state had a 10 percent tolerance over and above an existing weight limit and we raised the weight limit up and they still have that 10 percent tolerance, then they are above what we as engineers think should be allowed.

So, when federal legislation was considered two years ago, it was specifically stated that the new weight limits in the federal law would be inclusive of any tolerances. In other words, there would not be any. So, in effect, taking the Virginia example, 18,000 pounds on a single axle with 10 percent tolerance would be 19,800 pounds. If Virginia were to go to 20,000 pounds, that would be it. It would not be 20,000 plus 10 percent. It would be 20,000 pounds.

This raises, then, a very serious question. What about tolerances for inaccuracies in scales? Over the years, and even today, the traditional method of checking the motor carrier's axle weights has

been on the portable scale. Portable scales are notorious for inaccuracies up to as much as 15 percent.

This has been recognized in the state laws. But if we are facing a situation where this is taken away by federal legislation, which says no tolerances, you are illegal if you are above it. Then the need for very accurate determination of weights is more important than ever before. Perhaps the answer here would lie not in administrative or statutory tolerances, but in merely a scale tolerance.

Now, I hope I have indicated to you how serious a problem this is to the industry. We would be fooling ourselves, and I think the industry would be fooling itself, if we thought that the future in truck sizes and weights was not going to involve these complications.

I guess what I would like to hope for is that most of you here today would say, "You can't do it this way; no type of equipment can be made that would adequately and accurately do this." Then, perhaps, we could go to the federal officials and say, "Look, you can't do it this way. We have the people to tell you that you can't." On the other hand, if it can be done (and I suppose this type of weighing can be developed), then I guess the best thing you can do is wish us luck.

But as we face the future on this, we have to take up with renewed effort what we have tried before to get—more accurate weighing, from the standpoint of truck use—accurate weighings and equipment, so that the states can use it in enforcing their law and our carriers will have to have it in their terminals to be sure that, when vehicles go on the road, they are not exceeding the state weight limits.

There is a desperate need for the type of instrumentation and the type of manufacture of equipment that can give us and the regulatory authorities the kind of weight determinations which will enable us to operate vehicles that will be to the satisfaction of the state and federal governments and operate without damage to the nation's highways, be it the pavement or be it the structures. To the trucking industry, who is hauling the bulk of the nation's freight, weight determination is a very, very serious matter.

DEVELOPMENT OF A STATE MEASUREMENT CENTER

by R. R. Roof, Laboratory Metrologist, Bureau of Standard Weights and Measures, Pennsylvania Department of Justice

I very much appreciate the opportunity to appear on the program of the 56th National Conference on Weights and Measures. In making this presentation, I am privileged to represent not only the Commonwealth of Pennsylvania, but the metrologists of all the other weights and measures jurisdictions who manage their own state's standards laboratory. Certainly a state metrologist appearing on the program of the National Conference at the invitation of its Executive Secretary attests to the fact of the increasingly vital role these weights and measures officials have in the development of an effective weights and measures enforcement and service program.

As the demand for more exacting measurement services increases, the more apparent it becomes to all the states of the importance of adequate technical laboratory facilities. A state weights and measures laboratory serves not only state government, but commerce, industry, and educational and research institutions as well.

The state standards program was initiated in 1965 by the National Bureau of Standards, Office of Weights and Measures. The aim of the program was to supply the qualifying states with a new distribution of mass, length, and volumetric standards in U. S. Customary and Metric denominations. Not only would the National Bureau of Standards distribute new standards, but would also give to the qualifying states supplementary equipment and technical assistance to utilize the standards to the maximum. The participating states had to have a stable weights and measures program and suitable facilities such as a solid foundation floor and agreeable environmental conditions, had to agree to provide funds for laboratory accessories, and, finally, had to employ qualified personnel who could be trained to operate the facility once it was established.

The Pennsylvania Bureau of Standard Weights and Measures qualified for the state standards program in April 1967 by moving from its offices on the second floor of the main capitol, where it had been located since the inception of the Bureau in 1912, to new facilities on the bottom floor of the Transportation and Safety Building, with adequate space and conducive environmental conditions for

laboratory facilities. However, the laboratory was not dedicated until March 3, 1969.

Much of the equipment supplied to Pennsylvania, which was in the second group of ten states to be selected, was of a prototype nature, meeting original specifications set forth by the National Bureau of Standards. Serious initial problems of some vendors not meeting specifications caused much delay in the delivery of standards and equipment to the laboratory. Total worth of the standards, equipment, and technical assistance supplied to Pennsylvania was in excess of $75,000.

With the new facilities, equipment, and standards available, many requests for certification of testing services for Pennsylvania industry that formerly had to be refused due to inadequate facilities could be accepted and tested accurately with the new state standards. Inaccuracies in field standards theretofore undetectable on our old equipment were found, resulting in a fairly high rejection or condemnation rate. In the first year, 90 percent of the 157 fifty-pound field standards examined on the 30-kilogram balance were found to be outside of the permissible tolerance, requiring recalibration (readjustment) of these test weights.

It has become increasingly apparent that, of the three areas of capability of the laboratory (mass, length, and volume), the mass or calibration of weights has the most potential for the laboratory. In addition to the mass standards provided under the state standards program, the laboratory obtained a 2,500-pound and a 5,000-pound standard, which were taken to the National Bureau of Standards and calibrated against the national standards. As a result, the Pennsylvania laboratory now has calibrated known standards from a micropound (one-millionth pound) up to 5,000 pounds. A 20-gram capacity microbalance was acquired with accuracy to 1 microgram (one-millionth of a gram). With this new precision balance, which was not supplied in the federal program, the laboratory has been able to test an increasing number of small mass NBS Class S and Class S–1 weight kits. This has included actual weight calibration as well as certification by tolerance testing.

The Class S and Class S–1 weights are used in industry as plant standards and the testing of analytical single-pan balances. Since these sets range in denomination from 100 grams to 1 milligram, weights below 30 grams, which comprise about two-thirds of the total number in the individual kit, could not be accurately tested on the balances supplied under the state standards program, due to the very minimum tolerance on these weights. As a result, any state weights and measures jurisdiction participating in the state standards program which has a serious demand for weight calibration by industry would need to have additional precision balances to determine errors

on these small mass standards; and to industry, this area of testing is of crucial importance.

Probably the most typical instance of the Bureau's laboratory benefit to its field enforcement activities has been in the calibrating of the test weights on the Bureau's six large-capacity scale test units. Previously, the Bureau had no facilities for accurately testing the 20,000 pounds of field standards on these units; and since their original calibration at the National Bureau of Standards, dating as far back as 1961, there had not been a reverification of the weights. To be able to accurately test the large 5,000-pound field standards, the laboratory's 2,500-pound capacity equal-arm Russell balance had to be converted to a new capability of handling 5,000 pounds on either arm while still maintaining adequate precision. With the assistance of Mr. Harry K. Johnson of the National Bureau of Standards, the Russell balance was equipped with a new hydraulic system and two new high-capacity rams on the upper and lower cylinders of the balance.

As a result of this new technical capability of the Bureau, the owners of the 6,000 large-capacity scales in the commonwealth can be assured that their weighing devices will be tested by accurate and yearly verified field standards. Additionally, the laboratory has been able to provide this expanded testing service to several of the independent scale repair services throughout the commonwealth, thus assuring them of the accuracy of their standards and assisting them in meeting contract specifications with their clients.

Since Pennsylvania places heavy emphasis on its package control program, devoting about 60 percent of the Bureau personnel to this type of enforcement, the laboratory has had to become more integrated into supporting the field testing functions of the general-duty inspectors. Utilizing the precision equipment in the laboratory has permitted quick and precise checks on field tests of prepackaged commodities on a number of occasions. Packagers of commodities have differed with the determinations of the Bureau's field force, particularly when their products were ordered off sale for being below the labeled weight. Since the quantity control operations of packagers has reached new levels of sophistication, their contentions are not treated lightly by the Bureau. When a dispute occurs, the product is examined in the laboratory, which matches or exceeds the packer's accuracy. Additionally, problem commodities which are not conducive to field testing have been brought into the laboratory and tested for net determinations.

There is little doubt that a most essential element in the development of a state measurement center is a promotional effort both internal and external. The metrologist in charge of the state measurement center must constantly prove his worth to the total weights and

measures program. He must show and explain in understandable form to his superiors the continuing function and new projects of the laboratory, emphasizing areas such as in training, where its capabilities might be utilized to support the weights and measures enforcement activities of the Bureau.

The metrologist must compete with the other areas of the Bureau for funds and appropriations support, and constantly keep the Director interested in the operations so he will seek additional funding and manpower support for the laboratory from his superiors. The key to internal promotion is to keep as many people as possible informed, knowledgeable, and interested, because they have not had the benefit of your education and training, and could lose interest simply because they do not understand the scope of the work. By taking time to explain the operations of the laboratory to the Bureau's field inspectors as well as the Pennsylania local sealers of weights and measures when the opportunity presents itself, the metrologist has kept them knowledgeable in the laboratory activities; and since they have very close contact with Pennsylvania industry in their day-to-day work, they have been an invaluable source of referrals to laboratory from industry.

A vigorous external promotion program should be initiated. However, this is somewhat dependent on the time that can be allotted, the money appropriated, and your own public relations expertise. Numerous field trips have been made to key Pennsylvania industries to meet with standards and quality assurance personnel to better understand their role and how their problems might relate to services that could be provided by the Bureau's laboratory. Speaking engagements have been scheduled and industry officials are encouraged to visit and inspect the laboratory facilities. Professional societies, educational groups, and federal agencies such as the Defense Supply Contract Administration Service, with nearly 200 inspectors in key Pennsylvania industries, have been excellent sources for getting the word out.

On an increasing number of occasions, the laboratory has been called upon to assist industry officials on in-plant measuring problems, from care and use of weight and volumetric standards to assistance in setting up production line scale auditing programs, as well as instruction on the proper testing of their scales. While some of the problems we encountered were beyond our current capabilities, through diligent research and contact with other federal agencies and private standards laboratories, we have been able to accurately refer the individual to a proper alternative so his problem could be solved.

To maintain a high degree of professionalism and continually attempt to increase its quality of service, the Pennsylvania State

Standards Laboratory was enrolled into the National Conference of Standards Laboratories, which promotes cooperative efforts toward solving mutual problems faced by our type of facility. Many of the most recognized laboratories in industry, government, and education throughout the country belong to NCSL.

Additionally, the laboratory became a participating member of the American Society for Quality Control, Harrisburg section, and it is my privilege to hold an office within the local section. With the potential of the laboratory's services and the assistance of these two organizations, the laboratory will be able to obtain the recognized professionalism and confidence that produces the environment necessary for a standards laboratory to flourish.

The success of a state measurement center depends largely upon the initiative, the industry, and the enthusiasm with which the state participates and contributes to the support of that program. The National Bureau of Standards and its dedicated staff of the Office of Weights and Measures have provided the ball field (the standards, the equipment, and the balances), and have trained the players (the metrologists), and it is up to the team (states) to "play ball."

FORUM DISCUSSION

Mr. W. S. Watson (California): Mr. Landvater, I have several comments I would like to make concerning type approval. For example, what would a small scale manufacturer who is manufacturing for the local market do for type approval? What does the manufacturer do for type approval who has manufactured a device for which the National Bureau has yet to adopt a code? What would we do in a situation where, after having phased out our type approval program, we were called upon to test the device of a manufacturer who has either neglected or refused for some reason to get type approval?

Mr. Landvater: I am thinking exclusively of a case where a manufacturer expects to get type approval throughout the country and where he, therefore, wants to go to one source to get type approval. If a manufacturer is going to sell in one local area, that is his option. I did not intend to suggest that a state should abdicate its right to type approval examination. I do not know how to respond to your second point because I am afraid I do not understand.

Mr. Warnlof: In the absence of a code, there must have been a new development, such as the example we have here today, where we are in the process of working with cryogenic measuring devices. I suggest it is the responsibility of the National Bureau of Standards

to aid in the development of appropriate codes for new devices and to make recommendations to the S & T Committee.

Mr. C. Wooten (Florida): We are in favor of the prototype program that you now have. However, I would like to see a manufacturer, after he gets prototype approval and ships his new device into a local or state area, notify the weights and measures office of this so that the inspectors can, in turn, be notified and will not be completely lost when they encounter a new scale.

Mr. L. D. Holloway (Idaho): I have many reports of prototype examinations from scale manufacturers, but I have very few from meter manufacturers. Are new types of devices not being developed, designed, and produced, or have the meter manufacturers ignored the NBS prototype examination program?

Mr. H. E. Siebold (Liquid Controls Corp.): I cannot answer that as Chairman of the Meter Manufacturers Technical Committee, but I can give you my own personal feeling. There has been some reluctance to advocate national type approval. I think you will find more willingness to accept prototype certification or inspection rather than national type approval. We do propose to submit new devices as they come along, but I think part of the answer is also that there are not that many new measuring devices brought out. Some of the accessory equipment may be changed slightly, and here you have to decide for yourself whether it is new and different enough to submit for prototype examination.

Mr. J. R. Bird (New Jersey): There are many devices that have been type-approved in North Carolina, Massachusetts, New Jersey, and other states which have been meeting H–44 requirements for years, and many inspectors do not have a list of these. It might be appropriate for OWM to compile and issue a list of such devices. Also, how much of a test has been made on the devices for which prototype approval certificates are issued? Many times when we have conducted type approval tests on equipment, we have had to make repeat tests over periods of time up to maybe two years to determine the repeatability of the equipment, especially on the new electronic devices. One period of tests often is not enough.

Mr. Warnlof: We will gather the information you have requested and make it available to you.

Mr. M. Greenspan (New York City, N. Y.): It was mentioned that the City of New York does not quite fully accept NBS type approval examinations. I am all in favor of a system whereby we would have one national type approval. However, we still try to insist on type approval due to a number of incidents that have occurred. For instance, a gasoline pump dispensing unit was found to be so constructed that it did not meet the H–44 requirement stating that the security seal shall be readily accessible. In another instance,

a device that had received NBS type approval was found, in our view, to present an opportunity for fraudulent practices. Until the art is a little better developed in these areas, we will very reluctantly have to continue type approval.

Mr. Warnlof: First, since no gasoline pump dispensing unit has been submitted to NBS for prototype examination, the problem you have indicated is an enforcement one. The decision as to whether a device is so designed that it may facilitate fraud is difficult to make. The key word is "facilitate," since fraud may be practiced on most any device.

Mr. O. S. Watson (Consultant, Scales and Weighing): Mr. Roof, please describe the microbalance you have for calibrating standards of 30 grams and under, including the fractionals.

Mr. Roof: We bought a Mettler M5 microbalance with a capacity of 20 grams which reads out to 1 microgram. To be able to discern the Class S and S–1 tolerances, you almost need a finer balance than is supplied under the new state standards program.

Mr. Watson: Does the balance you refer to have digital indications and does it have sufficient sensitivity to get down to 1 microgram or 1 milligram?

Mr. Roof: It is a single-pan balance and does have digital indications. The sensitivity would be approximately 1 microgram.

Mr. S. D. Andrews (Florida): Mr. Roof, how did you go about the conversion of the Russell balance to 5,000 pounds?

Mr. Roof: We had the assistance of Harry Johnson of OWM. I also assisted, as did a very good large-capacity scale inspector we have who is very mechanically inclined. Many of the modifications were mechanical in nature. We installed a new ram in the bottom cylinder, which required removing the beam and upper cylinder. We bought two large weigh pans, so that we could apply weight to 10,000 pounds. The Office of Weights and Measures supplied the technical assistance.

Mr. Andrews: Will the base recommended for the original balance require modification?

Mr. Roof: If the beam would hold the 10,000 pounds that is required, I feel fairly confident that the base would also, but this would depend on how your base was built.

Mr. Warnlof: If you are thinking in those terms, Sid, you can contact OWM and we will get those answers for you.

Mr. R. L. Thompson (Maryland): Mr. Kiley, as a Maryland resident and with the responsibilities you have, you are probably familiar with many of the state's problems in weighing, where the state police have to avoid continued use of permanent installations in the weighing of vehicles and have to resort to the questionable wheel-load weighers. We are frequently approached by the state police to

be witnesses for the state, and if the state police are not fast enough we find ourselves, instead, witnesses for the defendant. Has your organization considered approaching people like the Maryland State Police, the Department of Highways in Virginia, or the Department of Transportation in Pennsylvania, and offered to engage in a cooperative effort to develop some portable unit that could be moved, whether by tractor trailer or pickup truck, to various locations in the state where vehicles could be weighed in the manner you described?

Mr. Kiley: We have done this, but not in the State of Maryland. We are a federation of state trucking associations, and each state trucking association is generally autonomous in approaching its problems. We have made this approach in other states and have also approached the National Bureau of Standards, who laid out a program, but the matter had to be dropped for lack of funds. Now that we have a new Department of Transportation that is very involved in this problem and also has the necessary funds, we hope to make another approach through them and then go to the Bureau of Standards and to the states to find an answer.

Mr. Thompson: Thank you. I would refer you to Lt. Guy Brown of the Maryland State Police.

Mr. Warnlof: We all operate within constraints as far as our resources are concerned. With existing resources, it was impossible for us to pursue this matter further.

Mr. S. H. Christie (New Jersey): Mr. Mann, in the handling of cryogenics, there has been a problem of osmosis, which seems to be accelerated with certain fluids. Are you familiar with this problem?

Mr. Mann: I am not familiar with the problem. I would be very interested in talking to you about it.

Mr. Warnlof: Doug, have you in your studies defined appropriate limits for performance requirements for cryogenic liquid-measuring devices?

Mr. Mann: During the establishment of the code in the State of California, we established a guideline as the result of many hours of discussion between meter manufacturers and the state regulatory agency. The code specifies a maintenance tolerance of plus 2 and minus 4 percent, with an acceptance tolerance of half of that. The results of a year's work on positive displacement meters, which are the meters currently used in practice, indicate that this is a reasonable state-of-the-art tolerance at this time.

Mr. Warnlof: What is the advantage of liquid measuring as opposed to gravimetric measuring?

Mr. Mann: The reason for metering of cryogenic fluids is the same as for metering in gasoline trucks. The quantities are getting smaller, and multi-deliveries from a single truck require on an economic basis the metering and billing of individual amounts.

AFTERNOON SESSION—THURSDAY, JULY 15, 1971

(M. L. Kinlaw, *Vice Chairman*, Presiding)

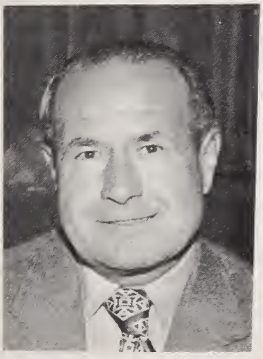
(Thursday's afternoon session was devoted to reports of the Conference committees. These reports, as well as other committee reports presented during the Conference, follow.)

REPORTS OF THE CONFERENCE COMMITTEES

REPORT OF THE COMMITTEE ON EDUCATION

Presented by E. Prideaux, *Chairman*, Supervisor, Weights and Measures Section, Division of Inspection and Consumer Services, Colorado Department of Agriculture

(Wednesday, July 14, 1971)



The Committee on Education submits its report to the 56th National Conference on Weights and Measures. The report consists of the tentative report transmitted in April as part of the Conference Announcement, as amended by the final report. The report represents recommendations of the Committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the open meeting of the Committee.

Subcommittee on Computer Technology

The Subcommittee met February 3 to discuss the framework of a plan for adoption by the National Conference of a model weights and measures information systems program. It is the opinion of the Subcommittee that the most important service that could be rendered to weights and measures administrators is the development of a series of prototype computer programs encompassing a unified objective of providing information useful in program planning, evaluation, and resource allocation.

Toward this end, the Subcommittee is cooperating with the NBS Office of Weights and Measures in the development of:

(a) A prototype resource allocation program to be used in the allocation of inspection emphasis for all goods and services within the purview of weights and measures law and regulation. This resource allocation program has been completed and is currently undergoing test in the States of Hawaii and Pennsylvania. Once documented and published, the program will be made available to the states.

(b) A series of program codes for use by the states in processing data that will promote the uniform dissemination of information among the states.

(c) A set of uniform report forms for device and package inspection that will promote the uniform collection of data to be used in the computer programming. The necessity for uniform reporting was graphically demonstrated by the costly experience of the four participating states.

The Subcommittee urges all jurisdictions having interest in or currently working with automatic data processing equipment to take an active interest in the model programs to be offered soon by the National Conference. Only through concerted planning by the Conference during this early stage of computer usage in weights and measures can the states hope to establish the uniformity of program design so necessary for interchanging information and for problem solving.

National Weights and Measures Week

Committee Chairman Earl Prideaux of the State of Colorado once again accepted the responsibility of serving as chairman of the important Subcommittee on National Weights and Measures Week. The Committee wishes to acknowledge and thank Mr. Prideaux for his enthusiasm and initiative in the promotion of the Week. As has been the case in past years, a statewide coordinator was appointed in each state to coordinate and report on activity throughout the state during the Week. Mr. Prideaux did an outstanding job in keeping the state coordinators informed regarding availability of and suggested uses for promotional material.

Newspaper mats, the consumer pamphlet "The Weights and Measures Men," and reduced-size Third Man posters were distributed on request by the Office of Weights and Measures.

Mr. Arthur Sanders of the Scale Manufacturers Association distributed suggested press releases, radio and TV spot announcements, a feature newspaper story, and other useful material in the SMA Weighlog. The Committee is grateful to Mr. Sanders and to SMA for this effort and for the window stickers made available again this year.

Mr. John O'Neill of Kansas suggested the development and use of a placemat depicting the "weights and measures story" for restaurant and cafe use during the Week. Several jurisdictions used this idea and developed attractive and colorful placemats using the sample supplied each jurisdiction by the State of Colorado. Many other jurisdictions have expressed interest in this item for next year's promotion.

The Committee wishes to acknowledge and express its deepest appreciation to Mrs. Margaret Dana, syndicated columnist, for her excellent article appearing during the Week.

Many of the states, counties, and cities used the Week as a climax in their public relations and information programs and developed exceptional promotional material for use during the Week. Each jurisdiction was urged to bring its most outstanding or innovative promotional idea to the 56th National Conference for the purpose of exchanging ideas with other jurisdictions.

During the open committee meeting, representatives of the National Conference of Standards Laboratories suggested that the title "National Weights and Measures Week" be changed to "National Measurement Week" to include the broad spectrum of measurements. The Committee felt that this suggestion was particularly appropriate in view of the favorable position of the Conference regarding adoption of the SI (System International). The Committee agreed with this suggestion and recommended favorable action by the Conference.

Discussion on Foregoing Item

Mr. W. I. Thompson (Monmouth County, N. J.): As an employee of government service now fighting for its own identity, I question any further diminution of the term weights and measures, especially at a time when the weights and measures activity in many instances is being taken over by a Consumer Affairs Division.

Mr. A. Sanders (Scale Manufacturers Association): I agree entirely with Bill Thompson. Measurement Week has a different connotation from National Weights and Measures Week. The purpose of Weights and Measures Week has been to promote the work of weights and measures people. The term measurement will dilute the whole subject, and weights and measures people will have no incentive to go out and promote the Week.

Mr. M. Rapp (Detecto Scales): The consumer will not associate the term National Measurement Week with the work done by weights and measures people, whereas the term Weights and Measures Week emphasizes not only the activity, but the people involved. My recommendation is that we stay with the old name until we find a better one.

Mr. J. E. Bowen (Newton, Mass.): In my work as a weights and measures official, I have been actively engaged in the promotion of Weights and Measures Week, and I want to applaud and agree with the comments that have been made.

Mr. S. D. Andrews (Florida): I would like to expand on these remarks because I have on previous occasions, at this Conference and other weights and measures conferences, expressed some rather grave misgivings about our moving away from our traditional position of weights and measures officials. I hope that this Conference will give serious consideration before changing the title of such an important and historical tradition as Weights and Measures Week, where we honor those men who are actually engaged in weights and measures activities.

(The recommendation of the Committee to change the name of National Weights and Measures Week to National Measurement Week was voted down by the Conference.)

Method of Sale of Commodities and Unit Pricing

The Committee was presented a full report concerning the status of these two items by Eric Vadelund, NBS staff assistant for the Committee on Laws and Regulations. The Education Committee highly endorses and supports the efforts of the Laws and Regulations Committee in these two areas and urges favorable action by the Conference on these items in the interest of national uniformity.

Consumer Affairs and Education

The Committee included during its interim meeting a round-table discussion with a select group of individuals representing the consumer interest. The purpose of the meeting was to explore those areas of concern to consumers in which weights and measures officials can lend assistance, and also to discuss and develop new ways and means by which state and local officials can more effectively respond to consumer problems and needs.

In addition to the Conference Chairman, Executive Secretary, Education Committee members, and OWM staff members, the follow-

ing distinguished consumer representatives were present for the meeting:

Mrs. Ann Abrams, Special Assistant to the Director, Institute for Applied Technology, NBS.
Mrs. Betty Bay, Director for Federal-State Relations, President's Committee on Consumer Interests.
Mr. J. J. Shevis, Public Relations Director, Consumer Federation of America.
Mrs. Margaret Dana, Consumer Relations Counsel.
Mr. J. C. Mays, Director, Consumer Protection Division, Dade County, Florida.
Mr. J. C. Stewart, Assistant Supervisor, Weights and Measures Regulatory Section, Virginia.

Many excellent suggestions for involving weights and measures officials more deeply in matters of consumer concern were discussed at length during the meeting. The Committee pledges its full support and cooperation to those organizations represented in their respective efforts to meet consumer needs. An invitation was extended to all participants to have representatives of their organizations present at future National Conference meetings for the exchange of information and development of guidelines in this important phase of weights and measures administration.

Metric Education

Steve Hatos of NBS appeared before the Committee to report on the progress and status of the U. S. Metric Study. It is the feeling of this Committee that, given the possibility of U. S. conversion to the metric system of measurement, there are two broad areas in the education field where the National Conference and weights and measures jurisdictions should take action.

First, in the light of statistics gathered by the Conference Task Force on Metrication, it is clear that weights and measures personnel will have to undergo an education program in order to be able to understand the metric system. Therefore, we strongly urge that upcoming weights and measures training programs and conferences have on their agendas at least one item concerning the metric system (e.g., history of the metric system).

Second, it is taken as an undisputed fact that the general public is for the most part completely unfamiliar with the metric system. Consequently, in the event that Congress approves a metric conversion program, a great deal of publicity will be needed in order to acquaint the public with this system. The National Conference on

Weights and Measures, as well as weights and measures officials at all levels, should be prepared to assist in a national educational program. Since it is the weights and measures area where the consumer will, no doubt, face the greatest hardships in adjusting to any new measurement system, officials must be ready to answer consumer inquiries about the metric system in a competent manner.

In order to assist jurisdictions in these endeavors, the Committee feels that it should prepare a bibliography of material which could be used in such education efforts. Of course, for the present, it would be up to the various jurisdictions to obtain this material from the sources indicated in the bibliography. However, the Committee will continue to explore the possibility of having the Office of Weights and Measures serve as a clearinghouse for such items.

Finally, the Committee urges that the Conference adopt the following resolution:

Whereas, U.S. conversion to the metric system is probable, and

Whereas, metric conversion would result in a good many impacts on the manufacturers and users of commercial weighing and measuring devices, weights and measures jurisdictions, and the general public: Therefore, be it

Resolved by the 56th National Conference on Weights and Measures that this Conference pledge its full support and cooperation to the Federal Government in a coordinated national program to increase the use of the metric system: And be it further

Resolved that the Executive Committee is authorized to take whatever action or actions that are needed to enhance an orderly changeover to metric units in the commercial weights and measures field following congressional authority to metricate in this area: And be it further

Resolved that copies of this resolution be sent to the President of the United States, the President of the Senate, the Speaker of the House of Representatives, the Secretary of Commerce, and the Director of the National Bureau of Standards.

General Information Project

Since the area of responsibility of the Committee on Education is expanding to cover a broader spectrum of interest, it is the view of the Committee that other Conference members can make valuable contributions on certain specific items. Mr. James Stewart, Assistant Supervisor of Weights and Measures for the State of Virginia, was asked by the Committee Chairman to make a comprehensive survey of state weights and measures offices and selected industries to solicit new ideas for the Committee's consideration in carrying out its responsibility to the National Conference. Mr. Stewart received many constructive suggestions that were compiled and presented to the

Committee during the interim meeting. Several of the suggestions have been implemented, and others are under serious consideration for the future. The Committee is grateful to Mr. Stewart for his efforts in contacting officials, compiling information, and presenting his report, and to those officials that responded to the survey with their suggestions for improvement in certain areas of Conference responsibility.

Railway Track Scale Program

The Committee was presented a description of the model state railway track scale testing program as proposed by the National Bureau of Standards. This cooperative state-railroad-industry-NBS program as administered by the Office of Weights and Measures was referred to the Liaison Committee for action by the Conference.

The Office of Weights and Measures has proposed an engineering study under the NBS Research Associate Program to evaluate electronic in-motion railroad car weighers and to recommend additional code requirements in NBS Handbook 44 and the development of standardized test procedures.

State Reports

The practice of compiling a pamphlet containing reports of special weights and measures activities in the states was resumed at the 55th National Conference on Weights and Measures. After a thorough discussion of the benefits derived from such a pamphlet, the Executive Secretary was instructed to contact the states again this year for information to be included in a similar pamphlet for distribution at the 56th National Conference. The Executive Secretary was also instructed to include a questionnaire asking the views of the states concerning the effectiveness of this project. The Committee urged all state directors to respond both to the call for interesting information and to the questionnaire, in order for the Committee to carry out the wishes of the Conference regarding this project.

The Committee is grateful to the 30 state directors who submitted activity reports for inclusion in the State Reports pamphlet. In response to the questionnaire concerning the pamphlet, 23 officials contacted feel that the practice of compiling and distributing this information is beneficial and should be continued. Seven officials responded negatively regarding the continuance of this project.

During the open meeting, Dr. Leland Gordon suggested inclusion of reports from major metropolitan areas in the State Reports pamphlet. It is the Committee's opinion that State Reports should reflect

all weights and measures activities within the state. Therefore, the Committee urges that state directors take this into consideration in the preparation of their reports.

Technical Education

The Committee heard a report by Otto Warnlof of the Office of Weights and Measures on the status of various projects and activities concerning training programs at the federal, state, and local levels. There was considerable discussion on such subjects as the home study course, audiovisual aids, state and local training officers, and participation by industry representatives. The Committee wishes to stress the value and importance of a sound training effort in all jurisdictions. Additionally, it feels that there is a need for new concepts and improved techniques and aids in weights and measures training programs. It was suggested that this matter be explored in greater detail by officials at the forthcoming Conference.

The Committee advises that the final draft has been completed for the new home study course and that availability will be announced when printing has been completed.

Master Schedule for State and Regional Conferences

The Committee is aware that at certain times in the past, state or regional weights and measures meetings have been scheduled for the same week, thus making attendance difficult or impossible for those who desired to attend both meetings. After much discussion, the Committee asked the Executive Secretary to compile and have available in the Office of Weights and Measures a master list of dates and locations for all state and regional weights and measures meetings. It is hoped that industry organizations that are closely associated to the weights and measures field also participate in this undertaking. State and industry officials are urged to plan their meetings as far in advance as possible and to work with the Office of Weights and Measures in the selection of dates to avoid future conflicts.

The Committee expresses its appreciation to all who have contributed to and participated in the committee deliberations. The Committee urges all weights and measures officials and other interested parties to promptly communicate with the Committee on all matters of concern embraced in the Committee's expanded area of activity. The Committee is also grateful to the other appropriate standing committees of the Conference for their interest in and action where necessary on those items referred to them by the Committee on Education. It is only in this manner that the Committee can render maximum service to the Conference.

E. Prideaux, *Chairman*, Colorado
J. I. Moore, North Carolina
G. E. Mattimoe, Hawaii
D. I. Offner, St. Louis, Missouri
H. F. Wollin, *Secretary*, NBS
R. N. Smith, *Staff Assistant*, NBS

Committee on Education

(On motion of Mr. W. I. Thompson, seconded from the floor, the Conference by voice vote defeated the committee recommendation to change the name of National Weights and Measures Week; and on motion of the committee chairman, seconded from the floor, the report of the Committee on Education, as amended, was unanimously adopted by voice vote.)

(On motion of the committee chairman, seconded from the floor, the Conference by voice vote authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, so long as the sense of the report is not modified.)

REPORT OF THE COMMITTEE ON LIAISON WITH THE NATIONAL GOVERNMENT

Presented by L. D. Holloway, *Chairman*, Supervisor, Weights and Measures Division, Idaho Department of Agriculture

(Thursday, July 15, 1971)

The Committee on Liaison with the National Government submits its report to the 56th National Conference on Weights and Measures. The report consists of the tentative report transmitted in April as part of the Conference Announcement as amended by the final report.

The report represents recommendations of the Committee that have been formed on the basis of written comments received during the year and oral representations made during the open meeting of the Committee. The Committee intends to maintain the line of communications already established with federal agencies and to aggressively pursue all matters involving federal and state relations in the weights and measures field.

Relations with Federal Regulatory Agencies

1. During its interim meeting February 11–12, 1971, the Committee received a report from the Office of Weights and Measures concerning the status of various regulations from the Food and Drug Administration, the Federal Trade Commission, the Department of Agriculture, and the Interstate Commerce Commission.

The Committee received communications from state and local weights and measures officials concerning recently published USDA Meat Inspection Regulations. The issuance by USDA of a temporary order suspending the requirements of part 317.2(c) as applied to random weight meat packages shipped in nonconsumer containers drew varied opinions from state officials. Under the suspension, random meat packages enclosed in nonconsumer packages are not required to contain a declaration of the net quantity of contents. Some officials voiced concern over the suspension, stating the disadvantage to the retailer of having to strip the commodity to determine

the actual or average tare to use in marking net weight statements or to accept, if provided, the tare supplied by the packer and rely on its accuracy. There was even concern that, by not requiring these inner packages to be labeled, USDA was in conflict with the Model Packaging Regulation. Other officials felt the suspension justifiable, since traditional shrinkage problems associated with the shipment of prepackaged fresh meats necessarily dictates that the commodity be reweighed and labeled by the retailer just prior to retail display and sale.

The Committee has been assured by OWM that the suspension of 317.2(c) for random weight inner meat packages does not conflict with the requirements of the Model Packaging Regulation. Since no conflict of regulation exists, and particularly since there is no consensus of opinion by the states, the Committee can only instruct that a letter be sent to USDA explaining the divergence of views expressed by the states and asking that the matter receive additional study before final action. The Committee also recommends to the Conference that the matter be turned over to the Laws and Regulations Committee for future consideration and action as necessary.

2. The Committee carried over from the 55th National Conference the matter involving tare weights for commercial carriers. On the basis of a complaint from one state that its regulations conflict with Interstate Commerce Commission regulations regarding the inclusion of driver weight in a tare, the Committee is of the opinion that:

(a) the problem is not widespread in the states, since most weights and measures jurisdictions do not have responsibility in this area, and

(b) though a conflict does exist, its impact is negligible, since the net effect of both requirements is an accurate tare.

Accordingly, the Committee recommends to the Conference that no action is warranted at this time.

3. The Committee received correspondence from a weights and measures jurisdiction concerning serious short-weight violations encountered in various imported packaged products. Considerable inspection effort is necessary to take appropriate legal action on these short-weight violations. Additionally, the process of notifying foreign packers and importers of violations encountered poses communication problems. Therefore, the Committee has considered the problem and has authorized OWM to contact the appropriate federal agency having jurisdiction over imported goods to seek its cooperation and enforcement assistance in this matter.

1. *Military Installations*

The Committee met with a representative of the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) to discuss the program of weights and measures inspections on military installations. The program as established in June 1970 appears to be completely successful. However, on the basis of discussions with the representative from DOD and members of OWM, several potential problem areas are apparent.

(a) Memoranda circulated to the states by the Committee, requesting among other things that results of inspections both acceptable and unacceptable be forwarded to DOD, are not receiving widespread cooperation. As an example, only seven jurisdictions have forwarded reports since June 1970.

(b) Several jurisdictions reported that, upon followup visits, no apparent corrective action had been taken by military authorities.

In taking these matters into account, the Committee asked OWM to cooperate with DOD in establishing procedures that will provide explicit program guidance for both military and weights and measures officials. These guidelines are presented herein for consideration and adoption by the National Conference:

GUIDELINES FOR WEIGHTS AND MEASURES INSPECTION IN RESALE ACTIVITIES AT MILITARY INSTALLATIONS

General Information

1. *Authority.*—**The program was established on a formal basis June 8, 1970 by a memorandum from the Assistant Secretary of Defense for Manpower and Reserve Affairs to the Assistant Secretaries of the Military Departments. The program received official endorsement by weights and measures officials during the 55th National Conference on Weights and Measures in July 1970.**

2. *Scope.*—**The program is a cooperative undertaking between the military and state and local weights and measures officials for the purpose of achieving standards of commercial equity in the military that are commensurate with standards in public merchandising. Participation in the program by military commanders is directed. Participation by state and local weights and measures officials is contingent upon existing priorities of need and the limitations of budget and manpower. However, weights and measures officials are expected to exert every effort to provide assistance to military commanders in view of the unanimous approval at the National Conference.**

3. *Operational Standards.*—Technical requirements pertaining to weighing and measuring devices shall be as recognized in NBS Handbook 44—Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices, Fourth Edition, 1971. Labeling requirements pertaining to prepackaged commodities shall be as specified in the Model State Packaging and Labeling Regulation as adopted by the National Conference on Weights and Measures.

Program Implementation

1. *Meeting.*—The most important consideration in planning for the inspection program is that installation commanders and weights and measures officials meet and discuss all aspects of weights and measures administration.

Installation commanders are directed to contact weights and measures officials to establish an inspection program. Weights and measures officials are expected to fully inform the installation commander of the nature, extent, benefit, and, if applicable, the cost of inspection services. Such discussion should include the concept of NBS Handbook 44, the average concept in checking prepackaged commodities as outlined in NBS Handbook 67, and the labeling requirements as specified in the Model State Packaging and Labeling Regulation, as adopted by the National Conference on Weights and Measures.

If practical, weights and measures officials should survey the installation with representatives of the commander and officials of resale activities to determine the extent of weights and measures checks currently being performed, the size of resale activities, and the numbers and types of scales and metering devices in use.

It is important at this meeting that both the military commander and the weights and measures official agree to the extent of inspection services to be performed and that administrative details, such as entry upon the installation and reporting of discrepancies encountered, be agreed upon by all parties.

2. *Minimum Requirements.*—By memorandum of June 8, 1970, from the Assistant Secretary of Defense for Manpower and Reserve Affairs, installation commanders are directed, at a minimum, to provide for the inspection of weighing and measuring devices used in serving resale activity patrons together with appropriate checks of the accuracy of prepackaged goods put up by store personnel.

Weights and measures officials must take cognizance of these temporary limitations. However, military commanders may, at their discretion, broaden the inspection program to include other areas. Again, weights and measures officials should provide guidance to commanders as to the nature of inspections that should be conducted based on the types of devices used on the installation and the volume of prepackaged goods sold through resale activities. For example, several installation commanders have authorized weights and measures officials to inspect weighing and measuring devices not used in direct selling to military consumers and to inspect other than store-packed packages being sold in resale activities. These inspections have been quite helpful to the military in monitoring the accuracy of goods being introduced into military resale channels, whether such goods are in packaged form or in bulk shipments and weighed or measured at point of receipt.

3. *Scheduling Inspections.*—Any inspection program, to be effective, must operate on an unannounced basis. Weights and measures officials should not

announce their visits to military store operators in advance. On the other hand, officials of resale activities within the military operate stores which, by square area comparison to public supermarkets, far exceed the volume of business enjoyed by stores in the public sector. Such condition dictates that military store operators plan in advance for peak sales which normally coincide with military pay periods. Weights and measures officials should be aware of when these peak periods occur and should attempt to schedule their inspections in a period that would be the least disruptive to normal store operation.

4. *Entry upon Military Installations.*—Nearly all military installations control right of entry upon military grounds, and all military installations control right of entry to military resale activities. Installation commanders and weights and measures officials must cooperate to establish right of entry to military grounds and resale activities for inspection officials that will allow for a minimum of delay and yet take cognizance of security standards that are unique to the installation.

5. *Inspection.*—Weights and measures officials must understand that an inspection is for the purpose of performing a cooperative service for the military. Legally, state and local inspection officials have no jurisdiction over the devices being used or prepackaged goods being displayed for sale. Accordingly, "stop sale," "stop removal," or "condemnation" procedures cannot be used unless expressly authorized by the installation commander. Even then, such powers are to be used administratively and there is no sanction, legal or otherwise, for noncompliance with such use. The authority for any action must be drawn from the military commander.

Military commanders must understand that the inspection service is designed to benefit their command rather than impose any hardship, and that the service provided will require the valuable time of inspectors well trained in the field of weights and measures. The assurance of commercial equity in resale activities within a command carries with it an economy of effort that serves the best interest of military consumers and the armed services as a whole. Therefore, commanders should take a personal interest in achieving high commercial standards and should provide the vehicle for immediate corrective action when discrepancies are encountered.

6. *Reporting.*—Reports of inspections conducted are the yardsticks to be used in evaluating the success of the program. When completing inspections, weights and measures officials, after visiting with store operators, should then visit with the installation commander or his designated representative to discuss results and to leave copies of inspection reports.

Weights and measures officials are requested to forward copies of all inspections to:

Office of Weights and Measures
Attention: Military Inspections
National Bureau of Standards
Washington, D. C. 20234

Commanders should feel free to submit any comments or questions to the above address. The Office of Weights and Measures will process the data and provide a monthly cumulative report to the Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

7. *Corrective Action.*—It is the responsibility of the installation commander to insure that appropriate action is taken to correct violations of operational standards as outlined in paragraph 3 under General Information.

Weights and measures officials encountering recurring violations after repeated notice of violation to the installation commander are requested to forward notice of same directly to:

Colonel Robert A. Hammerle
OASD (M&RA) (PAF) (MPP)
Room 1B660
The Pentagon
Washington, D. C. 20301

8. *Technical Education and Training.*—It is the intent of the Department of Defense to work toward standards of commercial equity in its resale activities that are commensurate with standards enjoyed in the public sector. However, such standards require time to achieve, along with a thorough understanding of good commercial weighing and measuring practices. To this end, a program of technical education and training is now under way whereby officials from the NBS Office of Weights and Measures provide instruction at selected military resale activity schools. All commanders are encouraged to have their store operators and their staff participate in training seminars sponsored by State and local weights and measures officials in their immediate area. Similarly, weights and measures officials are encouraged to plan and conduct training in commercial weighing and measuring practices for military store operators.

The Committee learned that OWM is cooperating with DOD in providing instruction on weights and measures enforcement to military students attending commissary schools throughout the United States. Additionally, OWM is participating in programs sponsored by military associations concerned with operating military resale activities.

The Committee recognizes the splendid cooperation exhibited by DOD in this program and recommends to the National Conference that every effort be given to promoting the programs at all levels of weights and measures enforcement.

2. *Post Offices*

The matter of weights and measures inspection of postal scales was carried over from the 55th National Conference, at which time the Committee directed the Executive Secretary to begin negotiations with postal officials in establishing such a program.

Since the 1970 Conference the Post Office Department has, by Public Law 91–375, undergone reorganization. Under the Act, the new U. S. Postal Service is established as an independent organization of the Executive Branch of the United States Government. It is the opinion of the Committee that the reorganization into a quasi-independent corporation, with all powers and duties vested in a Board of Governors, is clear expression of intent to operate such organization in the same manner as a private corporation. In light of this opinion, the Committee addressed a letter to the General Counsel of the Postal Service expressing the view that the scales

used to compute basic postal charges are commercial devices and are subject to the accuracy requirements as established by law or regulation in the states. The General Counsel has responded to the Committee stating that the Postal Service is still an arm of the Federal Government and, therefore, not subject to state and local jurisdiction.

With this ruling in mind, and in the interest of continuing to pursue a cooperative program with postal authorities similar to the DOD program, the Committee met with postal officials to discuss the terms of such an endeavor. Of principal concern in establishing such a program is the issuance of a policy statement by the Postal Service under which weights and measures officials could use traditional powers in regulating postal scales.

The Committee expected to be able to offer in its final report a directive from the U. S. Postal Service authorizing such a program. Unfortunately, the failure of the Postal Service to cooperatively seek issuance of a policy prior to the National Conference warrants further action by the Committee. Therefore, the Committee recommends to the Conference that correspondence be forwarded to the Postmaster General, apprising him of the situation and asking for his cooperation in this endeavor.

3. *General*

The Committee wishes to extend to the National Conference its opinion concerning the entire scope of weights and measures enforcement on federal establishments. The Committee sees two important roadblocks to enforcement by state and local officials on federal establishments.

(a) The question of jurisdiction necessitates that, whatever inspection activities are conducted, these can only be conducted with the approval and cooperation of federal officials having immediate control of the activity.

(b) The sheer number of devices and prepackaged commodities in federal resale or service activities, such as military commissaries and post offices, presents a nearly impossible task to current weights and measures resources. For instance, it is estimated that over 500,000 postal scales exist in this country. Additionally, there are some 300 military commissaries in the United States.

With these points in mind, the Committee has prepared correspondence to appropriate officials of the National Bureau of Standards asking that the Committee, as a representative of the states, be given the opportunity to discuss with them the possibility that an arm of the Federal Government be empowered to assume the

responsibility of weights and measures enforcement of federal establishments.

NBS Enabling Act

In its final report to the 55th National Conference, the Committee recommended to the National Bureau of Standards that the Bureau actively seek to extend its Enabling Act to include specific responsibility to promote uniformity between laws, regulations, and practices adopted by federal agencies and bearing on weights and measures enforcement. The matter was brought to the attention of the Bureau's legal advisor. In his opinion, such specific authority already exists under subsection 1.01.03 of the Enabling Act, which reads that the Secretary of Commerce is authorized to undertake "cooperation with other governmental agencies and private organizations in the establishment of standard practices."

This being the case, together with a generally favorable history of intergovernmental cooperation, the Committee recognizes that authority for NBS liaison activities with federal regulatory agencies does exist. However, in light of the increasing demands for state and local weights and measures activities and the fact that these officials have no jurisdiction over the devices and prepackaged goods in federal establishments, the Committee strongly urges that NBS seek to amend its Enabling Act to assume the responsibility of federal weights and measures enforcement in federally operated premises.

Weights and Measures Labeling Handbook

The Weights and Measures Labeling Handbook, NBS Handbook 108, has been published and is currently on sale through the Superintendent of Documents at a unit price of $3.25. Copies may be ordered by SD Catalog No. C13.11:108., U. S. Government Printing Office, Washington, D. C. 20402.

Advisory to OWM

The Committee received comment from OWM that valuable assistance could be rendered by having the Committee act in an advisory capacity to OWM on its programs. Accordingly, during its interim meeting, the Committee received a program review from the Chief of the Office of Weights and Measures outlining the anticipated activities of OWM for the coming fiscal year and the funds avail-

able for supporting such activities. On the basis of the review and several agenda items offered in the tentative report, the Committee recommended that:

(a) OWM publish its organizational structure to alleviate some confusion that currently exists within the states as to addressing correspondence to OWM on National Conference and non-Conference matters.

(b) A meeting be arranged with the proper managers of the National Bureau of Standards at which the Committee could discuss OWM programs and express the needs of the National Conference as these needs relate to OWM programs.

The Committee expresses its appreciation to OWM for suggesting that the Committee assume this important responsibility, and recommends to the National Conference that such a function be instituted as a yearly activity of the Committee.

National Railway Track Scale Program

The Committee received comment from OWM on efforts under way to achieve a nationwide railway track scale program embodying the cooperation of the technical staff of OWM and weights and measures enforcement officials in the field. The Committee strongly endorses such a program and recommends its adoption to the National Conference as follows:

MODEL STATE PROGRAM FOR RAILROAD TRACK SCALE TESTING

1. *Introduction.*—There are in the U. S. approximately 7,000 railroad track scales. Track scales are in use daily, and the commodities weighed represent millions of dollars to agriculture, industry, and commerce in every state. Regulatory authority over railroad track scales in use in the states rests with the state weights and measures officials. The weights and measures law applies to all commercial weighing devices.

2. *Problem.*—In the past, very little authority has been exercised over railroad track scales by weights and measures officials, due to the lack of special equipment needed to test these devices.

The National Bureau of Standards has long recognized the need for supervision of track scale accuracy and weighing, and since 1913 has conducted a track scale testing program. The Bureau annually tests and certifies the 17 master track scales located throughout the United States, since these are used as standards in the calibration of railroad-owned test cars. All of the major railroads operate composite test cars and conduct scale maintenance and testing programs.

Recent tests by NBS indicate that some scales have failed to meet the accuracy requirements and are not being properly maintained. Improper maintenance and resulting inaccuracies have caused high rejection rates in some areas.

3. *Proposal.*—It is proposed that the state weights and measures department, the National Bureau of Standards, and railroad industry cooperate in a track scale testing program. The testing equipment and personnel of NBS and the railroads will be utilized in making necessary tests. A state weights and measures official will be present to witness each NBS test and sign the reports. An NBS Report of Test will be issued for all scales tested by the National Bureau of Standards.

4. *Program Design.*—Railroad-owned scales will be tested for accuracy on a sample basis with NBS equipment. This will provide information concerning the effectiveness of railroad testing and maintenance programs.

Industry-owned scales will be tested on a sample basis by either NBS equipment or test cars owned by the railroads. The sample of railroad and industry-owned scales to be tested by NBS will be chosen cooperatively by NBS, the railroads, and the state weights and measures agencies. Criteria to be used to determine which industry or railroad scale will be tested by NBS include scale capacity, extent of commercial use, scale type, past test performance, and location. Industry and the railroads may request the NBS test.

All test cars used by the railroads should be calibrated at least once each year on an NBS-approved master scale. (An NBS field calibration may substitute for a master scale calibration.) Any railroad track scale used commercially should be tested at least once each year.

5. *Benefits.*—This program should result in improved railroad track scale accuracy. Consequently, more accurate determinations of loading and freight commodity charges will result. Through improved scale accuracy and weighing procedures, significant economic benefits will be realized by the railroads and private industry. This cooperative program will provide support for the state weights and measures officials in the certification of railroad track scales.

Consistent with its endorsement, the Committee has forwarded correspondence to appropriate NBS officials asking for Bureau support of the program. Additionally, the Committee anticipates meetings with select congressional leaders to emphasize the importance of the program and to secure the necessary funding to support its activities.

Physical Standards for Major Cities

OWM has conducted a limited survey of the large metropolitan cities having weights and measures laboratories to determine the types of standards in use and their relative age and condition. It is the opinion of the Committee that there exists the technical need for certain metropolitan cities to keep and use standards that are traceable to NBS. The Committee, therefore, has directed OWM to study the matter and to develop a tentative plan for consideration by the Bureau and the National Conference.

The matter of wheel-load weighers originated with the Committee on Specifications and Tolerances. In its report to the 55th National Conference, the S & T Committee urged weights and measures officials to provide OWM with information on the subject so that, in response to such data, the Liaison Committee could approach federal agencies on any conflicts in requirements. No data have been received by OWM.

Therefore, the Committee is of the opinion that no action is warranted at this time.

L. D. Holloway, *Chairman*, Idaho
M. Greenspan, New York City, N. Y.
R. C. Primley, Cities Service Oil Co.
A. Sanders, Scale Manufacturers Assn.
E. E. Wolski, Colgate-Palmolive Co.
H. F. Wollin, *Secretary*, NBS
D. E. Edgerly, *Staff Assistant*, NBS

Committee on Liaison with the
National Government

(On motion of the committee chairman, seconded from the floor, the report of the Committee on Liaison with the National Government was unanimously adopted by voice vote.)

(On motion of the committee chairman, seconded from the floor, the Conference by voice vote authorized the Executive Secretary to make such editorial changes as may be needed to the report without changing the intent or meaning of the report.)

REPORT OF THE COMMITTEE ON SPECIFICATIONS AND TOLERANCES

Presented by D. E. Konsoer, *Chairman*, Director, Bureau of Weights and Measures, Food Division, Wisconsin Department of Agriculture

(Thursday, July 15, 1971)

The Committee on Specifications and Tolerances submits its report to the 56th National Conference on Weights and Measures. The report consists of the tentative report, transmitted in April as part of the Conference Announcement, as amended by the final report.

The report represents recommendations of the Committee that have been formed on the basis of written and oral comments received during the year and oral presentations made during the open meeting of the Committee. All recommended amendments are to appropriate provisions of the codes of the National Bureau of Standards Handbook 44, 3d Edition, *Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.*

General Code

1. *G–A.7. Effective Enforcement Dates of Code Requirements.*—The Committee agrees with the comment it received that the requirements as added to the code last year would seem to preclude the regulatory authority of each jurisdiction, and thus recommends that this paragraph be amended to read as follows:

G-A.7. EFFECTIVE ENFORCEMENT DATES OF CODE REQUIREMENTS. —Unless otherwise specified, each new or amended code requirement shall not be subject to enforcement prior to January 1 of the year following the adoption by the National Conference on Weights and Measures and publication by the National Bureau of Standards.

(The foregoing item was adopted by voice vote.)

2. *G–S.5.5. Money Values—Mathematical Agreement.*—The Committee feels the philosophy expressed in this requirement is sound and applicable in many instances. However, the Committee believes that this requirement does not recognize the possibility of a quantity value presented as analog and a money value presented digitally. To provide requirements for this condition, it is the view of the Committee that the individual codes be amended as necessary. Therefore,

the Committee recommends that no change be made to G–S.5.5. and that the Scale Code be amended as described in Scale Code item 2.

(The foregoing item was adopted by voice vote.)

3. *G–UR.2.2. Installation of Indicating or Recording Element.*—A state official indicated that the means provided for direct communication between the weighing element and the primary indicating or recording element were often temporary in nature and proved unsatisfactory, and suggested that these means be permanently installed. The Committee recommends that this paragraph be amended to read as follows:

G-UR.2.2. INSTALLATION OF INDICATING OR RECORDING ELEMENT.—A device shall be so installed that there is no obstruction between a primary indicating or recording element and the weighing or measuring element; otherwise, there shall be convenient and permanently installed means for direct communication, oral or visual, between an individual located at a primary indicating or recording element and an individual located at the weighing or measuring element. [See also G-UR.3.2.]

(The foregoing item was adopted by voice vote.)

4. G–UR.4.4. *Replacement of Security Seal.*—The Committee received several recommendations concerning this requirement. It is the Committee's view that a security seal should be affixed to an adjustment mechanism at all times whether or not it is an official seal or that of a serviceman, manufacturer, or installer. The Committee recommends that this requirement be amended to read as follows:

G-UR.4.4 SECURITY SEAL.—A security seal shall be appropriately affixed to any adjustment mechanism designed to be sealed.

(The foregoing item was adopted by voice vote.)

Scale Code

1. *S.1.5.1. For Computing Scales Only—Value Graduations and Graduated Intervals.*—A manufacturer of computing scales has requested that this requirement be clarified to indicate that it pertains only to analog money-value graduations as they appear on the computing charts of drum or fan-type scales, and to extend these requirements to cover the higher prices needed for today's scales. Thus, the Committee recommended in its tentative report that S.1.5.1. be amended to read as follows:

S.1.5.1. MONEY-VALUE GRADUATIONS.—The value of the graduated intervals representing money values on a computing scale with analog indications shall be as follows:

(a) Not more than 1 cent at all unit prices of 25 cents per pound and less.

(b) Not more than 2 cents at unit prices of 26 cents per pound through $1.25 per pound. (Special graduations defining 5-cent intervals may be employed, but not in the spaces between regular graduations.)

(c) Not more than 5 cents at unit prices of $1.26 per pound through $5.00 per pound.

(d) Not more than 10 cents at unit prices above $5.00 per pound.

Value figures and graduations shall not be duplicated in any column or row on the graduated chart. (See also G-S.5.5., S.1.5.2., and S.1.5.3.)

On the basis of comments received both prior to and during the open meeting, the Committee has reconsidered this item and recommends the following change:

(c) Not more than 5 cents at unit prices of $1.26 per pound through $3.40 per pound.

(d) Not more than 10 cents at unit prices above $3.40 per pound.

(S.1.5.1. as amended was adopted by voice vote.)

2. To provide for agreement between analog and digital values as discussed in General Code item 2, paragraph G–S.5.5., the Committee recommends that present paragraph S.1.5.2. be renumbered S.1.5.3. and that a new paragraph S.1.5.2. be added as follows:

S.1.5.2. MONEY-VALUE COMPUTATION.—A computing scale with analog quantity indications used in retail trade may compute and present digital money values to the nearest quantity graduation when the value of the minimum graduated interval is 0.01 pound or less. (See also G-S.5.5.)

(The foregoing item was adopted by voice vote.)

3. *S.1.5.3. Customer's Indications (formerly S.1.5.2.).*—The Committee received a comment from the Southern Weights and Measures Association that there is presently being marketed computing scales with digital indications on the operator's side and only analog indications on the customer's side. It was the view of the Southern Association that devices equipped with digital indications for the operator should be similarly equipped for the customer. The Committee agrees and recommends the following nonretroactive amendment to this paragraph:

S.1.5.3. CUSTOMER'S INDICATIONS.—Weight indications shall be shown on the customer's side of computing scales when these are used for direct sales to retail customers. ***Computing scales equipped on the operator's side with digital indications, such as the net weight, price per pound, or total price, shall be similarly equipped on the customer's side. (Nonretroactive as of 1971.)***

(The foregoing item was adopted by voice vote.)

4. The Southern Association has recommended that recognition be given the newly developed computing scales having a tare mechanism that is readily accessible to the operator. It has long been an enforcement problem to insure that net weight is represented for commodities sold directly over computing scales, such as in the delicatessen section. To recognize the new developments in devices and provide for net-weight sales, the Committee recommended in its tentative report the following amendments to S.2. Design of Balance, Level, Damping, and Arresting Mechanisms:

Amend the title of S.2. to read:

S.2. DESIGN OF BALANCE, TARE, LEVEL, DAMPING, AND ARRESTING MECHANISMS.

Delete present paragraphs S.2.1.2. and S.2.1.3. and add new paragraphs as follows:

S.2.1.2. BALANCING MECHANISMS.—Except on cream-test, moisture-test, jewelers, prescription, prepackaging, checkweighing, and other scales not used in direct sales, a mechanism (excluding a balance ball) for adjusting the zero-load balance shall be operable or accessible only by a tool outside of and entirely separate from this mechanism. *A balance ball shall not itself be rotatable unless it is automatic in operation or it is enclosed in a cabinet. (Nonretroactive as of 1956 and to become retroactive on January 1, 1976.)*

S.2.1.3. TARE MECHANISM.—The tare mechanism (including a tare bar) shall operate only in a backward direction (that is, in the direction of underregistration) with respect to the zero-load balance condition of the scale.

Comment was made at the open meeting that on devices equipped with a tare knob the tare knob should be so located that a customer could view its operation. It is the Committee's opinion that this condition is enforceable under the present General Code requirement G–UR.3.2., which requires not only that the weight indications may be viewed by the customer but that the weighing and measuring operation may be observed as well. However, on the basis of several written comments on this recommended change, the Committee recommends the following editorial changes from its tentative report:

S.2.1.2. BALANCING MECHANISM ON SCALES USED IN DIRECT SALES.—A balancing mechanism (other than a balance ball) shall be operable or accessible only by a tool outside of and entirely separate from this mechanism, or enclosed in a cabinet. *A balance ball shall not itself be rotatable unless it is automatic in operation or is enclosed in a cabinet. (Nonretroactive as of 1956 and to become retroactive on January 1, 1976.)*

S.2.1.3. TARE MECHANISM.—The tare mechanism shall operate only in a backward direction (that is, in the direction of underregistration) with respect to the zero-load balance condition of the scale.

Delete S.2.5. and S.2.5.1. and renumber S.2.6., S.2.6.1., S.2.7., and S.2.7.1. as S.2.5., S.2.5.1., S.2.6., and S.2.6.1., respectively.

Add the following definitions:

direct sale. A sale in which both parties in the transaction are present when the quantity is being determined.

balancing mechanism. A mechanism (including a balance ball) that is designed for adjusting a scale to an accurate zero-load balance condition.

tare mechanism. A mechanism (including a tare bar) that is designed for determining or balancing out the weight of packaging material, containers, vehicles, or other materials that are not intended to be included in net-weight determinations.

(Section 4 as amended was adopted by voice vote.)

5. *SR.7. For Railway Track Scales.*—The Northwest Weights and Measures Association has recommended that the sensitivity requirement for railway track scales be reduced. The Committee feels this would be a progressive step to take and therefore recommends the following amendment to SR.7.:

SR.7. FOR RAILWAY TRACK SCALES.—The SR shall be three times the value of the minimum graduated interval on the weighbeam, or 100 pounds, whichever is less.

The Committee received a written comment that this requirement be adopted in its present form only if UR.1.1.7. was adopted.

(UR.1.1.7. was subsequently adopted and section 5 was adopted by voice vote.)

6. *T.1.1.1. With Two or More Elements.*—The Committee was advised that this requirement has created a hardship on scale owners, particularly with respect to maintaining agreement between the dial indication at capacity and the drop weight indication within the value of the minimum graduated interval on the scale. The Committee has given this problem (and others associated with section T.

Tolerances) very careful consideration, and recommended in its tentative report the following amendments to the section on Tolerances:

Amend paragraph T.1. to read:

T.1. TOLERANCE APPLICATION.—Tolerance values shall be applied to all indications and recorded representations of a scale.

Change the title of T.1.1. to read:

T.1.1. TO ERRORS OF UNDERREGISTRATION AND OVERREGISTRATION.

Delete paragraph T.1.1.1.; renumber present paragraphs T.1.2. through T.1.6. to T.1.3. through T.1.7., respectively; and add new paragraph T.1.2. as follows:

T.1.2. TO SCALES WITH MULTIPLE ELEMENTS.—Tolerances shall be applied independently to each indicating and recording element of a scale. However, the following requirements pertaining to analog and digital elements shall also apply:

(a) All analog elements similar in design shall not differ from one another, and all digital elements shall not differ from one another.

(b) All analog indications and recorded representations shall not differ from digital indications and recorded representations by an amount greater than the value of the minimum graduated interval on the scale.

(c) All components of the same element used in combination (such as a dial and unit weights) shall not differ by an amount greater than the applicable tolerance at a given test load.

On the basis of comments received both prior to and during the open meeting, the Committee recommends the following change from the tentative report:

(a) All analog indications within the same element shall not differ from one another and all digital elements shall not differ from one another.

(b) All analog indications and recorded representations shall not differ from digital indications and recorded representations by an amount greater than the value of the minimum graduated interval on the device, except the elements shall not differ under a no-load zero balance condition.

Delete paragraph T.3.1. Application, and renumber paragraphs T.3.2. through T.3.7. as T.3.1. through T.3.6., respectively.

Add the following parenthetical statement at the end of new paragraph T.3.1. General, as follows:

(Basic tolerance values include the minimum tolerance values as set forth in section T.2.)

Add the following definition to the Scale Code:

minimum tolerances. Minimum tolerances are the smallest values that can be applied to a scale. Minimum tolerances are determined on the basis of the value of the minimum graduated interval or the nominal or reading face capacity of the scale. (See also General Code definition for basic tolerances.)

(The foregoing section 6 on Tolerances as amended was adopted by voice vote.)

7. *Scales (Balances) Indicating in Troy Weight.*—Two suggestions were received requesting that basic tolerance values be provided for scales (balances) indicating in troy weight. It is the Committee's opinion that such scales are intended to be covered by the requirements for jewelers scales. To further clarify this situation, the Committee recommended in its tentative report that the definition for jewelers scale be amended to read as follows:

jewelers scale. One adapted to weighing gems and precious metals, including those indicating in troy weight.

In its tentative report the Committee tried to handle as expeditiously as possible requirements for balances and scales indicating in troy weight used by precious metals dealers. Since the tentative report, it was pointed out that this led to complications, especially in the area of minimum tolerance and SR requirements. The Committee withdraws its recommended amendment in the tentative report and offers the following comment: In the examination of balances used commercially, when Handbook 44 requirements are not applicable, the Committee recommends that state laboratory metrologists, field supervisors, and other knowledgeable personnel be consulted as to what requirements are appropriate in the examination. The Office of Weights and Measures should also be consulted when additional help is needed.

(The foregoing item as amended was adopted by voice vote.)

8. *T.3.7. For Wheel-Load Weighers.*—Last year the Committee, in response to several suggestions to reduce the tolerances for wheel-load weighers, recommended in its final report that more data be gathered on this matter and that this item be continued on the Committee's agenda. On the basis of the information received during the ensuing year, the Committee recommends no change to this requirement.

(The foregoing item was adopted by voice vote.)

9. *UR.1.1.4. For Hand-Operated Grain Hopper Scales Only.*—The Committee received several suggestions to eliminate the term "hand-operated" from paragraph UR.1.1.4. and other user requirement paragraphs in which it is used. The Committee agrees and recommends further that UR.1.1.4. be amended to read as follows:

UR.1.1.4. FOR GRAIN HOPPER SCALES ONLY.—The value of the minimum graduated interval shall be not greater than 10 pounds for scales with a nominal capacity of 50,000 pounds or less, and not greater than 20 pounds for scales with a nominal capacity of more than 50,000 pounds.

(The foregoing item was adopted by voice vote.)

10. *UR.1.1.7. For Railway Track Scales Only.*—The Committee received suggestions from the Northwest and Western Weights and Measures Associations to reduce the value of the minimum graduated interval in this requirement. On the basis of these suggestions and consultation with others experienced in the field of railroad weighing, the Committee believes that a change in this requirement is advisable and accordingly recommended in its tentative report the following nonretroactive amendment:

UR.1.1.7. FOR RAILWAY TRACK SCALES ONLY.—*The value of the minimum graduated interval shall be:*

(a) *Not greater than 20 pounds on non-automatic indicating scales.*

(b) *Not greater than 50 pounds on automatic indicating scales having nominal capacities up to and including 200,000 pounds.*

(c) *Not greater than 100 pounds on automatic indicating scales having nominal capacities over 200,000 pounds.*

(Nonretroactive as of 1971.)

On the basis of comments received during the open meeting, the Committee recommends that paragraphs (b) and (c) as given in the tentative report be rescinded and that the following new paragraph (b) be substituted:

(b) *Not greater than 100 pounds on automatic-indicating scales.*

(The foregoing item as amended was adopted by voice vote.)

11. *UR.1.1.8. For Scales with Nominal Capacities of 500 Pounds or More, other than Animal, Livestock, Hand-Operated Grain Hopper, Crane, Axle-Load, Vehicle Scales, Wheel-Load Weighers, and Railway Track Scales.*—The Committee received a recommendation that this paragraph be amended to provide a maximum value for the minimum graduated interval on scales with nominal capacities of

less than 500 pounds. It was the view of the Committee that, since there are so many applications for scales in this lower weight range, it would be difficult to stipulate a value that would be entirely suitable for all scales in this range. To provide further clarification, the Committee recommends that a note be added at the end of this paragraph so that it will read as follows:

UR.1.1.8. FOR SCALES WITH NOMINAL CAPACITIES OF 500 POUNDS OR MORE OTHER THAN ANIMAL, LIVESTOCK, GRAIN HOPPER, CRANE, AXLE-LOAD, VEHICLE SCALES, WHEEL-LOAD WEIGHERS, AND RAILWAY TRACK SCALES.—The value of the minimum graduated interval shall be not greater than 0.1 percent of the nominal capacity of the scale, and in any case not greater than 50 pounds.

NOTE: For scales with nominal capacities of less than 500 pounds, refer to paragraph G–UR.1.1. of the General Code, Suitability of Equipment.

In addition, the Committee recommends that paragraph UR.1.1.8. be changed from nonretroactive to retroactive status, as it has been nonretroactive since 1960.

(Section 11 was adopted by voice vote.)

12. The Western Association recommended that a new user requirement be added to provide for a minimum graduated interval of not greater than 10 pounds on automatic indicating scales with a nominal capacity of greater than 5,000 pounds, other than animal, livestock, grain hopper, crane, axle-load, vehicle, wheel-load weighers, railway, and aggregate scales. The Committee stated in its tentative report that, in its view, the present requirements of UR.1.1.8. are adequate and that, when a particular jurisdiction wishes to require that devices in certain applications be equipped with a minimum graduated interval less than the maximum described in UR.1.1.8., it may do so under the provisions of G–UR.1.1., Suitability of Equipment.

The Committee received a written comment suggesting that the Committee's recommendation in the tentative report opened the door for nonuniformity. The Committee's view expressed in the tentative report has not changed; however, it was not its intention to encourage nonuniformity but rather to recognize that under certain conditions a jurisdiction may wish to require a smaller minimum graduated interval than as stipulated in the present requirements of UR.1.1.8. The Committee wishes to remind the Conference that the values of the minimum graduated intervals in all of the UR.1. Selection Requirements are indicated as not greater than the specified amount. There are many applications where, in the weighing of extremely expensive commodities, one might recommend a finer graduation than the maximum specified in the UR.1. section. The Committee reiterates that in its view the present requirements of UR.1.1.8. are adequate.

However, when a jurisdiction determines that, for good merchandising practices, a device should be equipped with a minimum graduated interval less than the maximum described in UR.1.1.8., it may so require under the provisions of G–UR.1.1. Suitability of Equipment.

(Section 12 was adopted by voice vote.)

13. The Committee received several recommendations that the Scale Code be amended to include additional requirements pertaining to railway track scales and railway weighing. The Committee has recommended in this report several amendments to existing requirements for railway track scales. The Committee believes that adequate information is not available at this time to recommend further requirements and recommends that OWM continue to study this area and that all interested parties communicate with OWM during the ensuing year.

(The foregoing item was adopted by voice vote.)

Code for Belt-Conveyor Scales

1. *N.3.1. Zero-Load Test.*—On the basis of several suggestions to clarify this requirement, the Committee recommends that N.3.1. be amended to read as follows:

N.3.1. ZERO-LOAD TEST.—If a belt conveyor has been idle for a period of two hours or more, before the start of the test the conveyor shall be run empty for not less than 15 minutes. The test shall then be conducted with the belt conveyor empty for an interval of not less than 10 minutes and not less than three circuits of the belt. The counter shall be read when a marked spot on the belt passes a marked spot on the conveyor at the beginning and conclusion of the test. The zero-load test error shall not exceed 0.05 percent of the rated capacity per hour of test.

(The foregoing item was adopted by voice vote.)

Code for Liquid-Measuring Devices

1. *S.3.1. Diversion of Measured Liquid.*—The State of California suggested that this requirement be reworded similar to S.3.1. of the Code for Vehicle-Tank Meters and that subsection (b) of this requirement be included as a user requirement. The Committee felt that certain changes would be desirable and recommended in its tentative report that S.3.1. be amended and that new user requirement 2.4. be added as follows:

S.3.1. DIVERSION OF MEASURED LIQUID.—No means shall be provided by which any measured liquid can be diverted from the measuring chamber of the meter or discharge lines therefrom. However, two delivery outlets may be installed on a motor-fuel device used exclusively in the fueling of trucks if means are provided to insure that liquid can flow from only one such outlet at one time.

UR.2.4. DIVERSION OF LIQUID FLOW.—A motor-fuel device used exclusively in the fueling of trucks equipped with two delivery outlets shall be so installed that the flow from either of the delivery outlets cannot be diverted from the truck being serviced.

The Committee also recommended in its tentative report that an additional user requirement be added reading as follows:

INDICATION AND DELIVERY WITH TWO OUTLETS.—On a motor-fuel device (that may include a satellite dispenser) used exclusively in the fueling of trucks equipped with two delivery outlets, there shall be conspicuously displayed on the device appropriate signs or markings that explain the system of indication and delivery.

On the basis of written and oral comments, the Committee rescinded the second user requirement and recommended that UR.2.4. be amended to read as follows:

UR.2.4. DIVERSION OF LIQUID FLOW.—A motor fuel device equipped with two delivery outlets used exclusively in the fueling of trucks shall be so installed that any diversion of flow from either of the delivery outlets will be readily apparent.

(Section 1 as amended was adopted by voice vote.)

2. *N.4.1. Normal Tests.*—In order to have common usage of terms throughout the code, the Committee recommends the following editorial change to paragraph N.4.1.: Change the word "disconnected" at the end of the paragraph to "deactivated."

(The foregoing item was adopted by voice vote.)

3. *N.4.2.2. Special Tests for Retail Motor-Fuel Devices.*—The Committee received several communications that retail motor-fuel devices equipped with automatic nozzles are often operated at a discharge rate established by the automatic discharge nozzle when set at its slowest setting. As it is fundamental that devices be examined so as to duplicate as nearly as practicable service conditions of operation, the Committee recommends that the word "or" be deleted from subsection (a), that the word "or" be substituted for the words "whichever is less" in subsection (b), and that a new subsection (c) be added as follows:

(c) the minimum discharge rate at which the device will deliver when equipped with an automatic discharge nozzle set at its slowest setting, whichever is least.

(The foregoing item was adopted by voice vote.)

4. In recognition of the several suggestions received by the Committee concerning requirements for motor-fuel devices at marinas and airports, it is the view of the Committee that G–UR.3.2. Position of Equipment should be appropriately considered when such devices are inspected. Additionally, the Committee recommended in its tentative report that a new nonretroactive user requirement be added as follows:

UR.1.1.1. FOR MARINAS AND AIRPORTS.—*The length of the discharge hose shall be as short as practicable, and in no case exceed 50 feet. Discharge hoses exceeding 15 feet in length shall be adequately protected from weather and other environmental factors when not in use. (Nonretroactive as of 1971, and to become retroactive on January 1, 1974.)*

The Committee received both written and oral comments on its recommendation at the open meeting. On the basis of these several suggestions, the Committee recommends accepting the proposal of API to participate in a study, and, as an interim measure, recommends that UR.1.1.1. be amended to read as follows:

UR.1.1.1. FOR MARINAS AND AIRPORTS.—*The length of the discharge hose shall be as short as practical, and shall not exceed 50 feet unless it can be demonstrated that a longer hose is essential. Discharge hoses exceeding 15 feet in length shall be adequately protected from weather and other environmental factors when not in use. (Nonretroactive as of 1971, and to become retroactive on January 1, 1974.)*

(The foregoing item as amended was adopted by voice vote.)

5. *UR.3.2. Unit Price and Product Identity.*—The Committee received several suggestions that this requirement be amended to require that the device compute and deliver at the same price. The Committee, therefore, recommends that the word "and" be substituted for the words "or to" and the term "as the case may be" be deleted in line 4 of the first sentence of this paragraph. The sentence will then read:

On a retail device of the computing type or of the coin-operated type, there shall be displayed on each face of the device the unit price at which the device is set to compute and deliver, and there shall be conspicuously displayed on each side of the device the identity of the product that is being dispensed.

(The foregoing item was adopted by voice vote.)

6. In a communication from the Southern Association it was stated that in wholesale sales, when the volume of product delivered was adjusted for temperature variations, an automatic temperature-compensated meter was not always used. In those cases the temperature of the product was determined at various times and various locations throughout the day. In order to provide uniformity and equity in this method of sale, the Committee recommended in its tentative report an amendment to the title of UR.3.5. and the addition of new user requirement UR.3.5.3. as follows:

UR.3.5. TEMPERATURE COMPENSATION—WHOLESALE.

UR.3.5.3. NONAUTOMATIC TEMPERATURE COMPENSATION.—If the volume of the product delivered is adjusted to compensate for temperature variations, the product temperature shall be determined at the receiving vehicle at the time it is loaded. The accompanying invoice shall indicate that the volume of the product has been adjusted for temperature variation and shall state the temperature of the product from which the volume was adjusted.

The Committee received a written comment that the recommended amendment in the tentative report could be interpreted to require that the temperature be taken in the truck and preclude the use of thermometer wells at the meter or in the discharge lines leading to the fill spout. On the basis of this comment, the Committee recommends that this amendment read as follows:

UR.3.5.3. NONAUTOMATIC TEMPERATURE COMPENSATION.—If the volume of the product delivered is adjusted to the volume at 60 °F, the product temperature shall be taken during the delivery in the liquid chamber of the meter or in the meter inlet or discharge line adjacent to the meter, or shall be taken at the time the product is loaded in the compartment of the receiving vehicle. The accompanying invoice shall indicate that the volume of the product has been adjusted for temperature variations to a volume of 60 °F and shall also state the product temperature used in making the adjustment.

(The foregoing item as amended was adopted by voice vote.)

7. The Committee received several recommendations that the LMD Code be amended, if necessary, to provide for the wholesale application of the totalizers on retail gasoline pumps. This subject was discussed at the 52d National Conference in 1967 and included in the Committee's final report. The following recommendation of the Committee concerning the use of the totalizer on a retail motor-fuel dispenser as a commercial measuring device was adopted by the 52d Conference:

Any indicating or recording element of a liquid-measuring device that is to be the determining factor in a commercial transaction involving measurement should, without question, conform to all appropriate requirements for liquid-measuring devices.

The Committee included the following statement from its report to the 53d Conference:

The Committee notes specifically that the requirements pertaining to indicating elements included in the Code for Liquid Measuring Devices that are applicable to the totalizers in commercial service, are only those that are appropriate for wholesale devices, even though the totalizer is installed in a "retail device."

The Committee concurs with the actions taken during the 52d and 53d Conferences. However, it has been suggested that the LMD Code be amended to provide for the commercial use of retail devices equipped with key control systems. These devices allow certain individual purchasers to purchase gasoline through a pump with the use of registered keys. Payments are made monthly based on a totalizer reading. Such totalizers operate independently with the individual keys. The Committee, therefore, recommends that paragraphs S.1.4.2. and UR.3.1. of the LMD Code be amended to read as follows:

S.1.4.2. RETURN TO ZERO.—The primary indicating elements, and primary recording elements if the device is equipped to record, shall be readily returnable to a definite zero indication. However, a key-lock or other self-operated device may be equipped with cumulative indicating elements provided that it is also equipped with a zero-return indicating element. Means shall be provided to prevent the return of primary indicating elements, and of primary recording elements if the device is so equipped, beyond their correct zero position.

UR.3.1. RETURN OF INDICATING ELEMENT TO ZERO.—On any device used in making individual retail deliveries to individual consumers, the primary indicating element, except totalizers on key-lock or other self-operated devices, and the primary recording element if the device is equipped to record, shall be returned to zero before each such delivery.

(Section 7 as amended was adopted by voice vote.)

8. *New Plan of the American Petroleum Institute.*—The Committee has been advised that a plan has been developed and approved by API that will establish a close working relationship between weights and measures officials of each state and the Petroleum Council or Committee of that state. The plan offers a program and procedures for handling weights and measures problems that involve the petroleum industry.

The Committee was encouraged by the statement from API during its open meeting that, to date, the Petroleum Councils representing 30 states have been contacted, and cooperative programs with weights and measures officials have been established in these states. This effort will continue until all states have been contacted and a cooperative educational program initiated in each jurisdiction.

(The foregoing item was adopted by voice vote.)

Code for Vehicle-Tank Meters

1. *UR.2.2. Ticket in Printing Device.*—The State of California recommended that this requirement be amended to provide for instances in which two or more receptacles on the customer's premises are filled to allow for a cumulative total on the ticket. This would permit a ticket to remain in the device while the vehicle is in motion but does not leave the customer's premises. The Committee can see no problem with this practice and, thus, recommends that UR.2.2. be amended by adding at the end of the paragraph the phrase **"while on a public street, highway, or thoroughfare."**

(The foregoing item was adopted by voice vote.)

Code for LPG Liquid-Measuring Devices

1. *N.4.1. Normal Tests.*—For the reason explained previously in this report, the Committee recommends the following editorial change to paragraph N.4.1.: Change the word "disconnected" at the end of the paragraph to **"deactivated."**

(The foregoing item was adopted by voice vote.)

2. *UR.2.6. Ticket in Printing Device.*—For the same reason indicated in the paragraph relating to the Code for Vehicle-Tank Meters, the Committee recommends that UR.2.6. be amended by adding at the end of the paragraph the phrase **"while on a public street, highway, or thoroughfare."**

(The foregoing item was adopted by voice vote.)

3. The State of Florida informed the Committee that the vast majority of devices used in dispensing LP Gas at service stations were dispensing only a small portion of their total volume to the fuel tanks of highway vehicles. Most of the product is dispensed to bottles on trailers, campers, trucks, etc. To require a dispenser

with a zero set-back interlock would subject these dealers to an unjustifiable expense. It was the recommendation of the State of Florida that this code be amended so as not to require a zero set-back interlock on devices primarily used to fill those bottles. The Committee, therefore, recommends the following amendments:

Amend the title of S.2.7. to read as follows:

S.2.7. FOR RETAIL MOTOR-FUEL DEVICES ONLY.

Amend the definition for motor-fuel device by inserting the word **"primarily"** following the words "A stationary device" in the first line.

Amend the definition for retail device to read as follows:

retail device. A device used for single deliveries of liquefied petroleum gas for domestic or nonresale use.

(Section 3 was adopted by voice vote.)

Code for Vehicle Tanks—as Measures

1. *S.2.5. Permanent Indicators.*—In response to several suggestions, the Committee recommended in its tentative report that this requirement be amended to read as follows:

S.2.5. PERMANENT INDICATORS.—Any indicator that is not intended to remain adjustable, and its accompanying bracket or support, shall be securely welded in position.

On the basis of comments received during the open meeting, the Committee recommends that S.2.5. be amended to read as follows:

S.2.5. PERMANENCE.—Any indicator that is not intended to remain adjustable, *and all brackets or supports,* shall be securely welded in position. *(Nonretroactive as of 1971 and to become retroactive as of January 1, 1974.)*

(The foregoing item as amended was adopted by voice vote.)

Other Items

1. *Handbook 44 Revision.*—The Committee was advised that the National Bureau of Standards will publish a revised edition of Handbook 44, to be known as the Fourth Edition, following the 56th

Conference. This new edition of the handbook will be published to eliminate the necessity for inserting the considerable number of replacement sheets that have been issued since the publication of the Third Edition in 1965. Certain appropriate editorial changes will be made in the contents of the Introduction and the section on Fundamental Considerations. No changes, other than those adopted by the 56th Conference, will be made in the technical requirements of the various codes. However, the Fourth Edition will feature significant changes in the layout and typography of the codes to improve their readability and to facilitate the insertion of future amendments.

The Committee has seen a representative sample of the proposed revision and is most enthusiastic with its format. The Committee recommends the adoption of these changes and the publication of the Fourth Edition of NBS Handbook 44.

(The foregoing item was adopted by voice vote.)

2. *Timing Devices.*—On the basis of engineering studies by the Office of Weights and Measures, a Code for Timing Devices was developed. The Committee includes this code in its tentative report and recommends that this be included as a tentative code in Handbook 44. The Committee wishes to remind interested persons that the requirements of the General Code are also applicable to these devices.

1971
Tentative Code
TIMING DEVICES

(This Tentative Code has only a trial or experimental status and is not intended to be rigidly enforced. The requirements are designed for observation and study prior to the development and final adoption of a Code for Timing Devices.)

A. APPLICATION

A.1.—This code applies to devices used to measure time during which services are being dispensed (such as vehicle parking, laundry drying, and car washing).

A.2.—See also General Code requirements.

S. SPECIFICATIONS

S.1. DESIGN OF INDICATING AND RECORDING ELEMENTS AND OF RECORDED REPRESENTATIONS.

S.1.1. PRIMARY ELEMENTS.

S.1.1.1. GENERAL.—A timing device shall be equipped with a primary indicating element, and may also be equipped with a primary recording element. However, a readily observable in-service light that indicates that laundry driers and car washes are in operation shall be deemed an appropriate primary indicating element.

S.1.1.2. UNITS.—A timing device shall indicate and record, if the device is equipped to record, the time in terms of minutes for time intervals of 60 minutes or less and in hours and minutes for time intervals greater than 60 minutes.

S.1.1.3. VALUE OF SMALLEST UNIT.—The value of the smallest unit of indicated time and recorded time, if the device is equipped to record, shall not exceed the equivalent of:

(a) One-half hour on parking meters indicating time in excess of two hours.

(b) Six minutes on parking meters indicating time in excess of one but not greater than two hours.

(c) One minute on all other devices, except those equipped with an in-service light.

S.1.1.4. ADVANCEMENT OF INDICATING AND RECORDING ELEMENTS.—Primary indicating and recording elements shall be susceptible of advancement only during the mechanical operation of the device, except that clocks may be equipped to manually reset the time.

S.1.1.5. OPERATION OF IN-SERVICE INDICATOR LIGHT.—The in-service light indicator shall be operable only during the time the device is in operation.

S.1.2. GRADUATIONS.

S.1.2.1. LENGTH.—Graduations shall be so varied in length that they may be conveniently read.

S.1.2.2. WIDTH.—In any series of graduations, the width of a graduation shall in no case be greater than the width of the minimum clear interval between graduations, and the width of main graduations shall be not more than 50 percent greater than the width of subordinate graduations. Graduations shall in no case be less than 0.008 inch in width.

S.1.2.3. CLEAR INTERVAL BETWEEN GRADUATIONS.—The clear interval shall be not less than 0.03 inch. If the graduations are not parallel, the measurement shall be made

(a) along the line of relative movement between the graduations and the end of the indicator, or

(b) if the indicator is continuous, at the point of widest separation of the graduations.

S.1.3. INDICATORS.

S.1.3.1. SYMMETRY.—The index of an indicator shall be symmetrical with respect to the graduations with which it is associated and at least throughout that portion of its length that is associated with the graduations.

S.1.3.2. LENGTH.—The index of an indicator shall reach to the finest graduations with which it is used, unless the indicator and the graduations are in the same plane, in which case the distance between the end of the indicator and the ends of the graduations, measured along the line of the graduations, shall be not more than 0.04 inch.

S.1.3.3. WIDTH.—The width of the index of an indicator in relation to the series of graduations with which it is used shall be not greater than

(a) the width of the widest graduation and

(b) the width of the minimum clear interval between the graduations.

S.1.3.4. PARALLAX.—Parallax effects shall be reduced to a practicable minimum.

S.1.4. PRINTED TICKETS.—A printed ticket issued or stamped by a timing device shall have printed clearly thereon the time when service begins and when service ends. The time indication shall be designated as follows:

(a) Date (month and day).

(b) Time of day (hour and minute, and a.m. or p.m. designation when not in terms of 24-hour time).

S.2. MARKING REQUIREMENTS.

S.2.1. OPERATING INSTRUCTIONS.—Operating instructions shall be clearly stated on the device.

N. NOTES

N.1. TEST METHOD.—A timing device shall be tested with a timepiece equipped with a sweep second hand and with an error of not greater than plus or minus 15 seconds per 24-hour period. In the test of timing devices with a nominal capacity of one hour or less, stopwatches with a minimum graduated interval of one-fifth second shall be used. In the test of timing devices with a nominal capacity of more than one hour, the value of the minimum graduated interval on the timepiece shall be not greater than one second. Timepieces and stopwatches shall be calibrated with standard time signals as described in National Bureau of Standards Special Publication 236, NBS Frequency and Time Broadcast Services.

T. TOLERANCES

T.1. TOLERANCE VALUES.—Maintenance and acceptance tolerances for timing devices shall be as follows:

T.1.1. FOR LAUNDRY DRIERS AND CAR-WASH TIMERS.—The maintenance and acceptance tolerances on underregistration shall be 2 seconds per indicated minute and on overregistration 1 second per indicated minute.

T.1.2. FOR PARKING-GARAGE CLOCKS AND TIME RECORDERS.

T.1.2.1. ON TIME INTERVALS.—The maintenance and acceptance tolerances on overregistration and underregistration shall be three seconds per hour, not to exceed one minute per day.

T.1.2.2. ON TIME DIFFERENCE BETWEEN INDIVIDUAL CLOCKS USED FOR "TIME IN" and "TIME OUT".—The maintenance and acceptance tolerances for a period up through 24 hours shall be as follows:

(a) On overregistration, no tolerance.

(b) On underregistration, five minutes.

T.1.3. ON PARKING METERS.—The maintenance and acceptance tolerances shall be as shown in table 1.

TABLE 1.—MAINTENANCE AND ACCEPTANCE TOLERANCES FOR PARKING METERS

Nominal time capacity	Maintenance and Acceptance Tolerances	
	On overregistration	On underregistration
30 minutes or less	No tolerance	10 seconds per minute with minimum of 1 minute
Over 30 minutes to and including 1 hour	No tolerance	5 minutes plus 4 seconds per minute over 30 minutes
Over 1 hour	No tolerance	7 minutes plus 2 minutes per hour over 1 hour

T.2. TO TESTS INVOLVING DIGITAL INDICATIONS OR REPRESENTATIONS.—To the tolerances that would otherwise be applied, there shall be added an amount equal to one-half the minimum value that can be indicated or recorded.

UR. USER REQUIREMENTS

UR.1. STATEMENT OF RATES.—The price in terms of money per unit or units of time for the service dispensed shall be clearly, prominently, and conspicuously displayed.

UR.2. INOPERATIVE DEVICES.—Fully informative instructions for the return of money for service not received shall be prominently displayed at all installations.

UR.3. TIME REPRESENTATIONS.—Any time representation shall be within plus or minus two minutes of the correct time in effect in the area, except an individual clock used only for "time out."

DEFINITIONS OF TERMS

The terms defined here have a special and technical meaning when used in the Code for Timing Devices.

car-wash timers. A timer used in conjunction with a coin-operated device to measure the time during which car-wash water, cleaning solutions, or waxing solutions are dispensed.

in-service light indicator. A light used to indicate that a timing device is in operation.

laundry-drier timers. A timer used in conjunction with a coin-operated device to measure the period of time during which a laundry drier is in operation.

parking meter. A coin-operated device for measuring parking time for vehicles.

time recorders. A clock-operated mechanism designed to record the time of day. Examples of time recorders are those used in parking garages to record the "in" and "out" time of day for parked vehicles.

timing devices. A device used to measure the time during which a particular paid-for service is dispensed. Examples of timing devices are laundry driers, car-wash timers, parking meters, and parking-garage clocks and recorders.

(The Tentative Code for Timing Devices was adopted by voice vote.)

The Committee expresses its appreciation to all who have contributed to and participated in the committee deliberations. The Committee urges all weights and measures officials and other affected parties to promptly communicate with the Committee on all matters of concern. It is only in this manner that the Committee can consider all problems and fully evaluate all situations prior to issuing its reports.

D. E. Konsoer, *Chairman*, Wisconsin
W. C. Hughes, Massachusetts
J. C. Mays, Dade County, Florida
R. Rebuffo, Nevada
W. S. Watson, California
H. F. Wollin, *Secretary*, NBS
O. K. Warnlof, *Staff Assistant*, NBS

Committee on Specifications and Tolerances

(Mr. Konsoer moved for adoption, and after a second from the floor, the report of the Committee on Specifications and Tolerances as amended was adopted in its entirety by the Conference by voice vote.)

(On motion of the committee chairman, seconded from the floor, the Conference by voice vote authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, so long as the requirements thus adopted are strictly adhered to.)

REPORT OF THE COMMITTEE ON LAWS AND REGULATIONS

Presented by S. D. Andrews, *Chairman*, Director, Division of Standards, Florida Department of Agriculture

(Thursday, July 15, 1971)

The Committee on Laws and Regulations submits its report to the 56th National Conference on Weights and Measures. The report consists of the tentative report, transmitted in April as part of the Conference announcement, as amended by the final report.

The report represents recommendations of the Committee that have been formed on the basis of comments received during the year and during the open meeting of the Committee.

The Model State Law on Weights and Measures

Realizing that the language of the Model Law was cumbersome, and that some of the provisions have remained unchanged for many years, the Committee decided to attempt a modernization. The thrust of this revision was not to introduce new concepts, but rather to refine the old.

A basic consideration was to provide a framework for weights and measures enforcement. Accordingly, all references to the establishment of weights and measures agencies at the state, city, and county levels have been deleted. These deletions were made on the grounds that all states have long since made provisions for apportioning weights and measures jurisdiction.

The text of the revision which follows is basically the same as the present Model Law. The method of sale provisions have all been properly relegated to regulation, rather than having half by law and half by regulation. In addition, the Committee has included provisions for the method of sale of specific commodities, not covered by either law or regulation, but which have been the subject of Conference recommendations.

The sections dealing with packaging and labeling have been culled to understandable basics, avoiding duplication and the resultant confusion with the Model State Packaging and Labeling Regulation. The rationale behind all these changes is that the basic law should be tampered with as little as possible, leaving to regulation all the technicalities and the minor, but sometimes necessary, variations between jurisdictions.

Two significant additions are the provision for sale from bulk and the authority of the director to establish methods of sale when necessary. The majority of the remaining changes are editorial and not substantive, despite the obvious reduction in the number of words.

It is the Committee's hope and intent that the Model State Law, the Model State Regulation for the Method of Sale of Commodities, and the Model State Packaging and Labeling Regulation will be adopted in every jurisdiction as a unit in the interest of nationwide uniformity. The revised Model Law will provide the framework, with the Model Regulations providing the specifics necessary for implementation. It is the Committee's view that this approach will exactly parallel the situation with respect to regulations governing weighing and measuring devices which has proven to be so successful; i.e., the Law provides the necessary tool for action, and Handbook 44 provides the specifics.

Thus, the Committee recommends the adoption of the following revised Model Law and the new Model State Regulation for the Method of Sale of Commodities. To improve reference to the various sections of these new models, a table of contents will be included in the final publication of each document.

MODEL STATE WEIGHTS AND MEASURES LAW

Be it enacted by the Legislature of the State of _____
that this Act may be cited as the "Weights and Measures Act."

SECTION 1. *DEFINITIONS.*—When used in this Act:

1.1. *Weight(s) and (or) Measure(s).*—The term "weight(s) and (or) measure(s)" means all weights and measures of every kind, instruments and devices for weighing and measuring, and any appliance and accessories associated with any or all such instruments and devices.

1.2. *Weight.*—The term "weight" as used in connection with any commodity means net weight.

1.3. *Correct.*—The term "correct" as used in connection with weights and measures means conformance to all applicable requirements of this Act.

1.4. *Primary Standards.*—The term "primary standards" means the physical standards of the state which serve as the legal reference from which all other standards and weights and measures are derived.

1.5. *Secondary Standards.*—The term "secondary standards" means the physical standards which are traceable to the primary standards through comparisons, using acceptable laboratory procedures, and used in the enforcement of weights and measures laws and regulations.

1.6. *Director.*—The term "director" means the _____ of the Department of _____.

1.7. *Person.*—The term "person" means both plural and the singular, as the case demands, and includes individuals, partnerships, corporations, companies, societies, and associations.

1.8. *Sale from Bulk.*—The term "sale from bulk" means the sale of commodities when the quantity is determined at the time of sale.

1.9. *Package.*—The term "package" means any commodity put up or packaged in any manner in advance of sale in units suitable for either wholesale or retail sale.

Discussion on Section 1.9.

In the tentative report of the Committee, the definition for the term "package" appeared as follows:

1.9. Package.—The term "package" means any container or wrapping in which any commodity is enclosed for use in the delivery or display of that commodity to purchasers.

To clarify the definition of the term "package" so as not to include the container used for delivery of the commodity, such as a wrapping or container used in an over-the-counter sale, the Committee recommended in its final report an alternate definition, as follows:

1.9. Package.—The term "package" means any container or wrapping in which any commodity is enclosed for the sale or display of that commodity.

Following this proposal, very lengthy discussion ensued in which numerous other definitions were offered by the delegates and in each case voted down by the Conference. The committee chairman, on behalf of the L & R Committee, then recommended the following definition:

The term "package" shall be construed to mean a commodity put up or packaged in any manner in advance of sale in units suitable for either wholesale or retail sale.

(The amendment as offered by the committee chairman was adopted by voice vote.)

SECTION 2. *SYSTEMS OF WEIGHTS AND MEASURES.*—The system of weights and measures in customary use in the United States and the metric system of weights and measures are jointly recognized, and either one or both of these systems shall be used for all commercial purposes in the state. The definitions of basic units of weight and measure, the tables of weight and measure, and weights and measures equivalents as published by the National Bureau of Standards are recognized and shall govern weighing and measuring equipment and transactions in the state.

SECTION 3. *PHYSICAL STANDARDS.*—Weights and measures that are traceable to the U. S. prototype standards supplied by the Federal Government, or approved as being satisfactory by the National Bureau of Standards, shall be the state primary standards of weights and measures, and shall be maintained in such calibration as prescribed by the National Bureau of Standards. All secondary standards may be prescribed by the director and shall be verified upon their initial receipt, and as often thereafter as deemed necessary by the director.

SECTION 4. *TECHNICAL REQUIREMENTS FOR COMMERCIAL DEVICES.*—The specifications, tolerances, and other technical requirements for commercial weighing and measuring devices as adopted by the National Conference on Weights and Measures and published in National Bureau of Standards Handbook 44, "Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices," and supplements thereto or revisions thereof, shall apply to commercial weighing and measuring devices in the state, except insofar as modified or rejected by regulation.

SECTION 5. *POWERS AND DUTIES OF THE DIRECTOR.*—The director shall:

5.1. Maintain traceability of the state standards to the National Bureau of Standards.

5.2. Enforce the provisions of this Act.

5.3. Issue reasonable regulations for the enforcement of this Act, which regulations shall have the force and effect of law.

5.4. Establish standards of weight, measure, or count, reasonable standards of fill, and standards for the presentation of cost per unit information for any packaged commodity.

5.5. Grant any exemptions from the provisions of this Act or any regulations promulgated pursuant thereto, when appropriate to the maintenance of good commercial practices within the state.

5.6. Conduct investigations to ensure compliance with this Act.

5.7. Delegate to appropriate personnel any of these responsibilities for the proper administration of his office.

5.8. Test annually the standards of weight and measure used by any city or county within the state, and approve the same when found to be correct.

5.9. Inspect and test weights and measures kept, offered, or exposed for sale.

5.10. Inspect and test, to ascertain if they are correct, weights and measures commercially used

(a) in determining the weight, measure, or count of commodities or things sold, or offered or exposed for sale, on the basis of weight, measure, or count, or

(b) in computing the basic charge or payment for services rendered on the basis of weight, measure, or count.

Discussion on Sections 5.4, 5.6, 5.7, 5.9, 5.10

In its tentative report, the Committee recommended the following language for sections 5.4, 5.6, 5.7, 5.9, and 5.10:

5.4. Establish standards of weight, measure, or count, reasonable standards of fill, and standards for the presentation of cost per unit information for any packaged commodity, as necessary.

5.6. Conduct investigations necessary to ensure compliance with this Act.

5.7. Delegate to appropriate personnel any of these responsibilities necessary for the proper administration of his office.

5.9. Inspect and test, as necessary, weights and measures kept, offered, or exposed for sale.

5.10. Inspect and test, as necessary, to ascertain if they are correct, weights and measures commercially used . . .

(a) in determining the weight, measure, or count of commodities or things sold, or offered or exposed for sale, on the basis of weight, measure, or count, or

(b) in computing the basic charge or payment for services rendered on the basis of weight, measure, or count:

Provided, that in compliance with a regulation issued by the director, tests may be made on representative samples of such devices and the lots shall be held to be correct or incorrect on the basis of the results of the inspection and tests of such samples.

Mr. W. A. Kerlin (American Petroleum Institute): I understand that section 5.10 covers the sample testing of milk bottles and single-service containers, but it very definitely also includes the sample

testing of other weighing and measuring devices. I maintain that this would be an improper application of sampling procedures.

Mr. Vadelund: The language in section 5.10 does not specify that an improper sampling method is to be used. It does state that the director may issue a regulation to allow for sample testing of devices. It provides for two things—the sample testing of devices such as milk bottles and measure containers and the use of a sampling technique.

Mr. L. D. Draghetti (Agawam, Mass.): The Massachusetts Weights and Measures Association sent a letter dated June 21, 1971, to the L & R Committee requesting that the term "necessary" be struck from sections 5.4, 5.6, 5.7, 5.9, and 5.10, and that the proviso paragraph be deleted from section 5.10. We feel that these words are in conflict with the annual testing requirements of the Massachusetts laws and will result in a selective testing program.

Mr. H. E. Smith (San Mateo County, Calif.): I would like to speak in favor of Mr. Draghetti's proposal because some managers may interpret the term "necessary" in the most austere way possible, possibly resulting in a reduction of personnel and reduction in budget where weights and measures professionals are not heading the departments.

Mr. J. E. Bowen (Newton, Mass.): The main purpose of the National Conference on Weights and Measures is to promote uniformity in weights and measures enforcement. I feel that the jurisdictions who have mandatory testing and sealing should continue on this basis until the National Conference makes a decision on the preference of selective versus mandatory testing.

Mr. Vadelund: The matter of mandatory annual testing of devices was settled by the Conference some time ago. The existing Model Law states: "It shall be the duty of the director, within a 12-month period, or less frequently if in accordance with a schedule issued by him, and as much oftener as he may deem necessary, to inspect and test, to ascertain if they are correct, all weights and measures commercially used." All the Committee has done is simply to recast this requirement in different language.

Mr. R. W. Horger (Santa Clara County, Calif.): It seems to me that there is no need for the proviso paragraph, because whether we test the devices once a year or once in ten years, and whether the sampling system is used or not, it would still be up to the director of the department.

(The amendments proposed by Mr. Draghetti to sections 5.4, 5.6, 5.7, 5.9, and 5.10 were adopted by voice vote.)

5.11. Test all weights and measures used in checking the receipt or disbursement of supplies in every institution, for the maintenance of which funds are appropriate by the legislature of the state.

5.12. Approve for use, and may mark, such weights and measures as he finds to be correct, and shall reject and mark as rejected such weights and measures as he finds to be incorrect. Weights and measures that have been rejected may be seized if not corrected within the time specified or if used or disposed of in a manner not specifically authorized. The director shall condemn and may seize weights and measures found to be incorrect that are not capable of being made correct.

5.13. Weigh, measure, or inspect packaged commodities kept, offered, or exposed for sale, sold, or in the process of delivery, to determine whether they contain the amounts represented and whether they are kept, offered, or exposed for sale in accordance with this Act or regulations promulgated pursuant thereto. In carrying out the provisions of this section, the director shall employ recognized sampling procedures, such as are designated in National Bureau of Standards Handbook 67, "Checking Prepackaged Commodities."

5.14. Prescribe, by regulation, the appropriate term or unit of weight or measure to be used, whenever he determines in the case of a specific commodity that an existing practice of declaring the quantity by weight, measure, numerical count, or combination thereof, does not facilitate value comparisons by consumers, or offers an opportunity for consumer confusion.

5.15. Allow reasonable variations from the stated quantity of contents, which shall include those caused by loss or gain of moisture during the course of good distribution practice or by unavoidable deviations in good manufacturing practice only after the commodity has entered intrastate commerce.

Discussion on Section 5.15

In the Committee's final report, section 5.15 read as follows:

5.15. Allow reasonable variations from the stated quantity of contents, which shall include those caused by loss or gain of moisture during the course of good distribution practice or by unavoidable deviations in good manufacturing practice.

Mr. G. L. Johnson (Kentucky): I think that this variation is desirable. However, I feel that it stops too short. I would like to offer an amendment to include after the word "practice" (at the end of the sentence) the phrase "only after the commodity has entered intrastate commerce." As the paragraph now reads, we will be recognizing the variation due to moisture loss, but it does not say where it shall start.

(The amendment to section 5.15 was adopted by voice vote.)

SECTION 6. ***SPECIAL POLICE POWERS.***—**When necessary for the enforcement of this Act or regulations promulgated pursuant thereto, the director is:**

6.1. Authorized to enter any commercial premises during normal business hours, except that in the event such premises are not open to the public, he shall first present his credentials and obtain consent before making entry thereto, unless a search warrant has previously been obtained.

6.2. Empowered to issue stop-use, hold, and removal orders with respect to any weights and measures commercially used, and stop-sale, hold, and removal orders with respect to any packaged commodities or bulk commodities kept, offered, or exposed for sale.

6.3. Empowered to seize, for use as evidence, without formal warrant, any incorrect or unapproved weight, measure, package, or commodity found to be used, retained, offered, or exposed for sale or sold in violation of the provisions of this Act or regulations promulgated pursuant thereto.

6.4. Empowered to stop any commercial vehicle and, after presentment of his credentials, inspect the contents, require that the person in charge of that vehicle produce any documents in his possession concerning the contents, and require him to proceed with the vehicle to some specified place for inspection.

Discussion on Section 6

Mr. G. L. Johnson (Kentucky): I wish to offer an amendment because in our state many times we need the power of arrest. There are cases where we find the violator in transit; and by the time we go down to the court house, swear out a warrant, and get back, he is gone. We are law enforcement officers. Let's not strip ourselves of what little authority we have to provide industry and our consumers with the protection that they deserve. I suggest that an additional subsection be added to section 6 having the same language that is now written in our present Model Law, as follows:

6.5. With respect to the enforcement of this Act, the director is hereby vested with special police powers, and is authorized to arrest, without formal warrant, any violator of this Act.

(The amendment to section 6 was adopted by voice vote.)

SECTION 7. *POWERS AND DUTIES OF LOCAL OFFICIALS.*—Any weights and measures official appointed for a county or city shall have the duties enumerated in sections 5.9 through 5.13 and the powers enumerated in section 6 of this Act. These powers and duties shall extend to their respective jurisdictions, except that the jurisdiction of a county official shall not extend to any city for which a weights and measures official has been appointed.

SECTION 8. *MISREPRESENTATION OF QUANTITY.*—No person shall sell, offer, or expose for sale less than the quantity he represents, nor take any more than the quantity he represents when, as buyer, he furnishes the weight or measure by means of which the quantity is determined.

SECTION 9. *MISREPRESENTATION OF PRICING.*—No person shall misrepresent the price of any commodity or service sold, offered, exposed, or advertised for sale by weight, measure, or count, nor represent the price in any manner calculated or tending to mislead or in any way deceive a person.

SECTION 10. *METHOD OF SALE.*—Except as otherwise provided by the director, commodities in liquid form shall be sold by liquid measure or by weight, and commodities not in liquid form shall be sold only by weight, or by measure, or by count, so long as the method of sale provides accurate quantity information.

SECTION 11. *SALE FROM BULK.*—Whenever the quantity is determined by the seller, bulk sales in excess of twenty dollars ($20) and all bulk deliveries of heating fuel shall be accompanied by a delivery ticket containing the following information:

(a) The name and address of the vendor and purchaser.

(b) The date delivered.

(c) The quantity delivered and the quantity upon which the price is based, if this differs from the delivered quantity.

(d) The identity in the most descriptive terms commercially practicable, including any quality representation made in connection with the sale.

(e) The count of individually wrapped packages, if more than one.

SECTION 12. *INFORMATION REQUIRED ON PACKAGES.*—Except as otherwise provided in this Act or by regulations promulgated pursuant thereto, any package kept for the purpose of sale or offered or exposed for sale shall bear on the outside of the package a definite, plain, and conspicuous declaration of:

(a) The identity of the commodity in the package, unless the same can easily be identified through the wrapper or container.

(b) The quantity of contents in terms of weight, measure, or count.

(c) The name and place of business of the manufacturer, packer, or distributor, in the case of any package kept, offered, or exposed for sale, or sold in any place other than on the premises where packed.

SECTION 13. *DECLARATIONS OF UNIT PRICE ON RANDOM PACKAGES.*—In addition to the declarations required by section 12 of this Act, any package being one of a lot containing random weights of the same commodity and bearing the total selling price of the package shall bear on the outside of the package a plain and conspicuous declaration of the price per single unit of weight.

SECTION 14. *ADVERTISING PACKAGES FOR SALE.*—Whenever a packaged commodity is advertised in any manner with the retail price stated, there shall be closely and conspicuously associated with the retail price a declaration

of quantity as is required by law or regulation to appear on the package. Where a dual declaration is required, only the declaration that sets forth the quantity in terms of the smaller unit of weight or measure need appear in the advertisement.

SECTION 15. *OFFENSES AND PENALTIES.*—Any person who violates the following enumerated provisions or any provision of this Act or regulations promulgated pursuant thereto, for which a specific penalty has not been prescribed, shall be guilty of a misdemeanor, and upon a first conviction thereof shall be punished by a fine of not less than $50 or more than $500, or by imprisonment for not more than three months, or both. Upon a subsequent conviction thereof, he shall be punished by a fine of not less than $100 or more than $1,000, or by imprisonment for up to one year, or both. No person shall:

(a) Use or have in possession for use in commerce any incorrect weight or measure.

(b) Remove any tag, seal, or mark from any weight or measure without specific written authorization from the proper authority.

(c) Hinder or obstruct any weights and measures official in the performance of his duties.

Discussion on Section 15

Mr. Andrews: The Committee is of the opinion that it is both unwise and unnecessary to establish minimum penalties. Therefore, to allow for greater judicial discretion, the Committee suggests the deletion of the words "of not less than $50 or more than $500" and inserting the words "up to $500." Also, delete the words "of not less than $100 or more than $1,000" and insert the words "up to $1,000."

Mr. S. F. Valtri (Philadelphia, Pa.): In 19 years of experience in going to court, I have found that the judges invariably will impose the minimum fine. This means that we are giving the judge the opportunity to impose a $1.00 fine. If this is what we are going to do, then we might as well stop bringing violators into court. Therefore, I would like to make a motion that we revert back to the tentative report and keep the words "not less than" in this section.

Mr. G. L. Johnson (Kentucky): I think that, without a minimum fine, we are definitely weakening our weights and measures law. In my state, many judges use the minimum fine as a crutch, especially in the lower courts. I have heard the judge tell the neighbor we have brought in for violation, "Well, John, I am going to do the very best I can for you. I will give you the minimum fine of $100." I think that we definitely must have a minimum fine.

Mr. P. T. Gamelli (West Springfield, Mass.): I agree wholeheartedly with the minimum fine concept too. In order to show the importance of our law and of what we are trying to do, it is very

definitely necessary to have the minimum fine. Someone might say that, if there is a minimum fine, that is what the judge will impose. However, if there is a subsequent violation, you will already have something to go on. The cooperation of the courts I have found to be excellent.

(The Committee's amendment to the tentative report was voted down by the Conference.)

SECTION 16. *INJUNCTION.*—The director is authorized to apply to any court of competent jurisdiction for a temporary or permanent injunction restraining any person from violating any provision of this Act.

SECTION 17. *PRESUMPTIVE EVIDENCE.*—Whenever there shall exist a weight or measure or weighing or measuring device in or about any place in which or from which buying or selling is commonly carried on, there shall be a rebuttable presumption that such weight or measure or weighing or measuring device is regularly used for the business purposes of that place.

SECTION 18. *SEPARABILITY PROVISION.*—If any provision of this Act is declared unconstitutional, or the applicability thereof to any person or circumstance is held invalid, the constitutionality of the remainder of the Act and the applicability thereof to other persons and circumstances shall not be affected thereby.

SECTION 19. *REPEAL OF CONFLICTING LAWS.*—All laws and parts of laws contrary to or inconsistent with the provisions of this Act are repealed except as to offenses committed, liabilities incurred, and claims made thereunder prior to the effective date of this Act.

SECTION 20. *REGULATIONS TO BE UNAFFECTED BY REPEAL OF PRIOR ENABLING STATUTE.*—The adoption of this Act or any of its provisions shall not affect any regulations promulgated pursuant to the authority of any earlier enabling statute unless inconsistent with this Act or modified or revoked by the director.

SECTION 21. *EFFECTIVE DATE.*—This Act shall become effective on

_____.

(The Model Law as amended was adopted section by section by voice vote.)

* * * * * * *

MODEL STATE REGULATION
for the
METHOD OF SALE OF COMMODITIES

This Regulation shall apply to:

FOOD PRODUCTS

SECTION 1. *BERRIES AND SMALL FRUITS.*—Shall be offered and exposed for sale and sold by weight, or by measure in open containers having capacities of ½ dry pint, 1 dry pint, or 1 dry quart, and when sold by measure, the containers shall be deemed not to be packages for labeling purposes.

SECTION 2. *BREAD.*—Each loaf and each unit of a twin or multiple loaf made or procured for sale, kept, offered, exposed for sale, or sold, whether or not wrapped or sliced, shall weigh ½ pound, 1 pound, 1½ pounds, or a multiple of 1 pound, within reasonable variations or tolerances: *Provided,* that the provisions of this section shall not apply to biscuits, buns, or rolls weighing 4 ounces or less, or to "stale bread" sold and expressly represented at the time of sale as such, and when so sold, the wrappers shall be deemed not to be packages for labeling purposes.

SECTION 3. *BUTTER, OLEOMARGARINE, AND MARGARINE.*—Shall be offered and exposed for sale and sold by weight only in units of ¼ pound, ½ pound, 1 pound, or multiples of 1 pound.

SECTION 4. *FLOUR, CORN MEAL, AND HOMINY GRITS.*—Wheat flour, whole wheat flour, graham flour, self-rising wheat flour, phosphated wheat flour, bromated flour, corn flour, corn meal, and hominy grits, whether enriched or not, shall be packaged, kept, offered, or exposed for sale, or sold only in units of 2, 5, 10, 25, 50, or 100 pounds: *Provided,* that packages in units of less than 2 pounds or more than 100 pounds shall be permitted.

SECTION 5. *MEAT, POULTRY, AND SEAFOOD.*—Shall be sold by weight, except the following, which may be sold by weight, measure, or count:

(a) Shellfish.

(b) Items sold for consumption on the premises.

(c) Items sold as one of several elements comprising a ready-to-eat meal sold as a unit for consumption elsewhere than on the premises where sold.

(d) Items sold as part of a sandwich.

When meat, poultry, or seafood is combined with some other food element to form a distinctive food product, the quantity representation may be in terms of the total weight of the product or combination, and a quantity representation need not be made for each element.

In the case of ready-to-cook, stuffed poultry products, the label must show the total net weight of the poultry product and the minimum net weight of the poultry in the product.

SECTION 6. *FLUID MILK PRODUCTS.*—All fluid milk products, including but not limited to milk, lowfat milk, skim milk, cultured milks and cream shall be packaged for retail sale only in units of 1 gill, ½ liquid pint, 10 fluid ounces, 1 liquid pint, 1 liquid quart, ½ gallon, 1 gallon, 1½ gallons, 2 gallons, 2½ gallons, or multiples of 1 gallon: *Provided*, that packages in units of less than 1 gill shall be permitted.

SECTION 7. *OTHER MILK PRODUCTS.*—Cottage cheese, cottage cheese products, and other milk products which are solid, semi-solid, viscous, or a mixture of solid and liquid, as defined in the Pasteurized Milk Ordinance of the U. S. Public Health Service, as amended in 1965, shall be sold in terms of weight: *Provided*, that sour cream and yogurt shall be packaged for retail sale only in units of 4, 8, 12, 16, 32, 64, and 128 ounces avoirdupois: *And Provided further*, that yogurt may additionally be sold in units of 5 and 6 ounces avoirdupois.

SECTION 8. *PICKLES.*—The declaration of net quantity of contents on pickles and pickle products, including relishes but excluding one or two whole pickles in a transparent wrapping which may be declared by count, shall be expressed in terms of fluid measure. Sales of pickles from bulk may be by count.

NONFOOD PRODUCTS

SECTION 9. *COATINGS.*—Asphalt paints, coatings, and plastics shall be sold in terms of liquid measure.

SECTION 10. *SOFTWOOD LUMBER.*—Applies to softwood boards, timbers, and dimension lumber that have been dressed on four sides, but shall not apply to rough lumber, to lumber that has been matched, patterned, or shiplapped, or to lumber remanufactured or joined so as to have changed the form or identity, such as individual, assembled, or packaged millwork items.

10.1 DEFINITIONS.

10.1.1. *Dressed (Surfaced) Lumber.*—Lumber that has been dressed (or surfaced) for the purpose of attaining smoothness of surface and uniformity of size.

10.1.2. *Boards.*—Lumber 1¼ inches or less in actual thickness and 1½ or more inches in actual width. Boards less than 5½ inches in actual width may be classified as strips.

10.1.3. *Timbers.*—Lumber 4½ or more inches in least actual dimension. Timber may be classified as beams, stringers, posts, caps, sills, girders, purlins, etc.

10.1.4. *Dimension Lumber.*—Lumber from 1½ inches to, but not exceeding, 4½ inches in actual thickness, and 1½ or more inches in actual width. Dimension lumber may be classified as framing, joists, planks, rafters, studs, small timbers, etc.

10.1.5. *Rough Lumber.*—Lumber that has not been dressed but which has been sawed, edged, and trimmed at least to the extent of showing saw marks in the wood on the four longitudinal surfaces of each piece for its overall length.

10.1.6. *Matched Lumber.*—Lumber that has been worked with a tongue on one edge of each piece and a groove on the opposite edge to provide a close tongue-and-groove joint by fitting two pieces together; when end-matched, the tongue and groove are worked in the ends also.

10.1.7. *Patterned Lumber.*—Lumber that is shaped to a pattern or to a molded form, in addition to being dressed, matched, or shiplapped, or any combination of these workings.

10.1.8. *Shiplapped Lumber.*—Lumber that has been worked or rabbeted on both edges of each piece to provide a close-lapped joint by fitting two pieces together.

10.1.9. *Grade.*—The commercial designation assigned to lumber meeting specifications established by a nationally recognized grade rule writing organization.

10.1.10. *Species.*—The commercial name assigned to a species of trees.

10.1.11. *Species Group.*—The commercial name assigned to two or more individual species having similar characteristics.

10.1.12. *Representation.*—A "representation" shall be construed to mean any advertisement, offering, invoice, or the like that pertains to the sale of lumber.

10.1.13. *Minimum Dressed Sizes (Width and Thickness).*—The standardized width and thickness at which lumber is dressed when manufactured in accordance with the U. S. Department of Commerce Voluntary Product Standard 20-70, "American Softwood Lumber Standard," and regional grading rules conforming to VPS 20-70. (See table 1.)

10.2. IDENTITY.—Representations shall include a declaration of identity that specifies the grade or grades, species or species group, and whether the lumber is unseasoned(green) or dry.

10.3. QUANTITY.—Representations shall be in terms of the number of pieces, the minimum dressed width and thickness, the length of individual pieces or the lineal footage, except that:

(a) The use of nominal dimensions shall be allowed when used in conjunction with the required minimum dressed sizes and actual length.

(b) With respect to all invoices, a table of minimum dressed sizes may appear on the reverse side of the invoice, so long as appropriate reference to the table is prominently and conspicuously shown on the face of the invoice.

TABLE 1. SOFTWOOD LUMBER SIZES

Minimum standard dressed sizes at the time of manufacture for both unseasoned (green) and dry lumber as published by the U. S. Department of Commerce in Product Standard 20-70.

Product Classification (Nominal Size)	Minimum Dressed Sizes (See Note 2)	
	Unseasoned	Dry
Inches	*Inches*	*Inches*
Dimension Lumber		
2 X 4	1-9/16 X 3-9/16	1-1/2 X 3-1/2
2 X 6	1-9/16 X 5-5/8	1-1/2 X 5-1/2
2 X 8	1-9/16 X 7-1/2	1-1/2 X 7-1/4
2 X 10	1-9/16 X 9-1/2	1-1/2 X 9-1/4
2 X 12	1-9/16 X 11-1/2	1-1/2 X 11-1/4
(See note 1)		
Board Lumber		
1 X 4	25/32 X 3-9/16	3/4 X 3-1/2
1 X 6	25/32 X 5-5/8	3/4 X 5-1/2
1 X 8	25/32 X 7-1/2	3/4 X 7-1/4
1 X 10	25/32 X 9-1/2	3/4 X 9-1/4
1 X 12	25/32 X 11-1/2	3/4 X 11-1/4

Note 1. The dry thicknesses of nominal 3″ and 4″ lumber are 2-1/2″ and 3-1/2″, unseasoned thicknesses are 2-9/16″ and 3-9/16″. Widths for these thicknesses are the same as shown above.

Note 2. Product Standard 20-70 defines dry lumber as being 19 percent or less in moisture content and unseasoned lumber as being over 19 percent moisture content. The size of lumber changes approximately 1 percent for each 4 percent change in moisture content. Lumber stabilizes at approximately 15 percent moisture content under normal use conditions.

SECTION 11. *PEAT AND PEAT MOSS.*—Applies only with respect to organic matter of geological origin, excluding coal and lignite, originating principally from dead vegetative remains through the agency of water in the absence of air and occurring in a bog, swampland, or marsh, and containing an ash content not exceeding 25 percent on a dry-weight basis (dried in an oven at 105 °C. (221 °F.) until no further weight loss can be determined).

11.1. DECLARATION OF QUANTITY.—The declaration of quantity of peat and peat moss shall be expressed in weight units or in cubic-measure units.

11.2. UNITS.

11.2.1. *Weight.*—Peat and peat moss sold in terms of weight shall be offered and exposed for sale only in units of 100 pounds, 70 pounds, 50 pounds, 25 pounds, 10 pounds, or 3 pounds.

11.2.2. *Cubic Measure.*—Peat and peat moss sold in terms of cubic measure shall be offered and exposed for sale only in units of 6, 5.5, 4, 2, 1, 0.7, 0.5, 0.3, or 0.2 cubic feet. If the commodity is labeled in terms of compressed cubic measurement, the quantity declaration shall represent the quantity in the compressed state and the quantity from which the final product was compressed (the latter declaration not exceeding the actual amount of material that can be recovered).

SECTION 12. *ROOFING AND ROOFING MATERIAL.*—Shall be sold either by the "square" or by the "square foot" only.

12.1. DEFINITIONS.

12.1.1. *Square.*—The term "square" shall mean the quantity of roofing or roofing material that, when applied according to directions or instructions of the manufacturer, will cover an area of 100 square feet exclusive of side laps or side joints: *Provided*, that, in the case of roofing or roofing material of corrugated design, the side lap or side joint shall be one full corrugation.

12.1.2. *Square Foot.*—The term "square foot" shall mean the quantity of roofing or roofing material that, when applied according to the directions or instructions of the manufacturer, will cover 1 square foot (144 square inches) exclusive of side laps or side joints.

12.2. DECLARATION OF QUANTITY.—When the declaration of quantity on a package of roofing or roofing material contains the term "square," it shall include, plainly and conspicuously, a numerical definition of the term "square"; for example, "One square covers 100 square feet of roof area."

12.2.1. *Common Fractions.*—The use of the common fraction one-third (1/3) is specifically authorized in the quantity statement of a package of roofing or roofing material when, and only when, used as the common fraction of the "square."

12.2.2. *Quantity Statement.*—The primary declaration shall only be in terms of a square or square feet. There is no prohibition against the use of supplementary quantity declarations, such as shingle dimensions, but in no case shall the weight of the material be stated or implied. However, the use of numerical descriptions for rolls of felt roofing material may continue to be used.

SECTION 13. ***SEALANTS.***—**Calking compounds, glazing compounds, and putty shall be sold in terms of liquid measure.**

SECTION 14. ***ALL COMMODITIES.***—**Whenever an advertised, posted, or labeled price per unit of weight, measure, or count includes a fraction of a cent, all elements of the fraction shall be prominently displayed, and the numerals expressing the fraction shall be immediately adjacent to, of the same general design and style as, and at least one-half the height and width of the numerals representing the whole cent.**

SECTION 15. ***REVOCATION OF CONFLICTING REGULATIONS.***—**All provisions of all orders and regulations heretofore issued on this same subject that are contrary to or inconsistent with the provisions of this regulation, and specifically _____, are hereby revoked.**

SECTION 16. ***EFFECTIVE DATE.***—**This regulation shall become effective on _____, except that section 10, Softwood Lumber, shall become effective on April 1, 1972.**

Given under my hand and the seal of my office in the City of _____, on this _____ day of _____, A.D. 19_____.

Signed _____

(The Model State Regulation for the Method of Sale of Commodities was adopted section by section by voice vote.)

* * * * * * *

Model State Packaging and Labeling Regulations

1. *Shipping Containers:*

It has been brought to the attention of the Committee that the Model State Packaging and Labeling Regulation makes no mention of shipping containers used to deliver wholesale or retail packages to manufacturers, packers, or processors. However, section 1(8) of the Model Law specifically mentions the term "shipping containers."

In order to clarify this point, the Committee suggests that a section 1(b) be added to the Regulation, and subsequent sections renumbered accordingly.

1(b) Shipping containers or wrapping used solely for the transportation of any commodities in bulk or in quantity to manufacturers, packers, or processors, or to wholesale or retail distributors, but in no event shall this exclusion apply to packages of consumer or nonconsumer commodities, as defined herein.

2. *Combination Declarations:*

The requirements for Combination Declarations, as set forth in sections 6.3.1. and 6.3.2. of the Model Regulation, do not provide for all the possible combinations of quantity statements on certain packaged goods. A good example is the multiple declaration for roll type commodities required by section 6.6.8. of the Regulation. In order to clarify this apparent inconsistency, the Committee recommends the following change:

6.3.1. *COMBINATION DECLARATION.*—

(a) A declaration of quantity in terms of weight shall be combined with appropriate declarations of the measure, count, and size of the individual units unless a declaration of weight alone is fully informative.

(b) A declaration of quantity in terms of measure shall be combined with appropriate declarations of the weight, count, and size of the individual units unless a declaration of measure alone is fully informative.

(c) A declaration of quantity in terms of count shall be combined with appropriate declarations of the weight, measure, and size of the individual units unless a declaration of count alone is fully informative.

3. *Textiles:*

The American Textile Manufacturers Institute has urged the Committee to refine the provisions of the Model Regulation with respect to the packaging and labeling of textile products. It was felt that the existing requirements do not include provisions for all types of textiles, and that certain of the requirements would not provide purchasers with appropriate information. On this latter point, it was noted that the requirement for finished dimensions on certain textile products (sheets and pillowcases) would introduce a dimension of no value to the consumer. It was suggested that the consumer needs to know the size of the article the product is designed to fit, and the total amount of cloth in the package in order to make a reasonable value comparison.

It is the view of the Committee that sufficient justification for the requested changes has been given and, therefore, the following change to section 10.9.2. is recommended:

10.9.2. *TEXTILES.*—Bedsheets, blankets, pillowcases, comforters, quilts, bedspreads, mattress covers and pads, afghans, throws, dresser and other furniture scarfs, tablecloths and napkins, flags, curtains, drapes, dish towels, dish cloths, towels, face cloths, utility cloths, bath mats, carpets and rugs, pot holders, fixture and appliance covers, nonrectangular diapers, slip covers, etc., shall be exempt from the requirements of subsection 6.6.7. of this regulation: *Provided*, That

(a) The quantity statement for fitted sheets and mattress covers shall state, in inches, the length and width of the mattress for which the item is designed, such as "twin," "double," "king," etc. (Example: "Twin Fitted Sheet for 39 x 75 in mattress.")

(b) The quantity statement for flat sheets shall state the size designation of the mattress for which the sheet is designed, such as "twin," "double," "king," etc. The quantity statement also shall state, in inches, the length and width of the mattress for which the sheet is designed, followed in parentheses by a statement, in inches, of the length and width of the sheet before hemming. (Example: "Double Flat Sheet for 54 x 75 in mattress (81 x 104 in before hemming)").

(c) The quantity statement for pillowcases shall state the size designation of the pillow for which the pillowcase is designed, such as "youth," "standard," and "queen," etc. The quantity statement also shall state, in inches, the length and width of the pillow for which the pillowcase is designed, followed in parentheses by a statement, in inches, of the length and width of the pillowcase before hemming. (Example: "Standard Pillowcase for 20 x 26 in pillow (42 x 36 in before hemming).")

(d) The quantity statement for blankets, comforters, quilts, bedspreads, mattress pads, afghans, and throws shall state, in inches, the length and width of the finished item. The quantity statement also may state the length of any ornamentation and the size designation of the mattress for which the item is designed, such as "twin," "double," "king," etc.

(e) The quantity statement for tablecloths and napkins shall state, in inches, the length and width of the finished item. The quantity statement also may state parenthetically, in inches, the length and width of the item before hemming and properly identified as such.

(f) The quantity statement for curtains, drapes, flags, furniture scarfs, etc. shall state, in inches, the length and width of the finished item. The quantity statement also may state parenthetically, in inches, the length of any ornamentation.

(g) The quantity statement for carpets and rugs shall state, in feet, with any remainder in common or decimal fractions of the foot or in inches, the length and width of the item. The quantity statement also may state parenthetically, in inches, the length of any ornamentation.

(h) The quantity statement for woven dish towels, dish cloths, towels, face cloths, utility cloths, bath mats, etc. shall state, in inches, the length and width of the item. The quantity statement for such items, when knitted, need not state the dimensions.

(i) The quantity statement for textile products such as pot holders, fixture and appliance covers, non-rectangular diapers, slip covers, etc. shall be stated in terms of count and may include size designations and dimensions.

(j) The quantity statement for other than rectangular textile products identified in subsections (a) through (h) shall state the geometric shape of the product and the dimensions which are customarily used in describing such geometric shape. (Example: "Oval Tablecloth 54 x 42 in," representing the maximum length and width in this case.)

(k) The quantity statement for packages of remnants of textile products of assorted sizes, when sold by count, shall be accompanied by the term "irregular dimensions" and the minimum size of such remnants.

The textile manufacturers also requested that the Committee consider extending the degree of permissible variations for the dimensions of individual textile items, and provide for tolerances on the average of a given lot, shipment, or delivery of packaged textile items. It was pointed out that smaller textile items were in need of a larger plus and minus range because of the many variables inherent in the manufacturing process. Also, the textile manufacturing process requires a commitment to expected finished size far in advance of the completed item, unlike the manufacture of paper or foil where cutting to size is at or near the final step of the process.

The Committee is of the view that there is merit to the request for larger plus and minus variations for individual textile items and recommends the addition of section 10.9.3. to the Regulation:

10.9.3. *TEXTILES: VARIATIONS FROM DECLARED DIMENSIONS.*—

(a) For an item with no declared dimension less than 24 inches, a minus variation greater than 3% of a declared dimension and a plus variation greater than 6% of a declared dimension should be considered unreasonable.

(b) For an item with a declared dimension less than 24 inches, a minus variation greater than 6% of a declared dimension and a plus variation greater than 12% of a declared dimension should be considered unreasonable.

On the matter of a tolerance for packaged textile items, the Committee feels that the average concept is appropriate for textiles and that a specific tolerance is not warranted. The Committee cautions, however, that the nature of the manufacturing and distribution is such that it is possible for a particular lot, shipment, or delivery to average below the quantity represented. In such instances, it recommends that official examinations be made of additional lots, shipments, or deliveries to determine if all packages of the particular commodity are in violation or, conversely, all fully conform to legal requirements.

The Committee also had brought to its attention the need for some relief from the labeling requirements for variety packages of textiles.

Such packages often require lengthy listings to fulfill the quantity statement requirements. The Model Regulation currently grants limited exemptions to combination packages because of the lengthy nature of the quantity statement. It is proposed that similar exemptions be granted as follows:

10.9.4. *EXEMPTION: VARIETY TEXTILE PACKAGES.*—Variety packages of textiles which are required by reason of sections 6.3.1. and 6.3.2. to provide a combination declaration stating the quantity of each individual unit, shall be exempt from the requirements in this regulation for:

(a) LOCATION (See subsection 8.1.1.),

(b) FREE AREA (See subsection 8.1.4.), and

(c) MINIMUM HEIGHT OF NUMBERS AND LETTERS (See subsection 8.2.1.).

4. *Multi-Unit Packages:*

The Committee has been made aware of a minor inconsistency in the provisions concerning multi-unit packages. The Model provides that the individual units of a multi-unit package are exempt from the location requirement if all other requirements are met. However, the definition of multi-unit requires that the individual units be capable of individual scale (section 2.8.). If the individual units take advantage of the exemption from location (section 11.17.), then they are not capable of individual sale. They are not part of a multi-unit package by definition and, therefore, do not get the exemption. Because of this inconsistency, the Committee recommends deletion of the last paragraph of section 10.4. and of section 11.17. entirely, and the renumbering of subsequent sections.

(The amendments to the Model State Packaging and Labeling Regulation were adopted section by section by voice vote.)

Other Items

1. *Seed Labeling:*

The Committee met with representatives of the American Seed Trade Association concerning the proper labeling of vegetable and flower seed packets. As the result of deliberations since the interim meeting, the Committee proposes the following requirements to be considered for adoption at the next Conference:

(a) Packets of vegetable and flower seeds shall be labeled as to quantity, with a combination declaration of weight in terms of metric units and minimum count.

(b) The quantity declaration shall appear in the upper 30 percent of the label principal display panel in proximity to the price.

The effective date for these requirements is September 1, 1972.

(The foregoing item was adopted by voice vote.)

2. *Coin-Operated Devices:*

In its report to the 55th Conference, the Committee requested information from weights and measures officials concerning the possible need for quantity statements on vending machines. In the interim, the Committee has received very little information on this matter and again urges weights and measures officials to submit their views.

(The foregoing item was adopted by voice vote.)

3. *Unit Pricing:*

The Committee received a report from the Office of Weights and Measures on the extent of unit pricing experiments and current legislative proposals. Numerous unit pricing experiments are being conducted on a voluntary basis throughout the country. Many state and municipal legislative bodies are in the process of considering such legislation. Most legislative proposals place the responsibility for enforcing unit pricing requirements upon weights and measures officials. Additionally, the Model State Weights and Measures Law has long contained a requirement for unit pricing on certain types of packaged commodities.

It is the Committee's view that this widespread activity could well lead to a great degree of nonuniformity in cost-per-unit labeling. Accordingly, the Committee directed the Office of Weights and Measures to prepare a draft model regulation for cost-per-unit labeling for consideration at the 56th Conference. This draft was prepared and distributed to all interested parties prior to the 56th annual meeting.

In view of comments received on the draft prior to and during the Committee's open meeting, the Committee recommends the adoption of the following regulation:

MODEL STATE UNIT PRICING REGULATION

Section 1. Except for random weight packages unit priced in accord with existing regulations and uniform weight packages of cheese and cheese products unit priced in the same manner and by the same type equipment as random weight packages, any retail establishment providing unit price information in addition to the total price, for any commodity listed herein, shall also provide the unit price information for all packaged commodities listed herein and in the manner prescribed herein.

Section 2.

Meat, Poultry, and Seafood	Price per pound
Fruits and Vegetables	Price per pound or per individual unit, or whole unit of dry measure
Fruit and Vegetable Juices and Drinks	Price per quart
Dry Detergents, Soap Powders, and Dry Household Cleaners	Price per pound
Liquid Detergents and Household Cleaners and Disinfectants	Price per quart
Relishes and Condiments	Price per pound or quart
Liquid Soups and Condensed Liquid Soups	Price per pound or quart
Cereals	Price per pound
Candy	Price per pound
Cookies and Crackers	Price per pound
Sanitary Paper Products	Price per 50 sq ft, or, if by count, per 50 units, including ply
Foil, Film, and Other Rolls of Wrapping	Price per 50 square foot
Cooking Oils and Shortening	Price per quart or pound
Salad Dressings	Price per quart
Soft Drinks	Price per quart
Jams, Jellies, Preserves, and Peanut Butter	Price per pound
Coffee, Tea, and Cocoa	Price per pound
Syrups, Table and Topping	Price per pound or quart
Cheese, Natural and Processed	Price per pound
Rice	Price per pound
Pet Food	Price per pound
Toothpaste	Price per ounce
Deodorants, Personal	Price per ounce
Shaving Preparations	Price per ounce
Toilet Water and Colognes	Price per ounce
Hair Preparations	Price per ounce

The standard of reference for all categories listed above shall be the latest edition of the "Standard Industrial Classification Manual" published by the Executive Office of the President, Bureau of the Budget.

Section 3. Any of the commodities listed herein shall be exempt from these provisions when packaged in quantities of less than one ounce (avoirdupois) or one fluid ounce or when the total retail price thereof is ten cents or less.

Section 4. Any of the commodities listed herein shall be exempt from these provisions when there is only one brand in only one size appearing in a particular retail establishment.

Section 5. The unit price information shall be to the nearest tenth of one cent when less than one dollar and to the nearest cent when a dollar or more.

Section 6 (a). In any retail establishment in which unit price information is provided in accordance with the provisions of the regulation, that information may be displayed by means of a sign, which offers the unit price for one or more brands and/or sizes of a given commodity, by means of a sticker, stamp, sign, label, or tag affixed to the shelf upon which the commodity is displayed, or by means of a sticker, stamp, sign, label, or tag affixed to the consumer commodity itself.

Section 6 (b). Where a sign providing unit price information for one or more sizes or brands of a given commodity is used, that sign shall be provided clearly and in a nondeceptive manner in a central location as close as practical to all items to which the sign refers.

Section 6 (c). If a single sign or tag does provide the unit price information for more than one brand or size of a given commodity, then the following information shall be provided:

(1) The identity and the brand name of the commodity.

(2) The quantity of the packaged commodity if more than one package size per brand is displayed.

(3) The total retail sales price.

(4) The price per appropriate unit in accordance with section 2.

Section 7 (a). Not less than one-third of the commodity categories listed in section 2 of this regulation shall be unit priced by any individual retail establishment within 90 days after this regulation, by its terms, becomes applicable to such establishment.

Section 7 (b). Full compliance with this regulation by any individual retail establishment shall be attained within 120 days after this regulation, by its terms, becomes applicable to such establishment.

(The Model State Unit Pricing Regulation was adopted by voice vote.)

The Laws and Regulations Committee extends its thanks to all those members of the Conference and business and industry representatives who submitted items for consideration. Only through such continuing communications can the Committee fulfill its function to the Conference.

S. D. Andrews, *Chairman*, Florida
G. L. Delano, Montana
M. R. Dettler, Seattle, Washington
R. M. Leach, Michigan
R. L. Thompson, Maryland
H. F. Wollin, *Secretary*, NBS
E. A. Vadelund, *Staff Assistant*, NBS

Committee on Laws and Regulations

(Mr. Andrews moved for adoption, and after a second from the floor, the report of the Committee on Laws and Regulations was adopted in its entirety by the Conference by voice vote.)

(On motion of the committee chairman, seconded from the floor, the Conference by voice vote authorized the Executive Secretary to make any appropriate editorial changes in the language adopted by the Conference, so long as the requirements thus adopted are strictly adhered to.)

REPORT OF THE EXECUTIVE COMMITTEE

Presented by M. Jennings, *Chairman*, Director, Division of Marketing, Tennessee Department of Agriculture

(Tuesday, July 13, 1971)

The Executive Committee of the National Conference on Weights and Measures met in open session on Monday, July 12, 1971, at 11:00 a.m. Discussion was held on the following items:

1. *Plans for the 57th National Conference.*—The Executive Committee presented the following general arrangements for the 57th National Conference:

Site:	Washington, D. C.
Hotel:	The Shoreham
Dates:	July 10–14, 1972
Rates:	$19 single; $23 double; $45-up suites

The Committee is in agreement with these arrangements and recommends action accordingly by the Incoming Executive Committee.

2. *Conference Finances.*—The chairman, during the open meeting, pointed out the problem of rising costs of Conference operations.

The Conference treasury is at a very low level, and funds may not be available for all of the necessary expenses in the year ahead. It is the view of the Committee that such steps as are necessary be taken to provide adequate funds for the operation of the Conference, even if this means a further increase in the registration fee. The Committee recommends that the Incoming Executive Committee give this matter very careful consideration and take such action as needed.

3. *Program Details.*—It is the consensus of the Committee that this year's general program and events be continued. The Committee invites further suggestions which will be studied and included in the plans and arrangements for next year if possible.

4. *Amendments to the Organization and Procedure of the National Conference.*—In accordance with the actions of the 55th Conference and discussion during the open meeting, the Executive Committee recommends the following amendments to the Conference Organization and Procedure:

(a) Change the title of the Committee on Liaison with the National Government to **"Committee on Liaison with the Federal Government."**

(b) Change the title of the Committee on Education to **"Committee on Education, Administration, and Consumer Affairs."**

In addition to these changes in titles, section 7 of the Organization and Procedure should be amended to read as follows:

***Committee on Education, Administration, and Consumer Affairs.*—The Committee on Education, Administration, and Consumer Affairs annually presents a report for Conference action. Its field of operation embraces all matters dealing with the education and training of weights and measures officials, the promotion of weights and measures principles and techniques among the general public and the users of weighing and measuring devices, the development and recommendation of administrative procedures and public relations programs, and the identification of commercial weights and measures practices and problems which are of concern to consumers.**

The Executive Committee also recommends that the Executive Secretary be authorized to make such other editorial changes to the

Organization and Procedure statement as are necessary to implement these amendments.

5. *Future Conference Sites.*—The Committee was pleased to be advised that approval has been granted by the National Bureau of Standards to hold the National Conference on Weights and Measures outside the City of Washington, D. C., every other year, starting with 1973. This will mean that the Conference will meet in Washington next year and every even year thereafter. Hotel space has been reserved in Washington for the second week in July through 1980. These arrangements are necessary due to the heavy demand for hotel space in Washington, and especially for 1976, when Washington will be a focal point for the bicentennial celebrations of our country.

Tentative arrangements have been made to hold the 1973 Conference in Minneapolis, Minnesota, at the Leamington Hotel, the week of July 15–20, 1973. Thereafter, suitable locations in other sections of the country will be selected for each succeeding odd year, in accordance with the recommendations of future Executive Committees and the approval of the Conference. The Committee agrees with the suggestion it heard during the open meeting that preliminary plans and arrangements also be developed for cities throughout the United States over the next 10-year period.

6. *Metric Task Force.*—At the request of the National Bureau of Standards via authority granted to it by Public Law 90–472, popularly known as the Metric Study Act, the 54th National Conference on Weights and Measures authorized the Executive Committee "to conduct a study into the problems that measurement changes might have on the weighing and measuring field." The Executive Committee, in turn, directed the Conference Executive Secretary to establish a Task Force on Metrication to examine such problems. The Task Force was formalized on April 20, 1970, with an appropriate organizational charter. The charter provides that the Task Force will expire at the close of this Conference.

This past December, the Executive Committee, acting for the entire Conference, as provided by the Organization and Procedure of the Conference, approved the final report of the Task Force. This report will be part of the U. S. Metric Study Report on Commercial Weights and Measures, NBS SP 345–3 and the entire NBS Report that will be submitted to the Secretary of Commerce in August. Inquiries concerning the availability of the Commercial Weights and Measures Report should be sent to the NBS Office of Weights and Measures.

The Committee wishes to thank the members of the Task Force for their efforts in the preparation of the Task Force Report, and

wants to especially thank Mr. Stephen Hatos of the Office of Weights and Measures for the excellent manner in which he "quarterbacked" this endeavor.

7. *Report of Associate Membership Committee as Given by Emmett Wehmann, Committee Chairman.*—The Associate Membership has held two meetings this year and plans a third. The first of these was held at the Bureau in February, at which time plans for the State Directors' Reception, the Industry Educational Display, and the Conference Dance were discussed. An excellent exchange of viewpoints took place, which will result in a satisfactory program, we are confident.

The second meeting, held yesterday here in Washington, resulted in the following:

(a) The Committee has agreed to evaluate the Industry Display, a new experimental feature this year. At our third meeting this week, we will discuss our conclusions and offer comments.

(b) Mr. Chuck Campbell reported progress relating to the Conference Dance. The Committee agreed Mr. Campbell should be recognized for his outstanding efforts. The Committee expressed its thanks to Mr. Campbell and feels he should be introduced during the Directors' Reception. He has been asked to serve again as coordinator in the planning of the Conference Dance next year.

(c) At the final meeting this week, a recommendation will be made to the Executive Committee for a new chairman.

The Committee wishes to thank those delegates who participated in the open meeting on Monday. On behalf of the Executive Committee, may I say that we hope your experience during this Conference is informative and enjoyable. It has been our pleasure to serve you.

M. Jennings, Chairman
A. T. Anderson
M. L. Kinlaw
F. D. Morgan
J. L. O'Neill
J. A. J. Bovie, Jr.
L. D. Holloway
J. V. Pugh
H. E. Smith
W. J. Tusen
S. F. Valtri
C. C. Morgan

N. Bucur
C. O. Cottom
R. W. Glendenning
R. W. Searles
H. F. Wollin, *Secretary*
T. M. Stabler, *Staff Assistant*

Executive Committee

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

REPORT OF THE COMMITTEE ON NOMINATIONS

Presented by S. H. Christie, Jr., *Chairman*, State Superintendent, Division of Weights and Measures, New Jersey Department of Law and Public Safety

(Thursday, July 15, 1971)

The Committee on Nominations met on Monday, July 12, for the purpose of selecting a slate of nominees for all elective offices and for the ten elective memberships of the Executive Committee. In the selection of nominees from the active membership, consideration was given to attendance records, geographical distribution, Conference participation, and other factors deemed by the Committee to be important.

The Committee on Nominations submits the following names in nomination for office to serve during the ensuing year and at the 57th National Conference on Weights and Measures:

Chairman: E. H. Black, Ventura County, California.
Vice Chairmen: E. W. Ballentine, South Carolina; W. E. Czaia, Minnesota; R. Rebuffo, Nevada; H. K. Sharp, Oklahoma.
Treasurer: C. C. Morgan, Gary, Indiana.
Chaplain: J. I. Moore, North Carolina.
Executive Committee: Miss Irene I. Boone, Pennsylvania; M. Dennis, Nebraska; G. L. Johnson, Kentucky; J. H. Johnson, Louisiana; W. B. Kelly, Connecticut; T. Ladd, Akron, Ohio; J. H. Lewis, Washington; W. I. Thompson, Monmouth County, New Jersey; C. Wooten, Florida; C. S. Zmudzinski, St. Joseph County, Indiana.

S. H. Christie, Jr., *Chairman*, New Jersey
J. E. Bowen, Newton, Mass.
R. H. Fernsten, Alameda County, Calif.
J. H. Johnson, Louisiana
C. C. Morgan, Gary, Ind.
R. W. Searles, Medina County, Ohio
R. T. Williams, Texas

Committee on Nominations

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

REPORT OF THE COMMITTEE ON RESOLUTIONS

Presented by K. J. Simila, *Chairman*, Assistant Chief for Weights and Measures, Consumer Services Division, Oregon Department of Agriculture

(Thursday, July 15, 1971)

The Committee on Resolutions wishes to express the appreciation of the 56th National Conference on Weights and Measures to all who contributed in any way toward the conduct of a successful meeting. A special vote of thanks is extended to the following:

1. To the Honorable James T. Lynn, Under Secretary of Commerce, for his excellent keynote address and interest in the concerns of the National Conference on Weights and Measures.

2. To Mrs. Jean Nidetch, Founder and President, Weight Watchers International, for her highly successful efforts to serve the public in an area of "weight and measurement" known throughout the world, and for her delightful presentation as guest speaker to the annual Conference Luncheon.

3. To Dr. Lewis M. Branscomb, Director of the National Bureau of Standards, for his recognition of the importance of weights and measures administration in the United States, and for his excellent leadership and contributions in this field.

4. To Dr. F. K. Willenbrock, Director, Institute for Applied Technology, National Bureau of Standards, for his excellent presentation on Measurement in a Changing World of Technology, and for his support of weights and measures activities at all levels of government.

5. To Dr. M. L. Shotzberger, President, Catawba College, for his splendid address on Management as a Modern Approach.

6. To Dr. Thomas Brooks, President, American Council on Consumer Interests, and Dean, School of Home Economics, Southern Illinois University, for his interesting and informative talk on consumer affairs.

7. To Mr. S. E. Cohen, Washington Editor, Advertising Age Magazine, for his thought-provoking address to the Conference and his interest in the consumer movement.

8. To all other program speakers and to all committees for having given generously of their time and efforts in preparing and presenting their excellent papers and reports.

9. To the governing officials of all state and local jurisdictions for their manifest interest in weights and measures work.

10. To Mr. David S. Hinton, Assistant Convention Sales Manager, and the staff of the Shoreham Hotel for their many courtesies in contributing to the enjoyment and comforts of the delegates.

11. To representatives of business and industry for their liberal cooperation and hospitality.

12. To the staff of the National Bureau of Standards for planning and administering the many details involved in the work and program of the National Conference.

The following resolutions are presented in their entirety for consideration of the members of the Conference:

Resolution on the Metric System

Whereas, U. S. conversion to the metric system is probable, and

Whereas, metric conversion would result in a good many impacts on the manufacturers and users of commercial weighing and measuring devices, weights and measures jurisdictions, and the general public: Therefore, be it

Resolved by the 56th National Conference on Weights and Measures that this Conference pledge its full support and cooperation to the Federal Government in a coordinated national program to increase the use of the metric system: And be it further

Resolved that the Executive Committee is authorized to take whatever action or actions that are needed to enhance an orderly changeover to metric units in the commercial weights and measures field following congressional authority to convert to the metric system in this area: And be it further

Resolved that copies of this resolution be sent to the President of the United States, the President of the Senate, the Speaker of the House of Representatives, the Secretary of Commerce, and the Director of the National Bureau of Standards.

Resolution on R. W. Searles

Whereas, it is appropriate for an organization of professionals in a common field of endeavor to publicly recognize one of merit in their midst, and

Whereas, able and faithful service to weights and measures generally, and to this organization specifically, has been rendered by him continuously for over 25 years, and

Whereas, his integrity, dedication to, and genuine concern for the goal of equity in weights and measures have been an outstanding example to all: Therefore, be it

Resolved, that the 56th National Conference on Weights and Measures express its deep appreciation to Mr. R. W. Searles, Inspector of Weights and Measures, Medina County, Ohio, for services rendered as a long-time member and officer of the Conference: And be it further

Resolved, that this body, on behalf of the entire weights and measures fraternity, extend its best wishes to the Reverend and Mrs. Searles for health and happiness in the years ahead: And be it further

Resolved, that copies of this resolution be sent to the Governor of the State of Ohio, the leaders of both legislative chambers, the State Weights and Measures Division, Ohio Department of Agriculture, and the appointing authority, Medina County, Ohio.

K. J. Simila, *Chairman*, Oregon
M. Dennis, Nebraska
G. L. Johnson, Kentucky
E. Keeley, Delaware
L. A. Rick, St. Louis County, Mo.
C. S. Zmudzinski, St. Joseph County, Ind.

Committee on Resolutions

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

REPORT OF THE AUDITING COMMITTEE

Presented by S. J. Darsey, *Chairman*, Field Supervisor, Division of Standards, Florida Department of Agriculture

(Thursday, July 15, 1971)

The Auditing Committee of the 56th National Conference on Weights and Measures met on July 14, 1971. We examined the financial records of the Conference Treasurer, C. C. Morgan, and found the books well kept and all bills paid as of July 1, 1971.

S. J. Darsey, *Chairman*, Florida
R. J. Silcock, Vigo County, Ind.
R. J. Boney, Trenton, N. J.

Committee on Auditing

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

REPORT OF THE TREASURER

Presented by C. C. MORGAN, City Sealer of Weights and Measures, Gary, Indiana

(Thursday, July 15, 1971)

Balance on hand June 1, 1970		$ 4,352.05
RECEIPTS:		
Registration, 313 at $20.00	$6,260.00	
Trade Party	1,395.00	
Tickets for Park City	1,493.25	
Return from S & T Committee	14.84	
Officers' Luncheon	84.00	
Subtotal		9,247.09
Total		$13,599.14

DISBURSEMENTS:

Franklin Press, Plaque	$ 19.50
Hotel Utah, Executive Dinner and Breakfast, Conference Luncheon, food and beverage for Conference Dance, Orchestra, Registration and Meeting Room Expense	3,186.90
Treasure Mountains Rock City, Rides and Dinners	2,115.15
Rock City Resort Center, Beverages	274.65
Salt Lake Transportation Company, Bus Transportation	640.50
Millers & Ellison, Flowers	20.90
Central Printing, Printing during Conference	151.99
Faisal Kawar, Photographic Expense	45.00
IBM Typewriter Rental	40.00
Burns Detective Agency	27.00
Dorothy Freed, Music	58.00
Stan Farnsworth	25.00
Susan Litchfield	10.00
Advertisers, Matt Service, Inc., Matts	103.45
Committee on Specifications and Tolerances	1,553.64
Committee on Laws and Regulations	776.36
Committee on Education	1,208.66
Committee on Liaison with the National Government	767.81
Colonial Manor Motel	583.88
Franklin Press, Letterheads	38.15
Ann Knutson, Weights and Measures Week	25.00
Postmaster, Stamps	8.00
Franklin Press, Tickets	89.75
Brewood Engravers	116.00
Discount Trophies, Inc., Plaque	56.06
Misc. Registration, Film and Operating Expense, Cash	173.31
Bank Charges	2.66
Subtotal	$12,117.32
Balance on hand July 1, 1971	$ 1,481.82

Depository: Bank of Indiana

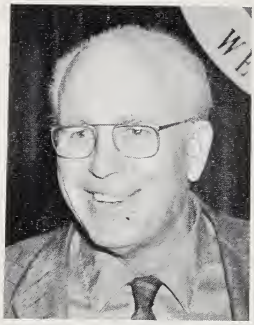
(Signed) C. C. Morgan, Treasurer

(On motion of the Treasurer, seconded from the floor, the Report of the Treasurer was adopted by the Conference.)

SUMMARY OF THE INCOMING EXECUTIVE COMMITTEE MEETING

Presiding Officer, E. H. Black, *Conference Chairman*, Sealer of Weights and Measures, Ventura County, California

(Friday Morning, July 16, 1971)



The newly elected Executive Committee held a breakfast meeting on Friday morning for the purpose of considering plans for the 57th National Conference on Weights and Measures and to discuss and take action on matters referred to it by the outgoing Executive Committee. A summary of the discussion and decisions that were reached follow:

1. The Committee was pleased to have Dr. Lewis M. Branscomb attend the meeting and participate in the discussion. Dr. Branscomb commented on matters pertaining to the relationship of the National Bureau of Standards to the Conference and expressed his interest in and support of the affairs of the Conference.

2. The Committee adopted a motion to hold the 57th Conference in Washington, D. C., at the Shoreham Hotel, on July 9–14, 1972.

3. The problem of Conference finances was discussed at some length. The increasing costs associated with the conduct of the Conference have reduced the Conference treasury to a minimum level. Consideration was given to several suggestions for reducing expenses and obtaining more funds for Conference operations. Such suggestions included: (1) Increase the registration fee; (2) reduce social functions; (3) limit the travel of standing committees; and (4) seek outside financial support. The Committee authorized Mr. H. F. Wollin, Executive Secretary, to study these suggestions and to take such actions as necessary to alleviate the problem.

4. Because of the present financial status of the Conference, the Committee decided not to allocate a specific budget for the Committee on Education, Administration, and Consumer Affairs. Approval was given to the Executive Secretary to provide such funds as are urgently needed and available for educational purposes.

5. The Committee was in agreement that the program for the 57th National Conference should follow the general format of the past few years. No decision was made on the selection of topics and speakers or on the scheduling of events, as these will be determined at a later date, depending on developments in the field of weights and measures during the coming months.

6. A motion was adopted giving the Executive Secretary approval to proceed with plans and arrangements for holding the 1973 Conference in Minneapolis, Minnesota. It was also recommended that steps be taken to establish a schedule of future Conference locations as far as ten years in advance.

7. It was recommended that the Conference Chairman appoint members to the several annual committees as soon as practicable following the Conference to allow ample time for members to correspond and carry out the functions of their committees.

8. Mr. M. S. Godsman, Chairman of the Associate Membership Committee, met with the Executive Committee to discuss matters relating to the affairs of the associate members in the Conference. He stated that his Committee will study the possibility of increased industry participation in the Conference and of improving communications with weights and measures officials. He also agreed to consult with industry representatives concerning their views regarding an increase of the registration fee for associate members.

9. In response to a proposal that was made during the Conference, the Committee discussed what steps could be taken to establish a State Weights and Measures Accreditation Program within the framework of the Conference. Mr. T. M. Stabler, Chief, Office of Weights and Measures, was assigned the responsibility for organizing a study committee on accreditation for the purpose of developing recommendations regarding this program. Mr. Stabler indicated that it should be possible to assemble the committee and report on its preliminary findings by the time of the interim meetings in February. The committee will present a detailed report on the progress of this important subject during the 57th Conference.

Delegates—State, City, and County Weights and Measures Officials

ALABAMA

State ---------- R. T. Hunt, Inspector, Division of Weights and Measures, Dept. of Agriculture, Room 222 State Office Building, Montgomery 36101 (205: 269–7722)

ARKANSAS

State ---------- J. C. Blackwood, Director, Weights and Measures Division, Arkansas State Plant Board, 421½ West Capitol, Little Rock 72203 (501: 371–1021)

B. W. Sullivant, Metrologist, Weights and Measures Division, State Plant Board, 4608 W. 61st St., Little Rock 72209 (501: 202–4384)

CALIFORNIA

State ---------- W. S. Watson, Chief, Bureau of Weights and Measures, Dept. of Agriculture 1220 N St., Sacramento 95820 (916: 445–7001)

County Sealers of Weights and Measures:

Alameda ---------- R. H. Fernsten, 333 Fifth St., Oakland 94607 (415: 874–6736)

Los Angeles ---------- J. R. Plummer, Assistant Director, 3200 N. Main St., Los Angeles 90031 (213: 225–1357)

San Diego ---------- S. R. Miller, P. O. Bx 588, San Diego 92112 (714: 239–7711)

San Mateo ---------- H. E. Smith, 702 Chestnut St., Redwood City 94063 (415: 369–1441)

Santa Clara ---------- R. W. Horger, 409 Mathew St., Santa Clara 95050 (408: 299–2105)

Sonoma ---------- E. J. Bologna, 2555 Mendocino Ave., Santa Rosa 95401 (707: 527–2548)

Ventura ---------- E. H. Black, Director, 608 El Rio Drive, Oxnard 93030 (805: 487–5511 X 4378)

COLORADO

State ---------- E. Prideaux, Supervisor, Weights and Measures Section, Division of Inspection and Consumer Services, Dept. of Agriculture 3130 Zuni St., Denver 80211 (303 : 659–0495)
H. Houston, State Inspector of Oils, Colorado Oil Inspection Dept., 1024 Speer Blvd., Denver 80204 (303 : 892–2096)

CONNECTICUT

State ---------- W. B. Kelley, Senior Inspector, Weights and Measures Division, Dept. of Consumer Protection, State Office Bldg., Hartford 06115 (203 : 566–4778)
A. M. Nelson, Metrologist, Weights and Measures Division, R–G–17, State Office Bldg., Hartford 06115 (203 : 566–5230)

City Sealers of Weights and Measures:
Hartford 06103 ---------- N. Kalechman, 550 Main St. (302 : 566–6457)
Middletown 06457 ------ G. J. Thommasi, Municipal Bldg. (203 : 347–4671)

DELAWARE

State ---------- E. Keeley, Supervisor, Division of Weights and Measures, Dept. of Agriculture, Drawer D, Dover 19901 (302 : 678–4824)

DISTRICT OF COLUMBIA

Weights, Measures, and Markets Branch, Building Division, Bureau of Building, Housing & Zoning, Department of Economic Development, 1104 You St., S. E., Washington, D. C. 20020 (202 : 629–4662)

District ---------- K. G. Hayden, Acting Chief
D. K. Forbes, Supervisor
Inspectors ---------- J. T. Bennick
F. J. Murray
W. W. Wells

FLORIDA

State ---------- S. D. Andrews, Director, Division of Standards, Dept of Agriculture, Room 107 Nathan Mayo Bldg., Tallahassee 32304 (904 : 599–7333)

C. Wooten, Chief, Bureau of Weights and Measures (904: 599–7339 X 339)

S. J. Darsey, Supervisor of Weights and Measures, 1118 S. 17th Ave., Hollywood 33020 (305: 922–8612)

County Sealer of Weights and Measures:

Dade ---------- J. C. Mays, Director, Consumer Protection Division, Justice Bldg., Room 903, 1351 N. W. 12th St., Miami 33125 (305: 377–5111)

GEORGIA

State ---------- T. E. Kirby, Director, Weights and Measures Laboratory, Farmers Market, Forest Park 30050 (404: 361–6764)

HAWAII

State ---------- G. E. Mattimoe, Deputy Director, Division of Weights and Measures, Dept. of Agriculture, 1428 S. King St., P. O. Box 5425, Honolulu 96814 (808: 941–3078)

IDAHO

State ---------- O. C. Arstein, Commissioner of Agriculture, 1365 Orchard Ave., Boise 83704 (208: 375–0190)

L. D. Holloway, Supervisor, Weights and Measures Division, Dept. of Agriculture, 2120 Warm Springs Ave., P. O. Box 790, Boise 83701 (208: 384–2345)

ILLINOIS

State ---------- G. E. Yard, Superintendent, Division of Feeds, Fertilizers, and Standards, Dept. of Agriculture, State Fairgrounds, 531 E. Sangamon Ave., Springfield 62706 (217: 525–7655)

City Sealers of Weights and Measures:

Chicago 60602 ---------- R. J. Fahey, Deputy Commissioner, Dept. of Consumer Sales, Weights and Measures, City Hall R–808 (312: 744–4093)

Chicago 60605 ---------- L. Prendergast, Public Vehicle License Inspector, Public Vehicle License Commission, 1111 S. State St., Room 105 (312: 744–6227)

Skokie 60076 ---------- S. S. Stann, Inspector, 5127 Oakton St. (312: 673–0500)

Springfield 62704 ---------- J. E. Underwood, Sealer, City Hall (217: 789–2166)

INDIANA

State ---------- L. A. Gredy, Director, Division of Weights and Measures, State Board of Health, 1330 W. Michigan St., Indianapolis 46206 (317: 633–6860)

County Inspectors of Weights and Measures:

Clark ---------- R. W. Walker, City-County Bldg., Room 314 Jeffersonville 47130 (812: 283–4451)

Floyd ---------- E. G. Silver, P. O. Box 362, City-County Bldg., New Albany 47150 (812: 945–5357)

Grant ---------- H. Cline, P. O. Box 421, Marion 46592 (317: 664–5239)

Johnson ---------- W. E. Handy, Johnson County Court House, Franklin 46131 (317: 862–4515)

Knox ---------- W. D. Liddil, Court House, Vincennes 47591 (812: 882–2358)

Lake ---------- N. Bucur, 524 Roosevelt St., Gary 46404 (219: 944–2187)

LaPorte ---------- E. Hanish, 119 Tilden Ave., Michigan City 46360 (219: 874–7197)

Madison ---------- C. W. Moore, Box 84, Lapel 46051 (317: 534–3328)

St. Joseph ---------- C. S. Zmudzinski, County-City Bldg., 227 W. Jefferson Blvd., South Bend 46601 (219: 284–9751)

Tippecanoe ---------- W. McMurry, PO Bx 444, Lafayette 47902 (317: 447–3230)

Vigo ---------- R. J. Silcock, Room 12—Courthouse, Terre Haute 47885 (812: 232–5746)

City Sealers of Weights and Measures:

Anderson 46011 ---------- E. E. Gadberry, P. O. Box 2100 (317: 646–5814)

Gary 46407 ---------- C. C. Morgan, 1100 Massachusetts St. (219: 944–6566)

Indianapolis 46204 ------ F. L. Brugh, City-County Bldg., Rm G–6 (317: 633–3733)
W. R. Copeland, Deputy Inspector
W. J. Roberts, Deputy Inspector

South Bend 46621 ------ B. S. Cichowicz, 701 W. Sample St., West Wing (219: 284–9297)

IOWA

State ---------- J. C. Boyd, Chief, Standards Control, Weights and Measures Division, Dept. of Agriculture, State Capitol Bldg., Des Moines 50319 (515: 281–5716)

KANSAS

State ---------- J. L. O'Neill, State Sealer, Division of Weights and Measures, State Board of Agriculture, State Office Bldg., Topeka 66612 (913: 296–3846)

City Sealer of Weights and Measures:
Kansas City 66101 ------ D. Lynch, Deputy Sealer, City Hall (913: 371–330 X 212)

KENTUCKY

State ---------- G. L. Johnson, Director, Division of Weights and Measures, Dept. of Agriculture, 106 W. Second St., Frankfort 40601 (502: 564–4870)
R. Egnew, Metrologist

LOUISIANA

State ---------- J. H. Johnson, Director, Division of Weights and Measures, Dept. of Agriculture, P. O. Box 44292 Capitol Station, Baton Rouge 70804 (504: 389–5168)

MAINE

State ---------- H. D. Robinson, Deputy State Sealer, Division of Consumer Protection, Dept. of Agriculture, State Office Bldg., Augusta 04330 (207: 289–3841)
G. Kennedy, Metrologist

MARYLAND

State ---------- R. L. Thompson, State Superintendent, Office of Weights and Measures, State Board of Agriculture, 360 Symons Hall, University of Maryland, College Park 20742 (301: 454–3551)
L. H. DeGrange, Field Supervisor (301: 454–3552)

R. D. Eaves, Inspector (301: 635–3791)
R. W. Glendenning, Inspector, P. O. Box 356, Chestertown 21620 (301: 778–2237)
S. I. Hayden, Inspector, 360 Symons Hall, University of Maryland, College Park 20742 (301: 373–5486)
M. R. Shockley, Inspector (301: 454–3552)
R. L. Weller, Inspector (301: 454–3552)

County Sealers of Weights and Measures:

Montgomery ---------- M. S. Soward, Chief, Division of Zoning, Permits and Licenses, County Office Bldg., Rockville 20870 (301: 279–1426)
C. Cooley, Inspector II
P. Peterson, Inspector II
W. Rice, Inspector II

Prince George's ---------- R. J. Cord, County Service Bldg., Room 101, Hyattsville 20871 (301: 779–3851)

City Sealers of Weights and Measures:

Baltimore 21202 ---------- T. A. Considine, Chief, Division of Tests, Rm. 1103 Municipal Bldg., (301: 752–2000 X 2845)
J. W. Fincham, Chief Inspector (301: 752–2000 X 796)

MASSACHUSETTS

State ---------- W. C. Hughes, Head Administrative Assistant, Division of Standards, Executive Office of Consumer Affairs, State House—Room 194, Boston 02133 (617: 727–3483)

City Sealers of Weights and Measures:

Agawan 01001 ---------- L. D. Draghetti, 36 Main St. (413: 786–0400)
Cambridge 02139 ---------- A. T. Anderson, Room 202 City Hall (617: 876–6800)
Everett 02149 ---------- L. L. Elliott, City Hall (617: 389–2100)
Fitchburg 01420 ---------- W. T. Deloge, 42 Elm St. (617: 343–7012)
Newton 02159 ---------- J. E. Bowen, City Hall, Newton Centre (617: 244–4700)
Springfield 01103 ---------- R. E. Clark, Municipal Bldg., Court St. (413: 736–2711)
W. Springfield 01089 ---------- P. T. Gamelli, 61 Morgan Rd. (413: 781–7550)

MICHIGAN

State ---------- R. M. Leach, Chief, Food Inspection Division, Dept. of Agriculture, Lewis Cass Bldg., Lansing 48913 (517: 373–1060)

County Sealer of Weights and Measures:

Washtenaw ---------- R. Harter, 4133 Washtenaw Rd., Ann Arbor 48104 (313: 971–6054 X 297)

MINNESOTA

State ---------- W. E. Czaia, Director, Division of Weights and Measures, Dept. of Public Service, 1015 Currie Ave., Minneapolis 55403 (612 : 333–3249)
A. W. Fenger, Inspector (507 : 388–1820)
R. A. Tharalson, Supervisor Inspector (612 : 333–3249)

City Inspector of Weights and Measures:
Minneapolis 55415 ------ L. J. Anderson, Inspector, Dept. of Licenses, Weights & Measures, City Hall, Rm. 101–A (612 : 861–6221)

MISSISSIPPI

State ---------- C. B. Noblin, Director, Weights and Measures Division, Dept. of Agriculture & Commerce, Box 1609, Jackson 39205 (601 : 354–6585)

MISSOURI

State ---------- J. H. Wilson, Director, Weights and Measures Division, Dept. of Agriculture, Jefferson Bldg., Jefferson City 65101 (314 : 636–7166 X 48)

County Sealer of Weights and Measures:
St. Louis ---------- L. A. Rick, 7900 Forsyth, Clayton 63105 (314 : 863–6360 Stat. 395)

City Sealer of Weights and Measures:
St. Louis 63104 ---------- D. I. Offner, Commissioner, Rm. 145 1220 Carr Lane Ave. (314 : 453–3251)

MONTANA

State ---------- G. L. Delano, Chief Sealer, Division of Weights and Measures, Dept. of Agriculture, Capitol Bldg., Helena 59601 (406 : 449–2630)

NEBRASKA

State ---------- M. Dennis, Supervisor of Weights and Measures, Dept. of Agriculture, P. O. Box 4695 State House Station, Lincoln 68509 (402 : 471–2536)

City Sealer of Weights and Measures:
Omaha 68102 ---------- N. M. Ross, Chief, Weights and Measures Section, Permits & Inspection, Interim City Hall 108 S. 18th St. (402 : 341–8122 X 245)

NEW HAMPSHIRE

State ---------- W. J. Tusen, Chief, Bureau of Weights and Measures, Division of Markets and Standards, Dept. of Agriculture, State House Annex, Concord 03301 (603: 271–3700)

NEW JERSEY

State ---------- S. H. Christie, Jr., State Superintendent, Division of Weights and Measures, Dept. of Law and Public Safety, 187 W. Hanover St., Trenton 08625 (609: 292–4615)
J. R. Bird, Deputy State Superintendent
C. P. Conrad, Jr., Technician

County Superintendents of Weights and Measures:

Bergen ---------- J. A. Pollock, 66 Zabriskie St., Hackensack 07601 (201: 342–4191)

Burlington ---------- E. D. Gaskill, 54 Grant St., Mount Holly 08060 (609: 267–3300 X 210)

Camden ---------- A. J. Francesconi, Court House, Room 403, Camden 08101 (609: 964–0242)

Cumberland ---------- G. S. Franks, 1142 Landis Ave., Vineland 08360 (609: 691–0999)
N. DiMarco, Deputy Superintendent, 12–M Weymouth Place, Bridgeton 08302 (609: 451–0118)

Gloucester ---------- R. J. Morris, 49 Wood St., Woodbury 08096 (609: 845–1600)
J. Silvestro, Assistant Superintendent

Mercer ---------- R. M. Bodenweiser, Court House, Trenton 08607 (609: 989–8000)

Middlesex ---------- J. M. Chohamin, Old Records Bldg., Kennedy Square, New Brunswick 08819 (201: 246–0400)

Monmouth ---------- W. I. Thompson, Hall of Records, Rm. 302, Freehold 07728 (201: 431–4000)
J. A. J. Bovie, Jr., Assistant Superintendent, 82 W. Wall St., Neptune City 07753
E. Camoosa, Assistant Superintendent, 1106 Jeffrey St., Asbury Park 07712

Ocean ---------- M. R. Burd, Jr., 11 Hooper Ave., Toms River 08753 (201: 244–2121 X 257)

Salem ---------- R. B. Jones, P. O. Box 24, Court House, Salem 08079 (609: 935–3152)

Somerset ---------- J. A. Kriney, Somerset County Administration Bldg., Somerville 08876 (201: 725–4700)

Municipal Superintendents of Weights and Measures:

Kearney 07032 ---------- J. Pollock, Town Hall, 204 Kearny Ave. (201: 991–2700)

Passaic 07055 ---------- P. DeVries, City Hall (201: 471–3300)

Paterson 07505 ---------- W. J. Keihoe, 115 Van Houten St. (201: 684–3430)

Trenton 08618 ---------- R. J. Boney, Trenton Civic Center, Armory Drive (609: 392–3441 X 361)

NEW MEXICO

State ---------- R. F. Schulmeister, Metrologist, Division of Markets, Weights and Measures, Dept. of Agriculture, P. O. Box 3170, Las Cruces 88001 (505: 646–1616)

NEW YORK

County Sealers of Weights and Measures:

Monroe ---------- L. Romano, 291 Westfall Rd., Rochester 14620 (716: 473–8058)
A. Graziano

Nassau ---------- S. B. Knowlton, Assistant to Commissioner of Consumer Affairs, 400 County Seat Drive, Mineola 11501 (516: 535–3206)

City Sealers of Weights and Measures:

Glen Cove 11542 ---------- E. T. Hunter, City Hall, Bridge St. (516: 676–7877)

New York 10013 ---------- M. Greenspan, 80 Lafayette St., (212: 566–8776)

NORTH CAROLINA

State ---------- J. I. Moore, Superintendent, Weights and Measures Division, Dept. of Agriculture, P. O. Box 27647, Raleigh 27611 (919: 829–3315)
M. L. Kinlaw, Supervisor
R. F. Peaks, Inspector
P. B. Rasmussen, Inspector

OHIO

State ---------- R. E. Bowers, Chief, Weights and Measures, Dept. of Agriculture, Reynoldsburg 43068 (614: 866–6364)

County Sealers of Weights and Measures:

Clark ---------- J. S. Powers, County Bldg., Springfield 45502 (513: 324–5871)

Medina ---------- R. W. Searles, Board of Education Bldg., 137 West Friendship, Medina 44256 (216: 722–6354)

Tuscarawas ---------- J. E. Mathews, County Auditor's Office, New Philadelphia 44663 (216: 364–4421)

Wayne ---------- C. G. Lytle, % County Auditor, Wooster 44691 (216: 262–1816)

City Sealers of Weights and Measures:

Akron 44304 ---------- A. J. Ladd, 69 N. Union St. (216: 375–2612)

Canton 44702 ---------- J. R. Kalkman, 218 Cleveland Ave., S. W. (216: 455–8951 X 249)

Cincinnati 45214 ---------- L. B. Frank, 2147 Central Ave. (513: 421–5700 X 303)

OKLAHOMA

State ---------- H. K. Sharp, Assistant Director, Marketing Division, Dept. of Agriculture, 122 Capitol, Oklahoma City 73105 (405 : 521–3861)

OREGON

State ---------- K. J. Simila, Assistant Chief for Weights and Measures, Dairy & Consumer Services Division, Dept. of Agriculture, Agriculture Bldg., Salem 97310 (503 : 378–3792)

PENNSYLVANIA

State ---------- Miss Irene I. Boone, Acting Director, Bureau of Standard Weights and Measures, Dept. of Justice, B–130 Transportation & Safety Bldg., Harrisburg 17120 (717 : 787–6359)
R. W. Buchanan, Supervisor
R. R. Roof, Laboratory Metrologist

County Sealer of Weights and Measures:
Allegheny ---------- W. D. Scott, #4 County Court House, Pittsburgh 15219 (412 : 355–4480)

City Sealers of Weights and Measures:
Allentown 18101 -------- A. L. Heilman, Jr., City Hall, 435 Hamilton St. (215 : 434–9601 X 250)
Philadelphia 19107 ------ S. F. Valtri, Chief, Room 622 City Hall Annex, (215 : 686–3475, 3476)
C. E. McHugh, Supervisor
J. A. Sabo, Field Inspector II

PUERTO RICO

State ---------- M. V. Gonzalaz, Supervisor Official, Weights and Measures Division, P. O. Box 13934, Santurce 00908 (809 : 725–5667)

RHODE ISLAND

State ---------- E. R. Fisher, State Sealer of Weights and Measures, Dept. of Labor, 235 Promenade St., Providence 02908 (401 : 227–2756)

SOUTH CAROLINA

State ---------- E. W. Ballentine, Assistant to Commissioner, Dept. of Agriculture, P. O. Box 11280, Columbia 29211 (803 : 758–2426)
R. M. Magoffin, Deputy Commissioner
C. T. Smith, Director, Consumer Protection Division
J. A. Atkinson, Consumer Specialist
R. S. Barnhill
A. DeLorme, Jr.
J. V. Pugh, Director, Metrology Division

TENNESSEE

State ---------- M. Jennings, Director, Division of Marketing, Dept. of Agriculture, Box 9039 Melrose Station, Nashville 37204 (615 : 741–1561)
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TEXAS

State ---------- R. T. Williams, Director, Consumer Service Division, Dept. of Agriculture, John Reagan Bldg., Box 12847 Capitol Station, Austin 78711 (512 : 475–3140)
Z. Florence, Administrative Assistant (512 : 475–4357)

City Sealers of Weights and Measures:
Dallas 75201 ---------- J. D. Walton, 303 City Hall (214 : R18–9711)
Fort Worth 76107 ---------- R. L. Sharp, 1800 University Dr., (817 : 536–3217)

VERMONT

State ---------- T. F. Brink, Director, Division of Weights and Measures, Dept. of Agriculture, Agriculture Bldg., Montpelier 05602 (802 : 223–2311 X 469)

VIRGINIA

State ---------- J. F. Lyles, Supervisor, Weights and Measures Regulatory Section, Division of Regulatory Services, Dept. of Agriculture and Commerce, 1 North 14th St., Richmond 23219 (703 : 770–2476)

J. C. Stewart, Assistant Supervisor
F. Saunders, Field Supervisor (703: 362–1607)
M. Cain, Metrologist (703: 770–2476)
D. Reese, Inspector (703: 770–2476)
J. Rogers, Inspector (703: 986–4650)

County Sealer of Weights and Measures:

Arlington ---------- J. P. Noonan, Arlington County Court House, Arlington 22201 (703: 558–2343)

City Sealers of Weights and Measures:

Alexandria 22313 ---------- L. W. Vezina, P. O. Box 178, City Hall (703: 750–6241)

Danville 24541 ---------- C. A. Shumate, P. O. Box 3300 (601: 792–9211 X 310)

Newport News 23601 ---------- J. L. Davis, 118 Main St., City Hall (703: 596–3011)

Richmond 23219 ---------- A. B. Moody, Jr., Senior Inspector, 501 N. 9th St., Room 130 (703: 649–4208)
W. G. Alvin, Inspector (703: 288–4623)

Virginia Beach 23456 ---------- E. Litchfield, Assistant Consumer Protection Officer-Sealer, Consumer Protection Bureau, Municipal Center (703: 427–4421)

WEST VIRGINIA

State ---------- D. L. Griffith, Director, Consumer Protection Division, Dept. of Labor, Charleston, 25305 (304: 348–2195)

WISCONSIN

State ---------- D. E. Konsoer, Director, Bureau of Weights and Measures, Food Division, Dept. of Agriculture, 801 West Badger Road, Madison 53713 (608: 266–7243)

City Sealers of Weights and Measures:

Green Bay 54301 ---------- N. P. Tilleman, City Hall

Racine 53403 ---------- R. J. Zierten, City Hall (414: 634–7111)

Sheboygan 53081 ---------- R. K. Lorenz, City Hall (414: 457–5411)

Advertising Age:
S. E. Cohen, Washington Editor, National Press Bldg., Washington, D. C. 20004 (202: 737–7659)

Allied Chemical Corporation:
H. J. Kerr, Technical Service, Agricultural Division, P. O. Box 61, Hopewell, Virginia 23860 (703: 458–7811)

American Bakers Association:
J. M. Creed, General Counsel, 1700 Pennsylvania Ave., N. W., Washington, D. C. 20006 (202: 296–2526)

American Can Company:
W. H. Marks, Supervisor, Dixie Products, Technical Services Dept., 333 N. Commercial St., Neenah, Wisconsin 54956 (414: 722–4211 X 5509)

American Frozen Food Institute:
L. S. Fenn, Director of Technical Service, 919 18th St., N. W., Washington, D. C. 20006 (202: 296–4080)

American Oil Company:
J. E. St. Germain, Manager, Construction & Engineering, 1 N. Charles St., Baltimore, Maryland 21201 (301: 727–6700)

American Paper Institute:
M. B. Weir, Attorney, 161 E. 42nd St., New York, N. Y. 10017 (212: 682–8811)
W. V. Driscoll, Manager, Tissue Division, 260 Madison Ave., New York, N. Y. 10016 (212: 889–6200)

American Petroleum Institute:
W. A. Kerlin, Special Representative, 1801 K St., N. W., Washington, D. C. 20006 (202: 833–5643)
W. N. Seward, Assistant to Senior Vice President (202: 833–5661)
R. Southers, Coordinator of Operations and Engineering (202: 833–5643)
D. J. Hine, API Research Associate (301: 921–2401)

American Seed Trade Association:
R. J. Falasca, Assistant to the Vice President, 1030 15th St., N. W., Washington, D. C. 20005 (202: 223–4080)

American Textile Manufacturers Institute, Inc.:
R. E. Blanchard, Director, Market Division, 1457 Broadway, New York, N. Y. 10036 (212: 244–0800)

American Trucking Association, Inc.:
E. V. Kiley, Vice President, Research & Technical Services Division, 1616 P St., N. W., Washington, D. C. 20036 (202: 269–3215)

Amstar Corporation:
R. Fremgen, Quality Control Supervisor, 120 Wall St., New York, N. Y. 10005 (516: 433–2703)

Applied Information Industries:
F. J. Suttill, Director, New Product Development, 345 New Albany Rd., Moorestown, New Jersey 08057 (609: 234–1000 X 215)

Arkstrom Industries, Inc.:
A. Franzblau, President, 415 Avon Ave., Newark, New Jersey 07108 (201: 243–1410)

Armour and Company:
V. J. Delgiudice, Manager, Government Liaison Dept., Box 9222, Chicago, Illinois 60690 (312: 751–4612)

Asphalt Roofing Manufacturers Association:
H. H. Whittemore, Managing Director, Room 2111, 757 Third Ave., New York, N. Y. 10017 (212: 421–2690)
Atlantic Research/Systems Division:
S. S. Kozich, Director, Quality Assurance, 3333 Harbor Blvd., Costa Mesa, California 92626 (714: 546–8030)
Atlantic Richfield Company:
J. F. Straub, Jr., 260 Broad St., Philadelphia, Pennsylvania 19101 (215: 735–2345)
Bennett Pump Incorporated:
M. S. Godsman, Manager, Field Service, Broadway & Wood Sts., Muskegon, Michigan 49444 (616: 733–1302)
Berkel, Inc.:
D. Moody, Manager, Scale Division, One Berkel Drive, LaPorte, Indiana 47350 (219: 362–3165)
Borden, Inc.:
C. R. Test. Attorney, 50 W. Broad St., Columbus, Ohio 43215 (614: 461–4313)
Brookline Instrument Company:
B. L. Swersey, President, 4 Westchester Plaza, Elmsford, New York 10523 (914: 592–4553)
Cannon Mills Company:
H. S. Smith, Attorney, Legal Department, Kannapolis, North Carolina 28081 (704: 933–1221)
M. E. Kester, Assistant Vice President, Packaging Director
Car Wash Week—U. S. Oil Week:
J. B. Fraser, Managing Editor, 802 National Press Bldg., Washington, D. C. 20004 (202: 393–5180)
Cardinal Scale Manufacturing Company:
H. A. Harwood, Regional Manager, P. O. Box 382, Roslyn Heights, New York 11577 (516: 484–1133)
Chain Store Age:
H. V. Semling, Washington Correspondent, P. O. Box 674, Washington, D. C. (202: 521–2157)
Chatillon, John & Sons:
N. Lavenda, Sales Manager, 83–30 Kew Gardens Road, Kew Gardens, New York 11415 (212: 847–5000)
Chemical Specialties Manufacturing Association:
A. A. Mulliken, Executive Director, 50 E. 41st St., New York, N. Y. 10017 (212: 685–8722)
F. D. Sparre, Legislative Consultant
Coca-Cola Company:
R. L. Callahan, Jr., Attorney, P. O. Drawer 1734, Atlanta, Georgia 30301 (404: 875–3411)
Colgate-Palmolive Company:
E. E. Wolski, Manager of Quality Control, 300 Park Ave., New York, N. Y. 10022 (212: 751–1200)
Collier, Shannon, Rice & Edwards:
H. Jennings, 1625 Eye St., N. W., Washington, D. C. 20006 (202: 393–1050)
Consumers' Union:
Frances A. Ulmer, 777 National Press Bldg., Washington, D. C. (202: 638–5557)
Covington & Burling:
P. M. Phillipes, Attorney, 888 16th St., N. W., Washington, D. C. (202: 293–3300)

Dairy & Food Industries Supply Association:
D. H. Williams, Technical Director, 5530 Wisconsin Ave., Washington, D. C. 20015 (301: 652–4420)
Dee, J. B. & Company, Inc.:
G. Fishman, General Manager, 1722 W. 16th St., Indianapolis, Indiana 46207 (317: 635–5548)
DeLaval Separator Company:
H. Muhlack, Supervisor, Siemen's Meter Department, 5724 N. Pulaski Rd., Chicago, Illinois 60646 (312: 463–3020)
J. L. Raymond, Milk Process Department, DeLaval Building, Poughkeepsie, New York 12602 (914: 452–1000)
Detecto Scales, Inc.:
M. Rapp, Vice President, 103–00 Foster Ave., Brooklyn, New York 11236 (212: 949–4500)
Dresser Industries:
F. W. Love, Administrative Assistant, Petroleum Equipment Division, 124 W. College Ave., Salisbury, Maryland 21801 (301: 749–6161)
Eaton Corporation:
T. Edmonds, Sales Engineer, Control Division, 191 E. North Ave., Carol Stream, Illinois 60187 (312: 682–8051)
Emerson Electric Company:
A. J. Komich, Product Manager, Liquid Meters, Brooks Instrument Division, Box 450, Statesboro, Georgia 30458 (912: 786–5471)
Empro Products:
H. C. Hopper, Sales Manager, 459 McLean Blvd., Paterson, New Jersey 07513 (201: 271–1100)
Ethyl Corporation—Vis Queen Division:
A. Brown, Regional Sales Manager, 451 Florida Blvd., Baton Rouge, Louisiana 70821 (504: 348–0311)
M. D. Havercamp, Sales Manager (504: 348–0131)
P. G. Pilant, Midwest Sales Manager B & A Products (504: 348–4971)
Exact Weight Scale Company:
R. W. Grant, Vice President, Sales, 1005 W. 3rd Ave., Columbus, Ohio 43212 (614: 294–6253)
Fairbanks Morse:
K. F. Hammer, President, St. Johnsbury, Vermont 05819 (802: 748–2371)
T. G. Soper, Vice President, Marketing
J. P. York, Product Manager
Food Fair Store, Inc.:
L. DiMaria, Darien & Pattison Avenues, Philadelphia, Pennsylvania 19148 (215: 403–1301)
Fredonia Seed Company:
G. B. Weaver, President, Box 180, Fredonia, New York 14063 (716: 672–2174)
Fuller, H. J. & Sons, Inc.:
W. A. Scheurer, Public Relations, 1212 Chesapeake Ave., Columbus, Ohio 43212 (614: 488–3312)
Gasoline Pump Manufacturers Association:
R. M. Byrne, Technical Director, 331 Madison Ave., New York, N. Y. 10017 (212: 661–2050)
General Foods Corporation:
L. J. Adams, Attorney, 250 North St., White Plains, N. Y. 10605 (914: 694–2372)
J. P. Fay, Manager—Quality Assurance, (914: 694–5341)

General Mills, Inc.:

D. B. Colpitts, Technical Manager, Weights and Measures, 9000 Plymouth Ave., North, Minneapolis, Minnesota 55427 (612:540–2729)

W. C. Mailhot, Director, Quality Control, 9200 Wayzata Blvd., Minneapolis, Minnesota 55440 (612:540–2354)

O. A. Oudal, Consultant, 1411 East 99th St., Minneapolis, Minnesota 55420 (612:888–9825)

Gerber Products Company:

J. L. Littlefield, Government Relations Manager, 445 State St., Fremont, Michigan 49412 (616:928–2264)

Giant Food, Inc.:

Mrs. E. Peterson, Consumer Advisor, P. O. Box 1804, Washington, D. C. 20013 (202:341–4365)

Gilbarco Inc.:

R. E. Nix, Assistant to the Manager of Engineering, Friendly Road, Greensboro, North Carolina 27420 (919:292–3011)

Glass Container Manufacturers Institute, Inc.:

C. E. Wagner, Technical Director, 330 Madison Ave., New York, N. Y. 10017 (212:682–5533)

E. J. Mentz, Associate Technical Director

Grocery Manufacturers of America:

D. H. Greeley, Research Assistant, 1425 K St., N. W., Washington, D. C. 20005 (202:638–6100)

Gulf Oil Company:

G. R. Davis, Director, Supply & Operations, P. O. Box 611, Tulsa, Oklahoma 74135 (918:627–9151)

Halmor Services, Inc.:

J. C. Halpine, President, 1120 No. Boston, P. O. Box 6157, Tulsa, Oklahoma 74106 (918:587–4173)

Hammer Lithograph Corporation:

P. W. Bouchard, Assistant Sales Manager, 425 Exchange St., Rochester, New York 14608 (716:546–2112)

Hines, Edward Lumber Company:

A. F. Muschler, Technical Director, 200 S. Michigan Ave., Chicago, Illinois 60604 (312:922–9030)

Hi-Speed Checkweigher Co., Inc.:

G. E. Siddell, Sales, 605 W. State St., Ithaca, New York 14850 (201:356–6500)

G. F. Oberrender, Jr., Sales Manager

Hobart Manufacturing Company:

K. C. Allen, Vice President, Scale Operations, 216 So. Torrence St., Dayton, Ohio 45403 (513:254–8451)

C. G. Gehringer, Sales Manager, Industrial Sales, Pennsylvania Ave., Troy, Ohio 45373 (513:335–7171)

M. E. Bone, Weights and Measures Representative, 216 S. Torrence St., Dayton, Ohio 45403 (513:254–8451)

Howe Richardson Scale Company:

H. S. Dalecki, Assistant National Service Manager, 36–12 47th Ave., Long Island City, New York 11101 (212:392–7050)

Humble Oil & Refining Company:

S. M. Paxson, Product Handling Specialist, Box 1288, Baltimore, Maryland 21204 (301:667–9100)

Jewel Companies, Inc.:
R. W. Miller, Jr., General Attorney, 1955 W. North Ave., Melrose Park, Illinois 60160 (312:345–0500)
Johnson & Johnson:
G. E. Heinze, National Director, Control Laboratories, Research Center, New Brunswick, New Jersey 08903 (201:524–1352)
Keene Corporation:
R. D. Perrenoud, Project Engineer, Pump & Meter Division, P. O. Box 250, Greeneville, Tennessee 37743 (615:638–8156)
Keyes Fibre Company:
W. A. Largent, Director, Consumer Division, 420 Lexington Ave., New York, N. Y. 10017 (212:686–3790)
King, J. A. & Company:
J. A. King, Chairman of the Board, Box 21225, Greensboro, North Carolina 27420 (919:292–0511)
Kraft Foods:
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