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INVESTIGATION OF CONCENTRATION OF ECONOMIC POWER

TEMPORARY NATIONAL ECONOMIC COMMITTEE

A STUDY MADE UNDER THE AUSPICES OF THE DEPARTMENT OF AGRICULTURE FOR THE TEMPORARY NATIONAL ECONOMIC COMMITTEE, SEVENTY-SIXTH CONGRESS, THIRD SESSION, PURSUANT TO PUBLIC RESOLUTION NO. 113 (SEVENTY-FIFTH CONGRESS), AUTHORIZING AND DIRECTING A SELECT COMMITTEE TO MAKE A FULL AND COMPLETE STUDY AND INVESTIGATION WITH RESPECT TO THE CONCENTRATION OF ECONOMIC POWER IN, AND FINANCIAL CONTROL OVER, PRODUCTION AND DISTRIBUTION OF GOODS AND SERVICES

MONOGRAPH No. 24

CONSUMER STANDARDS

Printed for the use of the
Temporary National Economic Committee



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MONOGRAPH NO. 24

CONSUMER STANDARDS

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ACKNOWLEDGMENT

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The Temporary National Economic Committee is greatly indebted to these authors for this contribution to the literature of the subject under review.

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(Signed) **JOSEPH C. O'MAHONEY,**
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LETTER OF TRANSMITTAL

HON. JOSEPH C. O'MAHONEY,
*Chairman, Temporary National Economic Committee,
United States Senate, Washington, D. C.*

DEAR SENATOR O'MAHONEY: I have the honor to submit herewith a report on consumer standards which brings together for the first time the facts concerning Federal activities in the fields of standardization, inspection, testing, and research which refer to, or provide a basis for, consumer standards. To this are added chapters on similar activities by private agencies and on procurement methods and procedures of both Government and private agencies. It is an analytical inventory of our present resources for the development and utilization of consumer standards, supplemented by a discussion of how these resources have been utilized and by the statements and opinions of professional, trade, and consumer groups on that subject.

The monograph is the work of Samuel P. Kaidanovsky, a member of our staff and Technical Director of the Consumer Standards Project sponsored by this Division. It is based upon original research carried out under his direction. Miss Alice L. Edwards, also of our staff and formerly executive secretary of the American Home Economics Association, assisted in the preparation of the report and is the author of the chapters on consumer buying and on value of standards to consumers.

Respectfully submitted.

D. E. MONTGOMERY,
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OCTOBER 23, 1940.

INTRODUCTION

Interest in consumer standards both on the part of the Government and of consumers is of long standing. Perhaps the first effective demonstration of this interest on a large scale was the passage of the Federal Food and Drugs Act of 1906, followed by similar State laws in the ensuing years. Numerous other Federal and State laws since, and a few before, have dealt directly or indirectly with standards for consumer goods and many State and Federal Government departments have exercised functions related to standardization.

In June 1933, the office of Consumers' Counsel was created within the Agricultural Adjustment Administration as an integral part of this Administration. The activities of the Consumers' Counsel consisted mainly of examination of marketing agreements and codes, research in connection with consumer problems arising under the Agricultural Adjustment Act, and investigation and publicity with respect to food and cotton textile prices to consumers. In analyzing proposed marketing agreements and codes, several principles were used by the Consumers' Counsel as a guide. Among them were included effective provisions for grading and standardizing products to insure honesty of labeling.

However, Governmental agencies dealing specifically with the general problem of consumer standards did not emerge until the establishment of the Consumers' Advisory Board of the National Recovery Administration. This Board maintained a continuous interest in consumer standards throughout its existence. The very first policy statements of this Board related to the subject of consumer standards, and Board committees early concerned themselves with the quality, grading, and labeling requirements of N. R. A. codes.

As a result, approximately 245 of the 556 approved N. R. A. codes and some 200 supplements contained provisions for, or at least references to, the establishment of standards, grades, and labels. The drafting, application, and enforcement of consumer standards were brought into discussion before the N. R. A. code hearings where manufacturers, distributors, and consumers were given an opportunity to freely express their opinions on the subject of consumer standards. Under this procedure the necessity for consumer standards was dramatized more than at any other time.

A Standards Unit was first established by the Consumers' Advisory Board in January 1934. In October 1934 by administrative orders the standards work handled by several advisory groups was centralized in the Research and Planning Division of the N. R. A. Effective cooperation was achieved between the Standards Unit of the Consumers' Advisory Board and the Research and Planning Division of the N. R. A.

On July 30, 1935, by Presidential Executive order, a new Consumers' Division was established in the National Recovery Administration.

In it were consolidated the activities of three previously existing agencies: The Consumers' Advisory Board, the Consumers' Division of the National Emergency Council, and the Cabinet Committee on Price Policy.

With the termination of the National Recovery Administration on December 21, 1935, the Consumers' Division was transferred to the Department of Labor, and later designated as the Consumers' Project.

A Standards Section, established in the Consumers' Project, continued some of the research work on consumer standards and related problems, previously carried on by the Consumers' Advisory Board. The Consumers' Project came to an end on June 30, 1938. On July 1 there was created the Consumer Standards Project, a Federal WPA Project, which continued and enlarged the research done by the Consumers' Project in the field of standards for consumer goods.

With the exception of the last agency mentioned, which still functions under the sponsorship of the Consumers' Counsel Division, United States Department of Agriculture, the consumer agencies previously referred to are not treated in this monograph, which considers only existing agencies. However, they have been specifically discussed at this point because their activities contributed substantially to the work being done by existing agencies.

This monograph deals with standardization, inspection, and testing activities of the Federal Government and with the research work being conducted by various Federal agencies which refer to, or provide a basis for, consumer standards. The standards work of some of the most active private companies, technical and professional societies, and trade associations are discussed.

Standardization and simplification of products is also affected by State legislation; the range of State laws is given by two examples, one illustrating a field where almost complete uniformity has been effected, and the other where heterogeneity of requirements exist. These examples are fertilizer and new bedding and upholstery.

Procurement methods and procedures of the Federal agencies, States, counties, and municipalities are discussed, and results of surveys made on this subject, some especially conducted for the purpose of this monograph, are extensively considered.

Standardization procedure, definitions, and terminology used by different agencies are discussed. The procedures in setting up standards employed by various governmental and nongovernmental agencies are illustrated by charts. Further, the activities of some independent purchasing agencies, commercial testing laboratories, and commodity testing and rating agencies are described.

The extent and character of commodity information available to consumers, and the value of standards, grades, and informative labels to consumers and their effect on merchandising are also covered.

Finally, a few recommendations and policies made by various groups, such as consumers, retailers, trade associations, and professional societies, relating to consumer standards, grades, and labels, are also presented to indicate the viewpoint of various nongovernmental groups on the subject of consumer standards.

CHAPTER I

DEFINITION OF BASIC TERMS

The basic concept underlying the use of term "standard" is quite definitely established. The definition of a standard as given in Funk and Wagnalls "New Standard Dictionary" is: (1) "Any measure of extent, quality, or value established by law or by general usage and consent; a weight, vessel, instrument, or device sanctioned or used as a definite unit, as of value, dimension, time, or quality, by reference to which other measuring-instruments may be constructed and tested or regulated. (2) Hence, any type, model, example, or authority with which comparison may be made; any fact, thing, or circumstance forming a basis for adjustment and regulation; a criterion of excellence; test; as a standard of portion by weight of fine metal and alloy established by authority."

Dr. Lyman J. Briggs, Director of the National Bureau of Standards, points out the analogy of the intentional standardization as practiced by man (conscious deliberate selection) and standardization as a survival process (natural selection).

We need only glance at the rich background of standards in nature to gain perspective and obtain a better appreciation of present trends in standardization and their significance. In the same species of plants, fishes, birds, or animals, individuals resemble each other in the minutest detail of structure and function. So thorough has nature been that each species may be recognized by the standardized organs, functions, characteristics, or habits peculiar to each. At the same time, individuals exhibit definite distinguishing characteristics and develop in diverse directions to stimulate the natural processes of selection, survival, and evolution.

The more the mysteries of nature are dispelled by knowledge, the more is standardization revealed, as in the geometrical arrangement of crystal formation, predicted discoveries of new chemical elements, or the coming of a comet. We depend upon the meticulous regularity of the sun's appearance, the recurring phases of the moon, and the perfectly timed rotation of the planets. We accept as indisputable facts the definitely established boiling and freezing points, the peculiar behavior of certain materials and the changeless normal properties of elasticity, strength, hardness, ductility, viscosity, refractivity, electric conductivity, permeability, and other properties of the elemental things of nature which man is constantly appropriating for his use.

The variations of color available to the painter are composed of parts of a narrow band of spectral wave lengths and all of the artistry in music is conveyed through another small group of frequencies. And yet we hear no complaints that nature has carried standardization to extremes, that life is dull, drab, or dreary as a result of standardized chemical elements, standardized crystalline growth, or wave lengths, as in sound, radio, light, and X-rays.

In every direction we find standardization, whether we look to the orbits of the electrons about the atom, the constellations of the stars, the microcosm or the macrocosm, industry or sport, commerce or the arts.

The architect may be limited to one size of common brick but he has a choice of color, texture, and arrangement sufficient to produce an unlimited variety of structures and effects, while the accomplished limitation of dimensions gives him a basis upon which to start and relieves his mind altogether of the problem of the size of brick to be employed.¹

¹ "Commercial Standards and Their Value to Business," p. III, CSO-40, U. S. Government Printing Office, Washington, D. C., 1940.

Webster's New International Dictionary defines a "Specification" as "A written statement containing a minute description or enumeration of particulars. A written or printed description of work to be done, forming part of the contract and describing qualities of material and mode of construction, and also giving dimension and other information not shown in the drawings." A specification is a shorthand vehicle to converse quickly and accurately about materials and products.

Many standardizing organizations, such as the American Standards Association, the American Society for Testing Materials, and others, have gone into the matter of standardizing specifications, and, hence, there are now a large number of standard specifications.

Some of the specifications are becoming so definite as to be universally accepted. For example, cement is almost always bought under the standard specifications of the American Society for Testing Materials.

Specifications are sometimes standardized by the Federal Government for use in its purchases. Federal Specifications, set up by the Procurement Division of the United States Treasury Department, are standard specifications. Specifications of the Society of Automotive Engineers, chiefly used by the automotive industry, may also be considered standard specifications.

The following definitions of standardization, simplification, grades and grading, and standards for consumer goods have been selected as representative definitions of basic terms in the field of standards.

Mr. Norman F. Harriman defines standardization and simplification as follows:

"Standardization" may be defined as the unification of the methods, practices, and technique involved in the manufacture, construction, and use of materials, machines, and products, and in all lines of endeavor which present the necessity for performing repetition work. From the viewpoint of the buyer and vendor, it is the establishment of a criterion for the dimensions, quality, or performance of those materials, machines, and products. In its former aspects, it tends to assist scientific and engineering development and to prevent waste in manufacturing. In its latter aspect its purpose is principally to assist in promoting a common understanding between producer and user.

Standardization primarily means the setting up of standards by which extent, quantity, quality, value, performance, or service, may be judged or determined. It is the crystallization of the best thought and practice of industry, business, or art into definite forms for general usage.²

Standardization is generally applied to some individual article or some particular process, while simplification is commonly considered in connection with lines of products or methods of business procedure. "Simplification," or the elimination of excess types, grades, sizes, finishes, etc., of products, or superfluous or unnecessary methods, certainly results in standard products or practices. In other words, simplification is standardization by elimination rather than by selection. In either case, the result is the establishment of a standard.

The term "simplification," frequently is more appealing than standardization of variety, as it sounds less formal.³

Dr. Jessie V. Coles thus defines grades and grading:

Grading is the comparison of goods with standards and the resulting separation into groups possessing uniform qualities. The group is called the "grades," and the process of comparing with the standard and dividing is called "grading." The term "standardized grades" is used to designate grades which are exact and which are based on commonly known and recognized

² "Standards and Standardization," by Norman F. Harriman, McGraw-Hill Book Co., Inc., New York City, p. 78, 1928.

³ *Ibid.*, p. 117.

standards. Although the use of some kind of standard is necessary to divide goods into grades, those grades which are not based on recognized standards are not usually termed "standardized grades." Sometimes a maximum standard is established with which goods are compared and rated. Strictly speaking, the resulting groups should be called ratings although they are usually designated as grades.

Standards set up for the purpose of grading and rating goods may be based upon a single quality or upon several qualities. They may also be based on performances of goods. Combinations of qualities and performances, as those for size and durability, are also possible.⁴

At the hearings on the Boren bill, H. R. 6652, before the House Committee on Interstate and Foreign Commerce, January 22, 1940, Mrs. Harriet R. Howe presented on behalf of the American Home Economics Association the following statement relating to standards for consumer goods:

By "standards for consumer goods" we mean a description of those of its qualities and characteristics important in consumer use, stated in terms of quantitative measurements, and understood alike by producers, distributors, and ultimate consumers. Consumers believe such standards are necessary because intelligent buying depends upon the ability to identify the relation between price and value of goods and services so that the individual is able to select those best adapted to his needs at a price he can afford to pay.

Weights and measures are examples of existing standards that have the same meaning for both sellers and buyers and that have long been accepted as a practical necessity in commerce. Everyone recognizes that price has no meaning without knowledge of how much is offered at a given price. Consumers believe that price is equally meaningless without knowledge of what is being offered at a given price. Buyers are helpless in trying to compare the real value to them of two pairs of silk hosiery, two suits of clothes, or two mechanical refrigerators at different prices when there is no way for them to make accurate comparisons between their quality and performance in use.

A more detailed study of the nomenclature used in the field of standards appears in the appendix.

⁴ "The Consumer-Buyer and the Market," by Jessie V. Coles, p. 447, John Wiley & Sons, New York City, 1938.

CHART I.—The Federal Government and Standardization

Agency	Agencies establishing standards which may be used by others	Agencies establishing standards for own use in carrying out their activities	Agencies establishing standards for their own use in approving loans, insuring private loans, or advancing money for improvements	Agencies whose research or operations aid or provide a basis for establishment of standards	Agencies whose duties are to assure that commodities sold or shipped in interstate commerce meet certain established standards	Agencies using standards established by other agencies in carrying out their activities	Agencies maintaining a grading or inspection service in performing their activities	Agencies inspecting or testing supplies or equipment to assure their conformity to applicable standards used in purchases, loans, insurance, or other activities	Agencies developing or establishing test methods which may be used by others	Agencies furthering the use of standards established by them or by other agencies
	1	2	3	4	5	6	7	8	9	10
Agriculture Department:										
Agricultural Adjustment Administration						Agricultural Adjustment Administration				
Consumers' Counsel Division										Consumers' Counsel Division
Consumer Standards Project										Consumer Standards Project
Agricultural Marketing Service	Agricultural Marketing Service	Agricultural Marketing Service		Consumer Standards Project Agricultural Marketing Service Agricultural Chemistry and Engineering	Agricultural Marketing Service	Agricultural Market Service	Agricultural Marketing Service		Agricultural Marketing Service	Agricultural Marketing Service
Bureau of Agricultural Chemistry and Engineering										Agricultural Chemistry and Engineering
Bureau of Agricultural Economics										
Bureau of Animal Industry	Animal Industry	Animal Industry		Animal Industry	Animal Industry	Animal Industry	Animal Industry		Animal Industry	Animal Industry
Bureau of Dairy Industry					Dairy Industry				Dairy Industry	
Bureau of Entomology and Plant Quarantine	Entomology and Plant Quarantine	Entomology and Plant Quarantine		Entomology and Plant Quarantine	Entomology and Plant Quarantine		Entomology and Plant Quarantine		Entomology and Plant Quarantine	Entomology and Plant Quarantine
Bureau of Home Economics						Home Economics		Home Economics	Home Economics	Home Economics
Bureau of Plant Industry	Plant Industry								Plant Industry	
Commodity Exchange Administration						Commodity Exchange Administration				
Extension Service			Farm Security Administration	Extension Service						Extension Service
Farm Security Administration										Farm Security Administration
Federal Crop Insurance Corporation						Federal Crop Insurance Corporation				
Forest Service				Forest Service		Forest Service			Forest Service	Forest Service
Office of Experiment Stations				Experiment Stations					Experiment Stations	Experiment Stations
Rural Electrification Administration	Rural Electrification Administration		Rural Electrification Administration	Rural Electrification Administration		Rural Electrification Administration		Rural Electrification Administration	Rural Electrification Administration	Rural Electrification Administration
Soil Conservation Service		Soil Conservation Service								
Surplus Marketing Administration						Surplus Marketing Administration				
Technical Advisory Board		Technical Advisory Board				Technical Advisory Board				
Central Housing Committee:	Central Housing Committee	Central Housing Committee		Central Housing Committee					Central Housing Committee	Central Housing Committee
Commerce Department:										
National Bureau of Standards	National Bureau of Standards	National Bureau of Standards		National Bureau of Standards		National Bureau of Standards		National Bureau of Standards	National Bureau of Standards	National Bureau of Standards
Federal Alcohol Administration	Federal Alcohol Administration	Federal Alcohol Administration			Federal Alcohol Administration					
Federal Loan Agency										
Federal Housing Administration	Federal Housing Administration	Federal Housing Administration		Federal Housing Administration		Federal Housing Administration		Federal Housing Administration	Federal Housing Administration	Federal Housing Administration
Home Owners' Loan Corporation	Home Owners' Loan Corporation	Home Owners' Loan Corporation		Home Owners' Loan Corporation		Home Owners' Loan Corporation		Home Owners' Loan Corporation	Home Owners' Loan Corporation	Home Owners' Loan Corporation
Federal Security Agency:										
Food and Drug Administration	Food and Drug Administration	Food and Drug Administration		Food and Drug Administration		Food and Drug Administration		Food and Drug Administration	Food and Drug Administration	Food and Drug Administration
Office of Education										Office of Education, Home Economics Education Service
Home Economics Education Service										
Public Health Service:	Public Health Service	Public Health Service		Public Health Service		Public Health Service		Public Health Service	Public Health Service	Public Health Service
Federal Trade Commission:	Federal Trade Commission	Federal Trade Commission		Federal Trade Commission		Federal Trade Commission			Federal Trade Commission	Federal Trade Commission
U. S. Housing Authority:	U. S. Housing Authority	U. S. Housing Authority	U. S. Housing Authority	U. S. Housing Authority		U. S. Housing Authority		U. S. Housing Authority	U. S. Housing Authority	U. S. Housing Authority
Government Printing Office:	Government Printing Office	Government Printing Office	Government Printing Office	Government Printing Office		Government Printing Office		Government Printing Office	Government Printing Office	Government Printing Office
Interior Department:										
Bureau of Mines				Bureau of Mines		Bureau of Mines			Bureau of Mines	Bureau of Mines
Fish and Wildlife Service				Fish and Wildlife Service					Fish and Wildlife Service	Fish and Wildlife Service
Geological Survey				Geological Survey					Geological Survey	Geological Survey
Indian Arts and Crafts Board										Indian Arts and Crafts
Office of Indian Affairs (Indian Service)		Office Indian Affairs				Office of Indian Affairs		Office Indian Affairs		Indian Arts and Crafts
Labor Department:										
Bureau of Labor Statistics										
Retail and Wholesale Price Divisions	Retail and Wholesale Price Divisions	Retail and Wholesale Price Divisions								
Children's Bureau:	Children's Bureau	Children's Bureau		Children's Bureau						
Navy Department:	Navy Department	Navy Department		Navy Department		Navy Department		Navy Department	Navy Department	Navy Department
Tariff Commission:										
Treasury Department:										
Procurement Division	Procurement Division	Procurement Division				Procurement Division		Procurement Division	Procurement Division	Procurement Division
Veterans' Administration		Veterans' Administration				Veterans' Administration				
War Department		War Department		War Department		War Department		War Department	War Department	War Department

¹This Administration was abolished, effective June 30, 1940, under the terms of Reorganization Plan No. 111. Its functions were transferred to the Alcohol Tax Unit of the Bureau of Internal Revenue, U. S. Treasury Department, Washington, D. C.

CHAPTER II

STANDARDIZATION, INSPECTION, AND LABELING ACTIVITIES OF THE FEDERAL AGENCIES

The Federal Government, the largest single purchaser in the country, deals with standards and specifications for materials and equipment in performing its activities. The research and service bureaus of the Government also are interested in many problems of standardization. The work of 46 Federal agencies concerned with standards, specifications, tests, and basic research leading to or affecting standards was studied for the purpose of this monograph. A detailed description of the standardization, inspection, and labeling activities of the Federal agencies presented in this study is supplemented by charts indicating the procedure used in establishing standards.

In analyzing the results of the study, the activities of the Federal Government in the field of standardization were subdivided into the following 10 groups:

1. Agencies establishing standards which may be used by others.
2. Agencies establishing standards for their own use in carrying out their activities.
3. Agencies establishing standards for their own specific use in approving loans, insuring private loans, or advancing money for improvements.
4. Agencies whose research or operations aid or provide a basis for establishment of standards.
5. Agencies whose duties are to assure that commodities sold or shipped in interstate commerce meet certain established standards.
6. Agencies using standards established by other agencies in carrying out their activities.
7. Agencies maintaining a grading or inspection service in performing their activities.
8. Agencies inspecting or testing supplies or equipment to assure their conformity to applicable standards used in purchases, loans, insurance, or other activities.
9. Agencies developing or establishing test methods which may be used by others.
10. Agencies furthering the use of standards established by them or by other agencies.

The activities of many of the Federal agencies analyzed fall into several different groups. In order to illustrate graphically the distribution of these activities in the field of standardization chart I was prepared.

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL ADJUSTMENT ADMINISTRATION

The Agricultural Adjustment Administration, United States Department of Agriculture, does not formulate or promulgate standards. However, it does specifically use many of the standards which have been promulgated by other bureaus in the Department and in many instances uses modifications of these standards. Parity payments to producers of cotton, wheat, corn, rice, and tobacco are made on the basis of an equivalent value according to adopted and established grades.

CONSUMERS' COUNSEL DIVISION

The office of Consumers' Counsel was set up by the Secretary of Agriculture as a division of the Agricultural Adjustment Administration in June 1933. Although the functions of Consumers' Counsel at the beginning were described in general terms, its activities soon crystallized in operation along the lines of (1) analyzing the probable effect on consumers of proposed and operating farm programs, and presenting its recommendations with respect thereto to the planning and action divisions of the Agricultural Adjustment Administration and (2) disseminating information to consumers on the operation of the farm program, and on ways of increasing purchasing power through informed and economical buying.

Early in the evolution of Consumers' Counsel administration the importance of the value of grading and standardizing to consumers and producers was recognized. Among the principles developed for the examination of, and reports on, codes and agreements was the statement—

That they should include effective provisions for grading and standardizing products to insure the honesty of weights and measures and of the product itself.¹

Necessity promoted this evolution, and its relationship to standards. This is illustrated by the early history of Consumers' Counsel. When the processing taxes were imposed upon wheat and cotton, among other agricultural items, during the early period of the Agricultural Adjustment Administration, wholesale and retail price rises ensued, with some distributors advertising that the increases were the result of the tax. In many instances it was found that the retail price rise was considerably more than the amount of the tax, while the buying public was led to believe that the tax was the entire cause. Recognizing the need for disseminating correct information, the Consumers' Counsel Division was set up to accomplish the task. Studies were made showing the effect of the per-bushel tax on wheat on the finished loaf of bread, and the effect of the per-pound tax on cotton on certain finished

¹ "Agricultural Adjustment: A Report of Administration of the Agricultural Adjustment Act, May 1933 to February 1934," p. 209, Agricultural Adjustment Administration, United States Department of Agriculture. 1934.

cotton goods. This information was disseminated to the public and distributors were called into conference and presented with it. The sudden price rises of these taxed commodities were halted more or less effectively and tended to remain at general levels near those immediately succeeding the adjustment to the taxes imposed.

However, Consumers' Counsel investigations and complaints from buyers indicated that, although price levels for given commodities remained stable, the composition and quality of the finished items often varied. For instance, the weight of the loaf could be, and sometimes was, reduced, or the amount of flour was decreased while moisture was increased;² or the weight of cotton shirts or overalls, or other textiles, was reduced for the same price line items.

In the spring of 1940 the manufacturers of ribbons for hat bands reduced the width of the band while maintaining the price. Also, stocking manufacturers, in the face of threatened rises in silk prices, increased the amount of rayon used, sometimes in the top and at others in the body of the stocking. Many similar examples could be furnished from the 1939-40 experience.

The need for more uniform and continuing standards was pointed to as an assurance that consumers in their daily purchases might have a proper basis for arriving at accurate value judgments.³

Recognizing the importance not only of price variation but also quality variation, the Consumers' Counsel Division emphasized in its policies and its publications the need for extension of standards to promote more wise and economical buying. This policy has become an important phase of the Division's work.

The activities of Consumers' Counsel Division in the planning, formulation, and administration of farm programs has involved consideration and use of various grades and standards, particularly in marketing agreements. While the basic crop programs may have attempted supply control, this was approached quantitatively, in that certain acreage reductions were made, thus reducing the supply by cutting off a segment of the producing facilities. It did not involve any deviation from grade or standardization other than that following the normal processes, although there may have been some slight tendency for the quality grown on better acreage to be higher.

In the marketing agreement programs for milk, fruit, vegetable and nut products, in addition to the quantitative control, qualitative control has been employed. Control has been effected by limiting or prohibiting shipments of certain grades or sizes during all or part of the marketing season. In practice this meant, for example, that only milk which measured up to the specified standard, established in a local milk ordinance, could be marketed. In the case of fruits, vegetables, nuts, and other general crops, the shipment of certain grades such as "culls," or low-value grades, had been limited, or conversely only the grades which historically returned a price differential above a certain estimated minimum were allowed to be shipped. In most instances these grades or standards had been tested by industry practice and market acceptance and then were approved and promulgated by an authorized bureau of the Department, or by the States in which the program operated. Sometimes, but not often, modifi-

² "Bread Facts For Consumers," Consumers' Guide, vol. IV (3), p. 11, April 5, 1937.

³ "Checking Your Weights and Measures," Consumers' Guide, vol. III (21), pp. 3-6, 8, November 16, 1936.

cations of the promulgated grades and standards were provided in the terms of the regulation.

The importance of proper grading and standardizing to insure better understanding of values in the market place has been emphasized by the Division personnel in their cooperation with other divisions of the Agricultural Adjustment Administration, and with other bureaus, in considering the applications and effect of programs. This has been accomplished through informal conference, memoranda, and formal hearings. As grades and standards for food products need to be revised from time to time to meet improvements in production, shifts in consumer preference, and changes in the art or science of grading and standardization, Consumers' Counsel Division personnel have assisted in presenting the consumers' viewpoint on important factors to be considered in such revisions for the following commodities: Eggs, beef, butter, lard, poultry, cheese, and citrus fruits. Here, as in marketing agreements and other programs involving standards, it is the function of Consumers' Counsel Division economists and marketing specialists to focus attention on the consumer aspects of pending issues and to argue the consumer point of view with respect to them. Producers and distributors are always represented during the program. Consumers usually are not organized and consequently are not in position to present their case adequately.

Presentation of facts and substantial evidence to governmental agencies promulgating and developing standards is a direct responsibility of consumers if the standards are to be comprehensive and adequate. However, the task confronting the average group of consumers of acquainting themselves with all the technicalities and detail involved in each standard is formidable and difficult to obtain, unless they have a clearing house of information to assist them. To help fulfill this function Consumers' Counsel has conferred with consumer groups acquainting them with the need for specific standards and with pertinent facts and information. Consumers' Counsel has appeared to present the consumers' case in the considerations leading to the ice cream and ice cream freezer regulations for the District of Columbia. At hearings on standards for butter the personnel of the Division worked with consumer groups to assist them in the presentation of pertinent and substantial evidence relating to the desires of consumers and the effects of proposed standards on consumers. Much time and attention has been devoted to assisting consumers in presenting their cases before the Secretary of Agriculture at hearings on food standards, pursuant to the Food, Drug, and Cosmetic Act. This involves acquainting consumers with current practices, and in some cases malpractices, and with the technicalities of composition, quality, manufacturing techniques, and distribution, so that they may be able better to arrive at judgments as to what is in their best interests in the establishing of standards. It also means that the personnel of the Division must acquaint themselves with the economic and social effects of present and proposed practice and present evidence thereon for consideration in the standardizing process.

The same applies to standards procedure under the Agricultural Marketing Service, the Bureau of Animal Industry, the Federal Trade Commission, and others.

In addition, Consumers' Counsel Division also disseminates information through the media⁴ at its disposal. The Consumers' Guide, in addition to descriptive and explanatory articles on the farm program, presents pertinent information to purchasers as to the value of grades and standards and how they may be used advantageously. The basic data upon which such Consumers' Guide articles are developed are obtained from the United States Department of Agriculture and other governmental and private sources. The objective is to present in nontechnical, layman's language information which can be used by the average purchaser. These articles appear in the Consumers' Guide from time to time.⁵ The Consumers' Guide is distributed free to approximately 140,000 subscribers (May 1940), throughout each of the 48 States, the District of Columbia, Canada, and other countries.

Consumers' Guide mailing list

(Total State count on all keys used in mailing Consumers' Guide)

State:		State—Continued.	
Alabama.....	923	Maryland.....	1, 825
Arizona.....	399	Massachusetts.....	4, 830
Arkansas.....	679	Michigan.....	5, 766
California.....	11, 822	Minnesota.....	3, 656
Colorado.....	1, 607	Mississippi.....	599
Connecticut.....	2, 304	Missouri.....	3, 199
Delaware.....	285	Montana.....	1, 025
District of Columbia.....	2, 996	Nebraska.....	2, 291
Florida.....	1, 087	Nevada.....	126
Georgia.....	978	New Hampshire.....	520
Idaho.....	448	New Jersey.....	5, 033
Illinois.....	10, 647	New Mexico.....	314
Indiana.....	3, 603	New York.....	20, 365
Iowa.....	2, 927	North Carolina.....	1, 331
Kansas.....	3, 064	North Dakota.....	1, 591
Kentucky.....	913	Ohio.....	9, 031
Louisiana.....	778	Oklahoma.....	1, 129
Maine.....	750	Oregon.....	1, 516

⁴ "Consumers' Guide," a publication of the U. S. Department of Agriculture, Washington, D. C., issued monthly from June through September; semimonthly from October through May. Prepared by the Consumers' Counsel Division, Agricultural Adjustment Administration.

The Consumers' Guide is printed with the approval of the Bureau of the Budget as required by rule 42 of the Joint Committee on Printing. Official free distribution, 150,000 copies per issue. Additional copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., 5 cents a copy, or by subscription 50 cents a year, domestic; 80 cents a year, foreign. Postage stamps will not be accepted in payment.

"Cooperative Bookshelf," 13 pp., Publication No. 3, Consumers' Counsel Division, U. S. Government Printing Office, Washington, D. C., May 1937. 5 cents.

"Consumers' Bookshelf," 100 pp., Publication No. 4, Consumers' Counsel Division, U. S. Government Printing Office, Washington, D. C., December 1937. 15 cents.

"Consumers Look at Eggs," 13 pp., Consumer Study Outlines No. 1, Consumers' Counsel Division, U. S. Government Printing Office, Washington, D. C., May 1937. 10 cents.

"Materials for Consumer Education, A Selected Bibliography," (CS-61 (revised), Consumers' Counsel Division, Agricultural Adjustment Administration, U. S. Department of Agriculture, Washington, D. C., September 1939, mimeographed. Address: Consumers' Counsel Division, Agricultural Adjustment Administration U. S. Department of Agriculture, Washington, D. C.

⁵ "Are Price Tags Enough," by Donald E. Montgomery, Consumers' Counsel of the Agricultural Adjustment Administration, Consumers' Guide, vol. III (22), pp. 3-6, 21-23, November 30, 1936. "Buying Meat by Grade," Consumers' Guide, vol. VI (17), p. 3, June 1940. "Public Enemy No. 1 in the Kitchen," Consumers' Guide, vol. III (11), pp. 6-9, June 15, 1936. "What Kind of Safeguards," Consumers' Guide, vol. IV (4), pp. 13-17, April 19, 1937, vol. IV (5), pp. 9-11, May 3, 1937.

Consumers' Guide mailing list—Continued

State—Continued.		State—Continued.	
Pennsylvania.....	7, 871	Colombia.....	1
Rhode Island.....	347	Cuba.....	10
South Carolina.....	808	Ecuador.....	1
South Dakota.....	1, 044	Guatemala.....	1
Tennessee.....	1, 197	Haiti.....	2
Texas.....	2, 787	Hawaii.....	222
Utah.....	1, 024	Mexico.....	9
Vermont.....	646	Newfoundland.....	1
Virginia.....	1, 708	Nova Scotia.....	1
Washington.....	3, 895	Panama.....	1
West Virginia.....	744	Peru.....	4
Wisconsin.....	4, 839	Philippine Islands.....	33
Wyoming.....	409	Puerto Rico.....	59
Alaska.....	96	Virgin Islands.....	3
American Samoa.....	1	Argentina.....	1
Canada.....	274		
Canal Zone.....	24	Total.....	138, 421
Chile.....	1		

This count does not include foreign countries which require postage; there are 67 such names in foreign countries. Also, the count does include requests received from the public only through May 4, 1940, although the count was taken at the United States Government Printing Office, May 29, 1940.

The 1939 distribution shows an interesting cross section of its interest to national occupation groups.

Percentage distribution of Consumers' Guide subscribers in 1939, by occupations

	<i>Percent</i>
Housewives.....	22
White-collar workers.....	18
Teachers.....	16
Students.....	7
Professional workers.....	7
Industrial workers.....	4
Extension workers.....	3
Welfare, club, and Government workers.....	2
Occupation unknown.....	21
Total.....	100

CONSUMER STANDARDS PROJECT

The Consumer Standards Project is a Federal W. P. A. project, sponsored by the Consumers' Counsel Division of the United States Department of Agriculture, engaged in research on consumer problems. It carries on the work of the Consumers' Project of the United States Department of Labor which came to an end June 30, 1938, together with certain pertinent phases of research that had been initiated in the Consumers' Counsel Division.

At present the project is chiefly concerned with problems of standardization of consumer goods. This work is divided into four major activities:

(1) The project collects and analyzes Federal,⁶ State,⁷ and local

⁶ "Chart Analysis of Federal Food, Drug, and Cosmetic Act," by Consumer Standards Project, Consumers' Counsel Division, U. S. Department of Agriculture and Work Projects Administration, Washington, D. C., 1940.

⁷ "Analysis of United States and State Standards for Fresh Fruits and Vegetables," U. S. Government Printing Office, Washington, D. C., 1937, 25 cents.

⁸ "Survey of State Laws and Judicial Decisions on Bedding and Upholstery," by S. Mermin and J. M. Mayer. S. P. Kaidanovsky, Technical Director, Consumer Standards Project, vii+160 pp. Consumers' Counsel Division, U. S. Department of Agriculture and Work Projects Administration, Washington, D. C.

laws and regulations regarding quality and performance standards of consumer goods, and standards for container sizes, grades, and labels.

(2) It summarizes specifications and test methods used by Government and private agencies in establishment of standards for a number of selected consumer commodities. This work includes a comparative tabulation of quality grade terms used by Government agencies and private technical groups.⁸

(3) The project is engaged in a survey of consumer standards in foreign countries.

(4) The project is doing routine work necessary for preparing results of surveys conducted by the Consumers' Counsel Division. For example, the detailed work of a survey of the inspection and control of weights and measures conducted in cooperation with the National Conference on Weights and Measures; and a survey of courses in consumer education made in cooperation with the United States Office of Education, was done at the project.

The project also takes an active part in the work of several committees concerned with consumer goods, such as the Advisory Committee on Ultimate Consumer Goods of the American Standards Association, sectional committees of the association, and committees of the National Consumer-Retailer Council.⁹

The Consumer Standards Project is custodian of the records of the Consumers' Project of the United States Department of Labor, the Consumers' Advisory Board of the National Recovery Administration, and the Consumers' Division of the National Emergency Council.

AGRICULTURAL MARKETING SERVICE

The Agricultural Marketing Service is a "service and regulatory agency, concerned with various phases of marketing farm products."¹⁰

This Service was contemplated in the Departmental reorganization program of October 6, 1938, and was formally established July 1, 1939, following the passage of the Agricultural Appropriation Act for 1940. In the Agricultural Marketing Service were placed: (1) From the Bureau of Agricultural Economics—certain marketing research, service and regulatory work in connection with cotton; dairy and poultry products; fruits and vegetables; grain and seed; livestock, meats, and wool; hay and feed; tobacco; and warehousing; market news service; and all of the work on crop and livestock estimates; (2) from the Bureau of Animal Industry—administration of the Packers and Stockyards Act; (3) from the Bureau of Plant Industry—administration of the Federal Seed Act; and (4) from the Bureau of Dairy Industry—administration of the Dairy Exports Act.

For administrative purposes, the Service comprises the following Divisions: Agricultural Statistics; Cotton Marketing; Dairy and

⁸ "Summaries and Tabulations of Specifications and Test Methods for Selected Consumer Commodities," Consumer Standards Project, Consumers' Counsel Division, U. S. Department of Agriculture, Washington, D. C. In preparation.

⁹ "A Study of Informative Labeling," by S. P. Kaidanovsky and G. W. Herve; 170 pp., Consumer Standards Project, Consumers' Counsel Division, U. S. Department of Agriculture and Work Projects Administration, Washington, D. C., 1939, mimeographed.

¹⁰ "Agricultural Marketing Service, Organization and Functions," 97 pp., Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., March 1940, mimeographed.

Poultry Products; Fruits and Vegetables; Grain and Seed; Live-stock, Meats, and Wool; Packers and Stockyards; Tobacco; Warehousing; Marketing Information; and Business Administration. Much of the work of the Service is done in cooperation with State departments of agriculture, State agricultural colleges, experiment stations and extension services, and with other agencies; about 280 cooperative agreements are in effect.

Five Broad Functions.

The activities of the Agricultural Marketing Service may be classified in five broad fields: "(1) The collection and dissemination of crop and livestock production statistics; (2) the gathering and reporting of current market information from terminal markets, shipping points, and producing sections; (3) standardization and inspection to provide a common language in merchandising and a uniform yardstick for measuring gradations in quality of farm and food products; (4) research and demonstration in standardization, grading, preparation for market, handling, and other related phases of marketing; and (5) the administration of 'rules of fair play' in the merchandising of farm commodities."¹¹

Three of these functions are of particular interest in connection with consumer standards. They are the standardization, grading and inspection services, the associated programs of research and demonstration, and the regulatory activities.

Research.

The research conducted by the Service forms the basis of its activities. Grade standardization research is of primary importance. It centers about the development of standards for each farm commodity and the inspection methods by which the standards are applied. The standardization research involves the determination of all factors and attributes inherent in a product which may in any way affect its value and desirability. After these factors have been ascertained and isolated they are appraised individually and in relation to each other so as to arrive at their relative importance in determining the quality of the product. It is then necessary to adopt correct methods of grade identification by clearly outlined specifications expressed in simple terminology.

Because of long-time changes that take place in the production and use of a commodity, continued research is necessary in order to provide sound and practical bases for meeting the demands for standards that are made by the many interested parties. Such research also shows whether changes requested would be of only temporary value and whether they would benefit only a few persons. Continued research likewise is necessary for the purpose of developing and improving mechanical devices for measuring factors of quality. A great deal has already been done in this connection, but the interpretation of United States Standards is still based largely upon observation and judgment. This is true, for example, in the measurement of such quality factors as flavor and odor.

Many basic laboratory research projects are being conducted by the Service. These projects include cotton-fiber and spinning-fiber

¹¹ "Agricultural Marketing Service, Organization and Functions," 97 pp., Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., March 1940. mimeographed.

tests, milling and baking tests with wheat and other grains, wool shrinkage studies, and slaughter tests of different grades and weights of livestock. Experiments also include projects designed to perfect inspection equipment and techniques, market-reporting surveys, marketing studies in specific producing areas, and related projects on such phases as packing, packaging, and handling farm commodities.

A number of research projects are conducted in cooperation with other bureaus, and with State agricultural colleges. Studies of qualities of meats, for example, are made in cooperation with the Bureau of Animal Industry, the Bureau of Home Economics, the Virginia Agricultural Experiment Station, and the Virginia Division of Markets. Cotton-fiber research is conducted cooperatively with the Bureau of Plant Industry, Clemson Agricultural College, and the Agricultural and Mechanical College of Texas. Cotton-ginning studies are carried on jointly with the Bureau of Agricultural Chemistry and Engineering.¹²

Standardization and Inspection.

The authority for the standardization, grading, and inspection activities of the United States Department of Agriculture, as now conducted by the Agricultural Marketing Service, is provided by a number of Federal statutes, and by the authority carried annually in the Agricultural Appropriation Act to formulate standards for farm products and to inspect and certify their quality and condition. The statutes are the Cotton Futures Act of 1914 (re-enacted in 1916), the Grain Standards Act of 1916, the United States Warehouse Act of 1916, the Cotton Standards Act of 1923, the Tobacco Stocks and Standards Act of 1929, and the Tobacco Inspection Act of 1935. (Early impetus to farm products standardization work was given by the Food Products Inspection Act of 1917, an emergency war measure for conserving food supplies.)

A United States Standard is one formally approved by the United States Department of Agriculture and is official. It may be mandatory or permissive. When the use of a standard is made mandatory by law, the standard is always promulgated by the Secretary of Agriculture and no other standards may be used lawfully if the product is sold by grade and shipped in interstate and foreign commerce. For example, this is true for grain and for cotton. A permissive or optional United States Standard, on the other hand, may or may not be promulgated by the Secretary of Agriculture.

A United States Tentative Standard is one prepared by the United States Department of Agriculture for use under commercial conditions in order to test its practicability, or simply as a basis for discussion. It is subject to further investigation before being recommended as an official standard.

United States Standards of quality have been developed for nearly all the important agricultural commodities produced in this country. The procedure for the development of standards is shown in Chart II. These standards cover grains, cotton, tobacco, 57 of the fruits and vegetables, peanuts, honey, livestock, meats, wool, and a number of

¹² "Report of the Chief of the Agricultural Marketing Service—1939," pp. 21-27, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

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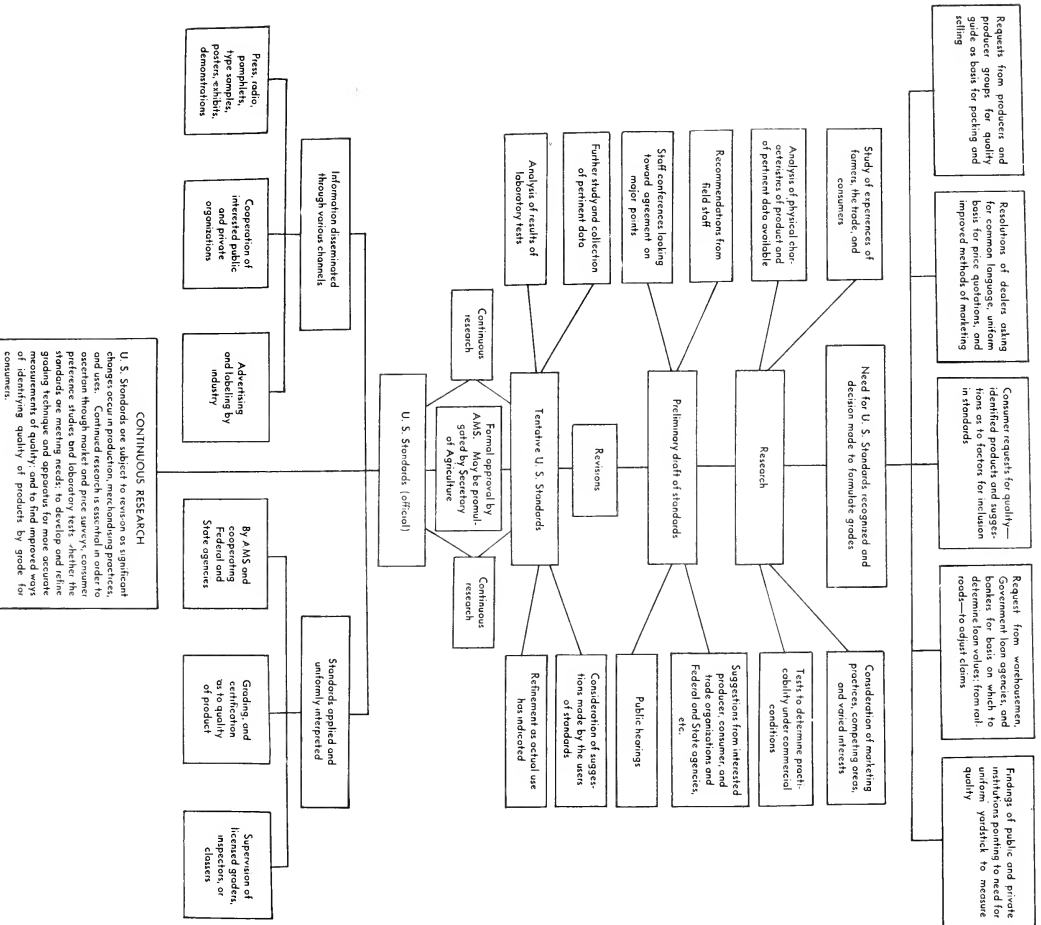
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U. S. Department of Agriculture
 Agricultural Marketing Service

Steps in Setting up Quality Standards for Farm Products



other products.¹³ For some of the commodities the standards are mandatory, but for others they are permissive and are used voluntarily as quality guides in buying and selling.¹⁴

In formulating United States Standards the various factors that determine quality gradations are placed into definite groups called grades. The specifications or descriptions of these separate grades are carefully worked out, with the assistance of commodity specialists of other bureaus. The advice of farmers, dealers, packers, and other interested persons and agencies also is sought. In recent years much consideration has been given, at least for the perishable and canned products, to the prejudices and preferences of consumers. The specifications for these grades are then subjected to extensive tests and study to determine their practicability when used under actual commercial conditions.

In some cases the immediate demand for grades has been such that the Department has issued descriptions of grades in tentative form. These tentative grades are given actual use in commercial practice, and their shortcomings noted and corrected, before they are adopted or promulgated as official.

Certain broad principles are recognized as fundamental in the establishment of standards for farm products. When establishing a standard, significant gradations in quality of the entire supply of the commodity must be recognized. In this respect, the quality standards as developed by the Agricultural Marketing Service, differ from the standards of minimum quality and identity fixed under the Federal Food, Drug, and Cosmetic Act. Standards of quality for farm products must apply to all segments of the supply in order to afford a basis for trade in all qualities of the products. The grades must be defined in such a way as to recognize commercial differences. The limits for a practical grade must be broad enough to avoid unnecessary technicalities and must conform, to some extent, to trade acceptance.

Standards for farm products are descriptive standards. Unlike standards of weights and measures, which are definite in their terms, descriptive standards require interpretation and exercise of judgment. At the same time, however, the standards for farm products must be uniform, within reasonable limits, throughout the country. They cannot vary from region to region, nor from market to market, and they cannot be changed from season to season to conform to the quality of a particular season's crop. To be uniform the standards must be interpreted accurately and applied consistently. The inspection and grading work, therefore, calls for competent inspectors to apply the specifications, and for centralized training and supervision of these inspectors. A carefully supervised system of inspection is maintained by the Agricultural Marketing Service.

¹³ Prior to July 1939 a number of the activities now in the Agricultural Marketing Service were a part of the Bureau of Agricultural Economics. Standards formerly set up by the Bureau of Agricultural Economics, and its predecessor, the Bureau of Markets, are now administered by the Agricultural Marketing Service.

¹⁴ Certain Federal statutes make permissive standards mandatory in some instances. Under the United States Warehouse Act, United States grades must be used if warehouse receipt designates the grade. Under the Commodity Exchange Act, United States Standards for cotton, grain, butter, potatoes, and wool top are mandatory in futures trading. The Export Apple and Pear Act requires inspection of these commodities before shipment to foreign markets. The Tobacco Inspection Act provides for mandatory inspection at designated auction markets.

Consumer Standards.

Most standards for farm products have been worked out from the producer's side of the marketing process. This has been only natural. Producers and dealers long ago learned that it was impossible to buy and sell intelligently without quality measurements. The use of grades by producers and dealers dates back a century and more for some commodities. Numerous sets of standards for grading grain, cotton, and other products were in use throughout the nineteenth century by trade organizations, chambers of commerce, boards of trade, and other groups. Later, grading and inspection were undertaken by several State governments. The fact that each market had its own grades and methods of interpreting grades led to endless confusion and to numerous abuses such as short weighing and undergrading, and thereby imposed merchandising hazards of all sorts upon the various groups concerned with the marketing and distribution processes.

That is how Federal standards and grades were first introduced. In the past 25 years Federal standardization and inspection, "functions that root deeply into the need of American agriculture," have become generally recognized as "fundamental to efficient marketing and distribution."¹⁵

Producers and dealers have found that the standards provide a common language for trading and a basis for market quotations; eliminate the necessity of personal inspection before purchase; provide a basis for price adjustment; afford a quality basis for payment; afford a check on the quality of production; promote a fair and honest basis for competition on contract bids; and provide a basis for loans on products in storage, and for regulating or controlling shipments under marketing agreements.

With this brief history of the development and use of standards for farm products, it is evident why most of the official grades have been established chiefly for use in wholesale channels of trade. Consumers, of course, have been kept in mind in the formulation processes; the resulting standards have been important to consumers because they have made marketing more efficient and thus reduced costs and prices. Only in very recent years, however, has it seemed practicable to bring the standardization work to ultimate consumers in more tangible and concrete form. Marked interest in grades has been shown the past few years by retail and consumer organizations. Though the commodity standards for which grades may be carried through to consumers are few, the increased stress being placed on this phase of standardization is indeed promising. The emphasis being placed on standardization of consumer commodities is in line with the present attitude of the United States Department of Agriculture, that in any farm program if it is to be complete, consumer interests must be considered.

For meats, poultry, butter, eggs, and canned fruits and vegetables, methods have been developed for carrying the grade designation to the consumer. The grade designation is marked on the product or its package in such a way that the grade designation is carried through the channels of trade to the ultimate consumer.

¹⁵ "Agricultural Marketing Service, Organization and Functions," 97 pp., Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., March 1940, mimeographed.

Meats.—United States Standards have been developed for beef, veal, lamb, pork, and prepared meats. They were developed largely in response to the needs and demands of distributors for some practical means of describing quality as a substitute for examination. The early terms, however, were too general for wide use and, furthermore, the slaughtering industry was inclined to change grade designations according to the season and the predominant quality of the meat available. Efforts to define and interpret the numerous grade terms began shortly after the turn of the present century when the Agricultural Experiment Station at the University of Illinois started its studies on beef, the meat showing the greatest variations in quality.

The results of these studies were used in setting up tentative standards, prepared by the United States Department of Agriculture about 1916, for classes and grades of beef. Numerous revisions were made before the "Official United States Standards for Grades of Carcass Beef" were set up in 1926. These standards were first used in commercial practice in 1927, at the insistence of the Better Beef Association, in the main a producers' and feeders' organization. The objective was to have the grade name stamped on the carcass beef in order that the quality might be readily identified by consumers. It was logically contended that this assurance of quality would broaden the demand for the better grades, then in abundant supply and selling at relatively low prices, and that improved prices would be reflected in the local livestock markets. Experimental grading and stamping were conducted in a limited way for a year before extending and placing it on a fee basis in June 1928.

The beef stamping procedure then was essentially the same as it is today for all meats; it involves the use of a roller stamp, applied by a Government grader. The stamp is rolled down the length of the carcass in such a way that the grade name appears on all principal retail cuts. The stamping fluid is harmless and usually disappears as the meat is cooked.

The system of grading, however, is different today. The change, toward simplification, was made in 1939 for the purpose of making it easier for the ultimate consumer to buy beef on the basis of quality. Under the previous system, grades were established by classes: steers, heifers, cows, bulls, and stags. A U. S. Choice or U. S. Good cut of beef might have been U. S. Choice or U. S. Good steer, or U. S. Choice or U. S. Good heifer, or U. S. Choice or U. S. Good cow, the latter being of a decidedly poorer quality than the other two. Under the present "single standard" system, the grade name also includes the class in indicating quality. Now all consumers need to do is familiarize themselves with one series of grade names,—U. S. Prime, U. S. Choice, U. S. Good, U. S. Commercial, and U. S. Utility, and their relative positions in the scale of grades. For wholesale transactions, U. S. Cutter and U. S. Canner grades also are used and provision is made for breaking down the U. S. Choice, U. S. Good, and U. S. Commercial grades into half-grade designations.

The beef grades were revised only after months of consultation. Department specialists worked with a committee of the industry in making the revisions. The proposed standards were then sent to hundreds of interested persons for comments and suggestions. Producers, distributors, retailers, and consumers participated, individually and through their organizations, in the revision of these grades.

Changes were suggested and made. The revised grades were put into use officially in July 1939.

Meat graders are now located at all principal packing centers in all parts of the country. Consequently, graded and stamped beef may be readily obtained by dealers in any city or town in the United States. Beef of all grades, however, is not available throughout the year in all regions. The highest grade regularly available in the Middle West and East, for example, is U. S. Choice (less than 1 percent of all carcass beef produced is eligible for the U. S. Prime grade, which is in demand by exclusive hotels, restaurants, and clubs). U. S. Good is the highest grade of beef regularly available from coast to coast.

A similar grading and stamping service is provided for lamb and veal. Five grades of lamb are stamped: U. S. Prime, U. S. Choice, U. S. Good, U. S. Medium, and U. S. Common. The same grades are used for stamping veal and calf carcasses.

Poultry and eggs.—An increasing interest is being shown on the part of consumers, and consequently by dealers and the Department, in grading programs for poultry and eggs. Especially marked has been the increase in turkeys graded for the holiday season markets. This work was started about 10 years ago, and, in the fiscal year ending June 30, 1939, was carried on at shipping points in 16 States. Most turkeys are packed in boxes and each box is stamped with the grade, but more and more turkeys are being marked individually with a grade tag.

Other classes of poultry are graded at a number of poultry-packing plants in the Middle West. The grade of the poultry is stamped on the container. If individual birds are marked, they must conform to U. S. Prime or U. S. Choice grades. An effort is being made to find a satisfactory method of marking individual birds.

The United States grades for eggs are made known to the consumer by means of certificates of quality, and seals which are used on 1-dozen cartons in which the eggs are packed. Some 75 firms throughout the country are authorized to use the certificates of quality and the seals. The grading work is constantly supervised. The certificate and seal give the grade, date of grading, and the size of eggs in the carton. Efforts are being made to promote the Federal-State egg grading programs now carried on at various points in 12 States.

Butter.—On November 3, 1938, the United States Standards of quality for creamery butter were promulgated by the Secretary of Agriculture to become effective on April 1, 1939. The new standards provide a more exact and simplified system for determining the score of butter than the superseded United States Tentative Standards which had been in use for approximately 20 years. The range of score was narrowed from the previous basis of 75 to 95 points to the percent basis of 85 to 93 points. The present grades identify and evaluate some 30 flavors, each of which is distinguishable in the grading process.

The grading and labeling service for butter is somewhat similar to that for eggs. Cartons of certain distributors of high-quality butter are provided with certificates of quality showing the grade of the butter as determined by an authorized representative of the United States Department of Agriculture. The work of the graders for

the 142 firms authorized to use the quality certificates is checked throughout the year by butter grading supervisors. The certificates are used only on butter rating 93 score or 92 score.

Questions are sometimes raised as to the value of this service to the consumer, because of the probability that the grade will be lowered substantially before the butter is purchased by the housewife. This does happen. A recent study of the quality of butter offered in retail stores in New York City and Chicago, however, showed that consumers who wish to obtain 92 score or 93 score butter will find it more often if they buy butter packaged with certificates of quality rather than if they buy on the basis of advertisements printed on the packages.¹⁶

Fruits and vegetables.—Simple grade terminology appears in the grades for canned fruits and vegetables.

Three grades—A, B, and C—have been developed for each of 26 canned fruits and vegetables. Though this work was started only about 8 years ago, the use of the official grade designations on individual labels is making rapid strides. At the same time that some canners and distributors are resisting the acceptance of this system of indicating quality on consumer merchandise, it is apparent that more and more consumers are refusing to pay a first-grade price for a third-grade product—as is often the case when the grade information is not available to them.¹⁷

In general, grade A represents the finest and most succulent fruits and vegetables; grade B—the general utility product not so tender and succulent perhaps, but prepared from the above average fruits and vegetables and satisfactory for use in the average household; grade C fruits and vegetables may lack eye appeal but they furnish wholesome and nutritious food, and serve a definite use in the average household.

The virtue of these grades is not only that they can serve both dealers and consumers, but also that they are so simple that the use of them by consumers requires no technical knowledge at all.¹⁸

A total of 82 standards has been developed for 57 different fresh fruits and vegetables. Two or more standards are necessary for some products because of differences in types and uses. These grades and their designations are not generally carried through to the retail markets. The problem here, as with many of the perishables, is that a package of fruits and vegetables that would be of grade U. S. No. 1 in the morning might be of a lower grade within a very short time because of decay or some kind of deterioration that developed after packing.

The grades of fresh fruits and vegetables, however, are used extensively in wholesale channels. An increasing quantity of graded products, such as potatoes, is becoming more readily available in retail centers. The use of grades facilitates wholesale transactions and aids in improving the quality of products shipped to the markets; thus, the consumer is benefited materially, even though indirectly.

¹⁶ "A Survey of Quality of Selected Brands of Butter Sold in One-Pound Cartons at Retail in New York and Chicago," by Gordon W. Sprague, Gertrude G. Foelich, and Edward Small, U. S. Department of Agriculture, Washington, D. C., February 1939, mimeographed.

¹⁷ "Report of the Chief of the Agricultural Marketing Service—1939," p. 15, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

¹⁸ "Simple as A B C—How Quality Grading of Canned Fruits and Vegetables Grew as a Government Service and What Yardsticks It Provides for Consumers," Consumers' Guide, vol. VI (11), pp. 10-13, Consumers' Counsel Division, Agricultural Adjustment Administration, Washington, D. C., March 1, 1940.

In recent months tentative grade standards have been developed for frozen peas and frozen lima beans and the work is being extended to other frozen foods. Growers of fruits and vegetables and leading processing firms have stressed the need for quality standards for the raw product and the processed product, to serve as a basis for transactions and the improvement of quality.

Containers.

Outlawing of short measure containers and the elimination of numerous odd sizes and shapes of containers for fruits and vegetables was made possible by the Standard Container Acts of 1916 and 1928, both of which are administered by the Agricultural Marketing Service. These acts have led to the reduction of the number of odd sizes and shapes of climax baskets and containers for small fruits and vegetables, and for hampers, round stave, and splint baskets. Enforcement of these acts has resulted in reducing the number of containers of these types from 166 to 36. No longer, for example, need housekeepers complain of false bottoms in berry boxes.

Numerous quantities of fruits and vegetables are packed in crates, cartons, drums, sacks, and paper containers for which United States standards are not in force. "These containers are used in such a wide variety of deceptive sizes and shapes that they impose an unnecessary burden on the distributing trade—and hence on the consumers and growers."¹⁹ A bill (H. R. 5530, 76th Cong.) containing new requirements for the standardization of other packages commonly used is now pending. Proponents of additional legislation point out that if regulation is helpful for part of the industry it ought to be beneficial for all. More than 280 crates, boxes, and cartons are now recognized in freight tariffs. It is difficult to believe that such a number of containers is needed for economical and efficient marketing of fruits and vegetables.

General Use of Standards.

The best test of the practicability of standards is the use being made of them. The United States Standards have not been as yet completely established in all branches of farm products marketing, but their use is rapidly being extended. When it is realized that the standardization program of the Department has been in progress for only about 25 years, and that most of the standards are of permissive character and their use wholly voluntary, the increasingly wide acceptance of the standardization program must be regarded as a real achievement.

The quantities graded each year represent a very small proportion of the total volume of some agricultural commodities; for others, however, a significant proportion is handled by grade. It is estimated that around 80 percent of the commercial potato crop, for example, is sold by grade.

During the year ending June 30, 1939, more than 670,000,000 pounds of meats were graded, most of which were beef; 321,000,000 pounds of butter were officially graded, 90,000,000 pounds of which were sold in consumer packages carrying the certificate of quality; approximately 30,000,000 pounds of dressed poultry (including 18,000,000 pounds of turkeys) were graded. More than a half million carloads

¹⁹ "Containers for Fruits and Vegetables," p. 2, Farmers' Bulletin No. 1821, U. S. Government Printing Office, Washington, D. C., April 1939, 10 cents.

of fruits and vegetables were inspected for grade at shipping points and at receiving markets.

Federal and State agencies and institutions are increasing the use of the United States Standards in purchasing supplies. Prorations of shipments, restrictions as to grade and size, and surplus commodity purchases have been based, for the most part, on the official standards.

Education and Demonstration.

Through educational and demonstrational programs the general public is becoming more familiar with the standardization programs, with the commodity grades, and with the position of the grades in the scale of grades. Thousands of persons annually attend demonstrations held by the Agricultural Marketing Service, usually in cooperation with State extension services and other State and county agencies. Most of this work, however, is intended for producers and retailers, though increasing attention is now being given to educational work among consumer groups. Specialists located in the field and in Washington are being encouraged to promote and to accept opportunities to speak before meetings of consumer organizations.

Specifications, or descriptions of the grades, of any product for which United States Standards have been established are available to consumers upon request, and a number of such requests are received daily. Numerous requests also are received for special articles on commodity grades. These requests come from widely divergent sources. With the aid of commodity specialists, these requests are handled by the Marketing Information Division of the Service. A small staff is maintained "to give timely, adequate, and effective dissemination to material that originates within the Service, and to distribute the information through the media best adapted for reaching groups that have different requirements."²⁰

Additional information is provided through the press and radio, and by the use of posters and exhibits. Assistance is given by the Consumers' Counsel Division of the Agricultural Adjustment Administration, particularly through the "Consumers' Guide." Information on grades is also disseminated in some of the radio and press materials prepared and issued by the United States Bureau of Home Economics.

Problems Involved.

By reason of their very nature, United States Standards for farm products cannot be expected to meet all requirements of producers, distributors, and consumers. In some cases the lack of precise specification, or terminology, arises out of difficulties inherent in the product itself, or in the limitations of present knowledge in measuring quality variations.

A big problem in the general adoption of permissive standards has been the slowness of dealers and the trades generally to accept them. A part of the opposition is due to fear that consumer standards would supersede well-established and expensively-advertised brand names. Resistance also comes from manufacturers and others who desire to market their products under brand names or other descriptions that

²⁰ "Agricultural Marketing Service Organization and Functions," p. 85, Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C., March 1940, mimeographed.

do not convey specific quality information. This type of resistance is being overcome in part by consumer insistence for grade terms which are understandable and carry the assurance that the purchaser receives the quality for which he pays.

Lack of uniformity in standards and grades established and required by State laws is an important problem, since when State grade definitions differ from those of other States, confusion arises. Iowa and New Mexico are the only States that have not enacted one or more laws pertaining to the standardization of fruits and vegetables. This is encouraging, at least insofar as an increasing number of States are adopting United States Standards. Many of the State laws and regulations conflict not only with the United States Standards but also with standards established by adjoining States. Non-uniformity also presents a serious problem in the case of State laws relating to sizes and other classifications.

Another problem involves the need for uniform and simple grade designations. Among the long list of grade names which now confuse the consumer are Choice, Extra, 93 score, A, AA, No. 1, and so forth. Resistance and active opposition on the part of trade groups must be contended with before changes are made. Cooperation with trade interests is essential. Progress in this direction was made recently in the simplification of the beef grade terminology. Simplification, however, is best exemplified in the A, B, C grades for canned and other processed fruits and vegetables, which are receiving increasingly wide consumer acceptance.

A difficult problem is faced in developing a consumer standardization program for some of the perishable commodities, such as fresh fruits and vegetables. The most economical practice is to grade and pack these products at producing or shipping points, often far removed from consuming markets. Even under the best of handling, some deterioration occurs in transit. Thus if practicable and acceptable consumer grades were formulated for some of these highly perishable products, regrading and repacking may have to be done in the wholesale markets or in the retail stores.

Each of these problems is being studied currently by the Agricultural Marketing Service and consumers' needs are being considered; and the Service will continue to work toward the improvement of grades and the extension of their use.

Other Activities of the Service.

The standardization and other service work of the Agricultural Marketing Service involves the administration of a number of specific regulatory and service statutes: Cotton Standards Act, Cotton Futures Act, Grain Standards Act, Packers and Stockyards Act, Perishable Agricultural Commodities Act, Standard Container Acts, Produce Agency Act, Export Apple and Pear Act, Dairy Exports Act, the Warehouse Act, the Tobacco Inspection Act, the Federal Seed Act, the Cotton Grade and Staple Statistics Act, Tobacco Stocks and Standards Act, the Peanut Statistics Act, the Wool Standards Act, the Insecticide Act,²¹ and the Naval Stores Act.²¹

²¹ Under the Reorganization Plan No. IV and by joint resolution of Congress approved June 4, 1940, the Food and Drug Administration was transferred to the Federal Security Agency, and functions of the Secretary of Agriculture with respect to the laws enforced by the Administration, except the Insecticide and Naval Stores Acts, were transferred to the Administrator of the Federal Security Agency. The personnel and activities authorized under the Insecticide and Naval Stores Acts were retained in the Department of Agriculture and transferred to the Agricultural Marketing Service.

INSECTICIDE ACT

Establishment of Standards.

Definite standards are set up by the Insecticide Act for paris green and lead arsenate (paste). Sections 6 and 7 read, in part, as follows:

SEC. 6 * * * The term "paris green" as used in this Act shall include the product sold in commerce as paris green and chemically known as the aceto-arsenite of copper. The term "lead arsenate" as used in this Act shall include the product or products sold in commerce as lead arsenate and consisting chemically of products derived from arsenic acid (H_3AsO_4) by replacing one or more hydrogen atoms by lead. * * *

SEC. 7. That for the purpose of this Act an article shall be deemed to be adulterated—

In the case of paris green: First, if it does not contain at least fifty per centum of arsenious oxide; second, if it contains arsenic in water-soluble forms equivalent to more than three and one-half per centum of arsenious oxide; third, if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

In the case of lead arsenate: First, if it contains more than fifty per centum of water; second, if it contains total arsenic equivalent to less than twelve and one-half per centum of arsenic oxide (As_2O_3); third, if it contains arsenic in water-soluble forms equivalent to more than seventy-five one-hundredths per centum of arsenic oxide (As_2O_3); fourth, if any substances have been mixed and packed with it so as to reduce, lower, or injuriously affect its quality or strength: *Provided, however,* That extra water may be added to lead arsenate (as described in this paragraph) if the resulting mixture is labeled lead arsenate and water, the percentage of extra water being plainly and correctly stated on the label.

Labeling Requirements.

If an insecticide or fungicide contains an inert substance or substances, section 8 of the act requires that the manufacturer disclose this fact by placing on the label of each container a statement of inert ingredients in the manner provided by the third paragraph of section 8, which reads, in part, as follows:

* * * if it consists partially or completely of an inert substance or substances which do not prevent, destroy, repel, or mitigate insects or fungi and does not have the names and percentage amounts of each and every one of such inert ingredients plainly and correctly stated on the label: *Provided, however,* That in lieu of naming and stating the percentage amount of each and every inert ingredient the producer may at his discretion state plainly upon the label the correct names and percentage amounts of each and every ingredient of the insecticide or fungicide having insecticidal or fungicidal properties, and make no mention of the inert ingredients, except insofar as to state the total percentage of inert ingredients present.

This, in effect, causes the manufacturer to set up his own standard of composition which shall be specified on the label. Any false or misleading statement on the label constitutes misbranding, or adulteration if the strength or purity of the product is below the declared standard or quality under which it is sold.

NAVAL STORES ACT

The Naval Stores Act provides for standards for the two principal commercial agricultural products coming under the classification of naval stores, namely, turpentine and rosin.

Standards for Turpentine.

In the case of turpentine the standards are of kind or identity. The Naval Stores Act recognized three distinct kinds of turpentine,

and a fourth was later covered by a standard promulgated by the Secretary of Agriculture, under authority granted by the act.

The four standard designations and a brief statement describing the kinds of turpentine follow:

Gum spirits of turpentine: The kind of spirits of turpentine that is obtained by distillation of the oleo-resin or gum from living trees (pines).

Steam distilled wood turpentine: The kind of turpentine that is obtained by steam distillation of resinous wood, such as old stumps.

Destructively distilled wood turpentine: The kind of turpentine that is made by destructive distillation (carbonization) of resinous wood.

Sulphate wood turpentine: The kind of turpentine that is recovered in the "sulphate" process of converting wood into paper pulp.

The above standard designations are for use in selling and shipping any turpentine in interstate commerce. Since no standard is provided for any mixture of two or more kinds of turpentine, or of turpentine with any foreign substance, such mixtures cannot be sold as turpentine of any kind whatsoever, nor may the word "turpentine" be used to describe such mixture in selling or shipping. The use of the standards implies that the article described thereby is of a quality consistent with that recognized by the naval stores trade as satisfactory for the purposes for which turpentine is customarily used.

Standards for Rosin.

The standards for rosin are standards of grade or color. Fourteen color grades are used for evaluating rosin, and 13 standards are in use for comparison and grading. These standards are made of combinations of specially selected colored glass, chosen for light-fastness, permanence of transparency, and suitable color transmission qualities. The individual glasses, including a colorless glass of varying thickness, depending on the thickness of the colored components, are cemented together. The combination is then securely cemented in a sleeve of nickel-silver, cut exactly $\frac{7}{8}$ -inch long, from $\frac{7}{8}$ -inch square stock, thereby giving a standard in the form of a $\frac{7}{8}$ -inch cube. This size is the standard size or thickness of the sample of rosin through which it is viewed. The several standards, and the grades they designate, are specified by letters, as follows: X, WW, WG, N, M, K, I, H, G, F, E, D, and FF. Rosin which is of a darker color than the standards for D and FF is graded B. No standard is needed for this grade. The FF is a special grade for wood rosin only, the color of which is a different and darker red than is found in normal gum rosin.

A standard of condition or quality has been promulgated for rosin which has developed an opaque condition, preventing its accurate evaluation in comparison with the regular color standards. This condition may be due either to crystallization of the rosin, or to occlusion of water. Whenever such rosin is to be graded, and the inspector cannot determine what the grade should be on the usual color scale, it is designated "Opaque," and the grade-mark OP is placed on the package. Both gum and wood rosin are subject to

"Opaqueing." Such rosin is usually sold on sample, as there is no market quotation for same.

In grading, the rosin must also be marked to show the kind; that is, the designation "gum rosin" or "wood rosin," as the case may be, must be shown on the package and also on the selling and shipping documents, together with the grade designation. Thus the words, "gum rosin" and "wood rosin," become standards of identity which must accurately describe the article, together with the grade-mark, which must describe its color or grade. "Gum rosin" is rosin made from the gum or oleo-rosin from living trees, remaining after the gum spirits of turpentine has been distilled, while "wood rosin" is rosin that is recovered from resinous wood, by extraction processes, after the steam distilled wood turpentine has been recovered.

The benefits accruing to consumers through the acts administered by the Agricultural Marketing Service are indirect in most cases; as they tend to eliminate merchandising losses to producers and reduce the hazards and risks in trade channels, they reduce costs and prices to consumers and assure a larger supply of high-quality products in consuming markets.

BUREAU OF AGRICULTURAL CHEMISTRY AND ENGINEERING

The Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture, was formed by the consolidation in the fiscal year 1939 of a part of the Bureau of Chemistry and Soils and a part of the Bureau of Agricultural Engineering. It is a research organization engaged in investigations and experiments in the fields of chemistry, physics, engineering, and other sciences with the objective of improving agriculture and developing new and wider uses for agricultural products.

Under the broad subject of the application of the science of chemistry to the improvement of agriculture, the Bureau is engaged in investigations concerning the technology, manufacture, utilization, and preservation, including freezing, of agricultural products and byproducts; in the biological, chemical, physical, microscopical, and technological investigation of foods, feeds, drugs, and substances used in the manufacture thereof, including studies of their physiological effects on the human organism; experiments on the utilization of agricultural and other raw materials for industrial purposes; and development of improved processes in the production of rosin and turpentine. The four regional research laboratories, buildings for which are now under construction, will soon begin investigations to develop new and wider uses for agricultural commodities.

The Bureau conducts investigations of farm machinery, farm buildings, rural electrification, and other engineering phases of agriculture. The investigations include land-clearing methods; planning farm operations, equipment, and lay-out for more efficient production; mechanical equipment for producing and processing farm products, including seedbed preparation, planting, cultivating and harvesting, fertilizer placement, hay drying, cotton ginning, fiber flax processing machinery, and control of insect pests; development of means to prevent dust explosions and agricultural fires; and the planning and construction of farm buildings, including heating, lighting, insulation, sanitation, and water supply for farmhouses, crop storages, and animal shelters, and facilities for the transportation and storage of perishable fruits and vegetables. Service is rendered other bureaus of the Department in the design and construction of structures outside the District of Columbia and the purchase of engineering equipment.²²

The work of the Bureau follows the general plan of organization which, in addition to the offices of Chief, Associate Chief, Assistant

²² "Directory of Organization and Field Activities of the Department of Agriculture, 1939," p. 16, Miscellaneous Publication No. 376, U. S. Government Printing Office, Washington, D. C., 1940, 25 cents.

Chief in Charge of Agricultural Engineering, Assistant Chief in Charge of Regional Research Laboratories, Adviser in Chemical Research, Business Administration, Information, and Editorial Service, and Library, has the following research divisions:

- Carbohydrate Research
- Food Research
- Industrial Farm Products Research
- Protein and Nutrition Research
- Naval Stores Research
- Chemical Investigations of Allergens in Agricultural Products
- Chemical Engineering Research
- Farm Mechanical Equipment Research
- Farm Structures Research
- Farm Operating Efficiency Investigations
- Rural Electrification Research
- Mechanical Processing of Farm Products
- Engineering Plan and Service

and the regional research laboratories:

- Northern Regional Research Laboratory (Peoria, Ill.)
- Southern Regional Research Laboratory (New Orleans, La.)
- Eastern Regional Research Laboratory (Wyndmoor, Pa.)
- Western Regional Research Laboratory (Albany, Calif.)

Standardization is not a function of the Bureau of Agricultural Chemistry and Engineering, but the knowledge gained in connection with its research work contributes toward a more exact understanding of how to define or specify the composition and properties of agricultural materials and their derived products; how to improve analytical, testing, and research devices and procedures; how to improve technological methods and equipment for processing agricultural materials; how to improve certain products; and how to improve structures, mechanical equipment, and engineering operations needed in farming. That such knowledge is useful in connection with standardization is recognized by other agencies which call upon this Bureau to collaborate in the development of specifications and standards. Any standards developed independently are only incidental to the research work of the Bureau and primarily for the promotion of such work. Their adoption by outside agencies would be entirely voluntary. The various research divisions and the regional research laboratories are presented with many problems which either are indirectly related to the process of formulating standards or eventually lead to factors which may be used as basis for standards. The Bureau of Agricultural Chemistry and Engineering cooperates not only with the other bureaus in the Department of Agriculture and other governmental agencies in developing and promoting standardization but also cooperates extensively with various trade and scientific organizations in the same field. The Bureau has cooperated with the Federal Specifications Executive Committee, the National Bureau of Standards, and other governmental agencies, also with the Association of Official Agricultural Chemists, the American Society for Testing Materials, the International Society of Leather Trades' Chemists, the American Leather Chemists' Association, and the American Standards Association. Frequently the Bureau's assistance is requested by and given to various trade associa-

tions in connection with problems concerning products originating in agriculture.

The Bureau, in addition to occasional direct work on standardizing various products, also supplies important technical information and develops test methods by which standards may be determined.

Carbohydrate Research.

Members of the Bureau and the Food and Drug Administration developed the Brice-Keane method and device for grading sugar and starch by means of the photoelectric reflectometer.²³ This is a relatively simplified process by which the whiteness of a sugar or starch sample is determined. This method is now a standardized procedure used by a number of sugar and starch companies in testing the quality of sugar and starch.²⁴

The Carbohydrate Research Division also did research work upon and compiled data on maple sirup on which grading standards were supplied to the States that used them in connection with the preparation of larger quantities for State distribution. New turbidity grading standards were also supplied. The use of permanent glass standards was further investigated.²⁵

Food Research.

The Food Research Division of the Bureau has been engaged for many years in finding the best methods for handling and processing vegetables and fruits. This work was performed in the branch laboratories and in Washington, D. C., in cooperation with the agricultural experiment stations and other State agencies and with growers and packers.

Recent investigations have been directed to the best methods for freezing fruits and vegetables. These investigations related not only to the varieties which are best suited to freezing but also to the development of the best procedures to follow in carrying through the freezing process. Better methods of blanching the products have been developed by the Bureau, which are now accepted as practically standard procedure, recognizing that further improvements may be made.

The Seattle Frozen Pack Laboratory and the Los Angeles Fruit and Vegetable Products Laboratory collaborated with the Northwest Frozen Food Association and the United States Bureau of Agricultural Economics in preparing tentative standards for grades of frozen peas. The Bureau of Agricultural Chemistry and Engineering contributed to the technical work which provided the basis for the standards on freezing and quality of the finished products. These standards became effective on May 25, 1939. Steps are now being taken toward the working out of grades for other frozen products such as asparagus, through further cooperation with the interested parties.

The Food Research Division also developed deaerators of an improved type which remove the oxygen in orange juice and allow the production of canned juice of better and longer keeping quality.

²³ "Photoelectric Grading of White Sugars and Their Solutions by Reflectance and Transmittancy Measurements," by J. C. Keane and B. A. Brice, *Industrial and Engineering Chemistry, Analytical Edition*, vol. 9, pp. 258-263, June 15, 1937.

²⁴ *Ibid.*, pp. 258-263.

²⁵ "Report of the Chief of the Bureau of Agricultural Chemistry and Engineering, 1939," p. 20, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

This device is now widely used in the procedure of packing orange and other juices. The Bureau also developed a method for accurately estimating the peel-oil content of citrus juices which has been adopted by canners and juice graders.²⁶

In following through baking investigations the Bureau has found that the best temperature for long-time storage of compressed yeast is 30° F. It also found from the studies on the staling of bakery products that staling of bread is directly correlated with the exchange of moisture between crumb and crust.

In addition, the Food Research Division has been working on a method for checking the accuracy of the usual egg grading process by measuring the surface of broken-out egg white with special apparatus; as a result of extensive use it has found a correlation between the surface area of the broken-out egg white and its freshness. This provides a scientific standard for checking the accuracy of the present methods of commercial egg graders on a simple basis and allows for revamping of methods and basic grade factors. In commercial practice the candling of eggs can be adjusted accordingly to give more accurate results.²⁷

The Bureau also has conducted investigations relating to the methods for better maintaining eggs in a fresh state while in storage through the use of a carbon dioxide oiling process. By removing the air from the egg shell by means of a vacuum and then applying an oil saturated with carbon dioxide, the freshness of the egg will be maintained for a longer period of time. This is used commercially.²⁸

Industrial Farm Products Research.

The Industrial Farm Products Research Division continued its investigation into the physiological processes whereby certain bacteria can live and proliferate in saturated solutions of salt, looking toward a better understanding of the damage which may occur during curing processes employing salt. Such processes are used not only in curing hides and skins, but also in the preservation of vegetables, meats, and fish for food purposes.

For many years the Bureau has cooperated with other governmental departments such as the National Bureau of Standards, the War Department, the Post Office Department, Government Printing Office, and others in developing leather specifications for various purposes.

A representative of the Bureau of Agricultural Chemistry and Engineering is a member of the Leather Products Technical Committee of the Federal Specifications Executive Committee; and on the Subcommittee on Shoes of the Advisory Committee on Ultimate Consumer Goods, American Standards Association. Within the past year the Bureau has cooperated with the Government Printing Office in developing special commercially tanned leathers for binding purposes. Methods have been developed by the Bureau for testing and research work on the accelerated aging of leathers. This allows the

²⁶ "By-Products from Citrus Fruits," by E. M. Chace, 15 pp., Circular 232, U. S. Department of Agriculture, Washington, D. C., revised, February 1925. (Out of print.)

²⁷ "Report of the Chief of the Bureau of Agricultural Chemistry and Engineering, 1939," p. 11, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

²⁸ "A Summary of Studies on the Oiling of Eggs," by T. M. Swenson, 27 pp., Circular 58, Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C., 1939, mimeographed.

Bureau to determine by relatively rapid processes what the effect of different curing and tanning processes may be, insofar as the serviceability and life of various leathers are concerned. The Bureau also has developed methods for determining the resistance of leathers to water penetration; to molding; and to deterioration from acid rot; folding endurance; wear resistance; and other qualities, each valuable to the consumer of the products.²⁹

In collaboration with the Association of Paint, Varnish, and Lacquer Manufacturers; National Bureau of Standards; and the Federal Specifications Executive Committee, investigations as to the durability of coatings containing soybean oil were conducted indicating that soybean oils may be used suitably in many kinds of paint. This may result in the changing of existing standards, such as Federal Specifications, applying to the composition of certain paints for specified purposes and allowing the substitution of soybean oil of specified grades and qualities for other oils previously required.

The Bureau of Agricultural Chemistry and Engineering has worked with the Commission on the Standardization of Biological Stains, an independent organization, in developing standard stains for histological work on vegetable and animal tissues, and also has contributed to improvements on the methods for testing and analysis of stains. Some of the improved methods developed by the Bureau have been adopted as standard procedure for analysis of these dyes. The analysis of the dyes usually involves chemical and spectrophotometric examinations. The Bureau has contributed to the revision of dye descriptions to be used in the dye monographs for the forthcoming edition of the National Formulary.

Protein and Nutrition Research.

In addition to investigations relating to the usability and keeping quality of various proteins under different conditions, the Protein and Nutrition Research Division has investigated the composition and qualities of various types of mixed feeds. The underlying principles for advantageous mixing of feeds have been investigated and the results made available through publications of the United States Department of Agriculture.

The Naval Stores Research Division.

The Naval Stores Research Division has conducted extensive investigations relating to the chemical and physical properties of naval stores (turpentine and rosin). A considerable portion of its work related to the improvement of production methods both directly and also as it is related to farm and forestry practice. It has contributed directly to the development of more standardized practices of stilling rosin and gum so as to obtain better qualities of turpentine and rosin which in turn are sold on standards.

The standards for turpentine refer both to the method of production and to the color. As stated on page 24, turpentine is classified as gum turpentine or wood turpentine, with further subdivisions for wood turpentine into steam distilled, destructively distilled, and sulfate process. According to the Naval Stores Act, enforced by the Agricultural Marketing Service, turpentine and rosin must be

²⁹ "Report of the Chief of the Bureau of Agricultural Chemistry and Engineering, 1939." pp. 31-35, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

labeled with the classification of the product according to the type of process by which it was produced, that is, turpentine must be labeled "gum spirits of turpentine," "steam distilled wood turpentine," "destructively distilled wood turpentine," or "sulphate wood turpentine," and rosin must be labeled "gum rosin" or "wood rosin." Commercial wood rosin is produced only by extracting chips which have been subjected to the steam-distillation process. This classification has a foundation in fact arising from the difference in the methods of production.

Although used more or less interchangeably for such purposes as paint thinners and solvents, these turpentines differ from gum spirits and from one another in composition to a greater or lesser extent depending on the process of production.

In addition to the classifications cited above the Naval Stores Act allows color standards applicable to rosin. They were developed by the Bureau of Chemistry and modified by the Food and Drug Administration. The color standards for rosin are the result of research relating to the various classifications desired by the trade. The existing variable grading types were studied by the Bureau of Agricultural Chemistry and Engineering and master color standards were established with permanent glass types available for the use of graders.

The Naval Stores Act does not require color standards for turpentine. However, the Bureau of Agricultural Chemistry and Engineering contemplates the development of color standards for the various classes of turpentine in cooperation with the American Society for Testing Materials. These standards would have no official authority under the Naval Stores Act until accepted by the Secretary of Agriculture after public hearings, but their use would be sufficiently widespread to be of major marketing importance in the sale of turpentine.

Standard specifications for various kinds of turpentine have been developed by the Bureau in cooperation with the American Society for Testing Materials and have been accepted as official specifications by this society and the Federal Specifications Executive Committee. The factors considered by the Bureau and the American Society for Testing Materials include appearance, color, odor, specific gravity, refractive index at 20° C., and distillation range.

Several committees have been organized by the American Society for Testing Materials to determine (1) the softening point of rosin, (2) the acid number of rosin, and (3) the saponification number of rosin. The naval stores research technicians work closely with these committees and assume a leading part in their work.

In addition to its contribution toward the standards for turpentine and rosin, the Naval Stores Research Division has conducted investigations relating to the quality of crude oleoresin gum, the raw product from which turpentine and rosin are made. Due to an increasing trend in the sale of crude gum by farmers the need for crude gum standards has been recognized and this is being given attention. The Bureau of Agricultural Chemistry and Engineering has developed a laboratory test for determining the output of turpentine and the quality of rosin which will result when a small sample of crude gum is tested. These laboratory investigations have been checked with commercial practice and a high degree of correlation has been found. The laboratory test therefore has been adopted commercially and is

used by the industry in determining the grade of crude gum. The Bureau is attempting to establish standards for crude gum on the basis of color as related to certain established colors painted on wooden strips available to graders. However, the results have not yet been proven practical and it may be necessary to attempt different methods. The laboratory test or pilot test apparently is the most accurate standard test for crude gum grades available for the present. However, it requires apparatus and technique which may not be readily available to the commercial grader. The grading of crude gum involves both a quantitative and a qualitative determination. The standard for crude gum is determined according to the laboratory method, not only by the quantity of turpentine which will be produced from it but also by the quality of the rosin resulting.

Farm Structures and Storage Research.

The Bureau of Agricultural Chemistry and Engineering does considerable work in determining the proper types of farm structures to be used for various purposes.

The Bureau has done considerable investigation on the effects of storage of different products such as corn, wheat, and potatoes under various conditions and has found that the box storage of potatoes resulted in less shrinkage and in a higher grade of potatoes than bulk storage, but the cost of boxes tended to offset the advantages. The common practice of grading potatoes at the time they are put into storage is found less desirable than storing the potatoes without grading them.

The Bureau has collaborated with the National Fire Prevention Association in developing safe practice codes for the construction and maintenance of buildings used for such purposes as storage and processing of agricultural products.

Rural Electrification Research.

A research project was prepared including the following objectives:

- (1) Survey and collate information on rural electrification research in State agricultural experiment stations;
- (2) make case studies of farms in various parts of the country, and by careful engineering analysis discover how the use of electrical equipment may be fitted economically into the farm program;
- (3) discover new uses, design new equipment, or redesign existing equipment to meet the needs of farm operations requiring both stationary and tractive powers * * *³⁰

The survey dealt primarily with the application of electricity in the dairy and poultry industries. Of the studies made, most were concerned with energy requirements, immediate costs, and immediate results, and but few with the basic principles involved.

Mechanical Processing of Farm Products.

Investigations have been conducted by the Bureau of Agricultural Chemistry and Engineering relating to the ginning operations and their effect upon cotton. Their principal objectives were to determine the effects of different methods of conditioning, cleaning, extracting, and ginning, and their relationship and correlation with the elements of quality of lint and ginned cottonseed. A survey of the mechanical equipment in ginning establishments has revealed that a considerable saving of power can be made by modernizing present gins. The

³⁰ "Report of the Chief of the Bureau of Agricultural Chemistry and Engineering, 1939," p. 88. U. S. Government Printing Office, Washington, D. C., 1939. 16 cents.

primary problem is to maintain original qualities by proper processing which will meet standards required by textile processors.

Regional Research Laboratories.

The regional research laboratories, when ready for operation, will work on particular investigations coordinated through the Washington headquarters. Their status may be considered as an extended arm of the Bureau's Washington operations which perform specified investigations usually adapted particularly to the region in which they are located.

BUREAU OF AGRICULTURAL ECONOMICS

The Bureau of Agricultural Economics, United States Department of Agriculture, was reorganized in the fiscal year 1939 with the resultant transfer of all regulatory duties to the Agricultural Marketing Service and the retention only of agricultural planning for the Nation, and economic research. As it is now organized, all the work of the Bureau is under the Chief, who is responsible to the Secretary of Agriculture for the performance of the duties outlined. To further the performance of these duties, six major groups of activities have been designated: (1) General planning; (2) rural welfare; (3) conservation and land use adjustment; (4) market planning; (5) the agricultural outlook; and (6) program relations.

The Bureau of Agricultural Economics does not now promulgate standards, but it does make studies of the economic bases of grades and standards, and it analyzes the effect of particular standards in the marketing process. For instance, in cotton prices, information collected during seasons 1928-32 showed conclusively that prices to growers in many local cotton markets reflected only a small portion of central market premiums and discounts for grade and staple length. Apparently one of the reasons was the lack of adequate information on the classification of cotton at the time it was sold. Classification services have been made available to growers in a few markets, and information has been collected to ascertain the influence of these services on the prices to growers and on the quality of cotton produced. Studies indicate that grade and staple premiums and discounts to growers varied directly with the reliability and general acceptability of the classification on the basis of which the cotton was sold. Aside from premiums and discounts on an individual-bale basis, farmers who sold in local markets where the average quality was relatively high usually received correspondingly higher prices than those who sold in local markets where the average quality was relatively low; but the average level of prices was little, if any, higher in markets with a public classification service than in those without such a service.

These findings suggest that, unless the public classification service is associated with material changes in marketing methods and practices other than varying prices on the basis of quality, the possibilities of raising the price level in specific local markets by means of such a classification service are limited chiefly to the influence of improvements in quality brought about by the classification service.

Studies are being made of economic possibilities of new markets for agricultural products. At present this work is limited to new markets for cotton. Three studies completed on the utilization of cotton and competing materials dealt with the use of cotton for fertilizer bags, cordage and twine, and hosiery.

Technical research of the Bureau of Agricultural Economics deals with the developing of new products. During the fiscal year 1938 the Post Office Department agreed to make trials of cotton twine in tying bundles of letters. In the past, jute twine has been used almost exclusively for this purpose. The Bureau cooperated with the Navy Department in the development of parachute cords of cotton in place of the silk cords now used. This potential use of cotton is not large, but it is obviously important for defense purposes. Cooperation was maintained with a number of other agencies in the development of specifications for fabrics, including specifications used by the Agricultural Adjustment Administration in its cotton-diversion program; by the Agricultural Marketing Service for certain coverings for cotton bales; and by the Bureau of Public Roads for soil-fixation in cuts and fills.

BUREAU OF ANIMAL INDUSTRY

The work of the Bureau of Animal Industry, United States Department of Agriculture, covers a wide field of research in animal husbandry and diseases of animals, the control and eradication of Bang's disease, eradication of cattle ticks, control of hog-cholera, inspection and quarantine, inspection of meat, virus-serum-toxin regulations and a marketing agreement with respect to hog-cholera virus and serum. The consumer is particularly interested in the scientific research providing for better quality of meat and poultry products and inspection services that safeguard the wholesomeness of meat, milk, and related food supplies.

In the field of research the Bureau of Animal Industry has dealt primarily with animal diseases and parasites, improvement of quality of meats through breeding and feeding, and the nutritive value of various meats, fats, and oils. Several other bureaus have cooperated in the investigations outlined. In studies of the quality of beef as affected by feeding, many data have been obtained. For instance, the fat of grass-fed steers has been found to be slightly yellower and to contain much more carotene, the chief source of vitamin A, than the fat of grain-fed cattle. There were no material differences in the percentages of edible meat in the two groups of cattle.

Research has been conducted pertaining to Karakul sheep, with special reference to the quality of fur of the lambs. Results indicate that desirable fur qualities in Karakul are based largely on complex genetic factors. Characteristics of mohair, the long lustrous coat of the Angora goat, have been studied by the Bureau. This work includes technical observations on mohair fibers involving comparisons with other fibers. Such studies have a bearing on suitability of the fibers for various industrial uses.

At the present time the Bureau is developing a small-type turkey, in response to market demands for turkeys suitable for small families and small ovens. Besides being several pounds lighter than ordi-

nary turkeys, young toms weighing, dressed and undrawn, 11 to 15½ pounds and young hens 6½ to 9 pounds, the new small-type bird has a compact body with short legs, long keel bone, and abundance of meat. Other characteristics are early maturity, high hatchability, and high viability.

The National Poultry Improvement Plan is supervised by the Bureau of Animal Industry,³¹ for the purpose of assisting the poultry industry in placing itself on a more sound and efficient basis. The consuming public should benefit indirectly from this plan through superior quality of eggs and poultry meat produced. One of the purposes of the National Poultry Improvement Plan is to identify authoritatively poultry breeding stock, hatching eggs, and chicks with respect to quality by expressing them in terms uniformly accepted in all parts of the country. Cooperation of agencies, within the States, and their acceptance of standards set up in the plan are purely voluntary.

The health of consumers is protected in large measure by the Government inspection of meat, and meat establishments, which is a function of the Bureau of Animal Industry, under the Federal Meat Inspection Act. It is estimated that Federal inspection covers about two-thirds of all food animals slaughtered in the United States. Establishments that distribute meat and meat food products in interstate or foreign commerce must have them inspected by the Federal Government. Meat that is condemned because of disease, spoilage, or failure to meet sanitary requirements is never allowed to be put on the market but is converted into fertilizer, grease, or other inedible products. Animals are inspected both before and at the time of slaughter. If the animal is visibly diseased or abnormal it is tagged with a metal label fastened to the ear. Depending on the condition of the animal, the tag may be either "U. S. Condemned" or "U. S. Suspect." In the case of suspects, final decision is withheld until the animal is slaughtered and a postmortem examination is made.

In establishments inspected by the Federal Government, all carcasses and internal organs receive a searching examination for possible presence of diseases, parasites, injuries, or other abnormal conditions. The men making inspections are divided into two groups. One group is composed of veterinarians, the other of trained lay inspectors. The veterinarians make the important decisions; the lay inspectors perform various duties under the supervision of veterinarians. If a carcass is deemed wholesome by the inspectors, the principal wholesale cuts are stamped "U. S. Insp'd and P's'd." General compliance with the provisions of the Federal Meat Inspection Act is evident from the relatively few violations reported by the Bureau of Animal Industry from month to month. Prosecutions for violations of the Act seldom exceed four or five a month. In September 1939, for instance, no prosecutions were reported; in October there were eight, and in November, two.³²

³¹ (It was put into operation July 1, 1935.) Under authority of an appropriation by Congress, Public. No. 62, 74th Cong., H. R. 6718, for the Bureau of Animal Industry to be used in cooperation with the State authorities in the administration of regulations for the improvement of poultry, poultry products, and hatcheries.

³² "Service and Regulatory Announcements," Bureau of Animal Industry, United States Department of Agriculture, U. S. Government Printing Office, Washington, D. C., September, October, November 1939, 5 cents each.

Another protective measure rendered by the Bureau of Animal Industry is the administration of the Virus-Serum-Toxin Law, by authority of which the Bureau supervises the production of viruses, serums, toxins, vaccines, and analogous products, sold in interstate or foreign commerce, for use in the treatment of domestic animals.³³ If such biological products fail to meet acceptable standards of purity and potency, The Secretary of Agriculture may prevent sale of such products, may revoke licenses, or may seize the products on the market. The administration of this law by the Bureau provides a protection to the livestock industry and indirectly benefits the general public, both through the more economical production of livestock products and through the control of animal diseases, some of which are transmissible to human beings.

Although its functions are chiefly in the fields of research and inspection work, the Bureau has issued a number of publications dealing, in popular form, with foods and other animal products in which consumers are interested. One of these is Miscellaneous Circular 63, "The Inspection Stamp as a Guide to Wholesome Meat," United States Department of Agriculture, May 1926; another is Miscellaneous Publication 317, "Improving Poultry Through the National Poultry Improvement Plan," United States Department of Agriculture, July 1938.

BUREAU OF DAIRY INDUSTRY

The Bureau of Dairy Industry, United States Department of Agriculture, conducts research in the breeding, feeding, and management of dairy cattle to promote efficiency in the production of milk and to improve its nutritive and sanitary quality. This Bureau also conducts scientific studies of handling milk on the farm, in transit, and at dairy plants; studies the promotion of efficiency in dairy plant equipment, arrangement, and operation; studies the bacteriology and chemistry of milk and its products, and the problems and manufacture of dairy products and byproducts; assists in establishing new products and methods in dairy plants; and inspects renovated-butter factories.

While the Bureau of Dairy Industry is a research agency primarily concerned with the activities enumerated above, its research involves some problems of interest to the consumer and to those developing marketing standards.

The Division of Dairy Research Laboratories.

Bacteria are important in the manufacture of nearly all dairy products. Therefore, research leading to an increase in the available information relating to the conditions controlling the growth and activity of bacteria and especially the effect they have on each other when growing in mixed cultures has been promoted by the Division of Dairy Research Laboratories. This basic information has been related to various dairy products and the quality resulting from differences in bacteria cultures.³⁴ An incidental result of this work was the development of a simple and comparatively inexpensive

³³ 37 Stat., 832, March 4, 1913.

³⁴ "Report of the Chief of the Bureau of Dairy Industry, 1939," p. 31, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

medium for growing the eye-forming cultures used in Swiss cheese making.

Research relating to the various fat, moisture and acid contents of various cheeses have led to the accumulation of basic knowledge pointing to the results which may be expected according to various relationships of such constituents in finished cheese. The results of this experimental work have been correlated with, and frequently have altered, commercial practice so as to obtain better quality and more standard results.³⁵

A method was developed by which the milk solids in fat in an ice-cream mix may be increased without danger of the objectionable sandy texture in ice cream, which is caused by the crystallization of lactose.³⁶ In this method, sucrose is added to skim milk in the proper proportion, and the mixture is concentrated under a vacuum to a point at which crystallization of lactose takes place on cooling. Since the sucrose prevents excessive thickening, the lactose crystals may be removed by centrifuging in the usual way to make a self-preserving skim-milk product that is low in lactose. Since this product permits the manufacture of an ice cream with better texture and higher nutritive value, and at the same time provides an outlet for a large quantity of surplus milk constituents, its general adoption is desirable.

Research has led to the development of a casein fiber having many of the characteristics of wool.³⁷ Casein fiber is not as strong as wool, but it has the same resiliency and takes the same dyes. However, it is not likely that it will, in the near future at least, become a competitor of wool; rather it should be looked upon as a means of extending the use of fabrics containing wool. By mixing a casein fiber with wool it is possible to make fabrics having the desirable properties of wool but at a lower price.³⁸

As mentioned, casein fiber does not have all of the characteristics of wool, particularly with regard to strength, but as a result of research conducted by the Bureau of Dairy Industry, casein fiber has been developed to a point where it may be an important companion product for wool, or, in other words, it approaches the present standards for wool.

In 1928 the Division of Dairy Research Laboratories published the results of the first of a series of investigations showing that the lactose of whey could be converted into lactic acid in a short time.³⁹ On the basis of this information the commercial manufacture of lactic acid and whey was successfully established. A considerable quantity of lactic acid is now used in making plastics, but since little acid of sufficient purity for this purpose is made in this country most of it is imported. In attempting to extend the outlet for lactic acid the need for a better method of purifying the crude acid produced

³⁵ *Ibid.*, pp. 35-36. "The Relation of the Quality of Milk to the Grade of Swiss Cheese," by L. A. Rogers, R. E. Hardell, and F. Fentz, *Journal Dairy Science*, vol. 22, pp. 43-48, January 1939.

³⁶ "Report of the Chief of the Bureau of Dairy Industry, 1939," p. 32, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

³⁷ "Report of the Chief of the Bureau of Dairy Industry, 1939," pp. 32-33, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

³⁸ "Casein Fiber," by E. O. Whittier and S. F. Gould, *Industrial and Engineering Chemistry*, New Edition, vol. 17, pp. 348-349, July 1939.

³⁹ "Report of the Chief of the Bureau of Dairy Industry, 1939," p. 33, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

in this country under commercial conditions was recognized. Such a method was developed and tested by the Division of Dairy Research Laboratories on a pilot plant scale in a commercial plant with such success that the plant is now taking steps to put this method into operation.

A method was developed for producing lactose with one crystallization sufficiently pure to meet the requirements of the pharmaceutical grade. Investigations were also conducted to show that whey solids may be used in confectionery, soups, and bakery goods. The use of these dairy byproducts in foods does not necessarily limit it to their substitution for ingredients of established foods. There is also the possibility of combining milk or some combinations of its constituents with other products to make new forms of foods, confections, or beverages. A start in this direction was made by combining skim milk with potatoes to make a new product having some of the characteristics of potato chips and the added advantage that, since it contains no fat, it has excellent keeping qualities. It can be made in regions, remote from markets, where skim milk and cull potatoes are cheap.⁴⁰

It is rather generally conceded that the grade of the great bulk of Cheddar cheese made in this country, even in the older cheese sections, is usually low. Investigations by the Division of Dairy Research Laboratories indicate that three factors are of major importance in establishing the texture and flavor of the ripened cheese. The first factor is the bacteriological condition of the milk from which the cheese is made; second, is the control of the manufacturing process with particular reference to the acidity developed in each step; the third is the adaptation of the curing room temperature to the particular characteristics of the cheese to be ripened. Regarding the first factor, the Division of Dairy Research Laboratories found that pasteurization is a partial remedy and is of value in helping to produce a uniform product; but even when the milk is pasteurized, it is necessary to eliminate the bacteriologically poor milk. Tests are now available which indicate the bacteriological condition of the milk with reasonable accuracy so simple that any cheese maker can use them. Regarding the second factor, the experimental results in this Division, which are fully corroborated by field observations, show that the acidity limits essential to a good flavor are very narrow and do not agree with those commonly adopted in the factories. Investigations relating to the third factor indicate that the present practice of storing cheese at 34° F. is sound when applied to the high acid, high moisture cheese now generally made, but data developed by the Division show that the cheese made from good milk with proper control of the acid development should be cured at a much higher temperature to develop the characteristic flavor of Cheddar cheese.⁴¹ The results of these investigations are being made available not only in published form but also by demonstration in cooperation with the University of Wisconsin through which one field man using the trailer laboratory is making them known directly to those interested.

⁴⁰ "Report of the Chief of the Bureau of Dairy Industry, 1939," pp. 34-35, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

⁴¹ *Ibid.*, p. 35.

An investigation of the relation of the fat and moisture content of Swiss cheese to the quality of the cheese has been completed. The laboratory results obtained under experimental conditions were confirmed by data collected by field men working in the commercial factories in Wisconsin and Ohio. These data show that there are definite limits for both water and fat beyond which the cheese maker cannot go without injuring the quality of the cheese.⁴²

Investigations were conducted to indicate and demonstrate the practicability of packing sliced Swiss cheese in cans for distribution to lunchrooms and restaurants.⁴³ Selected cheese is cut into blocks, wrapped in cellophane, and packed in cans. If the cheese is of a good quality and the storage temperature is not too high, this package may be held indefinitely. The lunch counter proprietor buying cheese in this form has less waste, the cheese is ready to serve, and he knows exactly how many sandwiches may be made from each package. Similar investigations and demonstrations have been carried on for Cheddar cheese with the same potentialities.

Division of Market Milk Investigations.

Experiments have been started to compare five different tests used in determining the quality of milk and to evaluate the tests in terms of the keeping quality of milk. Tests were made under various time-storage conditions. The tests are still in process and not yet conclusive. The experiments will be continued until a statistically significant number of samples covering a wide range of quality has been studied.

Investigations were conducted relating to the curd tension of milk. Curd tension of milk is important particularly in pediatric work. The Hill method, developed some years ago, has been the most generally accepted method for determining milk as hard curd or soft curd. The Division of Market Milk Investigations perfected a method for determining curd tension using hydrochloric acid and pepsin as a coagulant.⁴⁴ The recent method developed by the Bureau of the Dairy Industry apparently simulates human digestive conditions much more closely than does the Hill method.

Under the Hill method 33 grams is considered the proper dividing line between hard curd and soft curd milk. Under the newer method approximately 21 grams appears to be a reasonable dividing line, but more data on the relation between curd tension and digestion are necessary, before a definite standard can be set, although this work should provide the basis for setting such a standard. This becomes important particularly with the increase in the homogenization of milk and its increased sale of soft curd milk. When the results of these experiments are available in satisfactory form, it should then be possible for interested parties to establish a dividing line between hard curd and soft curd milk so that proper labeling may follow.

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

The Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, is not responsible for administering any of the various acts dealing with standards. Its basic research work,

⁴² "Report of the Chief of the Bureau of Dairy Industry, 1939," p. 36, U. S. Government Printing Office, Washington, D. C., 1939, 10 cents.

⁴³ *Ibid.*, p. 37.

⁴⁴ *Ibid.*, p. 40.

however, on insect control and honey production is largely, or in part, the scientific foundation for many standards for food products, textiles, leather, fibers, and forest products.

The results of the Bureau's work on termite control to prevent buildings from becoming infested with termites have been incorporated in specifications of many municipal building codes.

The research work on mothproofing materials has led to standard mothproofing procedure.

The Bureau's investigations on the control of granary and mill insects has done much to decrease the loss resulting from the reduction of wheat to low grade, or pecky, caused by these insects.

There are specific requirements as to insect injury in grading apples and peaches. The Bureau's investigations make possible the producing of fruit that will meet Grade A standards.

Grade A potatoes have definite specifications as to the amount of insect damage to the tubers that will be tolerated. The Bureau's work on the control of insects makes possible the production of Grade A potatoes.

The research work of the Bureau of Entomology and Plant Quarantine has resulted in the establishment of specifications by the Bureau that are used in grading honey.

Control of bot flies in cattle prevents grading down of hides as grubby.

Lumber is graded down if borer holes appear in the clear lumber. The forest insect investigations of the Bureau have led to standard procedures in lumbering and lumber handling processes to reduce this injury to a minimum.

The insecticide investigations of the Bureau provide the groundwork for standards for insecticides.

BUREAU OF HOME ECONOMICS

The Bureau of Home Economics of the United States Department of Agriculture devotes its entire resources to improving the levels of living of the Nation's families. Much of its work, therefore, is in the field of consumer problems.

Pursuant to the authority contained in the Agricultural Appropriation Act, the Bureau has been conducting investigations for a number of years on "the relative utility and economy of agricultural products for food, clothing, and other uses in the home, with special suggestions and plans and methods for the more effective utilization of such products for these purposes." Some of this research is carried on independently; some in cooperation with other agencies within the Department.

Steps in the Development of Consumer Standards.

In developing standards for consumer goods and securing widespread acceptance of such standards by household buyers and by business groups, four steps must be taken: (a) Determination of the products for which standards are practicable and important; (b) research to provide a basis for standards; (c) formulation of standards that will be helpful to consumers and feasible from the standpoint of producers and distributors; (d) promotion of the use by business agencies of established standards on labels, in advertising, and through other merchandising practices and devices; education of consumers in

the use of standards. In all four of these steps the work of the Bureau of Home Economics is of fundamental importance.

Determination of Products for Which Standards Will Be Developed.

Consumers need standards for some goods far more than for others. In deciding where to begin a program of establishment of standards, an agency or group of agencies would consider the consumption patterns of the Nation's families, scientific and technological developments that might facilitate progress, as well as work already completed or in progress.

The Bureau's research on the consumption of American families at different income levels provides information as to the relative importance of various goods in the family budget, i. e., their share of total family expenditures for living. Its research of human needs tells which products are important from the standpoint of family well-being. A standard might be much needed for a food product because of its close relation to health, even though expenditures for such food take a relatively small part of total family outlays. Use by a large proportion of families also is a criterion for deciding whether a product shall be included in the program. The Bureau's studies provide information on the proportion of families at different income levels using specific goods and services. Furthermore, because of close contacts with families and their problems, the Bureau's staff members are constantly aware of consumers' problems and interests.

Research Providing a Basis for Standards; the Formulation of Standards.

Much of the Bureau's research on utility and economy of agricultural products may be of direct use in the formulation of standards; some already have been so used. The Bureau is represented on the Advisory Committee on Ultimate Consumer Goods of the American Standards Association. Members of the Bureau's staff have served on several of the technical testing committees of the American Society for Testing Materials, and have taken an active part in the work of the National Consumer-Retailer Council which is working to promote informative labeling of household goods.

In the field of textiles and clothing, consumer specifications for fabrics are based on information obtained by the Bureau from a detailed study of the chemical and physical properties of various clothing and household textile materials, supplemented by serviceability tests whenever possible. The Bureau is studying the fabrics on the market and is suggesting minimum specifications for various classes of textiles and for various grades within each class. To date, such minimum consumer specifications have been proposed by the Bureau for broadcloth, toweling, sheeting, upholstery fabrics, and blankets.

These specifications for broadcloth, toweling, and sheeting have been used by the American Society for Testing Materials in the preparation of its recommended tentative specifications for these fabrics. The Bureau has taken the lead in the work of this society in the development of standard specifications for household and garment fabrics.

In cooperation with the Farm Security Administration, the Bureau is developing specifications for the textiles and clothing sold

by the cooperative associations of clients of the Administration. These specifications are being prepared on the basis of tests conducted by the Bureau.

With the increasing use of mixtures of rayon with silk, cotton, and wool in the manufacture of fabrics for garments and household textiles, it has become more important than ever to provide the buyer with labels describing these mixtures. As a basis for a program of informative labeling, the Bureau has studied the effect of substituting reworked wool and rayon for new wool in suitings. Fabrics have been specially woven from wool produced on experimental animals at the Agricultural Research Center and from spun rayon. The experimental suitings have been made into boys' knickers and placed in service in a local institution. Samples are withdrawn periodically for testing in order to determine the changes produced by wear.

The determination of sizes of children's garments and patterns according to age, the procedure now generally followed, has been a source of difficulty to the buyer. There has been great variation in actual size of garments sold for children of a given age, as, for example, for 6-year-olds. In order to provide a basis for development of a new standard system of body measurements, the Bureau sponsored and directed a Nation-wide cooperative project, subsidized by the Work Projects Administration, in which children 4 to 17 years of age were measured. Nineteen universities and other educational institutions participated in this work.

The study necessitated 36 measurements on each of 147,000 children in 15 States and the District of Columbia. The results have been incorporated in a suggested standard system of sizes. This system has been described in a publication of the Bureau and has been presented to representatives of national organizations of manufacturers and distributors of children's wear, under the sponsorship of the American Standards Association. The adoption of these standards will do much to improve the fit of children's ready-made clothing and the sizes of patterns for children's garments.

In order to provide the facts upon which better determination of sizes of women's clothing may be based, the Bureau has initiated and is sponsoring a similar cooperative study of the body measurements of women. For this purpose 58 measurements used in the manufacture of clothing are being taken on each individual.

In the field of food, the Bureau of Home Economics has cooperated with various agencies in the United States Department of Agriculture in research designed to provide information concerning qualities of food products, as a basis for the commodity grades promulgated by the Department. An example of such research is the extensive, long-time study of factors that affect the palatability of meat, conducted in cooperation with the Bureau of Animal Industry, the Agricultural Marketing Service, and a number of State agricultural experiment stations. In addition to measuring quality and studying palatability factors in a large number of cuts of meat representing different methods of production and processing, the relationship between shrinkage and methods, time, and temperature of cooking has been studied. A report of the effect of grade, style of cutting, and method of roasting, on shrinkage and cooking time of rib roasts of beef has been published.

The Agricultural Marketing Service consults with the Bureau of Home Economics when working upon grades for products purchased for family consumption. From its research, the Bureau provides data concerning qualities of the foods, and consumer buying habits and preferences.

The Bureau, with the Consumers' Counsel Division of the Agricultural Adjustment Administration, has represented consumers in the consideration of standards of identity by the Food and Drug Administration. In the grading of milk, it has cooperated with the United States Public Health Service. It has supplied information on consumer goods for use by the Federal Trade Commission in enforcement of the Federal Trade Commission Act.

Research on housing of farm families has provided a great deal of information as to the dwellings now in use. The Farm Housing Survey (a Civil Works Administration project) conducted in 1934 provides information on the current situation as to size, materials used in construction such as wood and brick, facilities and state of repair of farm dwellings, based on facts collected from more than a half million houses in 308 counties in 46 States. The Consumer Purchases Study (a Work Projects Administration project) furnishes facts about the housing of farm families at different income levels, including average number of rooms and number of persons per room; the prevalence of such facilities as running water, hot and cold water in kitchen and bath, indoor flush toilet, central heat, and electric lights; and the yearly expenditures of families for keeping their houses in repair. These data are basic for formulation of housing standards. They disclose types of materials that may be purchased for modernizing and for building new farm homes and therefore indicate probable consumer needs for standards, as buying guides.

Another important study of housing made by this Bureau summarizes what farm families say they want and need in house design to make their homes comfortable and convenient for different climatic conditions; it also includes their suggestions for adapting the houses to the requirements of different types of farming. Lack of such information has been one reason for the failure of architects and builders to plan dwellings suited to farm life, to the needs of both the family and the farm business.

Refrigeration is important in the preservation of the farm food supply for family use. The extension of electric power lines, promoted by the Rural Electrification Administration, and the growing use of gas in rural areas have made refrigeration available to more rural homemakers than ever before and thus have increased the demand for help in choosing the types best suited to family needs. The Bureau has studied the types of refrigeration available and is preparing a bulletin to guide the farm housewife in selection and use of such equipment. A representative of the Bureau has served on the committee on household refrigerators of the American Standards Association.

The Bureau has cooperated with the State experiment stations in the study of those items of household equipment most needed in farm homes in different sections of the country. The findings will be used in the preparation of standards and buying guides.

The Bureau has cooperated with the Rural Electrification Administration, the Extension Service, and the Bureau of Agricultural Chemistry and Engineering in the preparation of a bulletin on lighting the farmstead. In this publication the farm homemaker is advised as to the location of outlets and lights, and the points to be considered in choice of fixtures.

Promoting the Use of Consumer Standards.

Through its work with the National Consumer-Retailer Council, the Bureau, together with other organizations interested in consumer education, has worked toward an intelligent and sympathetic understanding of the problems of business by consumers and, conversely, the problems of consumers by business. The program of this council includes work on the development of definitions for products, standards for consumer goods; suggestions for labels for some of the more common widely used consumer commodities; promotion of other means of providing sound factual material to consumer-buyers.

The Bureau has prepared a series of buying guides to assist purchasers in judging the qualities of household textiles and of clothing. These guides suggest important points to be considered when purchasing and include publications on ready-made dresses, women's cloth coats, children's clothing, women's hosiery, men's and boys' shirts, sheets, blankets, and bath towels. Whenever possible these buying guides give specifications for the fabrics used in the finished article.

The Bureau also cooperates with the Extension Service in formulating study programs for rural groups interested in consumer buying. It provides material for the Consumers' Guide, published by the Consumers' Counsel Division, Agricultural Adjustment Administration. It conducts its educational program through radio broadcasts, bulletins, press releases, and other means of communication.

The homemaker requires a type of buying information different from that required by business and Government agencies. Consumers need simple labels and nontechnical statements as to qualities and performance. If standards for consumer goods are to be of maximum value to homemakers, they must be used in connection with a program of consumer education, such as that carried on by this Bureau, the Extension Service, and other educational agencies.

BUREAU OF PLANT INDUSTRY

The Bureau of Plant Industry, United States Department of Agriculture, has published descriptions of principal varieties of various fruits and vegetables. Because of a lack of a generally accepted, authentic, and adequate description of even the most important of vegetable varieties, there has been great disagreement and some confusion as to exactly what characteristics a certain variety should possess. Members of the seed trade who deal in vegetable seeds, as well as farmers, canning-factory operators, and most gardeners who buy vegetable seeds, have long desired and urgently requested that the United States Department of Agriculture undertake exhaustive studies and issue adequate descriptions of the most widely used varieties of vegetable seeds. This development of varietal descriptions relates only indirectly to standardization, for it is almost entirely in the field of horticultural development and investigation. However,

when varietal descriptions and designations have been specifically established, it is then possible to establish grades and standards of quality within each varietal group.

The Bureau of Plant Industry has cooperated in providing basic information of horticultural nature to other bureaus of the United States Department of Agriculture, directly interested in the promulgation of standards.

COMMODITY EXCHANGE ADMINISTRATION

The Commodity Exchange Administration, United States Department of Agriculture, does not establish standards of quality. It is only concerned with grades in connection with its supervision of commodity markets. Under section 5a (6) of the Commodity Exchange Act, the use of official United States grades in futures trading for commodities under the supervision of the Commodity Exchange Administration is mandatory when such grades have been promulgated. If no United States grades have been promulgated, then trading is regulated under the various grades adopted by the commodity exchanges, provided their inspection systems have been approved by the Secretary of Agriculture under the provisions of section 5 (a) of the act.

While the Administration does not establish standards of quality, it has cooperated with other bureaus in the Department in the formulation of grades for futures.

EXTENSION SERVICE

The Extension Service of the United States Department of Agriculture conducts an educational program for farmers, concerning grades and standards for fruits and vegetables, dairy products, poultry products, livestock, grain, tobacco, cotton, and other farm products. This work is closely related to the general educational program dealing with improvement of quality and the cultural practices which result in the production of the varieties, grades, and kinds of products that best satisfy consumer demand. Demonstrations are given by county agents and extension specialists on the proper methods of grading various products to meet United States or State standards. In addition, approved methods of harvesting, packaging, and loading are taught to farmers and farm groups. The majority of this work is conducted in the field or at shipping points, and frequently cooperative demonstrations are arranged at which representatives of the State and Federal departments of agriculture, whose work deals with grading and standardization, participate.

Considerable attention has been given in recent years to the development of grades and the use of marks or brands which can identify these grades to consumers. Extension Service representatives have assisted farmers in developing so-called quality-improvement programs. The objective of these programs is to develop a product of uniform quality and to identify it with a trade-mark or insignia which can thereby assure consumers of the designated quality of produce. Work of this nature has been done for various fresh fruits and vegetables, certain canned products, dressed poultry, dairy products, and other commodities.

In addition to the educational program for farmers on grades and standards, the Extension Service, through home demonstration work, conducts a program on consumer education for rural women. The consumer goods covered include food, clothing, furniture, house furnishings, electrical and other household equipment, and cosmetics. Homemakers learn, through their home demonstration work, to buy through examination of product, reading of labels, and questioning of retailers. Consumers are encouraged to ask for quality labels.

Each State has an extension specialist in some of the fields in home economics. These specialists develop materials for the use of home demonstration agents in the counties. Information for these materials on consumer education is taken from various sources, including the Bureau of Home Economics, American Home Economics Association, American Standards Association, and State experiment stations, and from such publications as "Consumers' Guide" of the Consumers' Counsel Division, Agricultural Adjustment Administration.

The home demonstration agents also educate farm women in the use of marketing standards for some of the products which they sell. These standards are used in the markets which farm women have established, particularly in the Southern States. Most of the educational work performed by the Extension Service in the use of marketing standards is conducted by county agents and State extension specialists. Demonstration meetings to show farmers how to grade their produce are arranged by the county agents who either speak themselves or bring in field members of the Agricultural Marketing Service, and specialists from the agricultural colleges.

Information is given not only on the grading itself but also on ways to improve quality so that higher grades may be met. These demonstrations may range from choice of seed, through the various cultural operations, to harvesting and packing. In some cases county agents demonstrate methods of harvesting, grading, and packing in the fields; and in others demonstrations are arranged at packing sheds, shipping points, and farmers' wholesale markets.

FARM SECURITY ADMINISTRATION

Standards for Commodities Used in Farm Production.

The Farm Security Administration, United States Department of Agriculture, has recommended certain quality standards for the use of its clients in making purchases with proceeds of loans received through the Administration. These standards, which are more in the nature of buying guides, apply only to goods used in farm production: Seed, fertilizer, equipment, and livestock. These standards have been prepared with the cooperation of other bureaus of the United States Department of Agriculture.

The seed standards set up minimum requirements for seeds used in farm production and for vegetable seeds used in home gardens. The factors considered in these standards are germination, seed purity, disease resistance, proportion of weed seeds permitted in a mixture, weight per bushel, and the need for purchasing untreated or treated seed. In each case the minimum requirement is specified. The reports outlining the standards also include a discussion of the variety of seeds which may be purchased and the proper method

to be used in the planting of seed. The work on seed standards which is being done by the Farm Security Administration supplements that regularly being done by the United States Department of Agriculture on seed labeling. The Farm Security Administration found that descriptive labels which are attached on seed sacks are not being made available to consumers who purchase in small quantities. The Administration also found that there was no protection to consumers who buy seed produced locally. Because of the large waste of money resulting from the improper purchase of seed by its clients, the Farm Security Administration set up its own minimum standards for seeds and suggested that its clients purchase them cooperatively.

The suggested minimum standards for fertilizer likewise are buying guides. It is recommended that fertilizer mixtures should contain not less than 20 percent plant food. It is also suggested that farmers purchase grades recommended by the State experiment stations or the extension service, and use high analysis fertilizers. Regional directors are authorized to prepare a list of a limited number of acceptable grades of fertilizers for farmers.

The specifications for machinery and equipment are also mainly buying guides which include factors important in the purchase of farm machinery. They contain descriptions of the proper types of equipment to be purchased for certain uses, and information on the care and repair of farm machinery. These specifications indicate first that, in purchasing equipment, farmers should ascertain that (1) the equipment is of a current model regularly furnished to the trade, (2) the design is in accordance with good practice and the workmanship and quality is satisfactory, (3) the machinery is new and unused unless otherwise specified, (4) a satisfactory guaranty is given by the seller that any defects due to poor workmanship developing within 3 months of the date of purchase will be adjusted, (5) service and parts are readily available, (6) purchase is subject to suitable instruction and demonstration, and (7) machines are to be set up if they are shipped in knocked-down form. The specifications then classify the various types of agricultural implements and machinery on the basis of the purpose for which they are to be used, namely: (1) Seed bed preparation, (2) planting, (3) cultivating, (4) spraying and dusting, (5) harvesting, and (6) processing. They describe the various types of implements available for each of these purposes and indicate the major factors that should be considered in the purchase of each type of equipment. Thus, in the case of planting equipment, it is recommended that the machines selected should be ones that can be used on diversified crops, should be equipped with an ample assortment of seed plates for various sizes of seeds, and that the range in the rate of seeding should cover future as well as existing farm needs.

Specifications and recommendations for livestock have been prepared which indicate the factors that farmers should consider in making proper selection of certain types of livestock, and how animals should be cared for after purchase. These specifications are more detailed in the case of horses, mules, and dairy stock, than they are in the case of sheep, swine, and poultry. They are, in effect, buying guides although they are called standards by the Farm Se-

curity Administration. The two principal factors that farmers are advised to consider in buying dairy stock are (1) freedom from disease (tuberculosis, bangs, mastitis, sound in udder), and (2) production. A schedule of prices is included which indicates the differentials that should be paid for dairy stock of different ages and with different butterfat production records.

Standards for Commodities for Farm Consumption.

The Bureau of Home Economics of the United States Department of Agriculture has been cooperating with the Farm Security Administration in providing information relating to selection of consumer commodities. The Bureau of Plant Industry and the Agricultural Adjustment Administration of the United States Department of Agriculture, and the Vocational Education Division of the Office of Education, United States Department of the Interior, have also cooperated with the Farm Security Administration in supplying information for guidance in consumer buying.

Account books, required by the Farm Security Administration, include a list of commodities bought by farm families each month. From these account books a list of commodities to be tested in order to determine their quality and performance has been compiled. The Bureau of Home Economics is conducting tests of many of these commodities, including boys' trousers, overalls, socks, foods, and cooking devices. As a result of these tests, specifications may be formulated to meet the particular needs of the clients of the Farm Security Administration, with major emphasis on performance.

Efforts are also being made to correlate commodity standards with nutritive values. Adequate minimum needs provided by a liberal supply of vegetables, milk, eggs, poultry, and meats, are included in these "dietetic standards."

The number of consumers contacted by the Farm Security Administration is necessarily small since the Administration helps only those families who cannot be served through any other channels. The educational program is developed by field workers and through cooperative endeavors. It is hoped that emphasis on home and family needs and costs, together with the detailed keeping of records by each family, will encourage buying of over-the-counter goods on the basis of quality and performance. The educational program for the development of buying on this basis will be more easily conducted in the rehabilitation projects of the Farm Security Administration where community cooperation is being created, than in cases where the Administration is merely assisting individuals. In the latter case, however, an attempt will be made to educate these individuals regarding quality purchasing.

Standards for Low-Cost Housing.

While the Farm Security Administration is not primarily a housing agency it has constructed low-cost homes for the farm families on, or near, relief which it has helped to become self-supporting.

The houses constructed under this program were designed to meet a wide variety of climatic conditions, living habits, and economic needs. Some of the first houses were suburban, such as Greenbelt communities, rather than rural. Today, however, the Farm Security

Administration is building through private contract only low-cost farm houses.

Construction has been based on a few simple principles, intended to produce adequate, attractive, but modest homes at the lowest possible cost:

Design.—Cubic footage of the house was held to the minimum necessary for health and comfort. Rooms were arranged for both compactness and convenience. Every unnecessary gable, beam, and purely decorative feature was eliminated.

Materials.—First grade materials were used throughout, so that maintenance and repair costs would be as low as possible. Standard materials, in standard sizes, usually proved most economical. The use of local products often resulted in considerable savings, through lower transportation costs.

Construction.—Precutting and prefabrication were highly developed. A small portable sawmill, for example, often was set up on the project, to cut lumber to exact specifications for a large number of houses. Complicated parts, such as window and door frames, and sometimes the entire frame of the house, were prefabricated at the mill, so they could be installed with a minimum of labor.

FEDERAL CROP INSURANCE CORPORATION

The Federal Crop Insurance Corporation, United States Department of Agriculture, utilizes the facilities of the Agricultural Marketing Service in the administration of the Grain Standards Act in connection with the establishment of standards of quality. These standards of quality are specified in the Official Grain Standards of the United States.

In accordance with these standards, premiums are computed in the class of wheat specified by the insured in his application, but the basic grade for computing premiums and indemnities with respect to each class is determined by the Federal Crop Insurance Corporation before applications for insurance are solicited. The Corporation has specified No. 1 as the grade for Northern Spring Wheat, and No. 2 as the grade for all of the other classes of wheat to be used as the basis for collecting premiums and paying indemnities.

Premiums may be paid in wheat, by cash, or by means of an advance from the Secretary of Agriculture against conservation and parity payments accruing to growers under the program administered by the Agricultural Adjustment Administration.

Indemnities are paid either in wheat, in cash by immediate settlement, or in cash by deferred settlement up to 90 days after approval by the Corporation of the insured's claim for indemnity. The insured may indicate the method by which he desires an indemnity to be paid, but the Corporation reserves the right to make payment in form other than that indicated by the insured.

Only an extremely small portion of the premiums have been paid in wheat. The cash received by the Corporation is used by the Corporation to promptly purchase wheat to hold in an insurance reserve to cover future indemnities. When indemnities are paid in cash, wheat is sold from this reserve to provide the necessary funds.

The classes and grades of wheat used in all of these transactions are

determined in accordance with the Official Grain Standards of the United States.

FOREST SERVICE

Congress has designated the Forest Service, United States Department of Agriculture, as the agency of the Federal Government specifically responsible for protecting, developing, and administering certain public lands and their living resources. The Forest Service is also authorized to help States and farm, industrial, and other owners to protect and develop such of their lands as are more valuable in forest growth than as plow land.

Broadly, responsibilities of the Forest Service are: (1) To initiate and apply, locally and nationally, action programs looking to the best use of forest lands in the interest of public welfare and help with action programs initiated by county, State, and Federal agencies; (2) to protect, develop, and administer in the public interest the national forest system and its resources, products, values, and services; (3) to conduct research in problems involving protection, development, management, renewal, and continuous use of all resources, products, values, and services of forest lands; (4) to make research and administrative findings and results available to individuals, industries, and public and private agencies generally.

In research, in national forest administration, and in initiating and applying action programs the Forest Service works in close cooperation with other branches and bureaus of the United States Department of Agriculture; and is guided by the Department's basic purpose of establishing and maintaining such sound land and resource management and use as will help build and maintain communities and local and national social and economic structures.

The Forest Service conducts certain research and investigations of interest to the consumer. Although it does not officially promulgate standards, it does a large amount of research work to determine the proper factors, with their evaluations, which become the bases for either official standards or standards adopted by semipublic organizations and extensively used in commercial practice.

Within the scope of marketing standards the research work of the Forest Service tends to fall into two general categories: (1) Forestry practice and the first marketing of raw forestry products, and (2) investigations as to the inherent identity and quality and most suitable uses for forestry products which have been at least initially processed, that is, lumber, in the conventional sense.

In administering public lands which have growing timber, it frequently is necessary and prudent to dispose, either to Government or private outlets, of that portion which is ready for cutting. While these sales are made in accordance with usual Government requirements applicable to the disposition of governmentally owned property, peculiarities unique to forestry are followed. Sales usually are made upon the basis of price per thousand board feet, log scale. This involves a process of estimating the probable output at the time the sale is advertised, and when the bids are offered the logs are scaled as the basis for monetary settlement. Many rules for measuring logs in board feet developed or were adopted in different parts of the country in the effort to obtain a rule which would give the amount

of lumber that could be sawed from a log of a given size under local marketing and sawing customs. Some of these rules, among others, are known as the Scribner rule, the Doyle rule, the Maine rule, the Spaulding rule, and the International rule. To establish a uniform or standard basis upon which to proceed in the sale of national forest timber, a regulation of the Secretary of Agriculture relating thereto was first issued in 1905. Its present form, regulation S-16, was published in the "Federal Register," August 15, 1936, page 1094, and stated that "The cubic volume rules and the Scribner Decimal C log rule, both as used by the Forest Service, are the official rules for scaling national forest timber." Improvement of milling machinery and changing customs in parts of the country made it desirable to have the option of using the International log rule under some circumstances, and the Secretary of Agriculture modified Regulation S-16⁴⁵ in 1938 to give this option, which as yet has not been widely exercised except in the Northeast.

The uniform use of the Scribner Decimal C rule, under a standard set of instructions⁴⁶ for deductions for defect and for its application in other ways has had an intensive and extensive influence on the practice of private owners near the national forests. Company after company joined voluntarily in the use of the standard so established. Logging contractors demanded "Government scale" for the logs they delivered. The Office of Indian Affairs of the United States Department of the Interior later adopted the same rule and issued similar instructions for its use. The influence of this standard has been far reaching.

The Forest Service also has attempted to promote more extended use of the standard cord measure. The conventional cord is 8 feet long by 4 feet wide and 4 feet high, or a cubic content measure of 128 cubic feet. In the sale of firewood and pulpwood, the common practice in many localities is to cut it at particular lengths, sometimes for fireplace width and other longer widths such as 52 inches for pulpwood purposes. Where the wood is cut at lengths other than 48 inches, it is necessary to make adjustments either in the height of the pile or the length to compensate for the variation in width. It has been stated that it is somewhat of a current practice in the pulpwood area of the South to sell on what is known as a "long cord" basis. The cubic foot content of this so-called long cord frequently is considerably in excess of the 128 cubic-foot content for the conventional cord. Similar practices prevail in some other areas. To protect the farmer and timber owner from unfair advantage because of such practices, the Forest Service has attempted to make known throughout all forestry areas what the standard cord measurement is, and how to measure for a standard cord, and has attempted to have this measurement adopted in commercial practice. This is mainly an educational program.

The Forest Service leads in the development of specifications for nursery stock for application in grading or culling small trees grown

⁴⁵ "Modification of Regulation S-16," Federal Register, p. 3137, U. S. Government Printing Office, Washington, D. C., December 23, 1938, 10 cents.

⁴⁶ "Instructions for the Scaling and Measurement of National Forest Timber," 103 pp., U. S. Forest Service, Washington, D. C., 1928.

in the nursery of the planting agency or in a cooperating nursery, or purchased from commercial nurserymen.⁴⁷

Cooperating with the Soil Conservation Service, the Forest Service developed standards and specifications, by species, for nursery stock, which may be used in buying stock from commercial nurserymen. The standards and specifications, based on data and experience available to the Forest Service and the Soil Conservation Service refer to size of stock, size of root, size of stem, and freedom from disease. Grades 1, 2, and 3 were established. Experience has indicated to the Forest Service and the Soil Conservation Service that certain types of nursery stock produced best results under given climatic and land conditions while other types of stock developed best under other conditions.⁴⁸ The specifications so developed were used not only in purchases of commercial nursery stock, but also by Government bureaus in the interchange of stock between Government nurseries. So far, the standards have dealt chiefly with conifers.

The Forest Service also developed a departmental forest seed policy approved by the Secretary of Agriculture on June 21, 1939.

This has resulted in a standard procedure for obtaining seed so as to give best results in the area awaiting planting. In substance, it states that the policy of the United States Department of Agriculture shall be (1) to use only tree seed of known locality or origin for nursery stock grown from such seed; (2) to require adequate evidence verifying the place near the origin of all lots of tree seed for nursery stock; (3) to require an accurate record of the origin of all lots of tree seed and nursery stock used in Department activities, and (4) to use local seed from natural stands whenever available.

FOREST PRODUCTS LABORATORY, MADISON, WIS.

The Forest Products Laboratory is a unit of the research organization of the Forest Service, United States Department of Agriculture. It is the only institution in the United States concerned wholly with the investigation of wood and wood products and their adaptation to diversified fields of use. In the course of its work on the more efficient and diversified utilization of forest materials the Laboratory is daily consulted by consumers, fabricators, producers, and by various Governmental agencies in regard to uniform test methods and standards for forest products and allied materials. So great is the magnitude of the Laboratory's work bearing upon standardization that no attempt can here be made even to catalog such activities. The following, however, may serve as illustrations of the general types of the Laboratory's activities related to forest products standardization.

Methods of Test.

Strength properties of clear wood.—One of the most important problems of forest products standardization relates to methods of testing the strength of clear wood. When the Forest Products Laboratory was contemplating an extensive research program to determine

⁴⁷ "Artificial Reforestation in the Southern Pine Region," 113 pp., Technical Bulletin 492, U. S. Government Printing Office, Washington, D. C., November 1935, 15 cents.

⁴⁸ *Ibid.*, p. 82.

the mechanical properties of various species of woods native to the United States it realized the necessity for adopting a uniform procedure so that comparable results would be obtained. Standard methods of testing small, clear pieces of wood were therefore developed to cover tests in bending (beams), compression parallel to the grain (columns), compression perpendicular to the grain (rail on tie), toughness, stiffness, hardness, and the like, as well as the selection of the test material, cutting the logs into specimens, rate of loading, and similar factors. The methods⁴⁹ have already been employed at the Laboratory in more than a half million tests made in determining some of the important properties of over 164 native species of wood. They have been adopted as standards by the American Society for Testing Materials, American Standards Association, and other authoritative bodies. The methods are now used not only in the United States but in many foreign countries. Their wide adoption enables the results of tests made in widely scattered laboratories to be compared.

Methods for conducting static tests of timbers in structural sizes.—Methods of testing timbers in structural sizes have been developed at the Laboratory and adopted as standard⁵⁰ by the American Society for Testing Materials, American Standards Association, and other authoritative bodies. The methods cover selection of materials, bending, compression perpendicular to grain, and compression parallel to grain tests of large-sized members. In addition, methods of testing minor specimens, cut from the larger specimens after test, are included. Previous lack of uniformity of testing procedure prevented direct comparison of data from different sources. The general adherence to these methods of tests enable direct comparison of the results of various laboratories.

Toughness test.—In the selection of lumber for exacting purposes, as, for example, airplane parts, assurance must be had that no pieces low in strength are admitted. Experience showed that visual inspection or specific gravity determinations were not sufficient, and that some mechanical test was desirable. Such a test must be rapid and one which will reject those pieces which are unsuitable. To meet this need the Laboratory developed a toughness machine and set up minimum acceptance requirements⁵¹ for those woods most commonly used in airplane construction. The toughness machine has also been found useful by manufacturers in the selection of wood, such as used in the manufacture of handles, where toughness is an essential property.

Hexagonal drum box testing machine.—Actual shipping container work at the Laboratory began with the invention of the box testing drum. This machine combines in a single test practically all the stresses and distortions that containers encounter in service. Upon the six internal faces of the drum are hazards and guides arranged in such a manner that, as the drum revolves, the loaded box or crate slides and falls, striking on its ends, sides, top, bottom, and edges so as to simulate the rough handling of actual transportation. The first drum

⁴⁹ "Strength and Related Properties of Woods Grown in the United States," p. 78, Technical Bulletin 479, U. S. Government Printing Office, Washington, D. C., September 1935, 25 cents.

⁵⁰ Idem.

⁵¹ "Manual for the Inspection of Aircraft Wood and Glue for the U. S. Navy," U. S. Navy Department, Washington, D. C., Revised Edition, 1940. (In press.)

built was 7 feet in inside diameter. Later a 14-foot drum was built. This test has been adopted as standard⁵² throughout the world.

Machining properties.—Machining properties refer to the common woodworking operations, such as planing, turning, shaping, and sanding. Different woods vary in these respects just as they do in other properties, and the machining properties of any given wood affect its utility for better or for worse. Workable methods of measuring and comparing machining properties have been developed, the work to date having been confined largely to southern hardwoods. These methods would lend themselves to use by other organizations so that comparable results could be obtained elsewhere with other woods. The actual work was done by the Forest Products Laboratory although in some parts close cooperation was maintained with the American Society of Mechanical Engineers.⁵³

Small sawmills.—With the depletion of the larger bodies of virgin timber there has been a marked increase in displacement of large mills by small mills. The latter mills are notoriously inefficient. Equipment operating methods vary widely. There have been no organized efforts to improve manufacturing practices, and as a result the small mill is little different from what it was a generation ago.

The Laboratory has been making an intensive study of the small mill, its equipment, and its operating and accounting methods all the way through from the standing tree to lumber in the pile with the objective of setting up standard operating methods that will result in more economical use of timber and at the same time will add stability to what is now a fly-by-night industry. A series of monographs⁵⁴ has been prepared and sent out to agencies that are in position to encourage the adoption of standard practices.

The Laboratory's work on this project is a continuing one, and in view of the thousands of mill units involved should eventually bring marked improvement in the handling of forest lands and in the general satisfaction resulting from the use of forest products.

Logging and milling studies.—Logging and milling studies conducted at the Forest Products Laboratory, and designed to supply information on costs of lumber production from trees and logs of different sizes were not directed toward standardization of tree cutting sizes definitely, but toward the standardization of methods⁵⁵ by which profitable tree cutting sizes could be determined. Sufficient studies have been made so that the procedure has come to be recognized as sound. It has gone far in promoting the acceptance of the principle of selective logging as a standard practice which should be followed in putting forest lands on a sustained yield basis.

Wood identification.—Methods for identifying wood as to species, groups of species, or genera primarily by means of its cellular structure as seen with or without a microscope have been developed for practically all native species of trees and several hundred commer-

⁵² "American Society for Testing Materials, Proceedings, Part 2, Technical Papers," pp. 320-342, American Society for Testing Materials, Philadelphia, Pa., 1916.

⁵³ "Further Experiments in the Planing of Hardwood," American Society of Mechanical Engineers Transactions, American Society of Mechanical Engineers, New York City, February 1939.

⁵⁴ "Small Sawmill Improvement," U. S. Forest Products Laboratory, Madison, Wis., not dated.

⁵⁵ "Selective Logging in the Northern Hardwoods of the Lake States," 47 pp. Technical Bulletin 164, U. S. Government Printing Office, Washington, D. C., January 1930, 5 cents.

cially important foreign species. Several keys for identification of the more important native species have been published.⁵⁶

Methods⁵⁷ have been developed and incorporated in purchasing specifications for recognizing compression wood, which is an abnormal type of wood with undesirable properties formed on the lower side of leaning coniferous trees.

Standard means⁵⁸ have been worked out for detecting brash wood of numerous species, that is, wood which is brittle and particularly low in shock-resisting ability and therefore undesirable for many uses.

A uniform method for detecting and comparing tool marks and other irregularities in the surface of wood not due to inherent structure of the wood itself has been worked out and applied in crime detection and historical research. The method consists primarily in use of oblique lighting in a darkened room for direct observation of taking photographs.

Seasoning of wood.—The Laboratory pioneered in methods of kiln drying wood which have been followed both in the United States and abroad. The object was to provide a rapid means of drying lumber so that it would be suitable for a wide variety of purposes. Drying is effective in minimizing such defects as stain, decay, checking, shrinkage, and warping. As a result of this work improved types of dry kilns were developed and standard kiln schedules⁵⁹ were formulated for lumber for general use and special schedules for aircraft lumber.⁶⁰ The latter are incorporated in the United States Army and the United States Navy Specifications.

In order to determine the degree of dryness of wood it was for many years necessary to cut a small piece from the end of the board and to weigh it both before and after oven drying at 212° F. Because of the time and material required in this procedure, the Laboratory designed and made an electrical-resistance type of moisture meter for the rapid determination of moisture content of wood.⁶¹ This instrument is widely used in industry to determine whether lumber meets moisture-content specifications.

Reducing moisture accumulation in walls and attics.—In modern dwelling construction a number of factors have resulted in an increased tendency for moisture to condense in walls and attics. Principal among these factors are tighter construction, heat-insulating materials, and artificial humidification during the heating season. Such condensation of moisture is particularly objectionable in frame dwellings because it may set up a decay hazard and may cause exterior paint failure or discoloration. Experimental work at the Laboratory revealed that certain types of building papers commonly referred to as vapor barriers are very effective in reducing the passage

⁵⁶ "The Identification of Furniture Woods," Miscellaneous Circular 66, U. S. Government Printing Office, Washington, D. C., November 1926, 25 cents.

⁵⁷ "Structure, Occurrence, and Properties of Compression Wood," 32 pp., Technical Bulletin 546, U. S. Government Printing Office, Washington, D. C., January 1937, 10 cents.

⁵⁸ "Causes of Brashness in Wood," Technical Bulletin 342, U. S. Department of Agriculture, Washington, D. C., January 1933. (Out of print.)

⁵⁹ "Kiln Drying Handbook," p. 43, Bulletin 1136, U. S. Government Printing Office, Washington, D. C., May 1929, 50 cents.

⁶⁰ "Manual for the Inspection of Aircraft Wood and Glue for the United States Navy," U. S. Navy Department, Washington, D. C., Revised Edition, 1940. (In press.)

⁶¹ "Determination of the Moisture Content of Wood by Electrical Means," General Electric Review, pp. 706-713, December 1931.

of vapor from the interior into and through a wall or ceiling. Such vapor barriers⁶² are now being widely used in the building industry.

Fire resistance of wood.—The Laboratory has participated in committee work of the American Society for Testing Materials, through which certain standards for testing the fire resistance of wood have been evolved. The Laboratory developed the firetube test⁶³ which is in use by many research workers, in this and foreign countries, for comparing the fire resistance of different treatments and coatings on woods but this test method has not yet been adopted in the United States as an official standard of any organization.

Wood preservatives.—The Forest Products Laboratory developed the details of the agar method⁶⁴ of studying the toxicities of wood preservatives against wood-destroying and wood-staining fungi. This method has been informally adopted in this country and is sometimes referred to as the American method, as opposed to wood block methods which are favored in Europe.

Paint.—The Laboratory has developed a classification and grading system⁶⁵ for house paint which it is believed will be very helpful in the selection of paints for different uses and in educating the users in how to obtain best results from various paints. The system has not yet been adopted as standard by any organization.

Glue.—The Forest Products Laboratory developed the plywood shear test⁶⁶ which has been used for many years in comparing the strength and water resistance of glue joints in plywood and which is used in U. S. Army Specifications, U. S. Navy Specifications, Federal Specifications, and other specifications covering the properties of casein glue. The laboratory also developed the block shear test⁶⁷ which is used for comparing the strength of glues or the quality of gluing in joints made with lumber. This test is included in U. S. Army Specifications and U. S. Navy Specifications for casein glue and is widely used as a research method of studying the technique of gluing.

Paper.—Many methods of testing papers for their physical properties have been developed at the Forest Products Laboratory (F. P. L.). A manual of standard test methods has been compiled over a period of years and methods are designated by F. P. L. numbers. In many instances these methods have been taken over by the Technical Association of the Pulp and Paper Industry (T. A. P. P. I.) and given their designation number, as indicated in parentheses following the F. P. L. designation. Some of these methods are: Tearing Resistance of Paper (F. P. L. No. 129 (TAPPI No. T414m-40); Fiber Composition of Paper (F. P. L. No. 3); Apparent Density of Paper (F. P. L. No. 123); Color of Paper (F. P. L. No. 137); Pore Volume of Paper (F. P. L. No. 131); Speck Count in Paper (F. P. L. No. 102); Void Volume of Paper (F. P. L.

⁶² "Condensation Problems in Modern Buildings," Conference on Air Conditioning, University of Illinois, Urbana, Ill., March 1939.

⁶³ "The Fireproofing of Wood," procedure of the National Fire Protection Association, May 1931.

⁶⁴ "A Suggested Toximetric Method for Wood Preservatives," Industrial and Engineering Chemistry, Analytical Edition, Vol. 2, p. 361, 1930.

⁶⁵ "A Proposed System of Classification for House Paints," Industrial and Engineering Chemistry, September 1937.

⁶⁶ "The Gluing of Wood," p. 69, Bulletin 1500, U. S. Government Printing Office, Washington, D. C., 1929, 25 cents.

⁶⁷ *Ibid.*, p. 71.

Nos. 90 and 91); and Volumetric Composition of Paper (F. P. L. No. 163).

Pulp.—A large number of methods for the evaluation of the chemical properties of pulps have been developed at the Forest Products Laboratory and has been adopted by the Technical Association of the Pulp and Paper Industry. Some of these are: Isolation of Cellulose, F. P. L. No. 33 (TAPPI No. T201m-37); Chlorine Consumption of Pulp, F. P. L. No. 35 (TAPPI No. T202m-40); Alpha Cellulose in Pulp, F. P. L. Nos. 37 and 38 (TAPPI No. T203m-40); Forming and Testing of Pulp Sheets, F. P. L. No. 95 (TAPPI No. T205m-40); Water Solubility of Pulp, F. P. L. No. 17 (TAPPI No. 207m); Moisture in Pulp by Toluene Method, F. P. L. No. 13 (TAPPI No. T208m); Methoxyl Groups in Pulp, F. P. L. No. 43 (TAPPI No. T209m); One Percent Alkali Solubility of Pulp, F. P. L. No. 19 (TAPPI No. T212m-40); and Quantitative Determination of Lignin, F. P. L. No. 31.

Methods for the physical evaluation of pulps developed at the Laboratory consist of the following: Pebble Mill Method for Strength Determination of Pulps, F. P. L. Nos. 98 and 101; Consistence of Pulp, F. P. L. No. 103; and Density of Fiber Substance, F. P. L. No. 100.

Pulpwood.—A method for the physical evaluation of pulpwood was developed in 1928 and subsequently adopted and revised by the Technical Association of the Pulp and Paper Industry as their method T7p-36 in 1936.

Other Forest Products Laboratory test methods associated with the above for chemical evaluation of pulpwood are: Water Solubility of Wood, F. P. L. Nos. 15 and 17 (TAPPI No. T1m); Methoxyl Groups in Wood, F. P. L. No. 43 (TAPPI No. T2m); Moisture in Wood Chips and Sawdust by Toluene Method, F. P. L. No. 13 (TAPPI No. T3m); One Percent Caustic Soda Solubility of Wood, F. P. L. No. 19 (TAPPI No. T4m-40); Other Solubility of Wood, F. P. L. No. 25 (TAPPI No. T5m-40); Alcohol-Benzene Solubility of Wood, F. P. L. No. 27 (TAPPI No. T6m-40); Quantitative Determination and Lignin, F. P. L. No. 31.

Score tester.—A score tester⁶⁸ that applies a combined tension, tearing, and bending test was developed at the Laboratory for studying the strength of the scored edges of fiber boxes. The scored edges of a fiber box are the weakest part of the container in resisting rough handling, and the machine has been used by fiber box manufacturers to determine the most efficient design of scores or creases to use. There has also been some interest recently in using this machine for determining the relative strength of different methods used in joining the ends of the body piece of boxes.

Tensile test for paperboard and paper.—A standard technique⁶⁹ has been developed for determining the stress-strain relationship under tension of paper and paperboard used in making solid fiber and corrugated fiberboards. The method makes use of an optical strain gage to measure stretch (strain) and the test is conducted under carefully controlled humidity conditions. With the results obtained it is possible to apply engineering principles in correlating

⁶⁸ Paper Trade Journal, pp. 59-60, January 1928.

⁶⁹ "A Study of Corrugated Fiberboard and Its Component Parts as Engineering Materials," by T. A. Carlson, Fiber Containers, p. 22, July 1939.

the strength of the paper and paperboard with the strength of built-up corrugated board.

Static bending test for corrugated and solid fiberboard.—A bending test technique⁷⁰ has been developed for determining the strength and stiffness of corrugated and solid fiberboard. Interest in this test is growing. It is being used by several laboratories and box manufacturers and will probably be adopted as a standard method of testing by the American Society for Testing Materials

Standards.

Softwood yard lumber.—Softwood yard lumber, which comprises about two-thirds of the yearly cut, was produced by several widely separated groups of lumbermen under specifications that differed considerably with regard to grades, sizes, and nomenclature. The Forest Products Laboratory in cooperation with these groups and other governmental agencies succeeded in bringing about a considerable degree of simplification and uniformity under provisions now embodied in American Lumber Standards for Softwood Lumber.⁷¹ Yard lumber specifications are now almost wholly in accord with these standards which have been accepted by the Government and by dealers and purchasers in general.

Softwood factory lumber.—Specifications for softwood factory lumber varied to a degree that caused frequent misunderstanding and confusion. Following a series of conferences, at which the lumber trade, the Forest Products Laboratory, and other governmental agencies were represented, agreement was reached on provisions that brought about much more uniform specifications. These provisions are now part of American Lumber Standards for Softwood Lumber and current specifications are in accord with these standards.

Standard hardwood lumber grades.—In cooperation with various lumber producing and consuming organizations the Laboratory worked on standards⁷² for quality classification of hardwood lumber that resulted in the adoption by the trade of one set of specifications that over a period of 12 years has effected not only more harmonious relations between buyers and sellers than existed previously but also more economical use of material.

Design stresses for structural timber.—In addition to limiting defects in timber to give assurance that a definite proportion of the strength of clear material remains, it is also necessary to know what working stresses may be assigned. The Forest Products Laboratory has derived safe working stresses for the different species of native woods. The safe working stresses are based on the properties of the wood in relation to the variability, duration of stress, the condition of service, and grade of material. Working stresses⁷³ have been assigned for extreme fiber in bending, compression perpendicular to grain, compression parallel to grain, horizontal shear, and modulus of elasticity.

⁷⁰ "Bending Tests of Corrugated Boards and Their Significance," by T. A. Carlson, *Fibre Containers*, March 1940; *Paper Trade Journal*, p. 123, February 1940.

⁷¹ "Lumber: Simplified Practice Recommendation R16-39," National Bureau of Standards, U. S. Government Printing Office, Washington, D. C., 1940, 20 cents.

⁷² "Rules for the Measurement and Inspection of Hardwood Lumber," National Hardwood Lumber Association, Chicago, Ill.

⁷³ "Wood Handbook," U. S. Government Printing Office, Washington, D. C., September 1935, 35 cents.

Grading of structural timbers.—To permit the more efficient use of timber and also to enable the designing of timber structures with assurance of safety, structural grading rules in which defects are limited in accordance with their effect on strength were developed at the Laboratory. These have formed the basis for the grading rules of structural timber of various lumber associations and other organizations to which definite working stresses could be assigned.⁷⁴

A similar method of grading has recently been developed for low-grade dimension stock which is largely used in house construction. These rules will permit the establishment of rules for low-grade stock so that definite working stresses can be assigned.

Specifications and stresses for wood poles.—The Laboratory is represented on and has worked with an American Standards Association sectional committee concerned with specifications and stresses for wood poles. Northern white cedar, western red cedar, American chestnut, Douglas-fir (creosoted) have been considered. The standards⁷⁵ have been widely accepted by pole producers and users and by regulatory bodies.

Strength values of various woods for use in airplane design.—As a basis for the design of wooden aircraft parts and members, a table of strength values of the different aircraft woods was prepared by the Laboratory. The special airplane design values take into account the quality of the material and its variation, provide a minimum density requirement, and include a consideration of the special effect of duration of stress. The design of data serve as standard⁷⁶ for the design of wooden aircraft members and parts in the United States.

Army and Navy Specifications for aircraft woods.—Specifications for various woods and plywood used in airplane construction have been issued by the different airplane divisions of the Army and Navy. Because of the critical requirements for woods used in airplane construction, the Laboratory has taken a major part in the preparation of these specifications for aircraft woods.

Aircraft airworthiness.—The Civil Aeronautics Authority has recently prepared regulations pertaining to the selection of airplane woods and manufacture of the finished wood parts. These regulations⁷⁷ are based largely on information obtained from the Laboratory.

Navy manual for inspection of aircraft wood and glue.—To aid the United States Navy Department in the proper selection, use, and standardization⁷⁸ of aircraft wood and glue the Laboratory in 1928 prepared a rather complete manual for use by inspectors of naval aircraft and naval material, assembly and repair officers of operating and maintenance organizations, and for instructional purposes. The Laboratory has recently completed revision of this manual to include all the latest information.

Building codes.—A large proportion of the lumber manufactured is used in the building industry. The satisfactory and economical

⁷⁴ "Guide to the Grading of Structural Timbers and the Determination of Working Stresses," 27 pp., Miscellaneous Publication 185, U. S. Government Printing Office, Washington, D. C., February 1934, 5 cents.

⁷⁵ "American Standards for Ultimate Fiber Stresses of Wood Poles," A. S. A. 05a-1933, American Standards Association, New York City, 1933.

⁷⁶ "Wood in Aircraft Construction," Aircraft Design Data Note 12, Bureau of Construction and Repair, U. S. Navy Department, Washington, D. C.

⁷⁷ "Aircraft Airworthiness," Report No. 15, Civil Aeronautics Authority, Washington, D. C., January 1940.

⁷⁸ "Manual for the Inspection of Aircraft Wood and Glue for the U. S. Navy," U. S. Navy Department, Washington, D. C., Revised Edition, 1940. (In press.)

use of this lumber is dependent largely upon reasonable and adequate building codes and regulations. The United States Department of Commerce issued some years ago recommended minimum requirements for small dwelling construction which have been widely used in preparing or revising building codes.⁷⁹ The Laboratory had the major part in the preparation of the section of the publication pertaining to wood. The Laboratory is represented on the Building Code Correlating Committee of the American Standards Association which is now actively engaged in preparing a new code. The Laboratory and the National Lumber Manufacturers Association have accepted joint sponsorship of the Sectional Committee on Building Code Requirements for Wood of the American Standards Association. A preliminary draft for these requirements for submission to the sectional committee is now being prepared by the Laboratory.

The Laboratory has participated also in the development of the specifications covering methods of applying preservatives prepared by the American Wood Preservers' Association, the Federal Government, the National Door Manufacturers' Association, and others.

Naval stores.—As the result of extensive tests, approximately $\frac{1}{4}$ -inch chipping has been set up by the Laboratory as the standard⁸⁰ height per week to chip trees in naval stores operations. Increased yields and profits per tree, combined with better health and growth of the trees turpented result from the use of the $\frac{1}{4}$ -inch chipping. Low chipping is now applied to both Government and privately owned timber.

Moisture content of wood.—In order that wood may give satisfaction in use, it is essential that attention be given to the factor of moisture content. As a result of work done by the Laboratory, the Southern Pine Association⁸¹ and the West Coast Lumbermen's Association⁸² have included moisture-content limitations in grading rules for southern pine and Douglas-fir, respectively.

Longitudinal shrinkage.—Longitudinal shrinkage from the green to the oven-dry condition of 0.3 of 1 percent has been set up as the upper limit for normal wood and any shrinkage above that is considered as being due to some abnormality of the wood. This limit is based on a large number of measurements of wood of normal and abnormal structure.

A minimum of not fewer than four annual rings of growth per inch of radius has been set up for the southern pines if excessive crooking due to uneven longitudinal shrinkage is to be avoided in otherwise normal wood. This was based on the results of numerous tests on the longitudinal shrinkage of southern pine wood of different rates of growth.

Hardwood log grades.—In spite of the long need for accurate and uniform methods of grading hardwood logs the log trade has made little progress in the development of standard procedure. During the past year the Laboratory has taken the initiative and has

⁷⁹ "Recommended Minimum Requirements for Small Dwelling Construction," Building and Housing Publication No. 18, National Bureau of Standards, U. S. Government Printing Office, Washington, D. C., 1932, 10 cents.

⁸⁰ "More Turpentine, Less Scar, Better Pine," 4 pp., Leaflet 83, U. S. Government Printing Office, Washington, D. C., 5 cents.

⁸¹ "Standard Specifications for Southern Pine Lumber Conforming to American Lumber Standards," Southern Pine Association, New Orleans, La., July 1933.

⁸² "Standard Grading and Dressing Rules for Douglas-fir, Sitka Spruce, West Coast Hemlock, Western Red Cedar; American Lumber Standards Sizes and Grades," West Coast Lumbermen's Association, Seattle, Wash., July 1934.

gone forward with basic studies in support of a new approach to quality classification of logs. When the log-buying program of the Northeastern Timber Salvage Administration was initiated in the fall of 1938 the Laboratory submitted its tentative draft of log grades, and with modifications it was adopted as the basis for log purchases. Two other log-buying agencies have adopted the principle suggested by the Laboratory. The results of studies to date give promise of a set of log grades that will be an acceptable standard for hardwood logs regardless of species or source.

Ladder code.—The Forest Products Laboratory, through its representation on the American Standards Association Sectional Committee on Ladders, took an active part in the preparation of a safety code for the construction, care, and use of ladders. This code governs safe practice for ladders, and has been adopted as standard⁸³ by the American Standards Association.

Terms for describing wood.—In discussing the properties and characteristics of different species of wood it is often desirable to describe them broadly by means of descriptive terms, rather than by quoting precise numerical values. There has been a long-felt need for precise terms to describe the various physical and mechanical properties of wood and to meet this need the Laboratory has developed a series of standard terms⁸⁴ for describing wood. Ten terms have been set up for each property, thus giving a relatively wide range of expression. The general use of standard terms will result in more precise evaluation of the various important physical properties of wood as well as eliminate the confusion resulting from the use of indiscriminate or uncorrelated terms.

Tool handles.—The Laboratory has from time to time prepared material for use in the formulation of specifications⁸⁵ for ax handles, pike poles, peavy handles, and so forth, of such species as ash and hickory. This material has been used by the National Bureau of Standards in the preparation of Simplified Practice Recommendations, by the Federal Government for purchase specifications, and by various manufacturers.

Federal Specifications for boxes.—The Laboratory has taken an active part in the preparation of Federal Specifications for seven types of wood and fiber boxes: Nailed and Lock-Corner (NN-B-621a); Wire-bound (NN-B-631a); Cleated-Plywood Construction (NN-B-601); Cleated-Fiberboard (NN-B-591); Fiber, Solid (LLL-B-636a); Fiber, Corrugated (LLL-B-631a).

Nailing schedule.—One of the developments resulting from the study of wooden boxes and crates is a nailing schedule⁸⁶ which gives the sizes and spacings of nails to use with different thicknesses of lumber. The schedule involves a classification of container woods into four groups according to nail-holding ability and other properties. All of the species within each group can be used interchangeably as far as the thickness of lumber and the size and spacing of nails are concerned. The sizes and spacings of nails recommended

⁸³ "Safety Code for the Construction, Care, and Use of Ladders," A14-1935, American Standards Association, New York City, 1935.

⁸⁴ "Standard Terms for Describing Wood," Journal of Forestry, No. 1, January 1938.

⁸⁵ "Ash Handles: Simplified Practice Recommendation R76-40," "Hickory Handles: Simplified Practice Recommendation R77-27," National Bureau of Standards, U. S. Government Printing Office, Washington, D. C., 1940, 1928. 5 cents each.

⁸⁶ "Principles of Box and Crate Construction," pp. 71, 107, Technical Bulletin 171, U. S. Government Printing Office, Washington, D. C., 1930, 55 cents.

for each group are based on the thickness of the lumber and the relation between thickness of the piece through which the nail passes and the thickness of the piece holding the point of the nail. The classification of species was first made in 1913, and this classification together with the nailing recommendations have been widely accepted by practically all organizations interested in wooden containers.

Plywood.—The increasing and wider use of plywood for construction purposes prompted the formulation of a Commercial Standard for Douglas-fir plywood. The Laboratory assisted in the preparation of this Commercial Standard⁸⁷ which covers moisture-resistance requirements, sizes, tolerances, inspection, manufacturing details, limitation of defects, and so forth.

Glue.—The Forest Products Laboratory participated in developing a Federal Specification⁸⁸ for animal glue.

Wood preservatives.—The Laboratory has actively participated in the formulation of the standard⁸⁹ specifications of the American Wood Preservers' Association for wood preservatives, particularly zinc chloride and various creosote oils and in the preservative specifications of the National Door Manufacturers' Association. It has also assisted in the development of Federal Specifications covering these preservatives and several proprietary preservatives.

Softwood log grades.—Quality classification of logs has been an important feature in all the Laboratory's logging and milling studies. An attempt has been made to grade logs under standard procedure, but no intensive studies of softwood log grades have been made comparable to the effort being devoted to hardwood grades. However, the entire softwood log-buying program of the Northeastern Timber Salvage Administration has been on the basis of grades set up as standard for purchases of hurricane-thrown timber. These grades were built up around grades that had previously been developed by the Laboratory for use in logging and milling studies of New England white pine. In use they have proved satisfactory in New England, and it is probable that with further development they will be made applicable to white pine throughout its region of growth.

Paper and pulp.—No specific paper and pulp standards have been promulgated by the Forest Products Laboratory, but indirectly technical data and recommendations obtained at the Laboratory have greatly influenced the purchase and use of the various pulpwoods to yield satisfactory and required pulps for various papers.

Pulpwood measuring standards.—The pulpwood industry in the South follows no standard method of measuring pine pulpwood, most of which is delivered in a green condition with the bark on shortly after felling. Pulpwood bolts vary from 48 to 66 inches in length, and the unit of overall measurement varies from 128 to 160 cubic feet. The Forest Products Laboratory, sensing the merit of using weight as a measure for green pulpwood, is engaged in an intensive study of the relation of weight to overall space occupied, and to solid volume of wood. The objective of the study is to obtain facts which it is hoped will reveal the practicability of weighing,

⁸⁷ "Douglas-fir Plywood: Commercial Standard CS45-36," National Bureau of Standards, U. S. Department of Commerce, Washington, D. C., 1939.

⁸⁸ "Federal Specification CG-451," U. S. Government Printing Office, Washington, D. C., May 1931, 5 cents.

⁸⁹ "Manual of the American Wood Preservers' Association," American Wood Preservers' Association, Washington, D. C., not dated.

and will make possible one standard of measurement, a standard not based on scaling judgment but upon weighing scales which are mechanical in operation. A standard of this type has particular merit in that the cost of producing pulpwood varies with weight rather than with space occupied.

House coverage.—The Laboratory prepared for the Federal Housing Administration a description of the minimum quality board suitable for coverage (subfloors and sheathing) in house construction. The Federal Housing Administration plans to use the description as a basis for judging the suitability of lumber associations' grades as described in standard grading rules. The method used in part as specifying acceptable quality by grade name or number has proved unsatisfactory because of the determination of comparable grades being highly controversial and grades of the same name or number differing widely in quality.

Cooperage.—Specifications for staves and heading are drawn and administered by the Associated Cooperage Industries of America. The Laboratory acts as consultant for the industry furnishing information on the effect of kiln drying, defects, size, and number of staves on the strength and serviceability.

Springboards.—The only specifications for springboards are those contained in the National Collegiate Athletic Association's "Swimming Guide." Those specifications were drawn for one-piece boards although the rules proper do not prohibit the use of laminated boards. Considerable trouble has developed in obtaining one-piece boards of satisfactory quality because of size and exacting requirements of use. The Laboratory as a result of experiments with laminated boards has furnished manufacturers with specifications for the construction, protection, and mounting of laminated boards. These specifications are used by the industry in the construction of boards, but have not been adopted as standard. There are no recognized standard specifications for either one-piece or laminated boards.

Some organizations promulgating standards with which the Forest Products Laboratory cooperates:

- American Paper and Pulp Association.
- American Society of Mechanical Engineers.
- American Society for Testing Materials.
- American Standards Association.
- American Wood Preservers' Association.
- Associated Cooperage Industries of America.
- National Collegiate Athletic Association.
- National Door Manufacturers Association.
- National Fire Protection Association.
- National Hardwood Lumber Association.
- National Lumber Manufacturers' Association.
- Northeastern Timber Salvage Administration.
- Southern Pine Association.
- Technical Association of the Pulp and Paper Industry.
- West Coast Lumbermen's Association.
- United States Department of the Treasury (Procurement Division).
- United States War Department.

United States Department of Justice (Federal Bureau of Investigation).
 United States Navy Department (Bureau of Aeronautics).
 United States Department of Commerce (National Bureau of Standards).
 United States Department of Labor (Bureau of Labor Standards).
 Civil Aeronautics Authority (now under United States Department of Commerce).
 Tennessee Valley Authority.
 Federal Housing Administration.

Some Government organizations using standards for forest products developed with the Laboratory's assistance:

Bureau of Agricultural Chemistry and Engineering.
 Bureau of Engraving and Printing.
 National Bureau of Standards.
 Civil Aeronautics Authority.
 Federal Bureau of Investigation.
 Federal Housing Administration.
 Forest Service.
 Government Printing Office.
 National Advisory Committee for Aeronautics.
 United States Navy Department.
 Tennessee Valley Authority.
 United States War Department.

OFFICE OF EXPERIMENT STATIONS

The Office of Experiment Stations, United States Department of Agriculture, administers Federal funds provided by the Hatch, Adams, Purnell, and supplementary acts, and title I of the Bankhead-Jones Act of 1935 for the support of research in agriculture and home economics by experiment stations in the several States and Alaska, Hawaii, and Puerto Rico; it also has immediate supervision of the experiment station of the United States Department of Agriculture in Puerto Rico. This Office examines in detail the work and expenditures of the State experiment stations to ascertain whether the Federal funds for their support are used and accounted for in accordance with the Federal acts and rulings, and reports annually to Congress on the work and expenditures of the experiment stations, as required by law.

The Office of Experiment Stations aids in coordinating the research of the United States Department of Agriculture and in coordinating the research of the Department with that of the State, Alaskan, Hawaiian, and Puerto Rican agricultural colleges and experiment stations. The Office collects and disseminates information and gives such advice and assistance as will best promote the efficiency of the experiment stations and the effective coordination of their work with that of the Department, including the issuance of the Experiment Station Record which gives a current review of progress and results of scientific research conducted by experiment stations and other agencies for the improvement of agriculture and rural life.

To administer properly the functions and responsibilities which devolve upon it, the Office of Experiment Stations maintains a record of the projects selected and developed by the agricultural experiment

stations in accordance with the appropriation acts supporting the respective projects. It also maintains records of all experiments being conducted at the experiment stations. There are slightly more than 3,000 Federal grant projects in process at the agricultural experiment stations and, including the Federal grant projects, approximately 8,500 projects, of which the Office has a record, as in process. The projects in process at the experiment stations other than the Federal grant projects are supported from other than Federal funds. However, the Office maintains a summary record concerning them.

Research at the agricultural experiment stations covers a wide field of investigation. For current administrative purposes the Office has divided the work under 17 general categories which may be used to indicate the general scope and field of their investigations and the research relating to standards and their development. These general categories are as follows:

Subject classification for Adams, Purnell, and Bankhead-Jones projects:

Agrotechny, agricultural engineering, agricultural economics, animal production, dairying, entomology, and zoology, field crops, forestry, genetics, home economics, horticulture, pastures and ranges, plant pathology, plant physiology, rural sociology, soils and fertilizers, veterinary.

An important part of the research being conducted by the experiment stations refers to or provides a basis for standards. Some samples of this research are shown, to indicate their contribution to standards and standards development.

A study on performance during wear of women's and children's silk, rayon, and cotton wearing apparel fabrics. A cooperative study participated in by States in the northeast region.

Selection, care, and wearing qualities of women's hosiery. Montana Agricultural Experiment Station.

Effect of sunlight on the strength and color of cotton fabrics. Texas Agricultural Experiment Station.

A study of values sought and practices followed by consumers in the purchase of "silk" street dresses and silk yard goods. Minnesota Agricultural Experiment Station.

Some body measurements of Texas school children. Texas Agricultural Experiment Station.

Standardization of home-canned tomatoes and tomato juice. Florida Agricultural Experiment Station.

Degree of fatness and tenderness and flavor in lamb. Texas Agricultural Experiment Station.

A study of the factors affecting grades, standards, and quality of mint oil and their relation to price of mint oil. Indiana Agricultural Experiment Station.

Grading, standardizing, and marketing Indiana peonies. Indiana Agricultural Experiment Station.

The efficient pouring utensil. Rhode Island Agricultural Experiment Station.

The accuracy of pressure gages used on household steam pressure cookers. Nebraska Agricultural Experiment Station.

Performance analysis of selected types of kerosene stoves. Maine Agricultural Experiment Station.

RURAL ELECTRIFICATION ADMINISTRATION

The Rural Electrification Administration, United States Department of Agriculture, in performing the functions authorized by Congress in the making of self-liquidating loans to finance the construction of rural electric distribution systems, the construction of electric generating plants, the installation of wiring and plumbing, and the acquisition of electric appliances, has been concerned with the development of physical standards as a basis for providing economical and dependable service for a sufficient period to assure the self-liquidation of loans.

There has been a general recognition of the need for standards covering all physical facilities financed with funds loaned by the Rural Electrification Administration. The need for specific standards was recognized when procedures were established for financing the following facilities for generation, distribution, or utilization of electricity:

1. Rural electric distribution systems, poles, and electric meters.
2. Electric generating plants.
3. Wiring installations.
4. Plumbing installations.
5. Electric brooders.
6. Electric irrigation pumping equipment.
7. Electric feed grinders.
8. Portable electric lamps.
9. Electric cold storage and processing plants.

In the initial stages of the development of procedures for financing these facilities it was decided to undertake the development of standards for these facilities.

Procedure in Formulating Standards.

To secure data for use in the formulation of these standards and for background information, specialists trained and experienced in the requirements for each of the facilities have studied all pertinent available literature, standards, data, and research papers.

Agreements upon the scope of standards are determined by conferences with technical specialists, legal counsel, and administrative directors. The scope is largely determined by restrictions in Congressional authorizations.

The development of standards is usually performed by specialists directly concerned with each set of facilities. If further research is necessary to secure additional data essential to the formulation of any standard, arrangements are made for such research with cooperating manufacturers or research agencies. In preparing the standard a number of drafts may be required to be submitted for criticism, discussion, and revision; individuals and organizations concerned with the standard are invited to participate. The adoption of the standard is determined by the specialists and administrative director on the basis of acceptability to these individuals and organizations. Formal approval of any standard is given by the administrative director whose functions and responsibilities are most closely related to the application of the standard.

The respective standards are usually included in documents such as contract forms and instructions for procedure in carrying through

a project, in which the standards are essential in furnishing, constructing, or installing facilities.

The use of standards is promoted by the requirement that the advance of funds under loan contracts is conditional upon compliance with such standards.

Inspection and Testing Procedure.

Inspection and testing to determine compliance with the standards is performed in various ways. In the usual procedure, compliance with basic design and performance standards is checked by staff specialists who determine that certain designated units comply with the standards. Inspection of separate items of equipment is made by engineer inspectors of the Rural Electrification Administration to determine compliance with standards of quality. Compliance with construction and installation standards of completed facilities is determined by field engineers of the Administration. Inspection of wiring installations is made by qualified inspectors acceptable to the Administration. Inspection of plumbing installations is made by State or county health authorities or by other inspectors acceptable to the Administration.

Rural Electric Distribution Systems, Poles, and Electric Meters.

Early in the work of the Rural Electrification Administration it was found that rural electrification in the United States was being impeded by the high cost of line construction and by high rates. In the case of rural lines existing in 1935, these two obstacles went together, since most of those lines belonged to private utilities which served urban and rural areas together and which used the same heavy construction in the open country that they used in thickly settled communities.

By utilizing the new high-strength conductors to increase span length, by eliminating the cross-arm on two-wire lines and otherwise simplifying construction, and by standardizing equipment, the Rural Electrification Administration has greatly reduced the cost of building rural lines.⁹⁰ By adapting the principle of mass production in the building of rural electric lines, the Administration has aided in the reduction of costs, so that the average cost of "REA-financed" lines is now below \$825 per mile including overhead expenses of the project, contrasted with the \$1,200 to \$2,000 generally prevailing prior to 1935. Inasmuch as interest and amortization payments form principal factors in deciding the rates that will enable an REA-financed power system to exist, the developments just outlined immediately increased the area into which self-liquidating electric power lines could be run. Adoption of the principle of "areal coverage," that is, designing and building a rural electric system as a unit so that it will reach as many as possible of the farms in a given area instead of stringing lines haphazardly along the main roads, has also increased the number of farm families that can be served economically.

The dominant type of borrower from the Rural Electrification Administration is the farmer's cooperative.

⁹⁰ "Construction Contract for Rural Electrification Distribution Project," ENG-B-1R3, U. S. Government Printing Office, Washington, D. C., September 1939, \$1.

The adoption of self-reading of meters by many cooperatives often cuts the cost of meter-reading from 25 cents per meter to 3 cents. On systems using the new cyclometer type meter, members are preparing their own electric bills to an increasing extent.

All distribution and transmission lines financed by the Administration must comply with the National Electrical Safety Code.

Electric Generating Plants.

In those instances where studies showed that a generating plant would form the most economical solution of the power problem, the Rural Electrification Administration has lent money for construction of such plants. The result has been a reduction in the cost of wholesale power to borrowers, outside the Tennessee Valley Authority area, to a Nation-wide average of 1.2 cents per kilowatt-hour. Rates below 1 cent have been obtained in many parts of the country.

Wiring Installations.

The Rural Electrification Administration has established standards for rural wiring. All wiring on properties to be served from an REA-financed line must be installed in accordance with the National Electrical Code of the National Board of Fire Underwriters and any state or local laws in effect at the time of installation. The specifications of the Rural Electrification Administration cover every detail of wiring, whether in houses, barns, or other buildings. They include standards of identity for wiring materials. Diagrams indicate how all installations and meter socket connections should be placed.⁹¹

When it enters into a loan contract with a borrower, the Administration stipulates that no consumer may be connected to an REA-financed line until a qualified inspector, independent of the borrower and approved by the Administration, has inspected the wiring and certified that it complies with the National Electrical Code and with any existing State or local laws or regulations.

Plumbing Installations.

The Rural Electrification Administration has established standards for plumbing installations. These standards are compulsory only insofar as they affect equipment to be financed through a loan from the Administration. They provide criteria, however, which aid the consumer in deciding whether the equipment that he considers buying is likely to give satisfactory and economical service.

Plumbing materials, for which specifications have been prepared, include water pumping and storage equipment; water supply faucets; and plumbing fixtures including water closets, lavatories, baths, sinks, and laundry tubs. The minimum requirements for motor and pump capacity in gallons per hour, and maximum water lifting feet and minimum horsepower capacity of electric motors are given. Specifications were also prepared for electrical water heating and storage equipment, water service suction piping, water service pressure piping, water distribution piping, surface drains, house drainage and vent piping, yard sewer piping, septic tanks, seepage drains, and standard piping materials including copper, clay, iron, and brass.

⁹¹ "Standard-R.E.A. Specifications for Wiring," 12 pp., REA-UT-8R4, Rural Electrification Administration, Washington, D. C., April 21, 1939, mimeographed.

Specifications were also set up for plumbing installations of each of these materials. For plumbing, as well as for wiring, a bidding procedure is used whereby dealers or manufacturers are permitted to bid on specifications; before bidding each manufacturer has to give evidence that his product meets these specifications.⁹²

Electric Brooders.

Electric brooder standards⁹³ established by the Rural Electrification Administration include: (1) Capacity rating, (2) wattage, (3) materials, and (4) performance. These standards enable the buyer to select satisfactory brooders that will be inexpensive to operate. The capacity rating indicates the number of chicks that can be raised to the end of the brooding season without crowding, rather than the number of day-old-chicks that can be accommodated. Wattage sufficient to keep the chicks under the hover warm under all climatic conditions is specified. Durability of materials and efficiency of insulation are also specified. Data on performance, economy, and reliability of operation are included in these standards. Besides establishing standards to guide buyers in selecting electric brooders suitable to their needs, the Administration has prepared detailed plans and specifications by which farmers can build satisfactory electric brooders in home workshops.

Electric Irrigation Pumping Equipment.

Specifications have been prepared for deep well turbine pumps and electrical equipment and wiring incidental to the operation of such pumps.⁹⁴ The specifications include both structural and performance requirements. The structural specifications cover materials, engineering design, construction, and workmanship used in connection with pumps, motors, and controls. The wiring of these pumping plants is subject to standards similar to those set forth in the wiring specifications.

Performance specifications are based on an evaluation of over-all plant efficiency (wire-to-water). Customarily the only guaranty a buyer is given is that the pump delivers a discharge pipe full of water. The power required to deliver this pipe full of water is seldom given consideration. These specifications stress economy of pumping water.

Feed Grinders.

Structural and performance standards for electric feed grinders⁹⁵ eligible for financing by the Rural Electrification Administration were established. Their establishment was made necessary because

⁹² "Plumbing: Contract Forms and Specifications," 36 pp., REA-UT-9R, Rural Electrification Administration, Washington, D. C., July 1939, mimeographed.

⁹³ "A Campaign Plan for More Electric Brooders in Your Own Community: Appendix I, Specifications Approved by the Rural Electrification Administration of United States of America for Hover Type Electric Poultry Brooders," pp. 20-29, Rural Electrification Administration, Washington, D. C., not dated, mimeographed.

⁹⁴ "Pumping Irrigation Water with Electric Power. A Manual of Instructions, Forms, and Specifications Pertaining to Financing, Purchase, and Installation of Electrically Operated Irrigation Pumping Equipment," Form UT-77, Rural Electrification Administration, U. S. Department of Agriculture, Washington, D. C., April 1940, mimeographed.

⁹⁵ "A Coordinated Program to Develop the Use of Electric Feed Grinders on Electrified Farms: Appendix 'A,' Specifications Adopted by the Rural Electrification Administration of United States of America for Feed Grinder Equipment and Installation Prerequisite to R. E. A. Financing," 9 pp., sec. I, Rural Electrification Administration, Washington, D. C., December 15, 1939, mimeographed.

"Manufacturers' Offers for Demonstration Hammer Mills (January 1940): Specifications, Feed Grinders," 9 pp., Rural Electrification Administration, Washington, D. C., January 1940, mimeographed.

most feed grinders suitable for electrical operation are made by small concerns. No adequate standards had been set up by the industry itself. The structural specifications cover materials, engineering design, construction, and workmanship. Specifications for metals, gray iron castings, high-test gray iron castings, malleable iron castings, black and zinc-coated iron and steel, and cable and conduit fittings conform to Federal Specifications insofar as these are applicable.⁹⁶ Performance specifications, set up as a result of widely varying performance claims, call for ratings of capacity and power consumption based on specified grains of specified moisture content ground to a specified fineness. These specifications benefit the farmer and guide the industry in producing units that meet the farmer's needs; they also guide the farmer in selecting an electric feed grinder designed to meet his special requirements. They provide a desirable load for the electric power system.

The Rural Electrification Administration is encouraging farmers served by REA-financed electric lines to pool their orders for electric feed grinders, as well as electric brooders and electric irrigation pumping equipment, in order to obtain the discounts customarily allowed in quantity purchases.

Portable Electric Lamps.

A special program was devised by the Rural Electrification Administration for providing farmers with lamps built in accordance with the Illuminating Engineering Society (I. E. S.) specifications. The manufacturers agreed to sell two I. E. S. lamps, one table model and one floor model, through regular distribution channels at a special price considerably lower than that which the farmer would have to pay for the same items if he bought them separately. These lamps have been approved for financing by the Rural Electrification Administration.

Electric Cold Storage and Processing Plants.

Specifications have been prepared for refrigerated food storage and processing plants.⁹⁷ These specifications include requirements for (1) design, (2) construction, and (3) operation supervision. The specifications for design cover all materials and equipment which will be included in the completed plant. The specifications for construction deal with such items as time and manner of construction, supervision and inspection, and defective workmanship and materials. The specifications for operation supervision cover selection, training, and compensation of operator, and supervision of operations.

Educational Program.

The Rural Electrification Administration has issued numerous pamphlets and folders encouraging productive use of electricity on the farm and in the farm home. It has a small staff of specialists in farm and farm home application of electricity who conduct demonstrations and advise consumers in areas in which R. E. A. borrowers operate electric power systems. Members of its staff have collaborated with the Office of Education, Federal Security Agency,

⁹⁶ "Federal Specifications QQ-M-151a, QQ-I-656, QQ-I-666, QQ-I-696, W-F-406," U. S. Government Printing Office, Washington, D. C., 5 cents each.

⁹⁷ "Refrigerated Food Storage and Processing Plant," pp. 5-19, Rural Electrification Administration, Washington, D. C., not dated, mimeographed.

in providing the content of a booklet on home-made electrical equipment now being prepared for use by vocational agriculture teachers.⁹⁸ Because of the preponderance of cooperatives among R. E. A. borrowers, the Federal rural electrification program is large a cooperative, and hence a consumers' program. The activities of the Rural Electrification Administration are motivated by a feeling that in order to be of the greatest benefit to the farmer, electricity must be able to pay its way on the farm. Hence R. E. A. is laying increasing emphasis on helping farmers to obtain suitable equipment at reasonable prices and on teaching them to use that equipment most effectively.

SOIL CONSERVATION SERVICE

The Soil Conservation Service, United States Department of Agriculture, uses trucks and other heavy equipment in the operation of its projects. The Service found that the applicable specifications used by other governmental agencies were too general. Consequently, special specifications were prepared by its engineering staff. These specifications must be approved by the Technical Advisory Board of the Department. In cases where the Technical Advisory Board has already established specifications for these types of equipment these specifications are used by the Soil Conservation Service.

SURPLUS MARKETING ADMINISTRATION

The Fruit and Vegetable Division of the Surplus Marketing Administration, United States Department of Agriculture, uses extensively marketing grades and standards which have been promulgated by the Agricultural Marketing Service, or by the States where no United States Standards apply or where modifications of the United States Standards in line with the State standards is deemed desirable.

Many of the programs under marketing agreements and orders provide for regulating shipments of specified agricultural commodities on the basis of grade and/or size.

Marketing agreements which use grade or size standards are—

- Walnuts.
- Watermelons.
- Colorado peas, lettuce, and cauliflower.
- Utah onions.
- Oregon fresh prunes.
- Florida citrus fruits.
- California Bartlett pears, plums, and Elberta peaches.
- Mississippi tomatoes.
- Beurre-Hardy pears.
- Tokay grapes.
- Colorado peaches.
- Fall and winter pears.
- Colorado onions.
- Utah peaches.

⁹⁸ "Building Electrical Equipment for the Farm." Vocational Division, Office of Education, Federal Security Agency. Washington, D. C. (In press.)

Under the legislative authority of the Agricultural Marketing Agreement Act of 1937, marketing agreements and orders issued by the Secretary of Agriculture may provide for limiting grade or size which in operation may mean the prohibition of shipment of certain grades or sizes of the commodity.

Many of the marketing agreement programs applicable to fruits and vegetables regulate the quality of the product marketed through a grade and size limitation. At times this regulation has assumed the form of a modification of the permissive grade and size standards promulgated by the Agricultural Marketing Service.

The Fruit and Vegetable Division works closely with the Federal Surplus Commodities Corporation in its surplus purchase and diversion programs which usually make use of grade and size standards. In the absence of established standards, specifications may be developed by both the Division and the Corporation in carrying out surplus removal programs.

The Federal Surplus Commodities Corporation, a part of the Surplus Marketing Administration, establishes and uses standards of quality in connection with its purchasing operations. The Corporation, in general, prefers the use of grades already promulgated when these are available. But when unfavorable weather such as a freeze damages a crop, and the Corporation is requested to make purchases from a salvage standpoint, sometimes it is necessary to establish a slight variation of the grades available. This is the only condition under which the Corporation may be said to establish a standard of quality.

In general, the Corporation uses four different types of standards of quality, namely:

- (1) United States grades promulgated by the Agricultural Marketing Service or official State grades;
- (2) Industry or exchange grades;
- (3) Commercial Standards of the National Bureau of Standards (particularly on cloth items);
- (4) Special adaptations of the United States grades to meet unusual circumstances.

The Corporation prefers the use of grades established by the Federal Government in making purchases. However, if it finds that no such grades are available, or that the use of these grades makes it difficult to complete the purchase program, it may use industry or exchange grades.

TECHNICAL ADVISORY BOARD

The Technical Advisory Board, United States Department of Agriculture, performs a two-fold function in connection with standards: (1) It approves all specifications for equipment involving engineering principles which are set up by various bureaus in the Department, and (2) it establishes its own specifications for the purchase of equipment when the number of purchases of such equipment by the Department is large enough to necessitate Department specifications.

The establishment of the Technical Advisory Board was authorized on June 8, 1938, by the Secretary of Agriculture. The Board consists of a chairman, three members and technical assistants. It

is a unit in the Office of Plant and Operations in the Office of the Secretary. Its functions are as follows: (1) It approves all technical engineering requirements in specifications employed by the Department in the procurement of articles, materials, supplies and equipment; (2) It decides all engineering questions of controversial or other character which may develop in connection with awards of contracts based on such specifications; (3) it supplements existing Federal Specifications by developing Department of Agriculture standard specifications to be used throughout the Department for the purchase of articles, materials, supplies, and equipment which involve the application of engineering principles; (4) it establishes uniform standards and criteria in connection with aerial photography, such as scales, reflying, and other pertinent material; (5) it has certain other miscellaneous duties in connection with the operation, maintenance, and repair of equipment, such as studies on plans for available future needs for equipment.

The standards activities of the Technical Advisory Board are limited by the Secretary to "articles, materials, supplies and equipment which involve the application of engineering principles." This means the Board may establish specifications on items, such as farming equipment, motor vehicles, and laboratory equipment. The Board has established its own specifications only for items which are purchased quite frequently. In all other cases, however, it has required that the specifications used must be approved by the Technical Advisory Board before a purchase can be made. Thus, the Technical Advisory Board establishes specifications for all equipment involving engineering principles used by the Department.

From time to time the Board has assisted other departments in the preparation of technical specifications. However, there is no interdepartmental exchange of specifications at the present time. This is partly due to the fact that other departments do not have boards, such as the Technical Advisory Board, for the establishment of standards in connection with the purchase of heavy equipment.

CENTRAL HOUSING COMMITTEE

Organization.

The Central Housing Committee had its origin in the recognition, by staff members of agencies concerned with housing, construction, and finance, of the need for some coordinating agency to prevent duplication of effort, to make available for use a large amount of accumulated data, and to establish closer working contacts between technical men engaged in similar lines of activities.

The need for such an organization was emphasized in the 1934 report of the National Resources Board. This resulted in action, and recommendations were made by housing agencies and other interested organizations for a committee on coordination of housing activities. Appointment by the President of the Central Housing Committee in 1935 followed. This Committee is an informal body concerned with exchange of ideas and with research in the field of housing. It is composed of executives of various Federal agencies dealing with housing, construction, and finance. Their technical assistants function through subcommittees and auxiliary groups of specialized interests, thus permitting exchange of experience and pertinent data and making available results of joint studies or compilations.

The following Federal agencies are represented on the Central Housing Committee:

- United States Department of Commerce.
- Farm Credit Administration.
- Farm Security Administration.
- Federal Home Loan Bank Board.
- Federal Housing Administration.
- Office of Government Reports.
- Public Building Administration.
- The RFC Mortgage Co.
- United States Housing Authority.

The following list of committees of the Central Housing Committee and their subcommittees will give an idea of the scope and range of interests:

Committees	Subcommittees
Ways and Means-----	
Appraisal and Mortgage Analysis-----	
Research, Design, and Construction-----	Fire Resistance, Landscape (Grounds), Heating and Ventilating, Plumbing Code, Planning and Design (Unit Building), Structure.
Economics and Statistics-----	Bibliography, Construction Costs, Financial Surveys, Utilization of Census Data, Continuing Series, Special Surveys.
Land Use and Site Planning-----	Planning Standards, Rehabilitation.
Law and Legislation-----	Legal Digest, Land Title Registration, Mechanics' Lien, Tax Collection, Mortgage Foreclosure.
Operation and Management-----	Accounting, Maintenance and Operation.
Public Relations-----	Exhibitions, Publications, Definitions, Discussions.

These committees and subcommittees have certain basic programs within the limits of which they are free to initiate discussions and make recommendations. In general, there is very little evidence of objections in expressions by agency representatives and many recommendations of considerable importance have been presented to and approved by the Central Housing Committee. Specifically, data have been shared, duplication of effort avoided, and joint or separate undertakings arranged where additional information is needed to deal with specific problems.

The Central Housing Committee and its subcommittees are served by assistants contributed by the member agencies to meet needs as they develop. Publications include the Housing Index-Digest, the Housing Legal Digest, and Technical Bulletins, the latter being of limited, confidential circulation.

Standardization Activities.

The Central Housing Committee is contributing much toward increased standardization in the housing construction of the Federal Government, and its efforts have been directed toward reduction in cost of such housing. This standardization work includes many phases such as structural practices, plumbing, heating, and ventilating, test methods, fire-resistance classification of building types and constructions, terminology, building maintenance, and specification. While such standardization activities are intended primarily for use in Government housing programs, the public also benefits thereby: first, through the provision of adequate housing at lower cost to the Government and consequently to the occupant and taxpayer; and second, through the availability to private industry of the standardized methods and practices thus developed. The various phases of these standardization activities are discussed briefly below.

Structural practices.—A description of the structural practices of Federal agencies concerned with housing has been compiled for convenient comparison as a step in exploring possibilities of greater uniformity. This was reviewed by the National Bureau of Standards, United States Department of Commerce, and the Forest Products Laboratory, United States Department of Agriculture, and returned to the Central Housing Committee with the comment that recommendations for greater uniformity could not be given until a study had been made of the problems peculiar to individual agencies which may have necessitated, to some extent, present dissimilar practices. When it is possible to complete these studies it is hoped that they will result in greater uniformity in structural practices of the Federal Government.

Experience of many Federal agencies has also been utilized by the Central Housing Committee in the preparation of a check list, covering all stages of building construction. This check list, intended chiefly for use of those charged with inspection of Government building projects, is nearing completion and will aid in the prevention of costly mistakes in building construction.

Plumbing.—In order to facilitate further Government housing undertakings, a subcommittee was charged with development of a Plumbing Manual. Three recommended plumbing codes were used as a basis for discussion. The Manual, now available, is primarily intended for the use of Federal Government agencies.

Fire-resistance classifications.—In 1938 Federal housing agencies requested the cooperation of the National Bureau of Standards and a newly organized subcommittee of the Central Housing Committee in the development of reasonable requirements as to fire resistance of buildings and constructions. The classification and definition of building types and constructions from the standpoint of fire resistance and the making of surveys of combustible contents related to representative building occupancies was undertaken. Surveys of school buildings, office buildings, dwellings, and apartments have been completed, and surveys of warehouses and other commercial buildings are in progress. Summaries of the surveys of schools and offices are available upon request to the Central Housing Committee.

Compilation of fire-resistance ratings of building constructions, based on results of fire tests, acceptance tests, or recent research, has also been started.

Heating and ventilating.—A heating and ventilating committee, recently organized, composed of representatives of Federal agencies dealing with problems in this field, is concerned chiefly with the development of performance standards, including correlation of existing data and the relation between thermal environment and health, and methods of testing and rating of equipment to determine conformity with these performance standards. This work was undertaken recently in cooperation with the National Bureau of Standards.

Test methods.—The National Bureau of Standards' program of technical housing research, conducted with the cooperation of the Central Housing Committee, resulted in the development of standard test procedure for evaluating the structural properties of house constructions. Tests of new types of constructions such as prefabricated units, performed under this procedure, compared with similar tests on conventional constructions, afford a more reasonable basis for judging the value of new types of constructions than any other method available. Ultimately, such tests may find their way into building codes to replace present requirements, which specify sizes of structural members rather than performance.

Terminology.—Lack of agreement as to definition of housing terms has resulted in much confusion. The Central Housing Committee found, however, that while the problem of terminology demanded immediate steps toward the development of greater uniformity, the work necessitated much study. A committee from five principal Federal agencies concerned with housing compiled a preliminary glossary of housing terms as a basis for discussion and constructive criticism prior to the drafting of a glossary which might serve as an official source of reference. This preliminary glossary was well received and constructive comments were made which are being incorporated in the final edition.

In addition, definitions from all publications issued by Federal Government agencies concerned with housing are now being compiled to serve as a further basis for the establishment of uniform terminology.

Building maintenance.—To protect large investments in housing made by the Federal Government, the Central Housing Committee is cooperating with the National Bureau of Standards and the Public Buildings Administration in the preparation of a building mainte-

nance or custodial handbook. This work will be based on wide experience in building maintenance and on the National Bureau of Standards' research in this field, and it is hoped that an important step toward standardization of building maintenance practice will result therefrom.

Specifications.—At the request of the Home Owners' Loan Corporation, a review of the section on appliances, equipment, and mechanical devices of its Master Specifications was made by the committee.

A new subcommittee is being organized to bring together persons engaged in writing specifications in order to simplify specification writing procedure. This undertaking in no way conflicts with work of the Federal Specifications Executive Committee, which is concerned with description of the type and quality of materials purchased by the Federal Government, rather than with the form of specifications. It is expected that considerable attention will be devoted to possibilities of adopting for general use the "streamlined specification system" developed by the secretary of the Central Housing Committee, a system already adopted by the Veterans' Administration. A streamlined specification is one in which a sharp distinction is drawn between contractual and structural elements, the former being covered by a single governing mandatory clause and the latter by a concise outline of materials and methods.⁹⁹

Landscape (Grounds development).—A subcommittee is cooperating with the National Park Service in the preparation of a landscape architects' handbook, with special emphasis on cost estimating. Such a handbook, if generally adopted, should promote the standardizing of many practices in this field. There has also been prepared a check list for the use of landscape inspectors.

⁹⁹ For a description of the procedure used in formulation of these specifications, see: "Streamlined Specifications," by Horace W. Peaslee, *Pencil Points*, vol. 20, pp. 533-538, August 1939.

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards, United States Department of Commerce, created by the act of Congress approved March 3, 1901, is charged with—

the custody of the standards; the comparison of the standards used in scientific investigations, engineering, manufacturing, commerce, and educational institutions with the standards adopted or recognized by the Government, the construction, when necessary, of standards, their multiples and subdivisions, the testing and calibration of standard measuring apparatus; the solution of problems which arise in connection with standards; the determination of physical constants and the properties of materials, when such data are of great importance to scientific or manufacturing interests and are not to be obtained of sufficient accuracy elsewhere.

The Bureau shall exercise its functions for the Government of the United States; for any State or municipal government within the United States; or for any scientific society, educational institution, firm, corporation, or individual within the United States engaged in manufacturing or other pursuits requiring the use of standards or standard measuring instruments.¹

The Bureau performs its functions through two major groups: Research and Testing Group, and Commercial Standardization Group.

Research and Testing Group.

The Research and Testing Group is subdivided into nine divisions: Electricity, weights and measures, heat and power, optics, chemistry, mechanics and sound, organic and fibrous materials, metallurgy, and clay and silicate products. This group handles all matters pertaining to investigations and research, testing and measuring. The organization of the Research and Testing Group is shown in chart III.

The work of the National Bureau of Standards in establishing and maintaining standards of measurement, quality, performance, and practice serves not only Federal and tax-supported agencies, but the consuming public as well.

The research and testing facilities of the Bureau are used to discover and evaluate material standards and to solve basic technical problems.

The Bureau's work on standards of measurement is designed to assist in the standardization of containers and products, in promoting systematic inspection of trade weights and measures, and facilitate research in science and technology. The establishment of more precise values for the standard constants furnishes an exact basis for scientific experiment and design and makes possible the efficient technical control of industrial processes.

The Bureau's work on standards of quality sets up attainable standards and test methods to assure high utility of the products

¹ Public Act No. 177, an act to establish the National Bureau of Standards, March 3, 1901. Amendments, June 30, 1932.

of industry and furnishes a scientific basis for truthful branding and advertising.

The Bureau likewise develops standards of performance: That is, specifications for the operative efficiency or accuracy of machines or devices. These are numerical statements of speed, uniformity, durability, output, economy, and other factors which together define the net efficiency of an appliance or machine. The ultimate purpose is to make exact knowledge the basis of the buyer's choice and to clarify the understanding between the manufacturer, distributor, retailer, and consumer.

Another function of the National Bureau of Standards of very general interest is the development of standards of practice; that is, collection of data and formulation of codes of practice for public utilities and other services. These codes are prepared in cooperation with the technical and commercial agencies concerned, and relate to the technical regulation of construction, installation, and operation. These codes are based upon standards of measurement, standards of quality, and standards of performance. The purpose of such work is to afford a single impersonal standard of practice mutually agreed upon by all concerned and clearly defined in measurable terms.

Testing and inspection for governmental agencies.—The law requires that the National Bureau of Standards shall carry out investigations and tests for the Federal and State Governments, and for many years the Bureau has served as a testing and research laboratory for practically every branch of the Government service.

The testing of scientific apparatus, materials, and supplies by the Bureau for other Government departments and for the various State governments is widely utilized, and requests for the Bureau's assistance in such matters are steadily increasing.

Another important service is the calibration of instruments and apparatus for Federal and State Governments in terms of the national standards.

Commodities purchased by the various departments and establishments of the Federal Government, excepting foods, drugs, and cosmetics, are tested by the National Bureau of Standards to determine whether they comply with the requirements of the specifications on which they are purchased. This gives the Bureau an unusual opportunity to observe how buying on specifications works out in practice. The experience of the National Bureau of Standards in this field is available for the preparation of performance standards.

The National Bureau of Standards is concerned not only with basic scientific research, but also with the development of standardized methods for testing materials, as well as with the actual testing of materials and commodities.

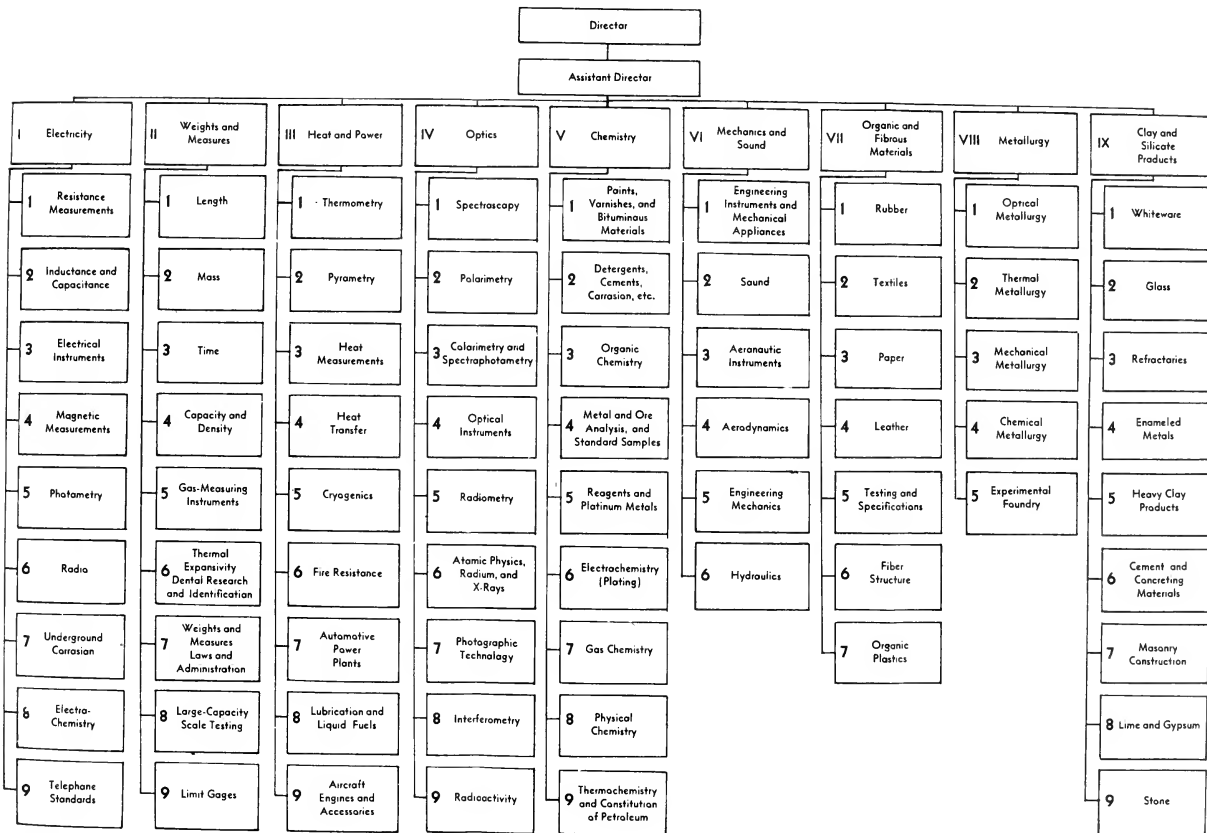
Tests and test methods developed by the Bureau during 1938 and 1939 include many items of particular interest to consumers.

Carpets.—A machine for testing the resistance to wear of carpets and rugs, developed by the Bureau, has been generally accepted by manufacturers for product control and research.

Ceramic whiteware.—Although the whiteware branch of the ceramic industry supplies consumers with numerous products, the consumer's attention is directed most frequently to tableware, sanitary ware, and floor and wall tile. For many years semivitreous

U. S. Department of Commerce · National Bureau of Standards

Organization of the Research and Testing Group



tableware and porous-bodied wall tile would craze after only a few months' service, regardless of how much care was taken in obtaining the correct "fit" between the body and the glaze at the time of manufacture. The cause of the failure was unknown and therefore a cure could not be applied. In the course of the Bureau's investigations of this subject, the cause of the failure was discovered, a test was developed by which the susceptibility of ware to this failure could be determined in a few hours, and a remedy for the defect was established. As a result the consumer can now purchase wall tile and very reasonably priced semivitreous tableware with the guaranty that it will not craze in service.

Electric lamps.—The National Bureau of Standards maintains the national standard of light. It gives technical advice on the performance characteristics to be included in Federal Specifications for lamps, and it tests lamps for the Federal Government. During the fiscal year ending June 30, 1940, over 5,000,000 incandescent electric lamps were inspected for the Government before shipment, and more than 7,800 samples selected from these lamps were life-tested at the National Bureau of Standards.

These lamps were purchased from contractors, each one of whom supplied lamps which by inspection and test were found to comply with the requirements of the Federal Specification for incandescent lamps.

These inspections and tests for the Government have a great influence upon the quality of all incandescent lamps, whether the manufacturers are contractors to supply lamps to the Government or not. All manufacturers of incandescent lamps, because of the sharp competition, are anxious to supply lamps to their customers that can be guaranteed to comply with the Federal Specifications, even though the makers are not actually supplying lamps to Federal departments.

The result is that American-made lamps are of uniform and high quality, which is not generally the case with imported lamps.

Paint and varnish.—While the major household purpose of paint is to decorate the home, its durability is equally important since it involves the question of frequency and expense of repainting. Research conducted at the National Bureau of Standards furnishes data on the probable life of paint, and has resulted in the development of test equipment which simulates the action of weather and accelerates its effects. Studies are made of the characteristics of paint films. Additional information concerning the composition of paints and varnishes for various purposes is made available through specifications used by the Federal Government agencies, in the preparation of which the Bureau takes an active part.

Paper and paper products.—The National Bureau of Standards has worked continuously on the development and improvement of testing procedures for measuring the quality of paper products.

The user of record materials is often concerned as to their probable longevity, and for several years the Bureau has been making exhaustive studies of writing and printing papers to find the qualities required for a given service and to find the best means of prolonging their service life as much as possible. From this work has been evolved a recommended classification of papers to be used for record purposes, which is based primarily on purity of the cellulose comprising the fibers, and on the strength of the papers.

Information on storage conditions for records was obtained by a survey of library conditions, by testing the paper of identical issues of books stored in libraries under different conditions, and by laboratory investigations of influences indicated as harmful by the results of the survey and testing. These studies led to recommended storage practice relative to illumination, purification of the air, humidity, and temperature. Other studies yielded information on protection against insects and on increasing the resistance of papers to wear by covering them with transparent sheetings. Information on the use of both paper and motion-picture film for reproduction of records, for the purpose of preserving records contained on impermanent material or for minimizing the handling of valuable documents, has also been obtained.

Rubber and rubber products.—Tires and brake linings have a great deal to do with the safety and comfort of the motorist. These two products are of importance to the Federal Government because of the large scale use of automotive equipment by the Post Office Department, United States Department of the Interior, War Department, and other departments, and have been singled out for detailed study so that purchase specifications can be brought up to date and kept in line with developments in the industry.

An important part of investigations of this kind consists in designing, constructing, and developing testing equipment. Endurance machines for tires have been built so that a tire may be run at any desired speed and load against a heavy drum which takes the place of the road. By the selection of appropriate conditions any one of the common types of tire failure, such as the breaking of the carcass or cracking of the tread, can be brought out or accentuated.

No satisfactory method for measuring tread wear is known other than the slow and expensive method of conducting driving tests under carefully controlled conditions. Since road tests are not practical for use in connection with purchase specifications, a long-time study is being made of the abrasion of rubber with the hope that eventually a simple reliable test will be developed for evaluating the resistance of a tire to abrasion without actually wearing it out on the road.

Equipment for the testing of brake lining is designed to measure not only the durability but also the performance of linings under a variety of conditions, hot or cold, wet or dry, and with frequent or infrequent stops. Since thousands of stops must be made with any particular sample in order to obtain a reliable indication of the way it will perform, the testing machine is designed to operate automatically according to any predetermined schedule, the results being recorded autographically.

Less extensive studies have recently been made by the Bureau in connection with purchase specifications for products such as rubber sheeting, surgeons' gloves, adhesive plaster, and rubber-insulated wires and cables. Recent technical advances have made it possible to greatly increase the life of rubber. Hence the principal feature of these studies has been the development of better accelerated aging tests so as to insure that the Government or the consumer using Government specifications will get the benefit of the improved quality, which is now possible.

Shoes.—At the request of the General Federation of Women's Clubs, work is being carried out for the purpose of securing information which will be of assistance in preparing standards for women's leather shoes. The method of preparing such standards on the basis of construction and material specifications has been discarded in favor of developing performance tests. The wear of the sole and the comfort of the shoe as indicated by the porosity of the leather are important properties for the determination of which the Bureau now has adequate tests. Consequently, attention has been turned to developing a machine for testing the shoe as a whole with respect to its ability to hold its shape and resist break-down. At the present time a machine of this kind is in constant operation testing shoes to determine the influence of the welt (McKay) turn, stitch-down, and cement types of construction on the ability of the shoe as a whole to stand up under simulated service conditions of flexure and pressure. No results are available from this work at present, but it represents a start in the direction of creating performance tests for an article in daily use by consumers.

Soaps and other cleaning materials.—Detergents (soaps and other cleaning materials) are essential in maintaining the appearance and sanitary condition of the home, and it is equally important that they should not injure the articles or surfaces to be cleaned. The National Bureau of Standards, in cooperation with manufacturers, the Federal Specifications Executive Committee, and the public, has developed many of the Government's specifications for such products. Detergents are purchased on the basis of these specifications, and laboratory tests are regularly conducted by the Bureau to determine compliance with these standards of quality and performance. This work tends to bring about better quality of material.

Much of the Bureau's information on this subject is being utilized by numerous State and municipal agencies, institutions, and other users in the preparation of their own specifications for cleaning materials.

Textiles.—Textile studies at the National Bureau of Standards are concerned with a variety of problems of interest to the consumer as well as the manufacturer. They range from studies of the ultimate nature of the fibers themselves, through investigations of the relation of the yarn and fabric construction and finish, to the properties of the finished product, and include studies of utilization, storage, and maintenance. Many of these studies have led to the development of standards, specifications, and test methods which are utilized by producers in bringing about an improvement in the quality of their products, by large department stores maintaining testing laboratories of their own in testing the quality of goods they buy as a measure of protection to themselves and to the ultimate consumers. Some of the subjects to which the Bureau has given consideration in the textile field include carpets, cotton textiles, dress fabrics, dry-cleaning solvents, gloves, hosiery, silk textiles, underwear, and waterproofed fabrics.

To illustrate the variety and scope of the Bureau's activities with reference to textiles, there are set forth below some examples of its studies that affect the consumer most directly.

Hosiery.—At the request of the General Federation of Women's Clubs, a hosiery testing machine was developed to simulate the

forces acting on a stocking at the knee and garter clasps in use. The applicability of this machine to the evaluation of variations in knitting, degumming, dyeing, finishing, laundering, and aging has been demonstrated.

A survey was made of women's full-fashioned silk hosiery from retail stores throughout the United States to provide a basis for a performance specification. The brand, retail price, appearance, and construction were found to be inadequate guides to the performance of stockings as indicated by the hosiery testing machine.

Standard methods of measuring and standard measurements for men's, women's, and children's hosiery are provided in Commercial Standard CS46 for Hosiery Length and Sizes, which has been accepted by the industry for guidance of producers, distributors, and users. This standard is also intended to eliminate confusion resulting from a diversity of measurements and methods, and to provide a uniform basis for guaranteeing lengths and sizes of hosiery.

Silk textiles.—There has been developed an accelerated aging test for silks which make it possible to predict how silk, and particularly weighted silk, will withstand the deteriorative effects of light, heat, and moist air, which are the factors largely responsible for its deterioration in service. It furnishes a laboratory method for indicating the relative stability of different silk fabrics.

The effect of light on silk, untreated and treated with dilute acids and alkalis, was studied. The results show that the stability of silk in light is dependent upon the acidity or alkalinity of the finishing solutions.

The trade practice rules of the Federal Trade Commission regarding the labeling of weighted silk textiles, together with the widespread interest of consumer groups in the amount of weighting in silk fabrics, led to the development of a method for analyzing weighted silk fabrics.

Underwear.—Standard sizes for knit and woven underwear were developed at the Bureau through a research associateship established by the Underwear Institute. These sizes are in general use in the industry.

The Bureau has also cooperated in a study of the properties of underwear fabrics made in a variety of weights, thicknesses, and constructions from cotton, wool, silk, rayon, and combinations of these fibers. The results of this study furnish data on representative underwear fabrics relative to the properties that appear important from the standpoint of comfort and health. The relative warmth, air permeability, thickness, weight, "softness," and "smoothness" for 97 fabrics were determined.

Weights and measures.—The National Bureau of Standards renders a Nation-wide service to the consumer through the direct or indirect standardization of devices used in weighing and measuring commodities purchased by over-the-counter buyers. The Bureau is the custodian of the national standards of weight and measure; it tests, on the one hand, the control standards which govern the manufacture of commercial weighing and measuring devices, and on the other hand, the reference standards of the States upon which their official tests of commercial devices are based. The Bureau exercises no regulatory powers on weights and measures, such supervision

having been left by the Congress almost exclusively to the jurisdiction of the States; however, by cooperative action the Bureau promotes uniformity of weights and measures laws and administration throughout the country, and serves as a clearing house for information on this subject.

The Bureau's work on weights and measures led to the formation of the National Conference on Weights and Measures which is composed of State and local officials engaged in the inspection of weights and measures and in the enforcement of laws and regulations on the subject. Although it is an unofficial organization with no direct authority to enforce its recommendations, the conference exerts a powerful influence in the field of weights and measures, largely through the adoption of codes and specifications, tolerances, and regulations for commercial weighing and measuring devices which are recommended to the States for official promulgation. These codes are published by the Bureau from time to time.

The National Conference on Weights and Measures seeks to place weights and measures administration on a uniform basis throughout the country. It looks toward adopting the most efficient methods for carrying on all phases of the work.

Since 1914 the Bureau has been conducting field tests of railway track scales such as are used for the weighing of railway freight cars; these tests have played an important part in the improvement effected during the past two decades in the accuracy of these large scales, the weights from which are used not only for assessing freight charges for rail transportation but also as the basis of sale for goods sold in carload lots. Three railway track scale testing equipments are maintained in service by the Bureau, with which more than 1,000 tests are made annually.

There was inaugurated by the Bureau in 1936, and is still in progress, a somewhat similar program directed to another class of large-capacity weighing machines. This program is being carried on in cooperation with State and local weights and measures officials, and provides for the testing and inspection, with Bureau equipment and personnel, of a representative number of wagon and motor-truck scales in each State which does not have adequate equipment for this type of testing. For the purpose of this program, suitable testing equipment and methods are demonstrated, and data are developed which clearly show the need for improved equipment, better methods, and much greater attention to this important class of commercial weighing scale. This work of the Bureau has been well received by scale owners and officials, and also by the consuming public whose coal, building material, and other commodities are weighed on vehicle scales. The general percentage of scales found inaccurate is high, approximating 78 percent, but it is encouraging to note that already, as a direct result of this program, a considerable number of States have procured improved testing apparatus, and it is anticipated that other States will do likewise. As the quality of testing equipment and the standard of testing technique are raised, fair competition among the users of vehicle scales will be promoted, and the rights of the producer who sells and of the consumer who buys upon the basis of vehicle-scale weights will be better safeguarded.

Building materials research.—Much interest is evidenced at the present time in the development of better housing facilities through-

out the country, particularly in low-cost housing. At the instance of the Central Housing Committee, composed of representatives of Federal agencies interested in housing, the National Bureau of Standards was selected as the agency to conduct investigations and tests on the physical properties of materials, except wood, entering into housing construction.

It is believed that the results of the present program have fully demonstrated the value of this type of research on housing not only to the Government housing agencies but also to the architects, the building industry, and the public.

Widespread interest has been shown in the reports which are now appearing in printed form and available to all groups interested in housing.

Many of the agencies have found it practicable to make decisions on the basis of objective tests by the National Bureau of Standards and other pertinent data rather than on individual experience, perhaps satisfactory in some cases, but not necessarily of general application.

Some specific examples of results of the building materials research program which lead to a reduction of cost are set forth.

Methods have been developed for the successful application of plaster on fiber insulating lath. Thus, a single material serves as plaster base and as thermal insulation and it is possible to obtain a specified degree of insulation at lower cost. The research also indicated that the plaster must be a strong plaster and at least one-half inch thick if cracking of the plaster is to be avoided.

Structural tests have shown the possibilities of using fiber insulating boards as sheathing. Here again one material serves two functions and the cost of obtaining a specified thermal insulation is reduced.

In cooperation with various manufacturers of masonry materials, methods of constructing masonry walls of less material and of less costly materials, such as cinder block, concrete block, tile, and so forth, either singly or in combination, have been investigated. It has been determined that 8-inch walls may often be substituted for 12-inch walls and that the cavity type of construction offers opportunity for obtaining a given performance as to structural strength and resistance to rain penetration at lower cost.

The results of studies of mortars in relation to building walls which prevent the penetration of rain have been incorporated in the specifications for new housing projects. The maintenance and repair costs of these structures may be expected to be considerably reduced.

The results of research have prevented the unnecessary expenditure of money on plasticizers and other admixtures in mortars.

Accelerated aging tests on wallboards give the basis for a specification for obtaining a material of longer life at the same cost. A method recently developed is the use of incombustible fillings. In a recent housing project, the required resistance was obtained by filling the partition around a stair enclosed with scrap brick, mortar, and plaster. In other cases, partition walls filled with mineral wool and plastered with gypsum plaster could be used instead of tile partitions. By the use of incombustible fillings, the field of application of the less-expensive wooden construction can be extended.

In cooperation with manufacturers, several types of fire resistant floor construction, which are less expensive than reinforced concrete slabs, have been studied.

Studies of paints by practical performance tests make possible the avoidance of unnecessarily expensive materials. The relative merits of various types of paints and pretreatments for sheet steel, both galvanized and ungalvanized, have been determined. The work on cement-water paints is expected to lead to formulas by which any contractor may mix satisfactory paint on the job from relatively inexpensive materials. Research has already shown that these paints properly applied are a reasonably satisfactory means of waterproofing leaky masonry walls.

Formulas for satisfactory nonproprietary calking compounds have been developed.

Tests of heating equipment enabled a satisfactory evaluation of costs of the equipment. In recent tests, one class of devices was found to be considerably overrated so that the bids including that type did not correspond to the same actual heating capacity as bids on other types. An oil-burning combination domestic hot-water supply and hot-water heating system was found satisfactory for small houses in a recent project.

The use of 3-inch soil stacks in the plumbing systems of small houses rather than 4-inch stacks has been found entirely satisfactory. Simplified piping systems have been developed for small houses and apartment houses. The adequacy of various methods of protection against the back flow of polluted water into the water supply system has been studied. All these improvements contribute to cost reduction, but major cost reductions in this field are to be expected only with prefabricated equipment.

The National Bureau of Standards cooperates with industry to eliminate superfluous sizes and varieties of building materials, avoiding waste and reducing costs. Recent recommendations cover concrete building units, lumber, and roofing ternes.

The Bureau assists industry in the development and establishment of Commercial Standards² of quality for building materials. Recent work has covered stock doors, windows, and frames, plywood, and hardwood paneling, trim, and molding.

The Bureau takes an active part in building code revision and modernization. It lends its influence toward the use of performance requirements and toward setting the requirements only as high as the safety and health of the public require. Placing the requirements on a performance basis makes possible the use of lower cost methods of obtaining the performance as soon as these methods are developed.

Commercial Standardization Group.—The Commercial Standardization Group is subdivided into three divisions: Simplified Practice, Trade Standards, and Codes and Specifications. The organization of the Commercial Standardization Group is shown in Chart IV.

The term "simplification," when used in the sense of eliminating unnecessary variety, is sometimes confused with standardization, but the two activities are essentially different. Standardization is primarily technical and creative; its function is to determine and

² For procedure in developing a Commercial Standard, see p. 88.

establish in use the best design, quality, method, or process for performing a desired function. Simplification, on the other hand, is commercial and selective; its function is to determine which sizes or items of a product are most important, and to concentrate production on them wherever possible. Simplification may be applied to articles already standardized as to design or size, or it may be applied as a steps preliminary to standardization, thereby reducing the number of items to be standardized.

Division of Simplified Practice.—The Division of Simplified Practice serves as a clearing house through which manufacturers, distributors, and consumer groups cooperate on a voluntary basis in furthering a Nation-wide program for the elimination of the excessive and needless variety of sizes, types, and dimensions of manufactured products, which tends to reduce costs of production and distribution. In addition to the industry itself, direct cooperators in, and beneficiaries of this activity are Federal, State, and municipal agencies, and consumers in general.

A Simplified Practice Recommendation may be initiated by any interested group. While most projects are initiated by manufacturers, several of the most successful ones have been initiated by distributors or users of the products. Of the list of 173 Simplified Practice Recommendations promulgated by the Bureau since 1922, 42 relate to so-called consumer goods. Of these, 10 were initiated by manufacturers, 24 by "users," and 8 by distributors.

According to the case-histories of some of these Simplified Practice Recommendations, it would appear that the need for simplification originated with manufacturers, whereas, actually, the manufacturers were prompted by suggestions made by the users of the products. Indeed, in some instances the initial proposals not only originated with the user-groups but were carried forward to completion by those user-groups. This is exemplified in R37-38, R50, and R58-36, to mention just three instances.³

Most of the "users" initiating the recommendations were agencies such as hotel and hospital associations.

The success of a simplified practice project depends largely upon the completeness and accuracy of the data collected through a survey of the specific industry. Studies of sales figures for different commodity lines frequently show that about 80 percent of a year's business is done in approximately 20 percent of the varieties in which the product is offered. The remaining 80 percent of the varieties which bring in only 20 percent of the volume is often an economic burden on industry, causing excessive inventories, higher carrying costs, slow turnover, and heavy obsolescence, with consequent loss to all concerned.

Procedure in developing a Simplified Practice Recommendation.—The procedure employed in the development of a Simplified Practice Recommendation includes the following steps:

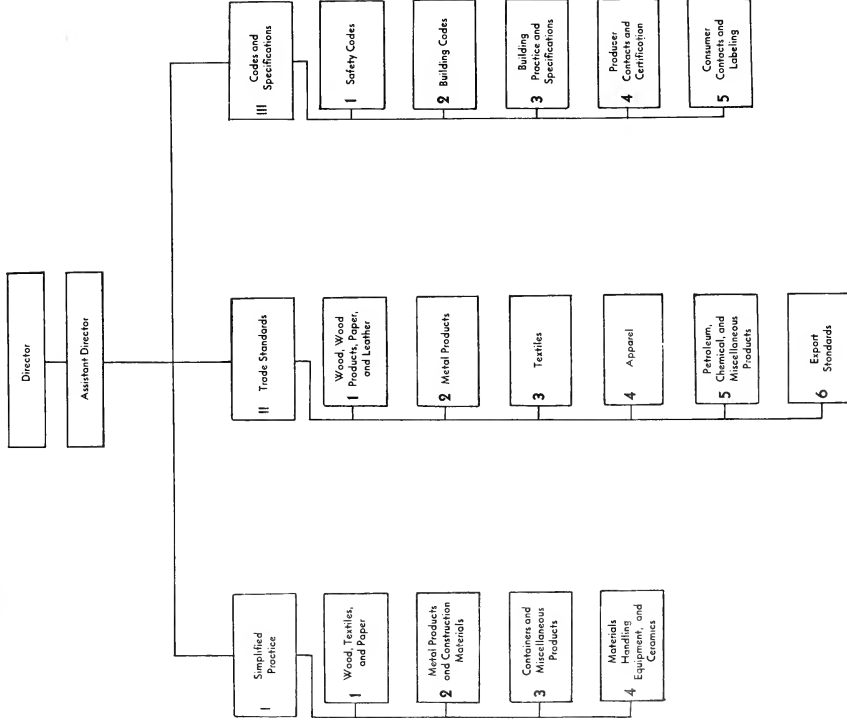
1. A survey by a representative committee of the industry covering sizes, varieties, and types of the article made during each year of a given period, the volume of each item produced annually, the relative importance of the items, the probable future trends, and the items which can be eliminated with varying degrees of advantage.

2. Preparation of a statement consolidating this information.

3. Presentation of the statement to a general conference of all interested groups representing producers, distributors, and consumers.

³ Letter from Edwin W. Ely, Chief, Division of Simplified Practice, National Bureau of Standards, Washington, D. C., dated August 19, 1940.

U. S. Department of Commerce National Bureau of Standards Organization of the Commercial Standardization Group



4. Adoption by the conference, on the basis of the survey findings, of a Simplified Practice Recommendation, usually in the form of a list of sizes or types of the product which appear adequate to meet all normal demands.

5. Appointment by the general conference, of a standing committee of the industry to maintain the recommendation, through revisions when necessary.

6. Circulation by the division to all concerned of a full report of the conference action for final acceptance of the recommendation.

7. Promulgation of the program by the Department of Commerce, through the National Bureau of Standards, and publication of the recommendation, upon receipt of adequate written support by manufacturers, distributors, and consumers.

The Division thereafter cooperates with the standing committee in conducting, from time to time, surveys to determine the degree of adherence, to maintain and extend support of the recommendation, and to secure data for reaffirmation or revision to meet changing industrial conditions.⁴

Typical development of a Simplified Practice Recommendation is shown in Chart V.

Of the 173 Simplified Practice Recommendations developed to date many have undergone one or more revisions.

The first Simplified Practice Recommendation was for vitrified paving brick; others cover a wide range of commodities including construction materials, metal products, tools, ceramic products, textiles, paper and cardboard products, mechanical products, containers, invoices and warehouse receipts.

Some of the first "user" organizations to participate in Simplified Practice conferences were the American Electric Railway Association, American Gas Association, American Home Economics Association, American Institute of Architects, American Railway Association (division VI, Purchases and Stores), Associated General Contractors of America, National Association of Purchasing Agents, Electric Power Club (now the National Electrical Manufacturers Association), National Electric Light Association (now Edison Electric Institute), National Retail Dry Goods Association, and the National Wholesale Druggist Association.

Division of Trade Standards.—The National Bureau of Standards, with the assistance of interested groups, sets up and promulgates so-called Commercial Standards; which—

* * * are voluntary recorded standards agreed upon by producers, distributors, and consumers,⁵ covering terminology, types, classifications, grades, sizes, and use characteristics of manufactured products as a basis for better understanding between buyer and seller. They include standard methods of test, rating, certification, and labeling, and provide a uniform basis for fair competition. They are made effective by means of voluntary guarantees on invoices, on labels, or by grade marks on the goods themselves.⁶

Representatives of industrial and commercial purchasers participate in these activities more extensively than do representatives from consumer organizations. It must be noted, however, that representatives of consumer organizations are invited to express their views of pending specifications and standards.

The ultimate purpose for having representatives of producers, distributors, and consumers attend conferences dealing with Commercial

⁴ Letter from Edwin W. Ely, Chief, Division of Simplified Practice, National Bureau of Standards, Washington, D. C., dated August 14, 1940.

⁵ The term "consumer" as used in National Bureau of Standards publications connotes the broader meaning of the term—the "user" of the commodity—whether he be the so-called "ultimate consumer" or one who buys the material for remanufacture or resale. The "consumer" may be a packer (who buys his containers from the manufacturer), a purchasing agent for an institution such as a hospital or hotel, or he may be a household buyer.

⁶ "Commercial Standards and Their Value to Business," by the National Bureau of Standards, p. 2, U. S. Government Printing Office, Washington, D. C., 1940.

Standards is to consider all points of view before establishing these Standards. Some consumer organizations represented at conferences on proposed standards include General Federation of Women's Clubs, American Home Economics Association, American Association of University Women, National Council of Women, National Congress of Parents and Teachers, National Federation of Business and Professional Women's Clubs, Young Women's Christian Association, and the Young Men's Christian Association.

The use of the Commercial Standards promulgated by the National Bureau of Standards is entirely voluntary on the part of producers, distributors, and consumers.

Any group, whether producers, distributors, or consumers, may request the cooperation of the National Bureau of Standards in the establishment of a Commercial Standard. In initiating the work, the proponent group is expected to assume certain responsibilities, such as the selection of the specification; the preparation of the tentative draft; attending preliminary conferences; and supplying data, information, or advice as the situation may require.

Upon receipt of a written request from an interested group, for cooperation in developing a Commercial Standard, the request is assigned, by the Division of Trade Standards, to a "project manager" who represents the National Bureau of Standards throughout the development of the project and is responsible for the proper conduct of the work.

Procedure in developing a Commercial Standard.—The procedure in developing a Commercial Standard requested by an interested group or by an industry usually includes the following steps:

1. A survey of existing specifications and selection or formulation by the proponent group of a tentatively satisfactory specification.

2. Preliminary conferences⁷ of members of the proponent group to consider the specification.

3. Review of the specification for technical accuracy by the appropriate division of the Bureau.

4. Circulation of proposed standard to other interested organizations, especially consumer groups, for advance comment.

5. Circulation of the specification to all organizations directly interested—producers, distributors, and consumers with invitation to attend a general conference or submit comments and criticisms.

6. Consideration, by the general conference, of the specification, and adoption as recommended Commercial Standard.

7. Appointment, by the general conference, of a standing committee to maintain the standard, through revision when necessary.

8. Circulation of the recommended standard to each unit of the whole industry including manufacturers, distributors, and organized consumers, with request for written acceptance.

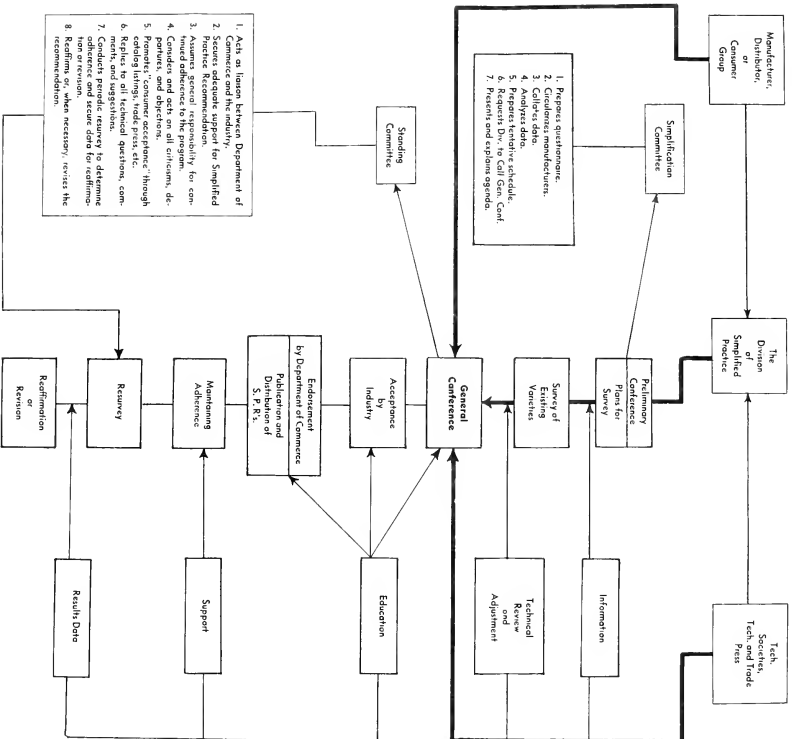
9. Promulgation of the recommended standard by the Department of Commerce, through the National Bureau of Standards, and publication of the Commercial Standard, upon receipt of acceptances representing 65 percent of production or consumption by volume, and in the absence of valid active opposition.⁸

⁷The reason for limiting these preliminary conferences to the proponent group, that is, the one initiating the procedure, is "for the purpose of facilitating action and helping to correlate and epitomize the desires of the group most eager to establish a Commercial Standard. This method tends to promote free and frank discussion of all ramifications of the standard and thus produces a firmer foundation for subsequent discussion, adjustment, acceptance, certification, and labeling." It is best to "have at least the proponent group substantially in harmony before calling a general conference of all interests." "Commercial Standards and Their Value to Business," by the National Bureau of Standards, p. 5, United States Government Printing Office, Washington, D. C., 1940.

⁸Letter from I. J. Fairchild, Chief, Division of Trade Standards, National Bureau of Standards, Washington, D. C., dated August 15, 1940.

U. S. Department of Commerce National Bureau of Standards

Typical Development of a Simplified Practice Recommendation



Typical development of a Commercial Standard is shown in chart VI.

Each proposal for a Commercial Standard requires a special approach adapted to the character of the particular commodity to be standardized and conditions in that industry.

The National Bureau of Standards does not expect that household buyers will become familiar with the requirements of Commercial Standards. The Bureau expects, however, that with the cooperation of associations of purchasing agents and consumer organizations, that both the industrial and commercial buyer, as well as the household purchaser, will benefit gradually through greater competition stimulated by acceptance, production, and sale of goods of higher quality and performance.

Women's silk dress fabrics and silk stockings are two commodities which may serve to illustrate the difficulties encountered in setting up, promulgating, and promoting the use of Commercial Standards.

The General Federation of Women's Clubs sponsored the development of performance specifications for silk dress fabrics. A draft of a specification was prepared, but no general agreement has been reached on performance, although the method by which the fabric may be tested is covered by Commercial Standard CS59-39. Specifications are being drafted at the present time for fabrics for evening dresses and for silk fabrics for sport dresses. Most manufacturers have opposed informative labeling of dress fabrics, claiming such labels would confuse consumers.

There is no accepted Commercial Standard including quality or performance specifications for silk stockings for women, although consumers have expressed their desire for such a standard. In 1937 the General Federation of Women's Clubs asked that standards of performance and quality with grades for silk stockings be developed.

The National Bureau of Standards began a series of tests to measure performance and quality of silk stockings, and, as a result, two machines to test the wear value of stockings were developed and built by the Bureau. Stockings, at prices ranging from 59 cents to \$9 a pair, purchased in 8 different cities, were tested on these machines. It was found that no relationship exists between price and "value" based on performance, the 69-cent stocking withstood the test. Undyed hosiery gave consistent performance when tested on one of these machines, but tests of finished hosiery gave variable results. Snag resistance and abrasion resistance were measured on other machines. Fastness of color and finish of silk stockings are important factors of performance which were tested. Manufacturers, after testing stockings in their own factories, claimed that the performance of the stockings after finishing could not be controlled, so instead of performance standards for silk stockings the National Association of Hosiery Manufacturers developed standards based on construction⁹ and urged their promulgation by the National Bureau of Standards. Certificates, showing compliance of the hosiery with the grades and quality of construction proposed, were drafted by the National Association of Hosiery Manufacturers. The industry as a whole, however, failed to adopt this type of certification. A few hosiery manufacturers have installed in their factories

⁹ "Standards of Construction and Inspection of Ladies' Full-Fashioned Hosiery," 15 pp., National Association of Hosiery Manufacturers, New York City, 1936.

testing machines developed by the National Bureau of Standards; to date 25 machines are being used.

It has been suggested that minimum standards for stockings be established; these standards to be based on wearability, extensibility, and recovery of shape, and to include grades if possible. If a Commercial Standard for stockings is finally adopted and is effective, grades for stockings might be unnecessary except to indicate imperfections or defects; stockings would be classified largely on the basis of sheerness, weight, or color, and would be graded standard or substandard in performance.

Division of Codes and Specifications.—The work of this Division is carried on by five sections dealing with safety codes, building codes, building practice and specifications, producer contracts and certification, and consumer contracts and labeling.

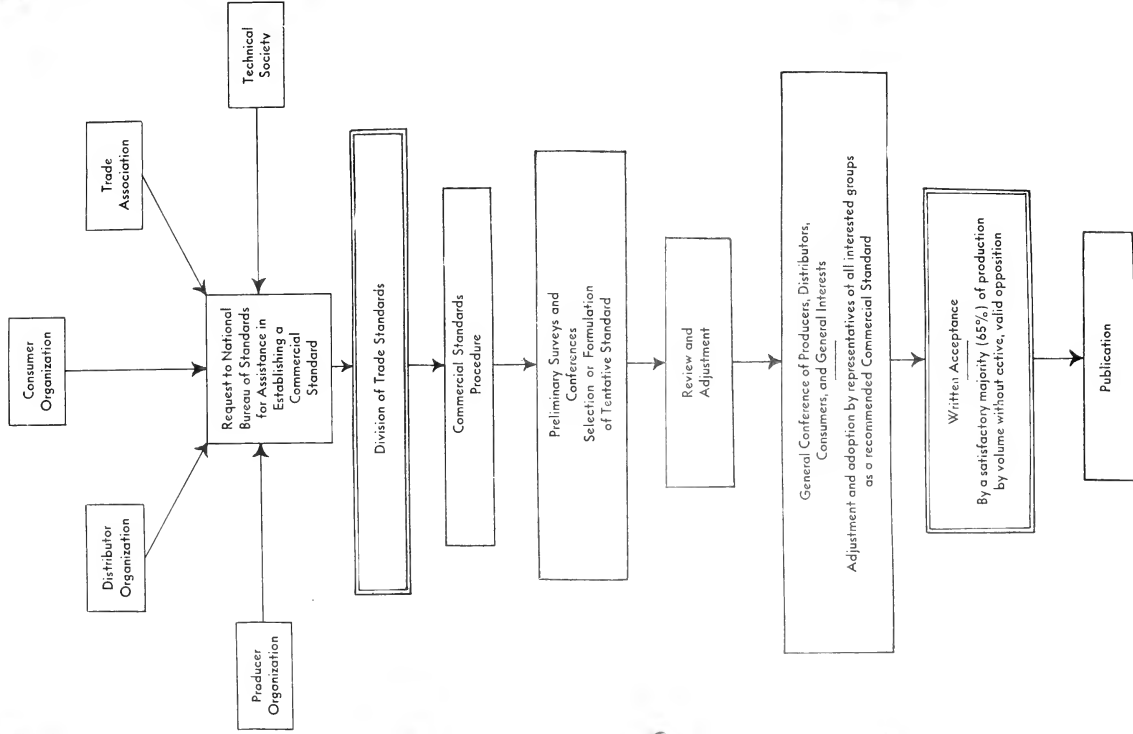
This Division cooperates with Federal, State, and municipal agencies in the development of safety codes. It investigates materials and apparatus incidental to the establishment of safety standards; also accidents and field conditions and current practices in industry. It cooperates with State and municipal officials in the application of safety standards, and with engineering, insurance, and other associations in preparing their own standards. It prepares publications bearing on the application of safety standards.

In cooperation with Federal, State, and municipal agencies and technical and trade organizations, the Division of Codes and Specifications prepares minimum requirements suitable for adoption in building and plumbing ordinances. It compiles and disseminates information concerning the status of building and plumbing codes. It also assists local code committees in the revision of their local codes.

The Division collects and disseminates scientific, practical, and statistical information showing approved methods of building, planning, construction, standardization, and adaptability of structural units, including the selection and economic utilization of building materials. It investigates current developments in construction of dwelling houses, including new types of materials and their uses and new uses for existing materials. It assembles information concerning the care and maintenance of the various parts of houses and prepares pamphlets, articles, and reports on subjects of interest to home builders and home owners.

The Division establishes contacts with agencies making purchases out of tax moneys and with representatives of "over-the-counter" buyers to show benefits derived by using nationally recognized standards and specifications under the Certification Plan as outlined below. It encourages manufacturers of staple goods to identify their commodities by labels to guarantee compliance with Federal Specifications or Commercial Standards. It aids public purchasers in formulating, selecting, and unifying specifications and commodity acceptance testing methods. The Division compiles and keeps up to date directories of commercial testing and college research laboratories, and Governmental testing laboratories. It prepares the National Directory of Commodity Specifications in which are classified and indexed references to all nationally recognized standards and specifications of technical societies and trade associations and several agencies of the Federal Government.

U. S. Department of Commerce National Bureau of Standards Typical Development of a Commercial Standard



The Certification Plan and its application to Federal Specifications and Commercial Standards is another program of interest to consumers which is carried on by the Division of Codes and Specifications. This plan is thus described by the National Bureau of Standards in part:

The Certification Plan consists in the compilation and distribution by the National Bureau of Standards, of lists of sources of supply of commodities covered by certain selected Federal Specifications and Commercial Standards. These lists contain the names of firms who have indicated their willingness to certify to purchasers, upon request, that the material supplied by them on contracts based on the selected specifications and standards does actually comply with the requirements and tests thereof and is so guaranteed by them.¹⁰

The Certification Plan has already been applied to 666 Federal Specifications and 54 Commercial Standards. These lists, to which additions are made from time to time, are distributed to tax-supported agencies (Federal, State, county, and municipal) and to all others upon request.

It must be pointed out that the application of the Certification Plan to Federal Specifications or Commercial Standards is limited to large contract buying, such as purchases made by the Federal Government, which in many instances is not a typical ultimate consumer. The nature of the Government's needs, as represented by Federal Specifications and those of the over-the-counter buyer are not the same. Commercial Standards, however, cover goods more frequently used by consumers and intermediate manufacturers.

Some of the benefits derived by the large-quantity purchasers from using nationally recognized specifications under the Certification Plan can be passed along to the "over-the-counter" buyer by the widespread application of the Labeling Plan¹¹ outlined below, which is based on certified compliance with nationally recognized specifications.

Another service of interest to consumers inaugurated by the National Bureau of Standards is the self-identifying, quality-guaranteeing Labeling Plan just referred to. In accordance with this plan, a firm desiring to bring effectively to the attention of the "over-the-counter" buyer, at the time of making a purchase, commodities which it is willing to guarantee as complying with the requirements of certain nationally recognized specifications or standards, places on the individual commodities or their containers labels which definitely identify both the specification and the manufacturer or the trade association which holds itself responsible for the guaranty.

An example of a Federal Specification suitable for quality labeling is that for bleached cotton sheets, Federal Specification DDD-S-281.

This specification covers the kind of material, the size, weight, thread count, breaking strength, hems, and stitching.

The Labeling Plan is capable of a considerable expansion into the realm of "over-the-counter" goods.

Research Associates.

At the present time over 60 research associates are maintained at the National Bureau of Standards under its research associate plan. Under this plan, a manufacturer, distributor, or user of a particular

¹⁰ "The Certification Plan: Its Significance, Scope, and Application to Selected Federal Specifications and Commercial Standards," 34 pp., LC-559, National Bureau of Standards, Washington, D. C., 1939, mimeographed.

¹¹ "Labeling Plan—Aid for Over-the-Counter Buyers," 10 pp., National Bureau of Standards, Washington, D. C., 1938, mimeographed.

commodity, generally through the recognized national association of that industry, maintains one or more technicians in the laboratories and shops of the Bureau under the supervision and regular procedure of the Bureau for the purpose of research in a field of mutual concern. An examination of the list of projects upon which these associates are now working discloses that about 44 percent of the research associates receive all or a part of their pay from organizations that are interested in research problems from the viewpoint of the user of the product rather than that of the manufacturer. It should be pointed out that the results obtained by the research associates working under this plan are given to the public through publications of the Bureau. One example is research in motor fuels; another, research in dental products.

Cooperation With Other Agencies.

Much of the Bureau's work in research and testing is utilized in preparing commodity specifications for the Federal Government and other tax-supported agencies, and in determining whether commodities purchased do actually comply with the specification requirements. A large part of the purchases made by the Federal Government are tested at the National Bureau of Standards.

In cooperation with the Federal Specifications Executive Committee, Procurement Division, Treasury Department, of which the Director of the National Bureau of Standards is chairman, members of the Bureau staff take a leading part in the preparation of Federal Specifications. The Bureau is represented on 62 of the 70 technical committees functioning to date. It furnishes chairmen for 34, vice-chairmen for 8, and secretaries for 4 of these technical committees.

The staff of the Bureau takes part in the activities of 127 technical and trade organizations representing various fields of endeavor, including science, technical research, and trade, both national and international. It has representation on 910 technical committees of these organizations, many of which depend upon the Bureau's cooperation in carrying forward their scientific and technical activities. The Bureau is represented on 300 technical committees and subcommittees of the American Society for Testing Materials (A. S. T. M.), a national technical society devoted to the promotion of the knowledge of engineering and the standardization of specifications and methods of testing. Through this representation the Bureau holds chairmanship of 30 of the A. S. T. M. committees, vice-chairmanship of 4, and secretaryship of 6.

The National Bureau of Standards is sponsor (or cosponsor) of 26 projects carried out under the procedure of the American Standards Association (A. S. A.). It is represented on 160 A. S. A. technical committees, having chairmanship of 15, vice chairmanship of 2, and secretaryship of 7. It is represented also on the following coordinating agencies of this association: Board of directors, Standards Council, Electrical Standards Committee, Mechanical Standards Committee, Advisory Committee on Ultimate Consumer Goods, Safety Code Correlating Committee, and Building Code Correlating Committee. All of the safety code, building code, and plumbing code requirements thus far formulated under the auspices of the Bureau have been accepted as a basis for the development of safety, building, and plumbing codes under the American Standards As-

sociation procedure. Two members of the staff of this association are located at the Bureau to facilitate the cooperative work of the two organizations.

The National Bureau of Standards cooperates with tax-supported purchasing agencies, industries, and national organizations in developing specifications and facilitating their use; it encourages the application of the latest development in the utilization and standardization of building materials, the development of engineering and safety codes, Simplified Practice Recommendations, and Commercial Standards of quality and performance.

As stated by representatives of the National Bureau of Standards—

Lack of adequate funds has kept the Bureau from going as far as it would like in the field of developing commodity standards for the ultimate small purchaser. However, it must not be overlooked that in devoting so much time and study to the problems of contract buyers, and in determining for them whether commodities meet certain specifications, the noncontract buyer has also been served indirectly through the economies introduced in manufacturing processes. Beyond a doubt the small consumer is thereby reaping the benefit by obtaining better goods, hence more value, for his money.

Attempts have been made to give the small consumer direct assistance in his buying through a labeling plan. It must be recognized that future progress in consumer standards will, for a great part, depend upon scientific testing of commodities and the properties of the materials from which they are made, carried out by experts using necessary scientific equipment, with all tests scientifically controlled.

FEDERAL ALCOHOL ADMINISTRATION ¹²

The Federal Alcohol Administration was created by the Federal Alcohol Act of 1935. Its purpose, as stated in the title is to—

further protect the revenue derived from distilled spirits, wine, and malt beverages, to regulate interstate and foreign commerce and enforce the postal laws with respect thereto, to enforce the twenty-first amendment, and for other purposes.

The Federal Alcohol Administration succeeded the Federal Alcohol Control Administration, an agency established under the provisions of the National Industrial Recovery Act. It was made a division of the Treasury Department and was headed by an Administrator appointed by the President by and with the advice and consent of the Senate.

Section 5 of the Federal Alcohol Administration Act makes it—unlawful for any person engaged in business as a distiller, brewer, rectifier, blender, or other producer, or as an importer or wholesaler, of distilled spirits, wine, or malt beverages, or as a bottler, or warehouseman and bottler, of distilled spirits, directly or indirectly or through an affiliate * * * to sell or ship or deliver for sale or shipment, or otherwise introduce in interstate or foreign commerce, or to receive therein, or to remove from customs custody for consumption, any distilled spirits, wines, or malt beverages in bottles, unless such products are bottled, packed, and labeled in conformity with such regulations to be prescribed by the Administrator.

The act requires that the labeling regulations with respect to packaging, marking, branding, and labeling, and size and fill of container of alcoholic products be such as to prohibit deception of the consumer through the use of false, misleading, obscene, or indecent matter, and to provide the consumer with adequate information as to quantity, quality, and identity. Similar provisions included in the act are designed to protect the consuming public from deceptive and misleading advertising.¹³

In the case of malt beverages, the labeling and advertising requirements apply to interstate transactions only if the law of the individual State imposes similar requirements on local malt beverage manufacturers and distributors.

The Federal Alcohol Administration has issued detailed regulations with respect to labeling and advertising of wine, distilled spirits, and malt beverages. These regulations and amendments were promulgated only after public hearings had been held. Each regulation is divided into two parts. The first part deals with standards of identity for each of the various types of alcoholic beverages, and the second part deals with information which is required to appear or

¹² This Administration was abolished, effective June 30, 1940, under the terms of Reorganization Plan No. III. Its functions were transferred to the Alcohol Tax Unit of the Bureau of Internal Revenue, U. S. Treasury Department, Washington, D. C.

¹³ The Federal Trade Commission also has jurisdiction over false advertising under the recent Wheeler-Lea amendment to the Federal Trade Commission Act, and there is likewise a close parallel to the Administration's powers with respect to labeling in the functions of the Food and Drug Administration under the Food, Drug, and Cosmetic Act.

which is prohibited from appearing on labels. The mandatory information is intended to apprise the consumer of the identity and quality of the products. Other information appearing on labels must not be false, misleading, obscene, or indecent, and the use of unenforceable guaranties, therapeutic claims, scientific analyses, and other information tending to mislead the consumer is banned.

The labeling regulations make mandatory the inclusion on the labels for wine of the brand name; class and type; designation of the product, in conformity with the standards of identity; name and address of the responsible firm such as the manufacturer, bottler, or importer; the alcoholic content; and net contents of container.

Standards of identity for the several classes and types of wine have been established for still grape wine; sparkling grape wine; carbonated grape wine; citrus wine; fruit wine; vermouth; and imitation, concentrate, and substandard wine.

The advertising regulations are patterned on the labeling regulations paralleling in many respects the requirements or prohibitions of the latter.

Regulations dealing with distilled spirits and malt beverages are similar to the regulations for wine, except that in the case of distilled spirits standards of fill of container are prescribed, which have the effect of requiring the use of bottles of prescribed sizes, which are not of such shape or design as to mislead the consumer as to contents.

Enforcement.

In order to prevent the shipment in interstate commerce of misbranded products, all bottlers and importers of distilled spirits and wines, and to a limited extent bottlers of malt beverages, are required to obtain from the Administration certificates of label approval covering alcoholic beverages intended to be withdrawn from customs custody or bottled for interstate shipment. The act, however, also provides that, where it is demonstrated to the satisfaction of the Administrator that a product will be distributed within a single State, it shall be exempted from the necessity of label approval. Twenty-two States have adopted, in whole or in part, the Administration's labeling regulations as State requirements applicable to intrastate transactions.

From December 16, 1938, to December 15, 1939, 93,656 applications for label approval certificates and certificates of exemption from label approval were acted upon. Of this number, 79,253 certificates of label approval were issued, 5,117 certificates of exemption were granted, and 2,286 applications for label approval were disapproved. Some 5,028 applications were returned because of incomplete filing.

Government officials have supervision over all customhouses, and are on duty at all distilled spirits distilleries and bottling plants to prevent the removal of the merchandise from the plants unless the importer or the bottler, as the case may be, is in possession of the required certificates of label approval.

Most of the complaints with respect to misbranding are received by the Administration from industry members and State alcoholic beverage control board officials. After appropriate investigation, cases involving violations of the law or regulations are disposed of

through the institution of proceedings for the suspension of permits, the acceptance of offers in compromise, the reference of the case to the Attorney General for prosecution, or the transmission of the file to State alcoholic control board officials for appropriate action under State laws. During the past year, permits were suspended in 8 cases involving labeling violations, 1 case was referred to the Attorney General for prosecution, and 15 cases were settled by offers in compromise. In addition, many minor and technical violations of the labeling regulations were corrected by correspondence with offenders, informing them of the requirements of the regulations and suggesting the immediate discontinuance of irregular practices.

As part of the enforcement program, the Administration employs specialists who examine advertisements of liquor firms in all of the major periodicals and newspapers carrying liquor advertising. Spot checks of advertising in smaller newspapers are made with the assistance of the Press Intelligence Division of the Office of Government Reports. In addition, reports of improper advertising in media of a more local nature are submitted by competitors, trade associations, and by members of the Administration's field staff. An official is assigned to check billboard and point-of-sale advertising. Examinations of approximately 75,000 advertisements are made annually.

FEDERAL LOAN AGENCY

FEDERAL HOUSING ADMINISTRATION

The objective of the program of the Federal Housing Administration, as defined in the National Housing Act, is "to encourage improvement in housing standards and conditions, to create a sound mortgage market, and to provide a system of mutual mortgage insurance."

From the standpoint of housing values, the development by the Federal Housing Administration of a national system of minimum property standards and construction requirements has been responsible for a marked improvement in the quality of the construction and planning of new homes, particularly in the lower-price brackets. Consequently, new home buyers under the Federal Housing Administration plan have secured sounder investments and more livable dwellings than were generally available for the same amounts of money under previous conditions.

Standards and Minimum Requirements for Individual Houses and Properties.

The interests of the home buyer and of the Federal Housing Administration are jointly served by the physical standards and requirements, developed by the Technical Division, for the properties securing insured mortgages. The procedure used in developing these standards is shown in chart VII. These standards are based on the minimum requirements considered necessary for a well-built dwelling which will be resistant to the elements and to normal use, and which will provide convenient, livable housing. These standards are especially intended to foster those elements which retard deterioration and decay, promote safety, safeguard health, and secure an efficient utilization of space.

Many Federal Housing Administration requirements are designed as safeguards against common faults and errors in building which result in accelerated deterioration of the structure, unsanitary conditions, and the premature development of value-destroying influences. These requirements, however, afford wide limits within which houses may be built to suit individual tastes if the location is planned to provide adequate light and air for these houses and their neighboring dwellings, as well as space for access to a garage, and an acceptable location with respect to street lines and adjacent houses. Requirements of this nature are of benefit to individual properties as well as to the neighborhood and community as a whole.

House plans of fixed design are not mandatory. Most plans may be used which meet minimum requirements as to room areas, closet

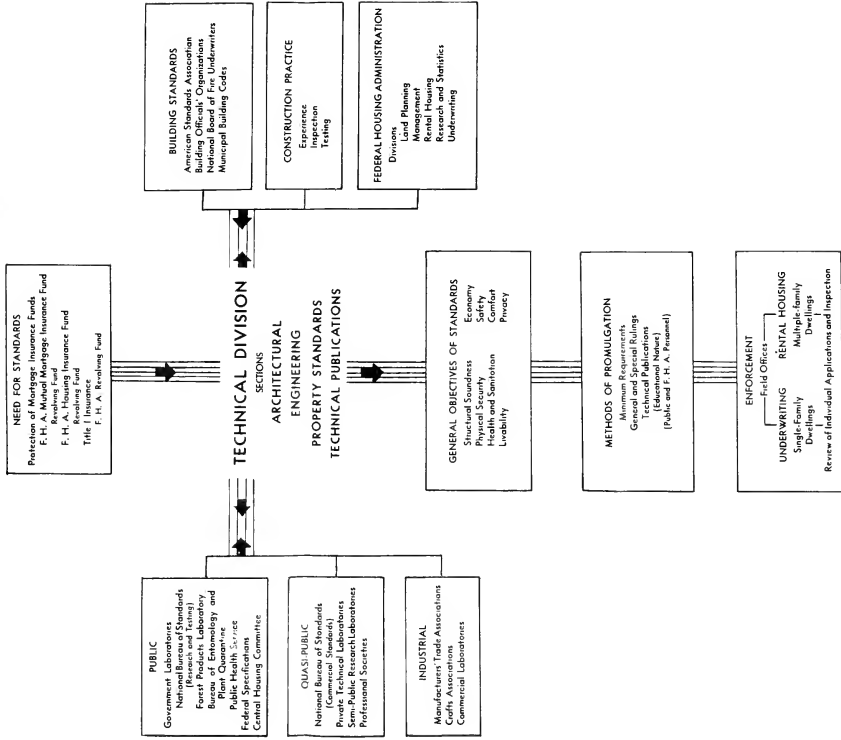
and storage space, and standards of privacy, and which avoid uneconomical use of space. The construction of houses planned and designed on a highly individualistic basis is discouraged, however, since such dwellings are generally limited in their appeal and may prove difficult to market if resale becomes necessary. On the other hand, departures from conventional plans and exterior designs are not discouraged if these departures are considered to have a broad appeal. In particular, the development of regional types of design which recognize climatic conditions as well as local tradition is encouraged.

The minimum construction requirements likewise do not restrict home owners and builders in their choice of suitable building materials or methods of construction. Any material or method normally used for building may be employed. Once the selection has been made, however, the Federal Housing Administration ascertains compliance with its minimum standards to assure the proper use of materials or methods so as to retard deterioration and functional obsolescence. When the proposed construction methods depart from the generally accepted practice proven by many years of experience, the Technical Division reviews them as individual systems and rules on their acceptability. The public thus receives the benefits of any improvements in construction or cost reductions which may be provided by new methods but is safeguarded against methods which may be structurally or otherwise unsound.

Each insuring office of the Federal Housing Administration uses minimum requirements, which have been adapted from a set of master requirements, to meet local conditions and customs. The master requirements consist of general minimum requirements applicable to any average locality. The requirements for individual districts are adjusted upward or downward to conform with local conditions, and may also include minor variations based on local custom or practice. These adjustments from the master requirements involve practical considerations such as the depth necessary to place foundations below the frost line; bracing to resist unusual stresses in localities subject to earthquakes; greater structural strength of roof members in regions subject to heavy snowfall; allowance for types of construction in southern areas which would not be feasible in the north; more stringent requirements for the waterproofing of basements in areas where water conditions are severe; and protection against termites in areas where termite infestation is prevalent. In some instances, variations in requirements show recognition that a desired objective in construction often may be attained in one of several ways and that local custom and practice, when satisfactory, should not be disturbed by requiring a different procedure without improvement in the ultimate result.

In preparing and revising the minimum construction requirements, the Technical Division uses standards established by such organizations or agencies as the American Standards Association; the American Society for Testing Materials; the National Bureau of Standards; the American Institute of Steel Construction; the United States Forest Products Laboratory; the Federal Specifications Executive Committee; and others. Many of these standards are based on long years of research, and experience in the laboratory and in practical construction. Where recognized standards and recommendations are not

Federal Loan Agency Federal Housing Administration Building Construction Standards Activities



available, the Technical Division relies on engineering analysis and good building practice. Commercial Standards of the National Bureau of Standards are often used as a basis for, or incorporation in, the requirements. Where a trade or branch of the building industry has not adopted a Commercial Standard for its product, the Technical Division in many instances recommends and cooperates in the development of such a standard.

The minimum requirements of the Federal Housing Administration for plumbing, heating, and electric wiring systems are also based upon the standards and recommendations of the National Bureau of Standards, the American Society of Heating and Ventilating Engineers, the American Gas Association, the National Board of Fire Underwriters, and the National Electrical Code. In establishing safe, satisfactory standards for sewage disposal and water supply in communities where public utility systems are not available, the Technical Division of the Federal Housing Administration depends largely upon the recommendations of the United States Public Health Service and the various State health departments. The requirements of the Federal Housing Administration deal primarily with the safety, suitability, and durability of household mechanical equipment and its installation, as well as with the general objective that the equipment contribute to the essential comfort and functioning of the dwelling.

The general purpose of the minimum requirements is to indicate the acceptable minimum standards of construction rather than to provide a definite specification. When available funds permit, home buyers sometimes find it desirable to exceed the minimum standards. The minimum requirements do not supersede local building codes except where those codes permit lower standards of construction than are acceptable to the Federal Housing Administration. In the numerous communities which do not have a building code, these minimum requirements provide the only means of regulating construction methods and often tend to raise the local construction standards.

In formulating its minimum requirements for adequate construction, the Federal Housing Administration does not demand that houses include so-called luxury items. For example, the use of insulation in walls, ceilings, or roofs is not required even though it recognizes that insulation is a valuable aid to comfort and possibly to heating economy. Insulation is considered not as a primary structural necessity but rather a desirable addition to a well-built dwelling if the owner can afford its cost. For the same reason, the requirements do not call for specific types of bathtubs, heating plants, thermostatic controls, and lighting fixtures, or for other refinements that add to comfort and convenience but do not affect the basic structure. Similarly, the interior and exterior finish of a house may be of a grade and quality within the home owner's paying ability, provided the finishing materials are sufficiently resistant to use and to the elements.

While adherence to the requirements of the Federal Housing Administration does not necessarily guarantee structural perfection, it assures adequate construction, functional efficiency, durability, and marketability. Any attempt to rectify faulty construction of foundations or of the structural shell of houses after construction is completed is costly; therefore, high quality of these basic items is con-

sidered of first importance in the formulation of Federal Housing Administration requirements.

These requirements thus constitute a protection to home buyers as well as an essential safeguard against excessive losses by the Administration itself.

Inspection.

Since the Federal Housing Administration insures lending institutions against loss of principal on mortgages written under the F. H. A. plan, the physical quality of the properties securing those mortgages is of prime importance to the Administration. An analysis of each mortgage includes not only a study of the home site but also of the design, construction, and equipment of the house. Furthermore, the neighborhood, general economic background of the community, and the financial characteristics of the mortgage are examined.

The outcome of this entire analysis determines whether or not the Federal Housing Administration will issue a commitment to insure the proposed mortgage. If a commitment is issued, inspections are made to determine whether the construction, alterations, or repairs comply with the conditions of the commitment. In the case of new dwellings three inspections are made in the course of construction to insure compliance with the approved plans and specifications and with the property standards and minimum construction requirements of the Federal Housing Administration. Three inspections, while constituting important safeguards for both the home buyer and the Administration, are not to be regarded as a substitute for the constant inspection and supervision afforded by an architect or construction superintendent.

The first inspection is made either when the excavation is completed and ready for footings and foundations, or when foundations are completed and ready for backfill, depending upon which stage, in the particular case, is considered to be the more important. The inspector notes the location of the building on the lot, subsoil conditions, adequacy of drainage, and other important items which can be best observed at this time. The second compliance inspection is made when the dwelling is enclosed, with all structural members exposed, and while the roughing-in for plumbing, heating, and electrical work is in place and visible. The third inspection is made when the building is completed and ready for occupancy.

If it is found at any stage that the construction or finished work does not comply with the terms of the commitment, additional inspections are made to determine whether acceptable corrections have been made. In the event that compliance is not secured, the Federal Housing Administration cannot stop construction or directly demand corrections. It can, however, refuse to insure the proposed mortgage unless proper corrections are made.

Land Subdivision Requirements.

Another contribution to increased property values for home buyers and to adequate safeguards for the Administration is provided by the work of the Land Planning Division in setting up standards for land subdivision. The minimum requirements for subdivisions are designed to accomplish the best use of land and to protect the basic plan of the neighborhood. The principles underlying these require-

ments include the development of urban land to create neighborhoods of definite character, the proper relationship of such neighborhoods to that of the community as a whole, and the design of neighborhoods to the requirements of the community for a definite type of housing accommodations. The land subdivision requirements also deal with the proper construction and width of roads and sidewalks, adequately sized utilities, and adequate drainage of the area for the protection of health and property.

Educational Activities.

Another important phase of the activities of the Federal Housing Administration has been its widespread educational program for better housing. Numerous technical bulletins, designed both for the building industry and for home buyers, have been prepared by the Administration as an aid to the construction of better homes and the creation of better neighborhoods. Educational articles describing good and bad building practices and emphasizing the most satisfactory procedures to follow in building or buying a home also have been widely printed by magazines and newspapers.

HOME OWNERS' LOAN CORPORATION

APPRAISAL AND RECONDITIONING DIVISION

The Need for Specifications.

The Appraisal and Reconditioning Division of Home Owners' Loan Corporation was established in 1934, and the need for appropriate specifications in the performance of its duties was recognized. The specifications of different governmental agencies were not suitable for use in the Home Owners' Loan Corporation's reconditioning work and, therefore, it was decided to set up specifications for the particular functions of this Division.

Master Specifications.

In the preparation of these specifications the following groups were consulted: Regional and State reconditioning offices of the Corporation, architects, engineers, manufacturers, and Government technicians. The experience of these groups was utilized in the establishment of these specifications, which were called Master Specifications.

The Master Specifications represent the minimum standards of workmanship and material acceptable in the reconditioning operations.

Modified Specifications: Variable conditions make it necessary to allow certain modifications of the Master Specifications. These modifications may be divided into two classes:

The usual modifications require an indication of different materials or type of work to be used.

The exceptional modifications are used in the preparation of individual job specifications in order to meet unusual or peculiar conditions.

The selection of suitable materials and equipment is left to the person preparing the specifications for a particular job.

In order to reduce the length of each individual job specification, reference is made only to the numbers of applicable paragraphs of

the Master Specifications when possible, and supplementary information is added. This arrangement prevents the repetition of the detailed information incorporated in the Master Specifications and provides uniformity in the preparation of specifications.

During the progress of reconditioning and upon completion of the work, inspection, examination, and tests are made of all materials and workmanship to ascertain that they are in conformity with the Master Specifications.

Three editions of the Master Specifications have been published. The first Master Specifications were released in December 1934, and a reprint with minor changes in March 1935. In the spring of 1937 the need for more comprehensive specifications was recognized as a result of improvements in building materials and appliances, and also because the Corporation as a realtor had entered into new phases of activity in handling its acquired properties. In June 1939 the Master Specifications were revised to include further refinements in content and scope, and to permit improved reconditioning work with a maximum of economy and a minimum of effort.

Since the Master Specifications have been prepared and adopted as a standard for reconditioning work by the Home Owners' Loan Corporation more than 80,000 copies have been distributed and the Corporation has satisfactorily completed over 700,000 reconditioning jobs.

An indication of the adaptability of the Master Specifications for various types of repair work is evidenced by the purchase of these specifications by private architects, engineers, manufacturers of building materials and appliances, and trade associations.

It seems that the experience accumulated by this Division, in repairing and reconditioning homes, and incorporated in the Master Specifications, may be of use to home owners in general.

FEDERAL SECURITY AGENCY

FOOD AND DRUG ADMINISTRATION

The Food and Drug Administration administers a group of acts designed to safeguard the purity and truthfulness of labeling of foods, drugs, and other commodities, the adulteration or misbranding of which may seriously impair the health and welfare of consumers and users of these products. These acts are—

	<i>Effective date</i>
1. Food, Drug, and Cosmetic Act.....	Jan. 1, 1940.
2. Caustic Poison Act.....	Mar. 4, 1927.
3. Tea Act.....	Mar. 2, 1897. Amended May 16, 1908, and May 31, 1920.
4. Import Milk Act.....	May 15, 1927.
5. Filled Milk Act.....	Mar. 4, 1923.

The jurisdiction of all the acts is limited to products in interstate commerce, or interstate and foreign commerce, and commerce within the District of Columbia or within any territory of the United States.

Headquarters of the organizations designed for the effective enforcement of these acts are located in Washington, D. C. Field stations with laboratories for testing various products coming within the jurisdiction of these acts are located in 16 principal cities throughout the country; inspection stations without laboratories are maintained in 20 cities; and, in addition, sea-food inspectors are located at numerous plants along the coasts of Georgia, Florida, Alabama, Mississippi, and Texas. Authority for the inspection of sea food when requested by the packers is contained in section 10A of the Food and Drugs Act of 1906; this section was not repealed with the enactment of the Food, Drug, and Cosmetic Act of 1938.

In general, enforcement of all acts is carried out by the collection and examination of samples of products after their entry into interstate commerce. Most of this work is done in the field stations. The staff laboratories in Washington are devoted mainly to investigational and research work. Types of such investigational or research work concurrently carried on are—

1. Bacteriological studies of foods, drugs, and cosmetics.
2. Vitamin tests and improvement of methods of testing.
3. Pharmacological tests, mainly of drugs and cosmetics.
4. Microanalytical studies of foods, drugs, and cosmetics and development of microanalytical methods.
5. Chemical studies of methods for detecting poisonous ingredients in foods, products of decomposition, and other forms of adulteration.
6. Chemical studies of cosmetics and of methods of determining their purity.

7. Chemical studies of drugs and of methods of evaluating their strength and purity.
8. Certification of coal-tar colors.
9. Chemical studies of caustic poisons.

In the enforcement of the various acts the Food and Drug Administration cooperates with various State agencies enforcing State laws. A Division of State Cooperation for the express purpose of promoting cooperative relations with State officials is maintained.

FOOD, DRUG, AND COSMETIC ACT

The Food, Drug, and Cosmetic Act of 1938 prohibits interstate and foreign commerce in adulterated and misbranded foods, drugs, and therapeutic devices. Comprehensive definitions of adulteration and misbranding are set up for the effective control of actual and potential abuses of consumer welfare. The various types of consumer protection afforded by the act are shown in a pamphlet prepared by the Food and Drug Administration, entitled, "Consumer Protection," and divided into sections on foods, drugs, cosmetics, and devices.

Foods.

The act authorizes the establishment of definitions and standards of identity and standards of quality and fill of container for all except a few foods. After establishment of such standards, foods entering interstate commerce are required by the act to comply with such definitions and standards.

Procedure in establishing standards.—A certain basic procedure, to be followed in establishing these standards, is required by sections 401 and 701 of the act. Superimposed on this is the procedure designed to facilitate the administrative handling of various problems arising in formulation of standards. The entire procedure may be briefly outlined as follows:

1. Recognition of need for standards, based on previous experience in enforcement work or requests or complaints from interested parties. Standardization of foods may begin upon the initiative of the Administrator or upon application of any interested industry or substantial portion thereof.

2. Decision by the Food and Drug Administration to undertake necessary work and placing products on program of standardization.

3. Investigation of factors which enter into formulation of standards. These include a study of previous standards which may have been promulgated by State and Federal Governments. When necessary investigations are made of methods of manufacture, including study of ingredients used; packing; labeling; and distribution of the product in interstate commerce; composition as revealed by chemical analysis; interviews with State officials, trade organizations, consumer organizations, and other agencies.

4. Study and summarization of reports of investigation.

5. Decision by Food and Drug Administration as to scope of standards to be proposed.

6. Study of problem by the Food Standards Committee of the Food and Drug Administration. This committee consists of six members of which four are State officials charged with the enforcement of State food laws and two members of the Food and Drug Administra-

tion. This committee considers the data accumulated by the Food and Drug Administration together with any data acquired by its members through their experience as State officials. Informal hearings are usually held to obtain expressions of opinion from interested manufacturers and consumers. The attendance of consumer representatives is encouraged. The committee formulates a recommendation to the Food and Drug Administration.

7. With the assistance of legal advisers of the Federal Security Agency proposed standards are formulated and a public hearing is announced at least 30 days in advance of the set date. The announcement of the hearing is published in the Federal Register and copies of notice are sent to the public press and trade publications.

8. A public hearing is held at which all interested parties are given an opportunity of presenting evidence regarding proposals. Affidavits are accepted from those who are unable to attend.

At the present time the procedure followed is outlined in a regulation issued on January 13, 1939, by the Secretary of Agriculture. This provides that after the close of the hearing reasonable time is given for filing of briefs, arguments, and suggestions by interested parties. After this the presiding officer prepares suggested findings of fact and formulates proposed standards. These are published in the Federal Register and a short additional time is allowed for filing of objections. The entire record then goes to the Administrator for a final determination of what the standard should be. He promulgates findings of fact and the final standard which are published in the Federal Register. The effective date of the standard is usually 90 days after its promulgation. When the standard becomes effective it has the force and effect of law and its enforcement follows through the general enforcement organization of the Food and Drug Administration.

Foods for which standards of identity have been promulgated to date:

Eggs: Liquid eggs, frozen eggs, dried eggs; egg yolks, frozen egg yolks, dried egg yolks.

Tomato juice, tomato puree, tomato paste, tomato catsup.

Vegetables, canned: Artichokes, asparagus, bean sprouts, green beans, green stringless beans or stringless green beans, wax beans or stringless wax beans, shelled beans, lima or butter beans, beets, beet greens, broccoli, brussels sprouts, cabbage, carrots, cauliflower, celery, collards, white sweet corn, white sugar corn, yellow corn, golden sweet corn, golden sugar corn, golden corn, field corn, dandelion greens, mushrooms, mustard greens, okra, onions, parsnips, black-eye peas or black-eyed peas, field peas, green sweet peppers, red sweet peppers, potatoes, sweet potatoes, rutabagas, salsify, spinach, Swiss chard, truffles, turnip greens, turnips.

Foods on which hearings have been held and on which standards of identity will be issued shortly:

Cream, whipping cream; evaporated milk, sweetened condensed milk, dried skim milk; preserves, jams, jellies; fruit butter; Cheddar cheese, washed curd cheese, Colby cheese, cream cheese.

Procedure for developing identity standards for food under the Food, Drug, and Cosmetic Act is shown in Chart VIII.

Foods for which standards of identity, quality, and fill of container have been promulgated to date:

Fruits and vegetables, canned: Apricots, cherries, peaches, pears, peas, tomatoes.

So far no procedure has definitely crystallized with respect to the formulation of standards of quality and fill of container. The only standards of the kind so far issued under the new law are substantially a reaffirmation of the standards of quality and fill of container which were in effect under the McNary-Mapes amendment of the old law. In formulating these there was, of course, not the need for the extended investigations which have usually characterized the formulation of definitions and standards of identity. Furthermore these quality and fill of container standards were not considered by the Standards Committee.¹⁴

Drugs.

Drugs sold as official drugs must comply with official requirements or standards, or may differ from these requirements if the difference is stated on the label. The official requirements or standards are contained in three compendiums recognized by the act, namely, the United States Pharmacopoeia, the Homeopathic Pharmacopoeia of the United States, and the National Formulary, or any supplement to any of them. The procedure for formulation of standards in each of these compendiums varies somewhat, and is described on pages 208-209.

Cosmetics.

Special standard-making procedure is not provided for cosmetics except with respect to coal-tar colors other than hair dyes. The act provides that dangerous coal-tar hair dyes must be labeled with the caution statement stipulated in the act. Cosmetics, except hair dyes, may contain only those coal-tar colors which come from a batch certified as being harmless.

Coal-Tar Dyes.

The Food, Drug, and Cosmetic Act defines foods, drugs, and cosmetics as adulterated if they bear or contain a coal-tar color other than one from a batch that has been certified in accordance with regulations. The act directs the Administrator to promulgate regulations providing for the listing of coal-tar colors which are harmless and suitable for use and for the certification of batches of such colors with or without harmless diluents. In order to provide for compliance with these requirements the Food and Drug Administration has set up a special laboratory for testing coal-tar colors. Regulations have been issued listing certain colors which may be certified. Standards for these colors have been established and manufacturers making such colors for use in foods, drugs, and cosmetics are required to submit samples for testing to the Food and Drug Administration. When tests show that colors are suitable for any of the various uses the manufacturer is issued a certificate on the batch. Such colors may then be used for the purposes stated in the certificate.

Devices.

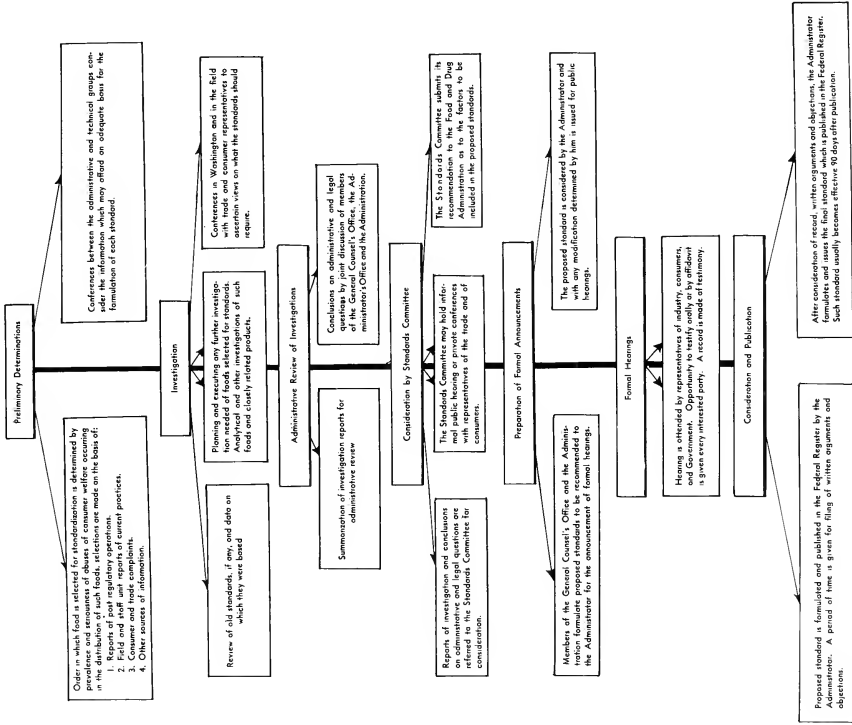
Consumer protection is afforded by the act with respect to devices; no special standard-making procedure, however, is provided.

CAUSTIC POISON ACT

The Caustic Poison Act specifies that certain information must be placed on retail parcels, packages, or containers of the caustic or corrosive substances to which the act applies:

¹⁴ Letter by C. W. Crawford, Acting Commissioner, Food and Drugs, Food and Drug Administration, Washington, D. C., August 2, 1940.

Federal Security Agency • Food and Drug Administration Procedure for Developing Identity Standards for Food Under the Food, Drug, and Cosmetic Act



- (1) The common name of the substance;
- (2) The name and place of the manufacturer, packer, seller, or distributor;
- (3) The word "poison" placed parallel with the main body of reading matter on the label or sticker, on a clear, plain background of a distinctly contrasting color, in uncondensed gothic capital letters, the letters to be not less than 24 point size unless there is on the label or sticker no other type so large, in which event the type shall be not smaller than the largest type on the label or sticker; and
- (4) Directions for treatment in case of accidental personal injury by any dangerous caustic or corrosive substance, except that such directions need not appear on labels or stickers, on parcels, packages, or containers at the time of shipment or of delivery for shipment by manufacturers and wholesalers for other than household use.

The Caustic Poison Act applies to the caustic or corrosive substances listed below and to preparations containing them, if the percentage is not less than that indicated:

	<i>Percent</i>
1. Hydrochloric acid (HCl)-----	10
2. Sulphuric acid (H ₂ SO ₄)-----	10
3. Nitric acid (HNO ₃)-----	5
4. Carboic acid (C ₆ H ₅ OH)-----	5
5. Oxalic acid (H ₂ C ₂ O ₄)-----	10
6. Any salt of oxalic acid-----	10
7. Acetic acid (HC ₂ H ₃ O ₂)-----	20
8. Hypochlorous acid or its salts (except chlorinated lime) to yield available chlorine-----	10
9. Potassium hydroxide (KOH)-----	10
10. Sodium hydroxide (NaOH)-----	10
11. Silver nitrate (AgNO ₃)-----	5
12. Ammonia water (NH ₃)-----	5

TEA ACT

Development of Standards.

The Tea Act authorizes the annual promulgation of standards of quality, purity, and fitness for consumption of all teas imported into this country.

Section 2 of the Tea Act provides that for each year, on or before the 15th of February, the Administrator of the Federal Security Agency shall appoint a Board consisting of seven members, each of whom shall be an expert in teas, who shall prepare and submit to him standard samples of tea. This Board is selected each year about the 1st of January; six of these members are selected by the Administrator from the trade, and one is the chief tea examiner or supervising tea examiner of the Food and Drug Administration. The Board usually meets the first week in February. The purpose of the Board is to select actual physical standards of a uniform quality and purity; any teas which are below this minimum standard for quality, purity, and fitness for consumption to be refused entry. Occasional changes are made in the personnel of the Board. As experience in selecting these standards is an important factor, changes in the personnel of the Board from year to year are made slowly.

These standards, when selected by the Board, are submitted to the Administrator of the Federal Security Agency for approval. They are authorized as standards under the Tea Act by the Administrator and published as a service and regulatory announcement. The teas selected for the coming year, effective May 1, 1940, are the following:

- (1) Formosa Oolong.
- (2) Formosa Black.
- (3) Congou.

- (4) Java (to be used for all fully fermented teas excepting China, Japan, and Formosa).
- (5) Japan Black.
- (6) Japan Green.
- (7) Japan Dust.
- (8) Gunpowder (to be used for all China green teas).
- (9) Scented Canton (to be used for all scented teas).
- (10) Canton Oolong.

The teas selected represent three types: Black tea, green tea, and oolong tea, which are sometimes designated by the trade as "fully fermented tea," "unfermented tea," and "semifermented tea," respectively. The standards for Formosa Black, Congou, Java, and Japan Black all represent black teas. Japan Green, Japan Dust, and Gunpowder standards represent Japanese and Chinese green teas, respectively. Formosa Oolong and Canton Oolong represent oolong teas from Japan and China, respectively, and the Scented Canton represents a standard for scented teas which may be prepared as black, green, or oolong tea. The number selected is merely for convenience in comparison. They are intended all to be uniform in quality, purity, and fitness for use.

The Board, in selecting these actual physical standards, chooses teas of which there is a stock suitable and compares the teas selected very carefully each with the other and with the standards for the previous year to insure a uniform standard. This selection of standards by the Board usually takes 5 days. The teas are examined according to the usages and customs of the trade for purity, quality, and fitness, as provided in section 7 of the Tea Act. This examination consists essentially in brewing a cup of tea, using a definite weight of tea, and is largely an organoleptic or taste examination. The infused leaf also is carefully examined to determine that it does not contain exhausted leaf, decayed leaf, or foreign material. Examination is made by a special test, which may be confirmed by chemical test, to insure that the tea does not contain facing or coloring material.

When these samples have been selected and approved by the Administrator of the Federal Security Agency and the standards promulgated, the teas selected are made into physical standards of a half-pound each, and are distributed to the tea examiners, who make the actual examinations of tea based on these standards, at ports of entry. They are also sold at cost to the trade, so that they may be distributed to those who are shipping or receiving tea, in order that shippers or others interested may make preliminary examinations to determine that they are shipping tea which appears to meet the standards.

Inspection.

Each lot or "chop" of tea imported is examined by the tea examiners of the Food and Drug Administration to determine that they meet these standards. If not, they are rejected.

There are five tea examiners who examine by this method of comparison every lot of tea which is offered for entry at any port in this country.

The Tea Act, therefore, insures that no tea which is below the standard is allowed entry into the United States. It does not include a labeling guaranty or approval, nor certification of the product.

As a result of this method of setting standards and examination, the amount of tea rejected is very small, seldom exceeding 0.5 percent.

Cooperation.

The Tea Act provides that these teas, when offered for entry, shall be held in customs custody in bonded warehouses except and until they are released. Teas which are refused entry are exported under customs supervision.

IMPORT MILK ACT

The Import Milk Act prohibits importation into the United States of milk and cream unless the shipper holds a valid permit from the Administrator of the Federal Security Agency. Such permit must be renewed each year and may be suspended or revoked for cause at any time. The Import Milk Act applies only to the Continental United States. The purpose of the measure is to promote the dairy industry of the United States and to protect the public health.

Standards.

As a preliminary to issuance of permit, certain conditions must be met and confirmed through investigations carried on by official veterinarians and inspectors. These include the following requirements specifically enumerated in the Import Milk Act:

(1) The producing animals must be healthy, as determined by a physical examination made not less than within 1 year before permit issues.

(2) If milk or cream is imported in a raw state, the producing animals must, in addition, be free from tuberculosis, as established by tuberculin test applied within 1 year previous to the issuance of permit.

(3) The dairy farms or plants in which the milk or cream is produced or handled must be in sanitary condition and score at least 50 points out of 100 points, according to the methods for scoring provided by score cards used by the United States Bureau of Dairy Industry.

At the time of entry, milk or cream offered for importation is restricted to bacteria content and temperature as follows:

(1) In the case of raw milk, bacteria content should not exceed 300,000 per cubic centimeter.

(2) In the case of raw cream, bacteria content should not exceed 750,000 per cubic centimeter.

(3) In the case of pasteurized milk, bacteria content should not exceed 100,000 per cubic centimeter.

(4) In the case of pasteurized cream, bacteria content should not exceed 500,000 per cubic centimeter.

(5) The temperature of either milk or cream should not exceed 50° F.

Importations of milk exceeding these limits for bacteria content and temperature are refused entry. The statute grants discretion to the Administrator of the Federal Security Agency to waive the above limitations for bacteria content in the case of milk or cream produced within a radius of 15 miles of a condensing plant in the United States where it is to be sterilized in processing. In such instances, the bacteria content should not exceed 1,200,000 per cubic centimeter. The statute also directs the Administrator to waive the requirement for tuberculin test on animals and the limitation of temperature in the case of milk which is produced within 20 miles of creameries or condensing plants in the United States where such milk is to be pasteurized or condensed.

Regulations drawn under the Import Milk Act define milk and cream, and also define condensed milk, evaporated milk, and sweetened condensed milk.

Labeling.

By regulation promulgated under the act, each container of milk or cream at time of importation is required to be branded or tagged with the name of the product, permit number, and name and address of the shipper.

Inspection.

To carry into effect the provisions of the act, the Administrator of the Federal Security Agency is directed to cause inspections to be made by his own representatives; or, at his discretion, he may accept reports of inspections which are made by duly accredited officials of an authorized department of any foreign government, or any State of the United States, or any municipality thereof.

Cooperation With Foreign Countries.

During the life of the Import Milk Act, permits have been issued to allow importation of fluid milk or cream from three foreign countries only, Canada, Mexico, and Switzerland. An outstanding number and volume of entries originated in Canada. Since inception of the measure, there has existed the closest cooperation between the United States Government and the Canadian Department of Agriculture in carrying its provisions into effect. Likewise, close cooperation is extended by the United States customs' officials at ports of entry.

FILLED MILK ACT

Definition of Filled Milk.

The Filled Milk Act defines filled milk as—

any milk, cream, or skimmed milk, whether or not condensed, evaporated, concentrated, powdered, dried or desiccated, to which has been added, or which has been blended or compounded with, any fat or oil other than milk fat, so that the resulting product is in imitation or semblance of milk, cream, or skimmed milk, whether or not condensed, evaporated, concentrated, powdered, dried, or desiccated.

This definition is not designed to serve purposes of labeling identification but to prohibit interstate commerce in filled milk if it is adulterated, injurious to the public health, or if its sale constitutes a fraud upon the public.

HOME ECONOMICS EDUCATION SERVICE OF THE UNITED STATES
OFFICE OF EDUCATION

The Home Economics Education Service of the United States Office of Education has for its objective "the improvement of home and family life in the Nation, through instruction in home economics in the public schools." This home economics program deals with the responsibility of members of the family in the selection, purchase, and intelligent use of the commodities and services required by the family.

Educational material including methods of teaching home economics to boys, girls, and adults, and descriptions of programs which have been successfully developed, are made available to the State and local supervisors of home economics, to those engaged in training teachers and to teachers generally. Educational programs in the schools are encouraged and strengthened through this service.

and contribute to a more intelligent appreciation of quality and performance standards, grades, and related significant information about commodities and services used by individuals, families, and communities.

"Consumer-Buying in the Educational Program for Homemaking," prepared by the Home Economics Education Service and published by the United States Office of Education in 1935, is designed for the use of those concerned with the teaching of consumer buying and has been used extensively by teachers of young people and adults.

Representatives of the Home Economics Education Service arrange regional conferences attended by State and local supervisors of home economics and representatives of teacher-training institutions, at which, in recent years, problems of education in consumer-buying have been frequently considered.

The Home Economics Education Service cooperated in planning a survey of consumer education in secondary schools which has been made by the Consumers' Counsel Division of the Agricultural Adjustment Administration. The report on the survey is now in the process of preparation. The data were tabulated by the staff of the Consumer Standards Project (Work Projects Administration).

UNITED STATES PUBLIC HEALTH SERVICE

The United States Public Health Service is not required by law to establish standards for products usually offered for direct purchase by the ultimate consumer, although many of its functions deal with the formulation of and encouragement for adoption of certain standards for the protection of health. Some of these standards affect the ultimate consumer more directly than do others.

The United States Public Health Service is specifically charged with the control and standardization of biological products; it also establishes standards for drinking and culinary water used on common water carriers in interstate commerce and cooperates with the States in the enforcement of these standards. Other cooperative activities of the Service with State agencies concerned with health matters relate to the formulation of standards for milk sanitation, sanitary control of the shellfish industry, control of industrial health hazards, and control of similar health problems.

Biological Products.

By an act of Congress approved July 1, 1902, the United States Public Health Service was given supervisory control, through licensing, of the manufacture, sale, and distribution in the District of Columbia and in interstate commerce, of biological and analogous products used in the prevention and treatment of diseases of man, to insure safe and standard products. With a few exceptions, however, these products are not ordinarily purchased by the ultimate consumer, but are dispensed by State and local health departments, hospitals, clinics, and private physicians. Standards of purity, potency, and manufacture of these products are established by the United States Public Health Service, and it is the function of the Service to ascertain that the standards are maintained in order that such products may be sold in interstate commerce. The products so controlled in-

clude the various vaccines, serums, antitoxins, arsenicals, and analogous preparations. Vaccine virus, diphtheria toxoid, typhoid fever vaccine, antipneumococcus serums, rabies vaccine, scarlet fever serum, and the arsenicals used in the treatment of syphilis are among the most familiar products standardized by the Service. Standards are also established for insulin, used in the treatment of diabetes, and this product is one which is most likely to be purchased directly by the consumer.

Those collaborating in the development of standards for biological products include physicians, manufacturers of biological products, the Permanent Commission of Biological Standardization of the League of Nations, and institutes of health of other nations.

In establishing a standard unit for a biological product, research is conducted to determine the amount of the product required for a curative dose. Effort is then made to adjust the volume of the unit to a convenient size for a dose for a patient. In many cases comparisons are made with international standards and the American and international units are correlated.

When a standard was developed, it became official when it had been promulgated by the Secretary of the Treasury;¹⁵ this authority is now vested in the Administrator of the Federal Security Agency.

The United States Public Health Service is the guardian of the standard units for the various biological products for which such standards have been developed. A plan is followed whereby standard units of different biological products are sent at stated intervals to the manufacturers of the respective products so that these manufacturers may compare their products with the standard units to insure continued adherence.

There are various biological products for which standards have not yet been established but for which standard tests have been developed. Manufacturers of these products send samples to the United States Public Health Service to be analyzed for strength in accordance with these tests.

In the exercise of control measures, licenses are granted by the Service only after inspection of the manufacturing establishment and laboratory examination of samples of its products with respect to potency and safety have been made. Control of certain serums is based on official tests. Samples of products on the market are continually being tested, and the products of all biological establishments are tested once a year.

Water Supplies.

In the prevention of interstate spread of disease, a function of the United States Public Health Service required by law, interstate quarantine regulations have been promulgated.

The first standards for drinking water used on interstate carriers were developed by the United States Public Health Service with the cooperation of advisors appointed by the Surgeon General. These standards, dealing only with the bacteriological quality of the water, were promulgated by the Secretary of the Treasury in 1914.

Present standards for drinking water, promulgated by the Secretary of the Treasury in 1925, were developed by the United States

¹⁵ On July 1, 1939, the U. S. Public Health Service was transferred from the U. S. Department of the Treasury to the Federal Security Agency.

Public Health Service with the assistance of an Advisory Committee on Official Water Standards appointed in 1922 by the Surgeon General. The members of this committee included sanitary engineers, bacteriologists, and chemists representing the following groups: Officials of city waterworks, State officials concerned with the enforcement of drinking water standards, and owners of water systems. It is of interest to note that these drinking water standards, dealing chiefly with source, treatment, and distribution, have been generally adopted as standards for public water supplies.

These standards are enforced by requiring annual certification by the United States Public Health Service of water supply sources used by common carriers in interstate commerce. The State health authorities cooperate in this work, and usually the certification by State sanitary engineers is accepted by the Service. The United States Public Health Service makes sanitary inspections relative to the handling of water and milk supplies, and the methods of taking on, cooling, and dispensing water supplies on common carriers in interstate commerce; and general sanitary conditions of vessels, coaches, interstate air carriers, and motor busses, coach yards, and the terminal stations of the various carriers.

Milk Supplies.

The United States Public Health Service Milk Ordinance and Code has been prepared by the Service for voluntary adoption by municipalities. It is based on the results of investigations in milk sanitation, tests of pasteurization practices and equipment, and epidemiological studies of milk-borne diseases.

The Milk Ordinance requires the grading of pasteurized and raw milk sold in the community, with the provision that the municipality may require the pasteurization of all milk sold therein. Each year the Service studies the operation of the milk ordinance in communities in which it has been adopted and determines the degree of compliance in terms of a numerical rating based on the information furnished by State milk sanitation authorities. The purpose of this activity is to encourage the communities of the United States to attain and maintain a high level of excellence in public health control of milk supplies.

Frozen Desserts.

Consideration of an ordinance for frozen desserts was initiated in 1936 as the result of a request from health officials in Memphis, Tenn.; a tentative ordinance, prepared by the United States Public Health Service and these officials, was adopted as a Memphis city ordinance. A later ordinance, developed by the United States Public Health Service, has been revised from time to time; and, as a result of the May 1940 conference of the Public Health Service Sanitation Advisory Board, a board of technical experts appointed by the Surgeon General to advise on various phases of environmental sanitation, a revised ordinance and code to be recommended for local adoption is now in preparation.

Restaurant Code.

A Tentative Ordinance and Code Regulating Eating and Drinking Establishments was issued in 1938. It presents a system of grading for such establishments and was prepared at the request of local and State health officers. Some of the items in the code deal with

examination and condemnation of adulterated food; cleaning and bacteriocidal treatment of utensils; notification of disease of workers; requirements for floors, walls, ceilings, ventilation, and toilet facilities, and other features of the building. The provisions of the code were reviewed at the May 1940 conference of the Public Health Service Sanitation Advisory Board and suggestions from various sources were considered. As a result, a revised edition of the Ordinance and Code Regulating Eating and Drinking Establishments has been released.

Other Activities.

The United States Public Health Service has contributed to the establishment of standard methods and procedures in various other fields of public health, but they are not standards promulgated and enforced by the Service; they are merely recommended standards. The Service is also represented on committees engaged in the formulation of standards; and in these cases the Service acts only as a member of the committee or in an advisory or consultant capacity.

In various other fields that relate to public health and sanitation the United States Public Health Service contributes to the standardization of equipment and practices. It has formulated minimum standards for lighting of low-cost homes; and established, or contributed to the establishment of specifications for the screening of rural houses to aid in the prevention of malaria; the construction of sanitary outdoor toilets and septic tanks; the ratproofing of dwellings and vessels; the construction of rural water supplies; sewage disposal; and housing.

The United States Public Health Service also investigates health hazards in industry and makes recommendations for necessary corrections in the revision of standards. Studies, such as determining the effect of certain amounts of toxic insecticide sprays on fruits and vegetables, lead poisoning in the storage battery industry, silicosis and lead poisoning among pottery workers, toxicity of lead and its compounds, inhalation of vapor from new commercial organic compounds used in industry, and health hazards associated with coal mining, metal mining, and smelting, are conducted by the Service.

These standards are in no sense compulsory so far as enforcement by the United States Public Health Service is concerned, and when minimum requirements for health protection are determined and established by the Service they are for information and recommendation only. In most instances the control over such matters comes under the jurisdiction of State and local authorities, and activities conducted thereunder must conform to State and local requirements. Through a cooperative agreement dealing with the establishment of standards for domestic water supply and sewage disposal, between the Federal Housing Administration, the United States Public Health Service and the State health authorities, the standards of the several States are enforced in all subdivisions or housing developments conducted in the States under the procedure of the Federal Housing Administration.

In the administration of title VI of the Social Security Act, which provides for allotments to States for the extension and improvement of State and local health services, certain minimum

qualifications for health officers and other health personnel have been established. These qualifications were formulated and recommended by the conferences of State and Territorial health officers with the Surgeon General of the United States Public Health Service. Similar minimum qualifications have been established for venereal disease control officers.

In the control of venereal diseases an attempt is being made to improve and standardize laboratory procedures in making sero-diagnostic tests for syphilis. This is being done by an evaluation of the various serologic procedures in State-controlled and other laboratories which conduct such tests.

Cooperation With Other Agencies.

The United States Public Health Service is a member of the United States Pharmacopoeial Convention, and is represented on the Committee of Revision of the United States Pharmacopoeia.

In addition to the activities mentioned, relating to or dealing with the formulation of standards, the United States Public Health Service, on request from the State health authorities and Federal departments and independent agencies, acts in a consulting capacity on matters of health and sanitation. These activities affect the public primarily with reference to water supplies, sewage disposal, sanitation in public buildings and parks, and other sanitary matters.

THE FEDERAL TRADE COMMISSION

The Federal Trade Commission derives its jurisdiction from three statutes: the original Federal Trade Commission Act,¹⁶ as amended by the Wheeler-Lea Act,¹⁷ the Clayton Act,¹⁸ and the Export Trade Act.¹⁹ By the original Federal Trade Commission Act, the Commission is empowered to prevent unfair methods of competition in interstate commerce and in foreign commerce. False labeling, false advertising, and other forms of deception fall within the methods of competition which the Commission was empowered to prevent under the original Federal Trade Commission Act. The Wheeler-Lea Act gave the Commission the additional power of preventing also unfair or deceptive acts or practices in interstate commerce and foreign commerce. In other words, acts or practices unfair or deceptive to the public, as well as competition unfair to competitors, are now within the power of the Commission to prevent.

There are three methods used by the Federal Trade Commission for the prevention of unfair competition and of unfair or deceptive acts or practices. These methods are (1) the issuance of cease and desist orders, (2) stipulations by which the parties who otherwise would be proceeded against agree with the Commission to stop using the method, act, or practice, and (3) the use of trade practice conferences.

These methods are discussed rather in detail since they illustrate a procedure the purpose of which is, to a great extent, the protection of the consumer.

Cease and Desist Orders.

Cease and desist orders are used in cases of misrepresentation where the party proceeded against has not availed himself of the opportunity given him by the Federal Trade Commission to cease and desist from the practice by stipulation. Such opportunity is not afforded by the Commission in all cases.

Certain types of false advertising cases are initially proceeded against by the Federal Trade Commission in a petition to the United States District Court having jurisdiction over the alleged offender, for a temporary injunction or restraining order to prevent the dissemination of or the causing of the dissemination of false advertising of food, drugs, devices, and cosmetics, pending the issuance of a complaint and the disposition thereof after hearings.

The issuance of a cease and desist order is preceded by the issuance of complaint which contains a notice of a hearing at which the respondent has the right to appear and be heard, the taking of testimony, the filing of briefs and the hearing of oral argument. If, after such procedure, the Federal Trade Commission is of the opinion

¹⁶ 38 Stat. 717.

¹⁷ 52 Stat. 111.

¹⁸ 38 Stat. 730.

¹⁹ 40 Stat. 516.

that the method, act, or practice is prohibited in any of the acts administered by the Commission, it makes a report in writing in which it states its findings as to the facts. Upon such findings of fact and upon the opinion of the Commission that the method, act, or practice is prohibited by these acts, it bases its order to cease and desist. The respondent has a right to a review of the order in the proper United States Circuit Court of Appeals. The respondent, in the event the order is affirmed by the circuit court of appeals, has a right to petition the Supreme Court of the United States for a writ of certiorari to review the judgment and decree of the circuit court of appeals. If the respondent does not petition a circuit court of appeals for review of the Commission's order within 60 days, the order becomes final at the end of such period. In case of violation of the order after it becomes final, the respondent makes himself liable for the recovery of a penalty for each violation. What has been stated as to the order becoming final at the expiration of 60 days and what has been stated with regard to penalties for violations applies to the original Federal Trade Commission Act as amended by the Wheeler-Lea Act, approved March 21, 1938. Prior to that date there had been no provision by which orders to cease and desist became final after any given period, nor had there been any penalty provided for violations of orders to cease and desist issued under the original Federal Trade Commission Act. However, under the original Federal Trade Commission Act if a respondent violated the order after it had been affirmed by a circuit court of appeals or after in a circuit court of appeals a decree of enforcement had been entered he made himself liable to punishment for contempt of the court which had affirmed the order or had entered the order of enforcement.

The scope and variety of cases involving false advertising and misrepresentations which deceive consumers may be illustrated by a few examples of cease and desist orders issued during 1939, as follows: (1) To cease and desist from misrepresenting the fiber content of hosiery, only partly composed of silk, by failing to disclose the other fibers therein. One concern was directed to discontinue misrepresenting the wool content of its products and from using the word "wool" to describe cloth containing other fibers unless such other fibers were conspicuously listed. (2) To discontinue use of the term "pure dye" to describe fabrics not made wholly of unweighted silk, as well as the unqualified term "satin" or "taffeta" to describe rayon. (3) To discontinue misrepresentations in connection with solicitation of orders from the public for photographic enlargements described by salesmen as "portraits" and "paintings," and from failing to disclose to purchasers the true nature of the proffered transaction. (4) Cease and desist from failure to disclose harmful potentialities of drug products. (5) A number of orders involved the misrepresentation of the composition or value of drugs, soap, textiles, welding machines, and so forth. (6) To discontinue representing Japanese-made bicycle frames as made in America; and from describing cosmetics as of foreign origin; and from obliterating or otherwise concealing marks of foreign origin on gloves.

The Wheeler-Lea Act specifically makes unlawful the false or misleading advertising of food, drugs, devices, and cosmetics, and gives

the Federal Trade Commission power to prevent such advertising. It also provides for penalties for certain types of violations of the provisions against false and misleading advertising of food, drugs, devices, and cosmetics. A false advertisement of a food, drug, device, or cosmetic is defined by the Wheeler-Lea Act to be one misleading in a material respect and it is provided in this act, in determining whether an advertisement is misleading, that there should be taken into account (among other things) not only representations made or suggested by statement, word, design, device, sound, or any combination thereof, but also the extent to which the advertisement fails to reveal facts material in the light of such representations or material with respect to the consequences which may result from the use of the commodity to which the advertisement relates under the conditions prescribed in said advertisement, or under such conditions as are customary or usual.

The advertising cases for 1938-39 covered false and misleading advertising of a wide range of food, drug, and cosmetic products, e. g.,²⁰ *Food*.—Coloring compounds, dairy products, flour, sea food, soft drinks, sirups, teas, and vitamin capsules.

Drugs.—Cough drops, deodorants, contraceptives, eye lotions, eyebrow treatments, germicides, habit forming and heart depressing drugs, hair dyes, tonics, treatment for dandruff, and nose salves. Also alleged remedies of many descriptions inclusive of treatments or cures for acne, asthma, alcoholism, boils, impure blood, constipation, grippe, headaches, indigestion, malaria, nervous disorders, obesity, stuttering, whooping-cough, and worms.

Devices.—Electrolysis machines for removal of superfluous hair, electromagnetic belts and blankets, hair curlers, reducing girdles, and sun lamps.

Cosmetics.—Beauty packs, eye treatments, facial lotion, face powders and creams, and shampoos.

Stipulations.

Under certain circumstances the Federal Trade Commission, instead of disposing of cases by formal complaint and trial, affords a respondent the privilege of disposing of a case by signing a statement of fact and agreement to discontinue the alleged unfair method of competition.

The Federal Trade Commission determines the form and subject matter of all stipulations which are prepared in accordance with the facts as disclosed by the investigation. If a respondent alleges the facts to be other than the investigation discloses, then the matter is not subject to stipulation and the proper and only procedure is to try the issue in order to develop the true facts.

In those classes of cases in which the Federal Trade Commission affords the respondent an opportunity to dispose of a matter by stipulation, that procedure accomplishes economically and expeditiously the same result as a complaint and order to cease and desist. It also simplifies the Commission's legal procedure and saves both the Government and the respondent the expense incident to trial of the complaint.

²⁰ See Releases "Monthly Summaries of Work," Federal Trade Commission, Washington, D. C., 1938-39.

Often it appears that a violation occurs through ignorance or misunderstanding, and that the attention of the offender has only to be called to such violation to induce discontinuance of the practice. In such an instance the Federal Trade Commission, instead of issuing a formal complaint, grants the respondent an opportunity to sign a statement of facts disclosed by the investigation and agreement to cease and desist from the practices charged. If such stipulation is signed, further action is suspended; if it is not signed, the case goes to trial.

Where signed stipulations are approved and accepted by the Federal Trade Commission, the public interest is deemed satisfied without issuance of formal complaint. They are not permitted in cases where a fraudulent business is concerned, where a legitimate business is conducted in a fraudulent manner, where the circumstances are such that there is reason to believe that an agreement entered into with the concern involved will not be kept, or where a violation of section 14 of the Federal Trade Commission Act, of the Clayton Act, or the criminal sections of the Sherman Act or any other statute, is believed to have occurred. The Commission reserves the right in all cases, for any reasons which it regards as sufficient, to refuse to extend the privilege of stipulation.

All stipulations are for the public record.

Unfair trade practices discontinued as a result of stipulations comprise a wide variety of misleading misrepresentations affecting a large number of businesses. These practices are usually of a type that can be readily corrected through this procedure.

The range of commodities involved in the disposition of cases by stipulation embraces practically all types of products sold in interstate commerce.

Stipulations in which various individuals, firms, and corporations agreed to cease and desist from the unlawful practices as set forth therein and which were approved by the Commission during the fiscal year ended June 30, 1939, included 271 cases in addition to 329 cases of a special class which were limited largely to false and misleading advertisements and were disposed of through a special procedure for this purpose. A total of 600 stipulations was thus approved and accepted during the year.

Trade Practice Conferences.

The Federal Trade Commission holds trade practice conferences for specific industries to discuss unfair trade practices and to effect correction through cooperative effort under rules. This procedure of the Commission has been in operation for many years, and through it a large body of fair trade practice rules has been established. Besides covering a variety of unfair methods of competition and other trade abuses, the rules contain certain consumer standards in respect of proper marking of products, disclosure of content, specification of minimum standard of composition or grade, advertising and labeling to prevent deceptive merchandise, misrepresentation and confusion of the buying public, standards and other provisions of interest to consumers.

The work is handled by the Commission's Division of Trade Practice Conferences, which was established in 1926. The Assistant Director of this division has stated:

Businessmen are glad, as a rule, to lend their support to voluntary and simultaneous abandonment of bad practices. They welcome the chance to wipe the slate clean. The overwhelming majority are unwilling to stoop to unfair tactics. At times some may feel that they must do so in order to meet in kind the unfair or unethical competition of less scrupulous competitors. Many concerns, as is often the case, would like to abandon their use of unfair or unethical methods if they can but be assured that their competitors will likewise stop and not take advantage of the situation. The trade practice conference procedure affords a means whereby this can be accomplished in a substantial and gratifying degree by having the rules placed in effect on a day certain, when by simultaneous action each may turn over a new leaf and make a fresh start on the same fair basis of competition.²¹

In some instances it may be found that the industry's principal difficulties are in final analysis, due to the lack of guiding standards for their product. The Commission has found it possible to assist industries in setting up in their rules such wholesome standards, thus clearing away the main stumbling block in their competitive problems. Not only is it found possible in certain situations, through industry and Commission collaboration, to formulate and establish such standards, but also to provide the necessary measure of enforcement to make them effective.²²

Through the trade practice conference and hearings, opportunity is afforded for voluntary participation by interested groups in the formulation of rules to provide for the elimination and prevention of unfair trade practices, and to foster and promote fair competitive conditions; to encourage high ethical standards in business relationships. At the conference a set of rules is discussed and proposed by the industry for the Federal Trade Commission. The Commission, after study and incorporation of perfecting corrections deemed desirable, makes such draft of the proposed rules available, and upon public notice affords all interested and affected parties opportunity to present their views or suggestions and to be heard at the public hearing ordered for the purpose. In passing upon the rules, the Commission gives consideration to all memorandums, briefs, oral arguments, and other information submitted pursuant to public notice. Thereupon, the rules, if deemed proper and acceptable, are approved and received by the Commission and promulgated as trade practice rules for the industry. Each member is supplied with a copy and an acceptance card on which he may record his voluntary undertaking to observe the rules in the conduct of his business.

The rules as approved are generally of two kinds or classes known respectively as group I and group II. Rules relating to practices falling within the broad phrase, unfair methods of competition, or other competitive practices inhibited by law, are designated as group I rules. Observance of these rules is required as a matter of law because of the illegal character of the practice, and its harmful effect upon the public. Other industry rules received by the Commission, but not applying to practices forbidden by law, are placed in group II, provided such rules are acceptable to the Commission as being in the public interest and constructively in furtherance of their competitive practices in the industry. Observance of group II rules is voluntary and depends upon cooperation developed by the industry and the degree of support accorded them by the public.

The following description of approved rules for the industries named is indicative of the consumer interest and protection in-

²¹ "Federal Trade Commission Regulation of Business Practices," p. 6, address by Henry Miller, Assistant Director of Trade Practice Conferences, Federal Trade Commission, before the Eleventh Boston Conference on Distribution, Boston Conference on Distribution, Boston, Mass., October 3, 1939.

²² *Ibid.*, p. 8.

volved in the trade practice conference work of the Federal Trade Commission. Virtually all of the rules mentioned are of group I.

Rayon industry.—Trade practice rules have been set up for this industry by the Federal Trade Commission making provision for the proper disclosure of fiber content of the innumerable articles of clothing and other textile products which contain rayon in whole or in part. The rules officially define the scope of the word "rayon" as a generic term and make detailed provision for labeling articles containing rayon so as to correctly inform the public of the composition of the fabric and to avoid misrepresentation, misinformation, and deceptive concealment. Provision is also made against advertising designation and selling methods which tend to confuse the fiber with silk, wool, cotton, or other material and which mislead the public or deprive purchasers of the benefits of honest and above-board merchandising. Experience has demonstrated that such rules and their observance generally have been of tremendous benefit to consumers as well as to the business concerns engaged in the marketing of merchandise containing this widely used textile fiber, of which the annual production in this country exceeded 340,000,000 pounds (1937 figures).

Silk industry.—Similar fiber identification rules have been promulgated by the Federal Trade Commission covering the large variety of articles of clothing and other merchandise which contain silk in whole or in part. The wearing apparel, household, and other textile commodities embraced in these rules cover more than 60 industry classifications of finished products which are produced in this country and aggregate approximately \$600,000,000 in annual retail sales value. The rules make provision for the proper labeling and disclosure of fiber content of the merchandise. The rules also contain specific provision for the proper application of the term "pure" or "pure dye" silk, and for the proper identification and disclosure of weighted silk and silk noil. False advertising, misbranding, loading, and adulteration of the product, deceptive concealment of deterioration or damage to merchandise, and many other unfair practices harmful to the buying public and to business are proscribed. (Proceedings for the adoption of rules covering textile products composed of fibers other than silk or rayon are pending.)

Fur industry.—Trade practice rules for this industry cover the marketing of furs and fur garments and were promulgated June 17, 1938. There are tens of thousands of establishments engaged in the fur industry as manufacturers and distributors of the finished product and as fur farmers, trappers, dyers, dressers, and other handlers. Sales to the consuming public total several hundred millions of dollars annually. The rules promote the use of ethical selling practices and provide therein essential consumer protection in their purchases of the valuable and useful merchandise of the industry. The use of misleading or deceptive designations of furs in tags, labels, advertisements, and selling representations are prohibited. The designations used are to disclose the true name of the animal from which the pelt was taken. The use of fictitious animal designations, the passing-off of fur of one animal as that of another, misrepresentation of geographical origin, use of deceptive guaranties or warranties, deceptive concealment of dyeing, blending, or piecing, or that fur has been dyed to imitate the fur of another animal or of a higher grade

pelt, deceptive concealment of the fact that products are made in whole or in part of second-hand furs, deceptive concealment of damage or injury to pelts caused in dyeing or processing, and many other forms of unfair methods of competition and practices which are injurious to the purchasing public as well as to honest competitors, are prohibited by the rules.

Dress industries.—Trade practice rules were established in December 1937, covering house dresses, wash frocks, and so-called popular-price dresses in which at that time the annual sales totaled nearly \$100,000,000, manufacturers' prices. Provision was made against false advertising and deceptive labeling with respect to quality, size, serviceability, character of fabric, color fastness, workmanship, washability, fiber content, shrinkage properties; also against the use of any other selling method which may be misleading or deceptive to the purchasing public. Various additional rules provide for maintaining, in the interest of the public, fair competitive conditions among the hundreds of manufacturers and thousands of merchants engaged in marketing dresses. Informative labeling of fiber content of the fabric is largely provided for in the above-mentioned rayon and silk rules.

Cotton converting industry.—Trade practice rules promulgated for this industry on August 18, 1939, in revised form, cover cotton and mixed cotton and rayon goods, embracing the following industrial classifications: Fabrics for clothiers' linings; corset, brassiere, and allied trade fabrics; converted curtain and drapery fabrics; shirting fabrics; wash goods fabrics; interlining fabrics; bleached goods; and all other cotton and cotton-mixture fabrics. Of direct interest to consumers are rules against misbranding and misrepresentation of the grade, quality, thread count, shrinkage properties, color fastness, washability of the goods, as well as any other form of misrepresentation or deceptive selling claims. The rules also prohibit the deceptive concealment from purchasers of the foreign origin of imported cotton goods which have been dyed or redyed in this country with the consequent obliteration of the original mark of foreign origin, and various other unfair competitive methods. All have been formulated in the interest of the public and for the protection of consumer and fair business enterprise.

Shrinkage of woven cotton products.—On this subject, specific and detailed provision is made in trade practice rules for proper labeling in respect to preshrunk character or shrinkage properties of woven cotton goods, the legal principles of the rules being also applicable to wearing apparel or other merchandise made of woven cotton goods. Unless and until processes are found and applied which will remove all shrinkage, the rules require that the product shall not be labeled or represented as shrinkproof or nonshrinkable, or by advertising or labeling claims of similar import. They also provide that in case the merchandise is labeled or represented as having been preshrunk or shrunk, full disclosure shall be made in connection therewith of the percentage of additional shrinkage the merchandise will undergo when laundered or used by the consumer. Thus the purchaser is to be appraised of the fact that, although having been preshrunk to a degree, the goods will shrink still more and what will be the extent of such additional shrinkage. Observance of these rules means the elimination of the chaotic, confusing, and misleading conditions in advertis-

ing and labeling which had sprung up in the matter of control of shrinkage of woven cotton merchandise of all kinds marketed annually to the extent of many hundreds of millions of dollars.

Infants' and children's knitted outerwear industry.—The proper labeling of infants' and children's knitted outerwear is provided for in trade practice rules for this industry. Under them, fiber content is to be disclosed in labeling and advertising in accordance with the rayon and silk rules. Misbranding and misrepresentation respecting the grade, quality, size, serviceability, color fastness, workmanship, shrinkage properties, or in any other respect, are to be eliminated. As in the case of other industries many other forms of trade abuses are also covered.

Ribbon industry.—Comprehensive trade practice rules were issued June 28, 1939, for this industry, covering ribbons and ribbon products, of which the manufacturing branch has a total annual sales volume of approximately \$12,000,000. Provision is made, among other things, for the elimination of misbranding and misrepresentation; for the disclosure of yardage on label, or spools of ribbon, also for disclosure of the fact when the ribbon is of the cut-edge or of the pasted-back type of construction instead of woven edge or back. A rule is included against the practice of dyeing or redyeing ribbon to obliterate mark of foreign origin and deceptively conceal the fact that the product was not made in the United States. Fiber identification and other provisions are incorporated for the protection of honest business and the consuming public.

Radio receiving sets, parts, and accessories industry.—This industry has aggregate sales amounting to more than \$460,000,000 per annum. Rules relating to the advertising and selling practices of the industry were promulgated by the Commission on July 22, 1939. The industry is comparatively new, also subject to rapid technological advances, and various competitive problems involving confusion and deception to the buying public had sprung up. To correct these difficulties, trade practice conference proceedings for the industry were held and the rules were established. These provide against all forms of misbranding, misrepresentation, and deceptive selling methods. They provide for proper advertising descriptions in respect to "all-wave," "world-wave," and "standard broadcast" sets; for the proper designations of the radio frequencies covered by the respective sets; also proscribed are deceptive or unfounded claims as to reception of foreign or distant broadcasts; freedom from fading, noise, electrical interference, static, and other phenomena; as to the performance of the receiving set in the locality of the purchaser, its ability to receive transmissions from or to ships at sea, amateur stations or other types of transmissions. Concealment of defects or deficiencies, misrepresentations as to ability to bring in certain foreign or domestic stations, are also covered; provision is made against the use of fake or "dummy" tubes; the misrepresentation of tube capacity of set; misrepresentation of the model, switching of cabinets to deceive; misrepresentations as to manufacturing sponsor of set; and various other unfair competitive methods. The rules constitute a concerted effort in cooperation with the industry to protect the buying public in their purchases of radio sets, parts, and accessories, for which millions are spent annually.

Putty industry.—Rules promulgated for this industry proscribe such practices as false advertising and deceptive representation of

grade, quality, manufacture, character, content of the product, false labeling, misrepresentation as to the oil content, whether the same is linseed oil or substitute oil; the use of adulterants or substitute oils to mislead and deceive; the misrepresentation of the white lead and other pigment content; the use of slack filled or short weight containers; the making of false guaranties; and many other forms of unfair trade practices, the prevention of which affords comprehensive consumer protection in the purchase of putty, an essential and widely used commodity.

Paint and varnish brush industry.—As in the case of putty, trade practice rules for the paint and varnish brush industry were promulgated to protect the buying public as well as honest business from advertising and selling practices which mislead, deceive or defraud purchasers. The rules not only prohibit all forms of deceptive advertising and labeling, but also contain comprehensive provisions in respect to labeling paint and varnish brushes so as to reveal the type of bristle or hair used in the brush, whether hog bristle, horse-hair, fiber, or mixture thereof. Inasmuch as the quality and value of the brush is largely dependent upon the type or proportion of bristle content, the truthful disclosure of the facts to the purchaser in this respect closes the door on conditions which in the marketing of this product would mislead, deceive, or defraud the consumer. The rules likewise provide for the prevention in the industry of many other forms of unfair trade practices.

Toilet brush industry.—The trade practice rules covering toilet brushes provide against concealment of foreign origin of the handles or blocks, misrepresentation of bristles and of the kind of wood in the handle or block. The rules also provide a system of approved designations to be used in connection with brushes sold as "Made in U. S. A." but containing handles made in Japan, England, France, or other foreign country. The purpose is to protect consumers from deception, confusion or misunderstanding in their purchases of domestic or foreign-made brushes or of brushes containing essential parts made in a foreign country. Various other forms of misbranding, false advertising, and unfair methods of competition are also inhibited.

Baby chick industry.—Trade practice rules promulgated for this industry are of special value to our farm population. They cover the sale and distribution by hatcherymen of baby chicks and make definite and detailed provision for the protection of farmers and other poultry raisers who purchase nearly a billion chicks annually. All forms of deceptive advertising and selling methods are inhibited, including deceptive concealment of material facts. Specific inhibitions are provided to control unethical selling methods which are grounded in false claims and deceptive representations relative to egg yield or egg-producing qualities, blood testing, vaccination, inoculation, pullorum testing, freedom from disease, purported bargain prices, trap nesting of flocks, liveability and stamina of chicks, and many other trade abuses and unethical selling practices which are injurious to the public as well as to scrupulous competitors.

Preserve, macaroni, and tomato paste industries.—Rules covering these industries relate to the advertising, sale, and distribution of fruit preserves, jams, jellies, macaroni, spaghetti, noodles, and related

products, and to tomato paste products. These various commodities are widely used by the public and involve a segment of our national trade and commerce of considerable proportions. The rules were issued in the interest of maintaining fair competition and protecting the public interest. They provide minimum standards of content of products and proscribe deceptive advertising or selling representations which conceal the fact when the product is substandard or is an imitation, or is deficient in required ingredients, as, for example, deficient in fruit content in the case of preserves, jams, jellies; or deficient in egg or semolina or farina flour content in the case of macaroni and related products; or is lacking in sufficient concentration of tomato content in the case of tomato paste products. Adulteration, use of artificial color to mask inferiority, and many forms of selling practices are covered which are injurious in their effect upon the buying public, or which interfere with the consumer's interest in the maintenance of fair methods of competition.

Oleomargarine industry.—Of somewhat similar nature are the rules covering the advertising and distribution of oleomargarine. Besides prohibiting false advertising and misrepresentation as to nutritive value, fat content, grade or character of ingredients of product, special provision is made against the practice of misrepresenting the product as containing milk when only skimmed milk has been used or when either the cream or other food content has been extracted from the milk. The rules condemn the failure to comply with Federal or State laws or regulations for oleomargarine, and various other unfair competitive methods.

Mirror industry.—These trade practice rules treat a most important problem from the standpoint of protecting the public and scrupulous business by, among other things, providing for labeling of mirrors to show whether the glass is plate glass or window glass. The passing off of one for the other is prohibited. Deception as to copper backing is also proscribed. Rules against improper use of such terms as "crystal glass," "sheet glass," are inhibited. Misleading or deceptive guaranties as to silver spoilage and as to durability of the product are prohibited. Sale of defective mirrors or seconds as first-class merchandise, or the deceptive concealment of the fact that the product is defective is likewise proscribed. The provisions of the rules to the effect that mirrors should be labeled to show whether the glass is plate or window glass constitute a forward step in informative labeling. A knowledge of the kind of glass in the mirror is of prime importance to consumers, enabling them to buy intelligently and to be protected from deception and imposition in the matter of price and quality. Manufacturers' sales of mirrors approximate annually \$20,000,000, for which, of course, the consumer pays much more.

Jewelry industry.—The rules established in this industry are aimed at protecting the public from such practices as selling watches which are secondhand or which have been rebuilt or contain secondhand movements without disclosure to purchaser that the merchandise is second-hand or rebuilt, thus protecting deceptive concealment; representing precious stones as being perfect, when in fact they show flaws or imperfections under a magnifier of not less than 10 power; passing-off imitation, synthetic, manufactured or cultured gems as the real, genuine, or natural; the practice of tinting gems to mislead

or to conceal defects or inferior nature of article, and many other practices which deceive or defraud purchasers and unfairly divert trade from the scrupulous competitor.

Rubber tire industry.—Trade practice rules relate to the sale and distribution of the products of this industry which consist principally of automobile tires and tubes. There are about 50 manufacturing companies and over 100,000 distributing outlets, with total capital investment of approximately \$2,000,000,000. The aggregate annual sales volume is estimated to be in excess of \$750,000,000. Of direct interest to the consumer are provisions against false advertising and misbranding, including misrepresentations as to the grade, size, life, durability, and other properties of any of the respective brands or makes of tires or tubes being offered to the public. The rules also provide against confusion and deception in regard to so-called "first-line" tires, "standard makes," "change over tires," "rebuilt," "recapped" and "retreaded" tires, with provision for the proper marking of such "rebuilt," "recapped," or "retreaded" tires that the public may not be deceived into believing they are new as they appear to be.

General Investigations.

One of the principal duties of the Federal Trade Commission, and the one which it inherited in 1915 from the Bureau of Corporations, is that of making general "investigations" into business conditions and practices, particularly as respects corporations engaged in interstate commerce (exclusive of banks, common carriers, and certain other types of utilities) and their relations with other companies or persons. In the conduct of such investigations, the Commission possesses broad powers for obtaining information.

Many general investigations and studies have been made by the Federal Trade Commission in which the consumers' interests are very large. These are, for example, the inquiry into the electric and gas utilities industries, an investigation into the conditions affecting the sale and distribution of milk, the investigation of "agricultural income" and related questions, and others. The most recent of the major investigations made by the Federal Trade Commission was that of the motor vehicle industry and trade.

The facts developed during the conduct of investigations have demonstrated the need, both of the Government and of the general public, for a more comprehensive knowledge of industry and its operations as a guide for an economic policy.

Export Trade.

The Federal Trade Commission administers the Export Trade Act (Webb-Pomerene Act), which permits a combine or cooperative, termed in the act an "association" for the sole purpose of engaging in export trade. The purpose of this act is to promote export trade by placing American exporters on an equal footing with competitors abroad, especially in those countries where cooperatives and cartels have been permitted and encouraged.

Agreements by the associations may provide, among others, standardization of products and improvement of the quality of goods exported; establishing rules and regulations for export packing and shipping.

Checking Advertising.

Another activity of the Federal Trade Commission consists in maintaining a constant check on newspaper and magazine advertisements and radio continuities. This program is conducted by the Radio and Periodical Division of the Commission. The surveying of advertising in newspapers and magazines was inaugurated by the Commission in 1929; the surveying of commercial advertising by radio was started in 1934. In 1939 this service was extended to include mail order catalogs, almanacs, and domestic newspapers published in foreign languages.²³

During the fiscal year ending June 30, 1939, the Division examined advertisements and noted those for further study as follows:

Newspaper and magazine advertisements.....	220,760
Allegations in advertisements marked for further study.....	26,176
Mail order catalog pages examined.....	10,927
Marked as possibly false, misleading, and deceptive.....	773
Commercial radio broadcast continuities.....	626,293
Continuities marked for further study.....	29,143

An analysis of questioned advertising reveals that 42.4 percent was for drugs; 10.4 percent for cosmetics and toiletries; 7.8 percent for foods, including beverages; 2.1 percent for health devices; 6.8 percent for commodity sales promotion plans; 5.3 percent for automobiles, radios, refrigerators and other equipment; 3.3 percent for correspondence courses; 21.9 percent for other miscellaneous products.

During the fiscal year ending June 30, 1939, the Federal Trade Commission, through the Radio and Periodical Division:

* * * sent questionnaires to advertisers in 679 cases and to advertising agencies in 44 cases, negotiated 230 stipulations accepted and approved by the Commission for discontinuance of misleading representations, and settled or closed by its various methods of procedure 394 such cases. In 26 cases the issuance of complaint was recommended, 18 for failure to stipulate and 8 without giving the advertiser an opportunity to stipulate because of gross deception or danger to the public involved in the practice. In 15 cases previously settled by stipulation complaints were recommended for violation of the terms of those stipulations.²⁴

Cooperating Scientific Services.

The Federal Trade Commission receives the cooperation of the staffs and facilities of such Federal agencies as the National Bureau of Standards; Public Health Service and Food and Drug Administration, Federal Security Agency; Bureau of Home Economics, and Bureau of Animal Husbandry, United States Department of Agriculture; the Commission has a small medical unit under the supervision of a physician assigned by the Public Health Service.

²³ "Annual Report of the Federal Trade Commission for the Fiscal Year Ending June 30, 1939," p. 135, Federal Trade Commission, Washington, D. C., 1939.

²⁴ *Ibid.*, p. 139.

FEDERAL WORKS AGENCY

UNITED STATES HOUSING AUTHORITY

The broad objective of the program of the United States Housing Authority, Federal Works Agency, is to provide decent, safe, and sanitary low-rent homes for low-income families now living in slums. Realization of this objective, which directly benefits low-rent housing tenants and indirectly benefits other tenants and home purchasers, is the joint responsibility of local public housing authorities and the Federal Government.

The program is entirely decentralized. The United States Housing Authority is a financial assistance agency, since it makes loans and subsidies to local municipal and county housing authorities who plan, build, own, and operate projects in their own communities. Loans are being made for a period of 60 years. The United States Housing Authority, in addition to providing technical aid, advises the local authorities on all phases of the development and administration of local housing programs and projects, and reviews all proposals to determine their compliance with the terms and spirit of the United States Housing Act.

This work has made necessary the development of standards and minimum requirements aimed at providing housing which can be built at a low first cost and which will have low maintenance and repair costs for a long period of time.

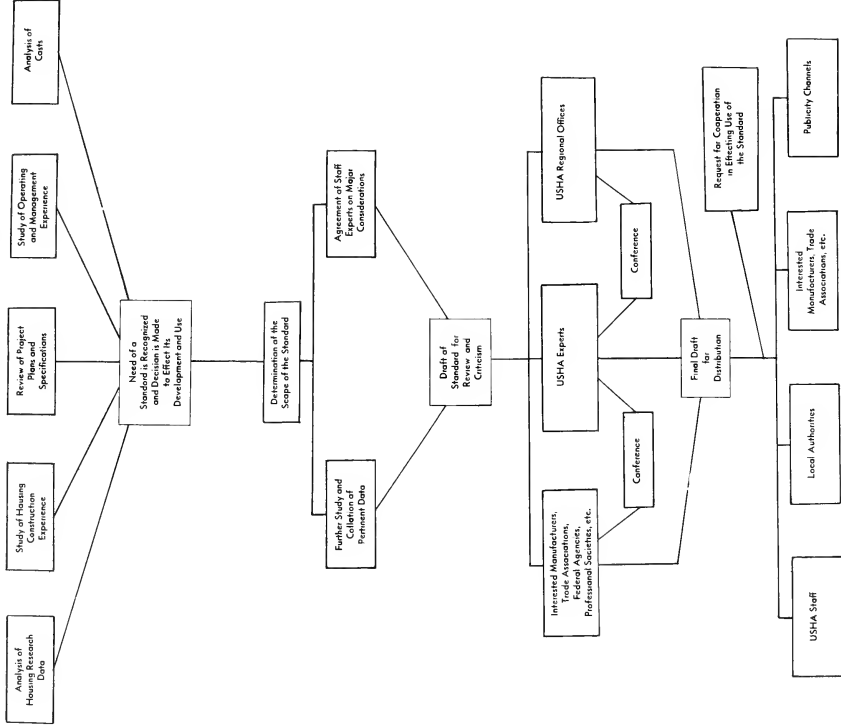
Standardization in the Low-Rent Housing Field.

Although the relationship of the United States Housing Authority to the local housing authorities does not permit it to dictate to them or to compel acceptance of its suggestions, most of its proposals concerning standardization of parts used in housing structures are being put into effect by these local authorities throughout the country. Some of the standards for dimensions, materials, and equipment developed for use in the housing program of the Authority are being accepted generally in the various trades and consequently are becoming important factors in aiding mass production. Standardization in large construction operations, such as low-rent housing projects, even when the standards are not generally adopted by the trades, results in the economy inherent in simplicity of design and uniformity of methods and materials.

Standardizing Activities.

Through the collation of housing experience data, the United States Housing Authority is in a position to interpret housing needs and to recommend and encourage the standardization of various elements and their component parts. This is being accomplished through the procedure outlined in chart IX. In addition many requirements and suggested standards for small detail parts are being recommended in everyday contacts and correspondence with manufacturers, trade associations, professional societies, and other Federal and non-Federal agencies. Several specific examples of achievements in this direction are discussed in the following paragraphs:

Federal Works Agency · U. S. Housing Administration Procedure for Establishing Standards in Connection With Low-Rent Housing Under the USHA Program



Windows.—A great variety of window sizes and types offered by manufacturers throughout the country has complicated the selection of the most suitable windows. A survey of 45 projects under the United States Housing Authority's program showed that in 21 projects 53 different types of steel casements were used, and in 18 projects 75 different types and sizes of wood double-hung windows were used. Recognizing that economies would be possible through the standardization of windows and that certain relationships between room sizes and window areas are desirable from a health standpoint, the United States Housing Authority invited manufacturers to assist in establishing a limited number of sizes and types suitable for low-rent housing. Through cooperative effort, 5 sizes of steel casement windows and 7 sizes of wood double-hung windows, with standard design details for economical construction, have been agreed upon and are now being recommended to local housing authorities for use on their projects.

Structural parts.—Suggested details for wood framing, shown in Policy and Procedure Bulletin No. 21, "The Structure," have been widely adopted by local engineers in preparing plans for low-rent housing projects. These suggestions help to effect standardization by simplifying the usual details of framing and by encouraging the use of uniform sizes for framing members. The general adoption of suggested design details for concrete members, which require only commercial lumber widths for forming, is helping to promote standardization in lumber sizes.

Ranges and refrigerators.—Through the cooperation of the refrigerator and range manufacturers, U. S. H. A. Suggested Specifications have been developed for such equipment. These are based on quality and omit refinements which are usually included chiefly for the purpose of increasing "sales appeal." For example, the electric refrigerators specified have no interior light, no door on the ice-tray compartment, and are finished without exterior decoration. Gas ranges are specified without pilot light burner ignition and with only one burner for broiler and oven instead of the usual two.

Lighting fixtures.—The United States Housing Authority, in cooperation with the American Lighting Equipment Association, is developing several types of lighting fixtures, simple in design and particularly adapted to low-rent housing needs.

Electric meters.—The meters which have been available on the market were designed by utility companies for the purpose of obtaining accurate records of consumption under varying types of loads. In cooperation with a leading manufacturer, an electric meter has been developed which is less complicated in design, less expensive, and particularly suited to low-rent housing needs. This type of meter is now being recommended as standard for housing projects with individual tenant metering plans.

Participation in Standardization Activities of Federal Agencies.

The United States Housing Authority assists in establishing standards, directly benefiting consumers, through cooperation with and participation in the work of the following Federal agencies:

- National Bureau of Standards.
- Federal Specifications Executive Committee.
- Federal Fire Council.

Central Housing Committee.
Federal Housing Administration.
Farm Security Administration.
Forest Products Laboratory.

Participation in Standardization Activities of National Organizations.

The United States Housing Authority is helping in the establishment of standards through participation in the work of national organizations such as—

American Standards Association.—Members of the staff serve on the Standards Council, which directs the technical work of the American Standards Association; the Building Code Correlating Committee; the Committee on Coordination of Building Material Dimensions; and several sectional committees.

American Society for Testing Materials.—The United States Housing Authority is represented on the Standing Committee on Manufactured Masonry Units and on the Lime Committee.

American Public Health Association.—The United States Housing Authority has been active in the work of the Committee on Hygiene of Housing, the function of which is the development of minimum health standards for housing. This work affects the design and performance requirements of such equipment and materials as heating units, plumbing equipment, lighting equipment, insulation, and others.

National Association of Housing Officials.—Members of the Staff are active in all phases of this organization's work and are contributing particularly to the development of standards of design and construction for low-rent housing through the Committee on Physical Standards and Construction.

Trade associations.—Many trade associations are interested in standardization for the purpose of reducing production costs and, consequently, selling prices. The United States Housing Authority interprets current housing needs to such groups and cooperates with them in the development of materials and equipment which will best meet these needs.

Other Activities Which Help to Promote Standardization.

In addition to the standardizing activities outlined, the Authority is helping to encourage the development of standardization in the housing field by conveying to the public, through press releases, speeches, and magazine articles, the story of low-rent housing and the new low construction costs made possible, to a great extent, through simplified design and large scale construction with standardization of component parts.

Publications of the United States Housing Authority.

The above items are illustrative of the United States Housing Authority's activities in connection with the standardization of component parts and equipment and housing structures. In a much broader sense the entire program is directed toward standardization since the establishment of minimum acceptable standards has been a chief factor in reducing costs to the point where rents can be brought within the means of the lowest income third. Some of the most important publications which set forth standards for the planning.

design, and construction of housing projects are briefly discussed below:

Policy and Procedure Bulletins.—A series of standard guides for use in the planning, design, and operation of low-rent housing projects have been established and published in a series of Policy and Procedure Bulletins. These are used by all local authorities participating in the housing program.

Suggested Specifications.—There has been developed, in cooperation with manufacturers and their trade associations, a set of U. S. H. A. Suggested Specifications for use in preparing individual housing project specifications. They simplify and clarify minimum requirements for substantial construction and safeguard against inferior or inappropriate materials and equipment. The use of these specifications saves time and minimizes the danger of omissions and errors which might later necessitate construction "change orders" with consequent additional costs. The extensive use of these specifications by architects and engineers in developing local projects, and their general acceptance by manufacturers, is helping to effect standardization in manufacturing.

Suggested unit plans.—Maximum efficiency, livability, and economy is being achieved through the use of a series of related plans for dwelling units and public space. These plans call for the use of standard sizes of construction materials and equipment used in housing structures. They are based on minimum room and window areas required for comfort and healthful living.

Development cost control.—An index has been developed which fixes cost standards for minimum acceptable construction in various regions of the country. It serves as a yardstick for keeping costs down to reasonable low-rent standards.

UNITED STATES GOVERNMENT PRINTING OFFICE

DIVISION OF TESTS AND TECHNICAL CONTROL

The Division of Tests and Technical Control of the United States Government Printing Office tests all materials entering into printing and binding processes, and is engaged in such standardization work and technical research as might be desirable to improve the quality of the products and the materials used by the United States Government Printing Office. This Division is under the direct supervision of the Public Printer. It assists all other divisions of the United States Government Printing Office in obtaining materials which are best suited to the requirements of their processes and aids in the solution of technical problems incident to plant operations. This Division works in close cooperation with the Director of Purchases of the United States Government Printing Office.

The Division of Tests and Technical Control consists of four sections, three of which are production units; (a) Chemical Laboratory Section, where all technical tests are made and technical research is conducted; (b) Ink Section, where all printing, writing, and miscellaneous inks used by the United States Government Printing Office and by other Governmental departments are manufactured; (c) Roller and Glue Section, where press rollers and bindery adhesives are manufactured; (d) Metal Section, where all type-casting metals are remelted and adjusted through chemical analyses to conform with standard formulas.

The Chemical Laboratory Section consists of six units: Paper testing, textile and binding materials, type metals and miscellaneous materials, oils and solvents, inks and color, and general research.

Paper.

In accordance with section 3 of the Government Printing Act of 1895²⁵ the Joint Committee on Printing of the United States Congress fixes standards of paper for the public printing and binding.

The Joint Committee on Printing is composed of three Senators, three Representatives and a clerk of the committee.

The Committee on Paper Specifications, of the Joint Committee on Printing, is composed of the Clerk of the Joint Committee on Printing, who serves in the capacity of Chairman; the Chief of Printing and Processing, Work Projects Administration; the Printing Clerk of the Post Office Department; the Inspector of Paper and Material for the Joint Committee on Printing; the Chief of the Paper Section of the National Bureau of Standards, United States Department of Commerce; and three officials of the United States Government Printing Office, namely, the Technical Director, the Director of Purchases, and the Superintendent of Stores and Traffic Manager. This Committee prepares specifications on paper and

²⁵ Jan. 12, 1895, ch. 23,

8, U. S. Stat. L., p. 601.

recommends their adoption to the Joint Committee on Printing of the United States Congress. New developments in paper manufacture and in the printing and binding industries and new requirements of all Governmental departments are considered in the formulation of specifications which are approved by the Joint Committee on Printing before each contract period. As a result, a specification of the United States Government Printing Office for any grade of paper represents the latest development in that particular grade. The Schedule of Paper for the year 1940 specified 82 grades of paper classified under 169 items, furnished by 39 different mills. Included in these purchases are all classes of paper ranging from newsprint to the highest quality of ledger and index paper. All deliveries of paper and envelopes for public printing and binding are tested by the United States Government Printing Office laboratory for compliance with specifications.

The use of specifications is not only beneficial to the United States Government Printing Office, but also to the paper industry as a whole. In 1928 the United States Government Printing Office conducted a research program to secure complete information concerning the quality of commercial bond and ledger papers for the purpose of establishing quality standards. Paper manufacturers were requested to furnish samples of their regular mill runs of papers. As a result of this work, specifications for six grades each of bond and ledger papers were recommended. The United States Government Printing Office subsequently discarded the most inferior one of these six grades and adopted specifications for use in the purchase of five grades each of bond and ledger papers. These specifications have been revised in the past few years to include chemical requirements regarding acidity and rosin sizing. Such specifications have proven satisfactory to paper manufacturers and the Federal Government, and are in accord with good commercial practice.

Bond and ledger papers are watermarked to show their rag content. This watermark is the eagle from the seal of the United States surmounted by 4 stars to indicate 100 percent rag content, 3 stars 75 percent, 2 stars 50 percent, and 1 star 25 percent rag content. Other bond or ledger papers, composed of wood pulp instead of rag fibers, are not watermarked. These five classes are sufficient to meet the needs of the United States Government Printing Office in bond and ledger papers. One of the primary advantages of the standardization of these papers is the reduction to a minimum of the number of grades which mills need to produce.

In cooperation with the mechanical department of the American Newspaper Publishers Association considerable research on newsprint and news ink was conducted from 1928 to 1933. The results of this work were published in Technical Bulletin No. 18, "Newsprint and News Ink."²⁸

The quality of paper and envelopes purchased on Government specifications up to 1925 was determined primarily by the bursting strength test. General dissatisfaction with this test was noted. It was found necessary, therefore, to conduct research to find more specific and definitive tests for the evaluation of paper, which might

²⁸ "Newsprint and News Ink," 86 pp., Technical Bulletin No. 18, U. S. Government Printing Office, Washington, D. C., 1933.

be used in revising the specifications for the purchase of this commodity by the United States Government Printing Office. As a result of this work on bond and ledger papers the folding endurance test was introduced into the specifications in 1925 and later applied to No. 1 and No. 2 quality kraft papers in 1926 and to kraft envelopes in 1929. The kraft paper manufacturers who cooperated in this work, and jobbers and consumers as well as the National Kraft Manufacturers' Association, showed considerable interest in the standardization of the quality of kraft papers and envelopes.

The question of permanence and durability of paper is receiving increased interest among certain printers concerned with preserving records of special future value. Considerable research in this field has been conducted by the paper industry. Since the year 1885 approximately 300 articles on this subject have been published in various trade magazines in this and other countries. These articles have been abstracted for ready reference in the Government Printing Office Technical Bulletin No. 22.²⁷

A new trend in paper testing is the development of laboratory methods for paper analysis tending toward correlation with certain printing qualities, in order that printability under given conditions may be reasonably predicted before the paper reaches the presses. Test methods have been developed by the Division of Tests and Technical Control which provide a basis for forecasting the printing quality of a paper. These test methods have been included in the specifications for most book papers purchased by the United States Government Printing Office. This subject was presented at the annual meeting of the American Pulp and Paper Mill Superintendents Association in June 1937,²⁸ and at the annual meetings of the Technical Association of the Pulp and Paper Industry in 1932²⁹ and 1939³⁰ reports of these test methods were presented.

Printing Inks.

No Government standard specifications for printing inks have as yet been developed. The research work on inks has resulted, however, in the development of formulas for all printing, addressograph, mimeograph, stamp pad, numbering machine, ruling, and writing inks manufactured by the United States Government Printing Office for its own use and for that of other governmental departments in Washington, D. C.

Press Rollers and Bindery Adhesives.

Research in the manufacture of composition press rollers, usually composed of glue and glycerin, has resulted in the use of recently developed substitutes for glycerin which might at some time be unobtainable due to its diversion to wartime use. The standardization of formulas containing in part such glycerin substitutes has elicited much

²⁷ "Permanence and Durability of Paper," by Morris S. Kantrowitz, Ernest W. Spencer, and Robert H. Simmons, Technical Bulletin No. 22, 114 pp., U. S. Government Printing Office, Washington, D. C., 1940.

²⁸ "Evaluating the Printing Qualifications of Paper," by M. S. Kantrowitz and R. H. Simmons, Paper Trade Journal, vol. CV (1), 6 pp., July 1, 1937.

²⁹ "The Bekk Smoothness Tester as an Aid in Studying the Printing Quality of Paper," by B. L. Wehmhoff, R. H. Simmons, and D. H. Boyce, presented at the Annual Meeting of the Technical Association of Pulp and Paper Industry (T. A. P. P. I.), New York City, February 1933, and published in the Paper Trade Journal, Technical Association Section, Vol. XCVI (4), p. 36 ff., January 26, 1933.

³⁰ "Paper Quality in Relation to Printing," address presented by R. H. Simmons at annual meeting of T. A. P. P. I. in New York City, February 1939, and published in the Paper Trade Journal, vol. 109 (19), 4 pp., November 9, 1939.

interest on the part of commercial roller makers throughout the United States.

Some roller making firms have adopted procedures, based upon this experience, for the preparation of rollers exhibiting superior quality and longer service than formerly obtainable.

A study was made of adhesives to determine the effectiveness of a high jell-strength glue for bindery use. This resulted in the elimination of two of the three grades of glue formerly purchased, effecting increased efficiency of machine production, and economy in total cost.

To reduce the warping of book covers, a special adhesive, nonwarping paste was developed. This paste is now being manufactured by several commercial paste makers in accordance with a formula developed by the Division of Tests and Technical Control.

Type Metal.

Standardization of type metal alloys in the United States Government Printing Office has proven to be a very important problem. After a thorough technical study, standard formulas were adopted for linotype, monotype, stereotype, and electrotype metals. Since type metal alloys deteriorate with each remelting it is necessary to maintain their standard composition by daily analyses and correction of the metals as each of them is returned for remelting. Approximately 12,000,000 pounds of metal are standardized per year. Technical control of type metal has resulted in improvement in the quality of printing, and increased production with the minimum amount of resetting. Longer runs and sharper printing have resulted from this research and standardization of the metal employed for both type forms and stereotype plates.

Electrotyping.

Research by the United States Government Printing Office in electrotyping resulted in the development and installation of improved equipment by the use of which a copper deposit of satisfactory thickness and more uniform quality is obtained. This method and technique of electrotyping has been advantageously used by commercial firms.

Bookbinding.

Research in bookbinding is conducted by the United States Government Printing Office in cooperation with the Book Manufacturers' Institute under the research associate plan established by the United States Congress, by which any group or association among the graphic arts industries may place its technical men in the United States Government Printing Office laboratory to conduct research under the supervision of the Public Printer and the Technical Director of the United States Government Printing Office on definite problems agreed upon by the association and the Public Printer.

The value of this cooperative research work was expressed by Mr. E. W. Palmer, president of the Kingsport Press, Kingsport, Tenn., and formerly chairman of the Research Division, Book Manufacturers' Institute, in a report to the Public Printer dated March, 1938, in which he states:

Even the briefest résumé of the work of the Research Associate and the Research Division of The Book Manufacturers' Institute (formerly the Employing Bookbinders of America) must be quite general in scope. Back in 1929, when the position of Research Associate was established in the Government Printing

Office, the graphic arts industry, and particularly the bookmaking branch, was notable for its total lack of specifications for guiding purchases; the lack of any adequate and systematic methods for testing materials; the absence of any established trade standards covering manufacturing technique; in short, it was hopelessly behind the times.

In this connection there is presented a brief résumé of the past research work, and a description of the present research together with an outline of proposed future investigations of the Division of Tests and Technical Control.

Studies of various bookbinding materials were made under this cooperative research and standardization program as a result of which three standards were developed and adopted by the bookbinding industry. These standards were promulgated and published as Commercial Standards by the National Bureau of Standards and were later approved as American Standards by the American Standards Association. These Commercial Standards are CS49-34 Chip Board, Laminated Chip Board, and Miscellaneous Boards for Bookbinding Purposes; CS50-34 Binders Board for Bookbinding and Other Purposes; and CS57-40 Book Cloths, Buckrams, and Impregnated Fabrics for Bookbinding Purposes except Library Bindings.

The present trend in bookbinding is toward replacing starch-filled book cloths with pyroxylin-treated fabrics, which are more moisture proof and vermin-resistant. Properties of various trade brands of these materials have been tested by the Division of Tests and Technical Control to determine their qualifications for bookbinding; starch-filled book cloths have been replaced by pyroxylin-treated fabrics in the bindery operations. Standard specifications have been developed for purchase of these fabrics.

Another example of development is the use of roll gold leaf backed by a thin sheet of cellophane which replaces the former paper backing. A thorough investigation of imitation gold leaf has been made and a procedure standardized for determining the comparative tarnish resistance of the various brands of that leaf, both flat and in the form of rolls. The impression made with this new product is sharper and clearer.

Various materials, such as end papers, super or crash, and sewing thread, used in the binding of books, have been studied with reference to their efficient use in operations.

During the course of this research several technical bulletins dealing with bookbinding materials were published.³¹

Within recent years State governments have adopted various specifications for the printing and binding of textbooks supplied, under contract, to the pupils in schools. A movement, supported by textbook publishers, textbook manufacturers, and State boards of education, has been started to make these specifications uniform and suitable for use in all States. The United States Government Printing Office rendered all possible assistance to a joint committee representing these groups in connection with the technical phases of these specifications.

³¹ "Bindery Adhesives," by B. L. Wehmhoff, Technical Bulletin No. 14, 22 pp., U. S. Government Printing Office, Washington, D. C., 1931. "The Evaluation of Bronze Stamping Leaf," by B. L. Wehmhoff and F. R. Blaylock, Technical Bulletin No. 17, 10 pp., U. S. Government Printing Office, Washington, D. C., 1933. "Starch Filled Book Cloth," by M. S. Kantrowitz, F. R. Blaylock, and G. G. Groome, Technical Bulletin No. 21, 27 pp., U. S. Government Printing Office, Washington, D. C., 1934.

Also eleven confidential special bulletins were published by F. R. Blaylock, Research Associate Employing Bookbinders of America (E. B. A.) and Book Manufacturers' Institute (B. M. I.), between the years 1929 to 1934, and issued only to members of the Employing Bookbinders of America.

The United States Government Printing Office has made bindery tests of chrome-tanned leathers, experimentally produced by American tanneries, and has overcome the first difficulties encountered in their use for bookbinding. As a result, specifications were prepared for the purchase of chrome-tanned sheepskin, goatskin, and cowhide leathers. Vegetable-tanned leathers have been completely eliminated from use in the United States Government Printing Office. This is an important development in the industry, because leather required for the most permanent and high quality bindings could formerly be obtained only from foreign countries.

In planning the future trend of this research work the following program has been outlined:

Special research:

Adhesives for bindery use.

Sizings.

Inks.

Book cover plastics.

Machine wrapping and sealing.

Pyroxylin-treated fabrics.

Insect and vermin damage.

Research to effect standardization of—

Sewing threads.

Muslin and tape cloths.

Sewing tapes.

Headbands.

Back-lining papers.

End papers.

Super or crash.

Other materials as the need develops.

State textbook specifications and standards.

Photoengraving and Lithographic Research.

Studies have been made in photoengraving and lithography with a view to standardizing and improving the character of reproduction of pictorial subjects with relation to the printing processes. The materials and formulas in these processes, being of an almost entirely chemical nature, were studied in their relation to functional properties and the purchase of the most suitable chemicals, for which standard specifications have been formulated.

Standardization of wet-plate collodion was found necessary. Laboratory analysis and performance tests made in photoengraving cameras, led to the development of a standard specification for wet-plate collodion.

In a similar way all of the various chemicals in photoengraving processes were investigated, and the best grades for use were determined.

An extensive study was made of photoengraving zinc to determine the chemical and physical structure of the metal most suitable to the etching and routing processes. As a result of this research, a standard specification was established upon which a uniform product could be bought. This study was reviewed in a scientific paper on the Technical Qualifications of Photoengraving Zinc, presented at the annual meeting of the graphic arts division of the American Society of Mechanical Engineers in Washington, May 1936.³²

³² "The Technical Qualifications of Photoengraving Zinc," by Ernest W. Spencer, published by the American Society of Mechanical Engineers, New York City, in Proceedings of the Graphic Arts Technical Conference, Washington, D. C., May 11-13, 1936, p. 23 ff.; and in the Production Year Book 1937, the Colton Press, New York City.

The graining of offset plates has a fundamental bearing on the process of offset printing. A microscopic study was made, therefore, of the plate grain and of the quartz sands used in automatic graining machines for producing the plate grain. Investigation of the commercial grades of sands on the market revealed a great lack of uniformity in their particle sizes and a great variety in crystalline structure. In order to obtain uniformity of plate grain and a uniform length of time required for the graining process, it was necessary to obtain sands consistent in structural form and granulation. A greater degree of fineness in the plate grain was also found to be a factor in producing more sharply printed images and more satisfactory press runs. In order to improve the process of offset printing in the United States Government Printing Office, as well as to stimulate standardization of sands for the trade in general, a study of this problem was made by the Division of Tests and Technical Control. The result of this study, which was published in a current issue of the *Printing Equipment Engineer*,³³ was to form definite specifications upon which sands are now purchased.

Cooperation With Technical and Trade Organizations.

The Division of Tests and Technical Control has cooperated with the American Standards Association, the United Typothetae of America, the Lithographic Technical Foundation, the American Newspaper Publishers Association, the Technical Association of the Pulp and Paper Industry, the American Society for Testing Materials, the Printing and Allied Trades Research Association of Great Britain, and other domestic and foreign associations dealing with standardization in the printing and binding industries. Several chemists, members of the staff of the United States Government Printing Office technical laboratory, serve on advisory boards and technical committees of scientific organizations and trade organizations, such as the Federal Specifications Executive Committee, the Interdepartmental Advisory Committee on Photography, the Technical Association of the Pulp and Paper Industry, and the American Society for Testing Materials.

As a result of the research constantly being conducted by the Division of Tests and Technical Control the paper industry and other trades are able to maintain better control of their products during manufacture. The printer ultimately derives benefit because he obtains a standardized product, the uniform behavior of which on his presses is assured.

³³ "Sands for Graining Zinc Offset Plates," Subject of Microscopic Study, by E. W. Spencer, *Printing Equipment Engineer*, vol. 50 (5), p. 6 ff., August 1935.

UNITED STATES DEPARTMENT OF THE INTERIOR

THE BITUMINOUS COAL DIVISION AND THE CONSUMERS' COUNSEL DIVISION, OFFICE OF THE SOLICITOR

Standardization and the dissemination of commodity information relating to coal constitute part of the activities of both the Bituminous Coal Division, United States Department of the Interior, and the Consumers' Counsel Division, in the Office of the Solicitor, in the same Department. Although dealing with the same basic subject matter, that is, the administration of the Bituminous Coal Act of 1937, these Divisions were made independent of each other by the act, and this independence was maintained by Reorganization Plan No. II, the effective date of which was fixed by Congress as July 1, 1939. Under Reorganization Plan No. II, the National Bituminous Coal Commission was abolished and its functions were transferred to the Secretary of the Interior; and the former Office of Consumers' Counsel of the National Bituminous Coal Commission became the Consumers' Counsel Division in the Office of the Solicitor, United States Department of the Interior.

Legislative Authorization.

The Bituminous Coal Act of 1937 embodies more than one provision under which the collection or dissemination of information relating to the qualities and uses of coal is authorized. Section 2 (a) of the act authorizes the Bituminous Coal Division³⁴ to—

initiate, promote, and conduct research designed to improve standards and methods used in the mining, preparation, conservation, distribution, and utilization of coal and the discovery of additional uses for coal, and for such purposes shall have authority to assist educational, governmental, and other research institutions in conducting research in coal, and to do such other acts and things as it deems necessary and proper to promote the use of coal and its derivatives

Section 14 (a) among other things directs the Bituminous Coal Division to "study and investigate the matter of increasing the uses of coal * * *."

In addition to these sections relating to research, there are other pertinent provisions connected with the price-establishing functions of the Bituminous Coal Division. The initially proposed prices are to be determined by the Bituminous Coal Division after first reviewing the price proposals made by the various district boards, representing those coal producers within the district who have accepted membership in the Bituminous Coal Code set up by section 4 of the act. The proposals of the district boards are, as required by section 4, II (a) of the act, to include prices for the "kinds, qualities, and sizes

³⁴ Here and in the ensuing pages when reference is made to the functions of the Bituminous Coal Division authorized by the act it should be understood that the act actually refers to the "Commission," but the Commission's functions are now exercised by the Bituminous Coal Division, as stated previously.

of coal," produced in the district, and a "classification of coal and price variations as to mines, consuming market areas, values as to uses, and seasonal demand." The prices are to reflect, as nearly as possible, the relative market value "of the various kinds, qualities, and sizes of coal," are to be just and equitable as between producers within the district, and are to have "due regard to the interests of the consuming public."

After the promulgation by the Bituminous Coal Division of proposed minimum prices the district boards, subject to the Division's subsequent approval or revision, "coordinate," for common consuming market areas, upon a fair competitive basis, the minimum prices and the rules and regulations determined by the Coal Division. Such co-ordination must take into account among other things, the relative market values at points of delivery in each common consuming market area, of "the various kinds, qualities, and sizes of coal," "their values as to uses," and the "competitive relationships between coal and other forms of fuel and energy," and "shall preserve as nearly as may be existing fair competitive opportunities."

Among the methods of "unfair competition" listed in section 4, II (i) of the act is the—

intentional misrepresentation of any analysis or of analyses, or of sizes, or the intentional making, causing, or permitting to be made, or publishing, of any false, untrue, misleading, or deceptive statement by way of advertising, invoicing, or otherwise concerning the size, quality, character, nature, preparation, or origin of any coal bought, sold, or consigned.

The Consumers' Counsel is authorized by the act among other things, "to appear in the interest of the consuming public" in any proceeding before the Bituminous Coal Division, and to conduct such "independent investigation of matters relative to the coal industry and the administration of this act as he may deem necessary to enable him properly to represent the consuming public in any proceeding" before the Bituminous Coal Division. The Consumers' Counsel is also authorized to obtain from the Bituminous Coal Division "any information at its command" and require the Division to "conduct any investigation as to any matter within its authority."

Use of Coal Standards in Establishing Prices.

The foregoing statement of powers conferred upon the Bituminous Coal Division and the Consumers' Counsel opens up several possibilities for standardization. The first of the powers listed, namely the power conferred on the Bituminous Coal Division to conduct research into certain general aspects of coal, need not concern us here. As stated on pages 23 and 24 of the "Third Annual Report Under the Bituminous Coal Act of 1937," dated January 3, 1940, the "immediate and major responsibility of establishing minimum prices and marketing rules and regulations" has absorbed the time of the research personnel of the Bituminous Coal Division to the exclusion of any substantial research not directly connected with that major responsibility.

The price-establishing powers of the Bituminous Coal Division constitute the chief source for its exercise of standardization activities. As previously indicated in the statement of legislative authorization, the determination of prices, when first proposed and when later co-ordinated, must take into account such matters as "kinds, qualities, and sizes" of coal and their "values as to uses." This seems to necessitate some kind of standards on which classifications may be made.

In response to this necessity, Order 234, dated March 16, 1938, and Order 235, dated March 17, 1938, were promulgated by the Bituminous Coal Division. Order 234 required code members to file with the Bituminous Coal Division and the district boards a "Questionnaire as to Analysis, Methods of Mining, Preparation of Coals and Other Information." Order 235 authorized the district boards to provide facilities for the sampling and analyzing of coals or to enter into contracts for performance of such work either by governmental agencies or by "competent and disinterested" private parties "generally engaged in the business of sampling and analyzing coals"; and to request from code members by questionnaire or otherwise, such information as would tend to establish the physical characteristics and performance characteristics of their coals. This order stated that whenever analyses filed as required by Order 234 were adjudged unrepresentative, the district board could make its own analysis.

Also, unless otherwise directed, the analysis to be made in every case shall be proximate analysis, and shall show the moisture, ash, volatile matter, fixed carbon, and sulfur content of the coal, and ash softening temperature, together with the heating value in British thermal units on an "as received" basis * * * all samples of coal taken for analysis purposes shall be tipple samples taken after final preparation of coal for shipment to market, in accordance with the standard methods developed by the United States Bureau of Mines in Technical Paper No. 133 or approved by the American Society for Testing Materials.

In accordance with these requirements, size and quality classifications have been made in each of the coal-producing districts subject to the act. The quality classifications have been based to a certain extent on a consideration of the following factors: moisture, ash, volatile matter, fixed carbon, British thermal units (B. t. u.), sulfur, ash softening temperature and (for lump and double-screened sizes) on size stability. However, other imponderable factors comprehended in the term "consumer acceptance" often have been given considerable weight in determining the quality classifications. Apparently no uniform and precise formula has been deemed feasible for the determination of quality classification, as may be seen from the manner in which the Bituminous Coal Division decides disputes as to such classifications.³⁵

Projected Changes in Coal Standards.

The Consumers' Counsel Division has, from time to time, recommended to the Bituminous Coal Division certain changes in the identity and use of coal standards. These recommendations have pertained both to size standards and quality standards.

Size standards.—In its briefs analyzing the coordinated minimum prices proposed by the Bituminous Coal Division, the Consumers' Counsel Division argued that size groups should be reduced in number and standardized for all producing districts. It pointed out that the 8-inch by 3-inch size was classified as "egg" in district 16, as "grate" in district 17, as "stove" in district 20, and as "furnace" in district 22. It was also observed that in some cases sizes were classified differently even within the same district, depending upon the consuming market, or the classifications used, or the transporta-

³⁵ See, for example, the decision with respect to a claim that the screenings from certain mines in District 7 should have been placed in classification "A" rather than "B," "Federal Register," p. 300, January 19, 1939.

tion method, or the preparation given at the mine (whether raw, washed, cleaned, and so forth). A further standardization and consolidation of size groups, it was argued, would be an aid to consumer interests, since price schedules would be more readily understood and price comparisons could more readily be made. In the publication "How Much Heat"³⁶ the Consumers' Counsel suggested as standard methods of determining and describing sizes the following methods adopted by the American Society for Testing Materials: "Method of Test for Screen Analysis of Coal" (A. S. T. M. Designation: D410-38), and "Method for Designating the Size of Coal from its Screen Analysis" (A. S. T. M. Designation: D431-38).

Quality standards.—Of broader significance than the Consumers' Counsel's proposals as to size standards are its recommendations regarding quality standards. The Consumers' Counsel has suggested that not only should the sampling be done in accordance with A. S. T. M. standard methods (as is recommended, in the alternative, by Order 235 of the Bituminous Coal Division) but also the analyses, and classifications of coal should be performed in accordance with the "Methods of Laboratory Sampling and Analysis of Coal and Coke" (A. S. T. M. Designation: D271-37), "Specifications for Classification of Coals by Grade" (A. S. T. M. Designation: D389-37), and "Specifications for Classification of Coals by Rank" (A. S. T. M. Designation: D388-38).

The classification by "rank" is a traditional method used by geologists, chemists, and engineers in describing different kinds of coal. For anthracite coal and for "high-rank bituminous," the classification has been on the basis of the percentage of fixed carbon and volatile matter (i. e., the highest rank coals, such as anthracite, having the highest fixed carbon content and lowest volatile matter content.) But certain other bituminous coals, while having more moisture and less heating value (i. e., less B. t. u.) than the "high-rank," do not vary considerably among themselves as to fixed carbon and volatile matter. These are therefore classified on the basis of moist B. t. u. per pound. The complete table of rank for bituminous coal, as approved by the American Society for Testing Materials, begins with the high-rank coals, divided into "Low Volatile" and "Medium Volatile" (classified on the basis of specified limits for fixed carbon and volatile matter); then follows "High Volatile A," "High Volatile B," and "High Volatile C" (classified on the basis of moist B. t. u. per pound). This table further continues with sub-bituminous, lignite, and brown coal, with their correspondingly lower amount of moist B. t. u. per pound.

The "grade" classification adopted by the American Society for Testing Materials and recommended in 1937 by the Consumers' Counsel is determined by size designation, the B. t. u., the ash content, the sulfur content, and the ash-softening temperature. The size of coal is designated in accordance with the Standard Method for Designating the Size of Coal from its Screen Analysis of the A. S. T. M. (D431-38).

The heating value is expressed in hundreds of B. t. u. per pound, to the nearest hundred, for example, 13,150 to 13,249 B. t. u., inclusive, would be expressed as 132.

³⁶ "How Much Heat" (Consumer Ideas No. 1), by Consumers' Counsel of the National Bituminous Coal Commission, 28 pp., U. S. Government Printing Office, Washington, D. C.; 1937, 10 cents.

The ash content, sulfur content, and ash-softening temperature are expressed in symbols. Thus, in the case of ash content, the first symbol is A4, for coal with an ash content from zero to 4 percent; the next is A6, for coal with ash content from 4.1 to 6 percent, and so on, the last being A20 plus, representing coal with ash content of 20.1 percent or higher.

In the case of ash-softening temperature (a. s. t.); the first symbol is F28, for coal with an a. s. t. of 2,800° F. and higher; the next is F26, for coal with an a. s. t. of 2,600° to 2,790° F., and so on, the last symbol being F20 minus, representing coal with an a. s. t. of less than 2,000° F.

In the case of sulfur, the first symbol is S0.7, for coal with sulfur content zero to 0.7 percent; the next is S1.0, for coal with sulfur from 0.8 to 1 percent; the next is S1.3, for coal with sulfur from 1.1 to 1.3 percent and so on, the last symbol being S5.0 plus, representing coal with sulfur content of 5.1 percent or higher.

Thus, a designation of a certain coal as 2-4 in., 132-A8-F24-S1.6 would indicate a coal of 2-inch to 4-inch size, having a heating value of approximately 13,200 B. t. u., an ash content of 6.1 to 8 percent, inclusive, an ash-softening temperature of 2,400° to 2,590° F., inclusive, and a sulfur content of 1.4 to 1.6 percent, inclusive.

While the above methods of description have the essentials of standardization, the symbols used are not likely to be easily understood by consumers without a considerable amount of explanation of their meaning. The Consumers' Counsel therefore decided in 1938 that another and simpler system of nomenclature should also be made available to consumers. It proposed, in "Know Your Coal",³⁷ that coal be rated by the primary factors of friability, ash, and British thermal units, and also by any other factors that may be important in the coals of the particular district; and that a simple, understandable classification for the three primary factors be as follows:

TABLE 1.—Coal classification

1. FRIABILITY OR SIZE STABILITY

Percent of coal as it comes from the mine which will pass over a 2-inch round-hole screen

A----- 40 percent and over B----- 39.9 percent and under

2. B. T. U.'S PER POUND

A-----	15,000 or more	I-----	11,001 to 11,500
B-----	14,500 to 15,000	J-----	10,501 to 11,000
C-----	14,001 to 14,500	K-----	10,001 to 10,500
D-----	13,501 to 14,000	L-----	9,501 to 10,000
E-----	13,001 to 13,500	M-----	9,001 to 9,500
F-----	12,501 to 13,000	N-----	8,501 to 9,000
G-----	12,001 to 12,500	O-----	8,001 to 8,500
H-----	11,501 to 12,000	P-----	8,000 or less

3. ASH

A-----	4.0 percent or less	F-----	12.1 to 14.0 percent
B-----	4.1 to 6.0 percent	G-----	14.1 to 16.0 percent
C-----	6.1 to 8.0 percent	H-----	16.1 to 18.0 percent
D-----	8.1 to 10.0 percent	I-----	18.1 to 20.0 percent
E-----	10.1 to 12.0 percent	J-----	20.1 percent or more

³⁷ "Know Your Coal" (Consumer Ideas No. 3), by Consumers' Counsel of the National Bituminous Coal Commission, 11 pp., U. S. Government Printing Office, Washington, D. C., 1938, 10 cents.

Comparison of the Bituminous Coal Division quality designations with those recommended by the Consumers' Counsel Division.—The coal classifications now used by the Bituminous Coal Division are influenced by consideration of numerous economic factors in addition to analytical qualities. For each classification the letter designations used, unlike the designations in the system recommended by the Consumers' Counsel Division in the preceding table, are not precisely defined; and the designations treat as a unit all the factors revealed by the physical and chemical analysis rather than grade each factor separately. The methods used to determine the classifications in each district are not always made explicit. In addition the classification systems differ from district to district; for example, in district 10 the classifications range from A to N, inclusive; in district 1, from A to H-2, inclusive; in district 4 from D to U, as follows: D, H, K, M, N, O, Q, R, T, U. The meaning of a letter used in one district bears no necessary relation to the meaning of the same letter used in another district. The letter classifications are significant only within the district, and denote a price classification rather than a quality classification.

The system recommended by the Consumers' Counsel, on the other hand, is intended to afford a precise, uniform, and simple method for the designation of quality. As the Consumers' Counsel explained in "Know Your Coal,"

if the proposals of the Consumers' Counsel for the standard classification of coal are adopted, and the consumer picks up his telephone to order a ton from the retailer, he will be able to ask the retailer what properties the various coals offered for sale have * * *. The consumer will be told that one coal has a rating of "A" for friability, "B" for ash, "C" for B. t. u.'s; and another has a rating of "A" for friability, "B" for ash, and "B" for B. t. u.'s. He can compare their prices and buy with his eyes open * * *.

What weight the consumer should give to the various characteristics of the coal he buys depends upon his geographical location, the type of burning equipment he uses, the amount of nuisance he is willing to put up with, and the prices he is willing to pay. Some dealers will be helpful to him in determining the proper weight to give to the various characteristics of the coal. Briefly, if the consumer lives near a coal-producing area that produces coal of high ash content and low B. t. u.'s he may find that the lowered cost due to the lower freight rate will more than make up for the additional work involved in shoveling more coal into this furnace and more ashes out of his firebox. If the consumer has an automatic stoker or other equipment, under certain conditions, he may find that high-volatile coals are a better buy than low-volatile, high B. t. u. coals that he possibly should burn in hand-fired equipment. Coals containing less B. t. u.'s may be a better buy if the equipment is properly designed to burn them.

Availability of Specific Coal Analyses to the Public.

Although the symbols used by the Bituminous Coal Division in coal classifications are not of direct value to consumers, the physical and chemical analyses upon which these classifications are largely based, do constitute an important source of information for consumers. The physical and chemical analyses are required to be filed with the Bituminous Coal Division together with the price proposals, and hence, as part of a public record, become available to the public. The Bituminous Coal Division has also promulgated a marketing regulation that any analyses of individual coals quoted to a consumer or distributor by any producer, must be filed with the statistical bureau and district board for the district in which the coal is produced, and

be open to inspection by interested persons at the offices of the statistical bureau of that district and the Coal Division.

Many requests from consumers, for analyses of the coals of specific mines have been addressed to the Consumers' Counsel Division, and this Division has furnished the pertinent data from the record.

To make the data on coal analyses available in more significant form, data books are being compiled jointly by the Consumers' Counsel Division and the Bureau of Mines, for the purpose of assembling the facts available at the Bituminous Coal Division and the Bureau of Mines regarding the chemical and physical properties of coals in each seam in each county within the producing districts. Data books containing available information for the Appalachian region embraced in price area 1 are nearing completion, and will show not only specimen analyses and their usual ranges but also the rank (low-, medium-, or high-volatile coals) and the character of the samples selected for analysis.

Publications of the Consumers' Counsel Division other than "How Much Heat" and "Know Your Coal," which contain information on the classification and kinds of coal of interest to consumers, include "The Consumer Speaks," "Study Material on Bituminous Coal, Unit II-A—Marketing, Conservation and Purchasing Information for Consumers," "Heat Values from Coal Dollars," "Coal Consumers Digest," and "Co-op Coal News."

BUREAU OF MINES

The Bureau of Mines was established May 16, 1910, for the—

purpose of conducting inquiries and scientific and technologic investigations concerning mining, and the preparation, treatment, and utilization of mineral substances with view to improving health conditions, and increasing safety, efficiency, economic development, and conserving resources through prevention of waste in the mining, quarrying, metallurgical, and other mining industries; to inquire into economic conditions affecting these industries; to investigate explosives and peat; and on behalf of the Government to investigate the mineral fuels and unfinished mineral products belonging to, or for the use of, the United States, with view to their most efficient mining, preparation, treatment and use; and to disseminate information concerning these subjects in such manner as will best carry out the purpose of this act.

Most of the activities of the Bureau of Mines concern the ultimate consumer, while some of the investigations and scientific research regarding commodities are directed toward commercial and Government purchasing specifications. It is believed, however, that consumer standards are influenced by basic research carried on by the Bureau of Mines. Undoubtedly, even today, the consumer is able to buy better fuel as a direct result of Bureau of Mines' work.

To select from the huge program of basic research carried on by the Bureau of Mines and to designate those studies that have some bearing on consumer problems of buying would be a tremendous task far beyond the scope of this monograph. However, a few items will serve to illustrate the contributions being made by the Bureau, and to indicate that research has far outdistanced the steps that have been taken toward development of standards for the ultimate product.

The utilization of solid, liquid, and gaseous fuels has been of continuing interest to the Bureau of Mines for many years. Coal affords an abundant and cheap fuel, and the Nation's coal resources being

larger than the known resources of petroleum and natural gas, coal will doubtless be a standard fuel indefinitely, in spite of the increase in consumption of fuel oils. Consequently, the Bureau has turned its attention in part to the development of clean, efficient coal for the householder. At its field stations in the northwest and south the Bureau has tested the effectiveness of pretreatment on hundreds of samples of coal, and it is now possible to obtain washed and dedusted bituminous coals that represent a decided advance in cleanness and efficiency over the dirty, crumbling fuel supplied a few years ago. Investigations of interest to consumers are being conducted on the utilization of coal refuse in making an activated char for water-purification purposes, for a base exchanger for water-softening, and for a soil conditioner in agriculture. Pulverization of coal is now of tremendous interest to industry and may in time be of value to householders should furnaces be equipped for the utilization of pulverized coal. Emphasis in this has been given both to the process and the substance itself. In 1939, reports were made on the physical and chemical properties of Alabama coal, washability studies of coal from three beds in that State, and the physical and chemical properties of coke made or used in the State of Washington.

Realizing that the present economic structure depends to a large degree upon petroleum and that the Nation's reserves of crude oil are not inexhaustible, the Bureau of Mines has conducted research on the liquefaction of coal by hydrogenation—a process already successfully applied in England, Germany, and France—for obtaining oil from American coal. As the Nation's oil is gradually depleted, it is hoped that motor fuel from coal can be made so efficiently and cheaply that it can supplement the diminishing supply of the oil fuel without drastic adjustment.

During 1939, the Bureau of Mines conducted carbonization tests on four low-volatile and three high-volatile A-rank coals. These tests were standardized in cooperation with the American Gas Association. The constitution of the coal subjected to carbonizing tests was determined by petrographic and chemical analysis. High- and low-temperature distillation assays were made on coals from various fields to estimate their coke and byproduct-making qualities. An investigation of the effect of adding chemicals to coal was concluded and a small overfeed stoker, which was tested in combination with a modern hot water boiler, was found to give over-all efficiencies as high as 76 percent with intermittent operation, as in house heating.

Other coal research includes that on the utilization of sub-bituminous coal and lignite; important as fuel in the West and Southwest, on the causes and means of preventing coal-dust explosions, and on the methods of burning fuel in furnaces.

Should the retail buying of coal be so developed as to include grade specifications, source of coal will be an important factor. The Bureau has made analyses of coals in the United States from more than 1,500 mines and prospects. Heating values of all coals have been determined in addition to proximate and ultimate analyses.

In 1938, 8,681 samples of coal, coke, and related products were analyzed in the coal analysis laboratory. Of these, 6,646 were analyzed in connection with purchases of coal for the use of Government and certain State institutions and for classifications of coals

by the National Bituminous Coal Commission (now Bituminous Coal Division, United States Department of the Interior), 1,823 related to the research program of the Bureau of Mines, and 212 were miscellaneous samples.

The Bureau of Mines, in cooperation with the American Society for Testing Materials, has developed new methods of testing and analyzing coal and coke, and has assisted in formulating specifications for classification of coal based on heat value, ash, and chemical and physical qualities. Moreover, studies have been made to determine the burning characteristics of fuels in domestic heaters. Classification of coals is made by rank, that is, according to degree of metamorphism in the natural series from lignite to anthracite; by grade, that is, according to nature and amount of impurities present, screen size, and so forth; and by type, that is, by varieties such as common banded, splint, cannel, and boghead or algal coals.

Studies of coke as a domestic heating fuel have included analysis grading and evaluation, and comparison with other fuels used for the same purpose. Coke is graded by size, heating value, percentage of fixed carbon, volatile matter, and ash. Because certain characteristics of coke are more desirable than others for domestic use, and some types of coke are more efficient, the Bureau of Mines has published several bulletins on this subject to provide data for ultimate consumers as a guide in buying for household use.

The Bureau of Mines cooperated with the American Society for Testing Materials in the preparation of standards for coke analysis and tests.

The Bureau of Mines technologic work on petroleum and natural gas is concerned with drilling, production, transportation, and refining, and to a lesser extent with petroleum products.

The Bureau of Mines performs an important function in helping to establish standards which the ultimate consumer may use in buying petroleum products.

The Bureau has long recognized that there is a merging from fundamental research in the laboratory to so-called "practical" research. Therefore, in developing the philosophy of any research project it is not enough to establish certain fundamental relationships by laboratory experiment: To be effective the work must have practical application in the field or at the plant.³⁸

* * * Many companies have their own research organizations, both in the laboratory and in the field, and some types of laboratory research are conducted at universities and other technical institutions.

Recognizing this growth and change, the Bureau of Mines for several years has concentrated its efforts on studies of a fundamental nature that apply throughout the whole industry and that cannot reasonably be made by individual companies or others.³⁹

Thus it may be that as consumer demand becomes more articulate the emphasis on that type of research having direct effect on the quality and performance of ultimate consumer products may become greater and more evident.

Studies of the characteristics of motor fuels and lubricants are made in order that more suitable grades of these products may be made available to meet consumer requirements.

³⁸ "Petroleum and Natural Gas Studies of the United States Bureau of Mines," by H. C. Fowler, p. 2, Information Circular 6737, Bureau of Mines, Washington, D. C., 1933. (Out of print.)

³⁹ *Ibid.*, p. 7.

The Bureau of Mines is represented on the Lubricants and Liquid Fuel Technical Committee of the Federal Specifications Executive Committee.

Surveys of motor gasolines date back to 1915, and are now made semiannually, with the assistance of the Cooperative Fuel Research Committee. This committee is composed of representatives from the Society of Automotive Engineers, American Petroleum Institute, Automobile Manufacturers' Association, and the National Bureau of Standards. The brand names of the samples that are collected at service station pumps in widely scattered cities throughout the United States, are not published, but each sample is designated by a number. The Bureau of Mines has frequently been besieged with letters requesting the brand names of the samples collected. Many of such letters also request a statement as to the best gasoline available in a given city. Although this is perhaps a normal inquiry from the viewpoint of the individual motorist, the Bureau of Mines does not profess to know which gasoline will best meet individual consumer needs in any given area. It is doubtful if any research group could make an unqualified statement on this point. The question of desirability and undesirability of particular brands involves so many factors in addition to the results obtained by laboratory tests, that, according to the Bureau, no serious student of the subject would care to make a dogmatic statement regarding the actual quality of any particular brand.

The average motorist does not have the required technical knowledge to judge the various factors determined by the analyses. Also, the factors of cost of fuel and condition of engine are matters for individual consideration by the buyer of motor fuels. However, the semiannual gasoline surveys are believed to be of value to students of motor-fuel problems, because they supply representative data on the qualities of gasolines that are actually being bought and used by the public, in so far as these qualities can be determined by laboratory analyses. By making the data available without identification, the Bureau believes that it is aiding the public, because technologists charged with the development of the refining industry make use of these data and thus are able to develop better technique in the manufacture of motor fuels.

A comment made by a member of the Bureau's staff indicates very clearly that effective grading of gasoline would have to be too complex for practical use.

The incongruity of such procedure will be clearer if a person considers the types of automotive equipment serviced at motor-fuel pumps. The driver of an expensive make of car desiring as nearly perfect performance as he is able to obtain, should have latitude in his decision regarding the quality of products that he uses. His initial investment probably justified premium prices for the best obtainable products. In contrast, a motor vehicle of the "jalopy" type may give satisfaction with any motor fuel that will explode in the cylinders and any type of lubricant that will keep the moving parts from "freezing" or "burning out."

The Bureau of Mines' studies on applied methods for reducing evaporation losses of gasoline are of interest to consumers. Evaporation of gasoline from bulk storage stations is one of the major and most deceptive sources of loss in marketing gasoline. The determination of loss is frequently complicated by the relatively large co-

efficient of expansion of gasoline, which is not understood by many retail distributors.

Other projects having a direct bearing on consumer standards of petroleum products include studies on fuel oil specifications, manufacture of paraffin wax from petroleum, and dry cleaning solvents. Many of the studies on properties of typical crude oils produced in various fields relate to that class of consumer standards indirectly influenced by fundamental research. Producers and refiners are guided by such studies in making consumer products available at more reasonable costs. The study reported in Technical Paper 477⁴⁰ was a forerunner of solvent refining, a process now used extensively in industry by which refiners are able to prepare petroleum products from crude stocks which formerly were considered unsuitable for such use.

The Bureau of Mines work on asphalt has been confined chiefly to the study of petroleum asphalts for use as road-building materials.

Helium is of direct concern to the consumer as it is used in treating certain respiratory diseases such as asthma, laryngitis, croup, and diphtheria. Before helium could be secured from the Government its price was approximately \$150 per thousand cubic feet, now the same volume can be bought for about \$15. Helium is mixed with oxygen when used for medical purposes. Research is being conducted on various uses of helium for medical and industrial purposes. During the fiscal year 1939 the Bureau of Mines sold more than a million cubic feet to private concerns for these purposes.

Research is also being conducted on chemical products obtainable from natural gas. Some of the products are: Rubber substitutes, ethyl, prestone and hi-octane fuel, insulation materials, and motor fuels from natural gas.

Among important research on minerals, having direct bearing on consumer standards, are studies on gypsum for fertilizer and plaster and on mineral wool for insulation.

Health and safety standards are established by the Bureau of Mines for flame safety lamps, electric mine-lamps, electric flashlights and for supplied-air respirators and filter-type dust respirators. Tests and investigations and the issuing of "approval plates" for these items are authorized under the act of Congress approved February 25, 1913.⁴¹ The purpose of investigations made under this program is to promote the development of electric flashlights, electric lamps, flame safety lamps and supplied air respirators that may be safely used in mines. Those articles passing required tests set up by the Bureau are called "permissible," and may be so labeled with standard approval plates. The Bureau reserves the right to rescind for cause at any time any approval granted under this schedule.

Among the health and safety publications is one entitled "Incomplete Combustion of Natural-Gas Space Heaters," which is of particular interest to consumers.⁴² The Bureau's study of carbon monoxide produced by certain types of natural gas heaters has caused a decided

⁴⁰"A Study of the Lubricant Fractions of Cabin Creek (W. Va.) Petroleum," by H. M. Smith, with chapters on the Action of Solvents on the Heavy Constituents of Petroleum, by F. W. Lane, I. H. Nelson, J. M. Devine, and H. M. Smith, 48 pp., Technical Paper 477, Bureau of Mines, Washington, D. C., 1931. (Out of print.)

⁴¹ 37 Stat. 681.

⁴²"Incomplete Combustion in Natural-Gas Space Heaters," by G. W. Jones, W. P. Yant, and L. B. Berger, 22 pp., Bureau of Mines Technical Paper 362, U. S. Government Printing Office, Washington, D. C., 1925, 5 cents.

change in the construction of this type of equipment during the last several years.

The Bureau of Mines, being primarily a research agency, is issuing material of a highly technical nature, however, some of its publications are of interest to the general public in revealing the content or characteristics of such commodities as coal, petroleum, etc., and the care of them.⁴³

FISH AND WILDLIFE SERVICE

Fisheries Work.

Although the fisheries work of the Fish and Wildlife Service, United States Department of the Interior, is concerned primarily with the practices of the fishermen and the operations of the distributive or processing trades, the consumer is thereby benefited indirectly.

Among specific items having some bearing on consumer standards are the following:

The Division of Alaska Fisheries has had seal furs, produced under its supervision, tested by the National Bureau of Standards for dye fastness and for durability of pelts tanned in various ways. Through its supervision of fishery operations in Alaska, this Division has a considerable influence on the canned salmon industries as well as on other important fishery industries of the Alaska Territory.

A provision of the laws relating to Alaska fisheries is designed to assure that salmon are in wholesome condition when canned. This law requires that all salmon to be preserved for sale as food for human consumption must be preserved or iced within 48 hours of the time they are killed.

The work of the Division of Scientific Inquiry affects consumers largely through the conservation measures resulting from its investigations. Through the adoption by the States of the recommended conservation principles based on sound biological information, the continuance of a supply of commercial fish, shellfish, and crustaceans is assured. The angling resources are being maintained and improved through the formulation of stocking policies based on ecological facts; through the improvement of hatchery techniques; by the detection and control of diseases, epidemics, and parasites; by stream and lake improvement; and by detection and elimination of pollution in natural waters. The Division also collects and tabulates whaling statistics and conducts biological investigations of whales. Various biological studies are making it possible to improve the quality of certain aquatic products, for example, the improvement of oyster bottoms to produce larger and fatter oysters.

The Division of Fish Culture is closely concerned with recreation. Through its production of fish in hatcheries and its help to various States, carrying on similar activities, a large number of game fish, and an enormous volume of commercial types as well, are released annually.

The Division of Fishery Industries, dealing, as it does primarily, with the commercial aspects of the fishery industry, has the greatest volume of its activities related to consumer standards.

⁴³ "List of Publications," Bureau of Mines, 1910-37, and "Supplements to List of Publications," Bureau of Mines, July 1, 1937, to June 30, 1938, and July 1, 1938, to June 30, 1939, U. S. Government Printing Office, Washington, D. C.

Economic research conducted by the Division of Fishery Industries has been largely in the field of marketing. This research is of benefit to the consumer to the extent that it aids more orderly and efficient marketing and results in improvement of quality and stabilization of prices. Various interests of the fish trade, as a result of this work, become better acquainted with the fish marketing structure outside their own particular fields and with the character and extent of operating economic forces, and are more able to adapt their activities to the general structure of the fishery industry. This enables them to operate at a higher efficiency with a resultant benefit to the general public. Even though relatively few of the members of the trade may have first-hand knowledge of this research work, the practices inaugurated spread to others through the operation of competitive forces.

Over a period of years, the Division of Fishery Industries has conducted studies of the wholesale marketing of fish in a number of the larger cities of the country. The most recent of these studies covered the San Francisco Bay area. Other studies have analyzed the marketing of shad on the Atlantic coast, the frozen fish situation, the leading varieties of fish in the retail trade of 60 cities, the Pacific halibut fishery, the oyster industry, the horse-mackerel fishery of Maine, and the fisheries of Puerto Rico and the Virgin Islands.

A study still in progress deals with a survey of the retail marketing of fish in some 50 cities east of the Mississippi River. This study will present a broad picture of the methods and practices of retailers handling fish in general grocery stores and fish markets which are the principal outlets. This study will also yield considerable information as to consumer preference regarding species of fish and forms of preparation.

It is already apparent from this study that there are a great many stores engaged in retailing of fresh and frozen fish, and a great variation among them in volume sold. A large proportion of the stores handling the commodity, however, sell such a small quantity that they are scarcely justified in giving that phase of the business intensive care. Nearly 40 percent of the 4,000 stores surveyed averaged less than \$10 in fish sales per week in 1938.

Data on the extent to which certain species predominated in the cities studied are included in the schedules for the survey. A significant phase of the schedule data was the variety of names under which some species were sold and the number of species that were sold under the same name. The attendant confusion of the consumer, and the opportunities for misrepresentation offered, are apparent.

In many cities distant from the source of supply, haddock fillet is a sort of generic name and may be used to cover all of the main supply of groundfish, which, for example, in one large western city is 60 percent cod and undoubtedly contains some element of cusk. In one large city fillet of sole is almost entirely halibut cut in such a way to make convenient slices for frying or broiling. In another large city a salt water species, croakers or hardheads, is quite frequently sold under the name of silver bass, but during some periods of the year when sheepshead from the Great Lakes are available they are sold as silver bass. The "tenderloin of trout" sold in one city in

the central United States is almost always grouper which has been cut after a fashion peculiar to the city. It is intimated by the members of the trade that in certain regions fillet of trout and red snapper are very frequently some other and cheaper fish. In one midwestern city, whiting, a salt-water fish, is commonly known as jack salmon, while this name is given to blue pike, a fresh-water fish, in several other cities.

The Fishery Market News Service, Division of Fishery Industries, maintains offices, with a reporting staff, in several of the larger fish marketing centers. Daily reports made public by these offices are valuable to the consumer in indicating prices prevailing on the wholesale market. These reports are primarily useful to the fishery trade and to the fishermen in marketing their catches; it has aided also in stabilizing market conditions in the industry.

The statistical section of the Division of Fishery Industries compiles and analyzes the data on the catch of fish and other aquatic products. These data are obtained by a staff of statistical agents who cover all the important fishery regions. A current and continuing indication of supply conditions is thus available and constitutes another factor in stabilizing markets.

The Division of Fishery Industries has made some study of the data on fish consumption obtained in the Consumer Purchases Study of the United States Departments of Labor and Agriculture. Similar data for some 50 cities, obtained in the Study of Money Disbursements of Wage Earners and Lower-Salaried Clerical Workers made by the United States Department of Labor, are better adapted for city-by-city analysis. The Fish and Wildlife Service plans to examine this material more carefully to indicate the significant features regarding fish consumption which do not appear in the original reports.

The studies by the technological section, Division of Fishery Industries, among other purposes, are directed toward (a) improved methods of judging the quality of fishery products, (b) better practices for handling and transporting fish, (c) developing more efficient preparation of medicinal and other fish oils, (d) establishing the nutritive value of all sea foods, and (e) establishing standards and grades of sanitary production. While the results of these studies directly affect the industry, any improvements in methods of production are reflected in higher quality and cheaper prices.

Improved methods of judging the quality of fishery products.—The adoption of freezing as a method of preserving fish, in recent years, has emphasized the necessity for utilizing only the highest quality of fish for this purpose. As a result of this need, a method was developed whereby a quality selection could be made by scientific methods. Considerable interest has been shown by the industry in this method since it enables it to prepare a higher quality product at a lower price.

Better practices for handling and transporting fish.—Research by the technologists have led to the improvement of the containers and methods of packing fresh fish. One of these developments is a refrigerated container for less than carloads of fish or fishery products. Another is the improvement in refrigerator car and truck design which tends to increase the efficiency of operation. Still another investigation which at present is under consideration deals with the

utilization of individual lockers for the storage of fish for family consumption. All of these improvements are reflected in the quality and the price of the products offered to the public.

Developing more efficient preparation of medicinal and other fish oils.—One of the earliest known methods for the production of cod-liver oil was permitting the livers to rot; this caused the oil to be released. Oil prepared in this manner was badly decomposed and of low vitamin value. Studies have been made which have set up maximum temperatures at which the livers can be heated for the production of a high vitamin oil. Other studies have led to the utilization of the livers of other species of fish in the preparation of medicinal oils of high vitamin content. Much of the body oil produced from fish has been diverted from the paint and soap industries to the medicinal and animal food fields. The modern poultry industry would find itself seriously handicapped had it not been for the investigations of the technologists of the Fish and Wildlife Service in finding new sources from which they could obtain an adequate supply of vitamin oil at a reasonable price. The income derived from the commercial use of the byproducts of the filleting industry has made it possible for this industry to operate more economically and thus pass the savings on to the consumer of its products.

Establishing the nutritive value of all sea foods.—The investigations dealing with the nutritive value of fish have indicated that fish contain an ample supply of all of the minerals necessary for growth and the maintenance of good health. It has been found that fish contain large amounts of iodine and thus its consumption has been recommended in those sections of the country where diseases caused by a lack of iodine are prevalent. It has also been established that sea food is one of the most valuable sources of a protein which is easily digested and assimilated for use by the body. All of these investigations directly affect the health and welfare of the consuming public.

Setting up standards and grades of sanitary production of fish.—Various investigations into the existing sanitary regulations and recommendations for their improvement have been made. The acceptance of these recommendations has resulted in the conservation of many thousands of pounds of excellent and healthful food previously lost to the consumer through careless handling. Codes of sanitary practice have been set up for the crab, oyster, and fresh-fish industries. Grades for salt herring and canned herring roe, used by the Division of Markets of the Virginia State Department of Agriculture and Immigration, have been established with the cooperation of the Division of Fishery Industries. The Fish and Wildlife Service has aided the Technical Committee on Provisions of the Federal Specifications Executive Committee in preparing Federal Specifications for fresh fish, fresh oysters, canned salmon, canned sardines, and canned tuna fish. The Service has also aided the Federal Trade Commission with technical advice in setting up quality definitions in Trade Practice Rules for the Tuna Fish Industry and Trade Practice Rules for the Sardine Industry.

Educational work.—The results of the fisheries' work of the Fish and Wildlife Service reaches the public through various channels used to publicize the findings of general interest, as well as through its effect on the fishery industry. The radio programs and popular

press releases which are now planned as a continuing feature of the Service's activity will disseminate information of interest to the consumer. This information may be particularly valuable in efforts to standardize the names of certain species of fish in which there is now a marked confusion and in increasing public knowledge of grades and standards for fishery products as they are developed.

Fur Resources Work.

Broadly speaking, the work of the Section of Fur Resources, Fish and Wildlife Service, United States Department of the Interior, falls under four headings, which are: (1) To make more generally known the commercial importance of fur in industry; (2) to emphasize the need of maintaining the supply of raw materials; (3) to explain methods by which this supply may not only be maintained in quantity but improved in quality; and (4) to conduct experiments on farms in the production of fur animals under controlled conditions. Most of the research work that may benefit the consumer is carried on cooperatively with other agencies.

Fur-fiber investigations.—At the Agricultural Research Center a study was begun in cooperation with the Bureau of Animal Industry, United States Department of Agriculture, to determine by microscopic examination the physical properties of fur and the factors that contribute to the production of superior quality fur. Special attention was given to fur-fibers of the silver fox, mink, marten, and Karakul sheep. A review was made of all the American and foreign literature covering similar investigations.

Through persistent research, media have been found that are suitable for making both temporary and permanent mounts to reveal the inner structure of the fibers, especially pigmentation, and to emphasize their outlines. In heavily pigmented and medullated fibers fine relationships between scales cannot be distinguished by direct observation, and in such cases the details were revealed by casts and photomicrographs. The precision of this method will undoubtedly prove of importance in the identification of unknown fibers.

Quality of tanned skins.—The work with the Bureau of Agricultural Chemistry and Engineering, United States Department of Agriculture, is set up to determine the influence of environmental factors on the quality of raw and tanned fur-animal skins. Pelts taken from young and adult silver foxes, fed experimental rations, were supplied by the Fish and Wildlife Service for this study. In addition, a number of prairie dog skins collected by field representatives of the Service, and guinea pig skins furnished by commercial breeders and the Bureau of Animal Industry, United States Department of Agriculture, were given to the Bureau of Agricultural Chemistry and Engineering for use in experimental tanning tests to determine their commercial value. Australian rabbit skins also were supplied. Observations were made on the effect of alternate freezing and thawing of silver fox skins immediately following pelting. No appreciable difference in either the tensile or bursting strength of the frozen and unfrozen skins was detected.

Felting studies.—The cooperative study to determine the value of various North American furs for felting has been carried on with the research department of one of the leading hat manufacturers. The fur of the mountain beaver and the hair of the guinea pig were found

to have no felting properties. One hundred pelts from 60-day-old domestic rabbits were classified and graded for furriers' purposes. Doeskins produced 5 percent more usable blown fur suitable for hat making than an equal number of the same grade of buckskins and yielded 11 to 16 percent more usable fur than an equal weight of buckskins. Skins graded as No. 1 and No. 2 produced 16 to 27 percent more usable fur than those graded No. 3 and No. 4.

Trade Practice Rules of the Federal Trade Commission.—Representatives of the Fish and Wildlife Service have been cooperating with the Federal Trade Commission in the preparation of Trade Practice Rules for the Fur Industry. The rules promulgated were released June 17, 1938. Information concerning the real and trade names of furs, as well as information regarding fur trade practices in general, was supplied for use in enforcing fair Trade Practice Rules for the Fur Industry. During the first year of operation of the rules the Federal Trade Commission handled over 500 cases of alleged misdescriptive advertising and made much progress in correcting bad practices against which the rules were directed.

Fur imports.—In cooperation with the Foreign Office of the Bureau of Agricultural Economics (now Office of Foreign Relations), United States Department of Agriculture, and the Committee for Reciprocity Information, United States State Department, representatives of the Fish and Wildlife Service have been furnishing statistical data and other information pertaining to fur farming developments in the United States and foreign countries. This was in connection with the import duty on silver fox pelts. A number of meetings were held in the offices of the United States Tariff Commission to give fur farmers an opportunity to present their views.

The United States Treasury Department was assisted in proceedings before the Court of Customs and Patent Appeals between the Federal Government and fur importers. Representatives of the Fish and Wildlife Service furnished scientific and other data for use in preparing the cases, in which duties amounting to many millions of dollars were involved.

Persian lamb production.—The popularity of Persian lambskins for use in coats and trimming has stimulated activity in Karakul sheep raising in this country in both purebred and grade flocks. Karakul sheep investigations in cooperation with the Bureau of Animal Industry, United States Department of Agriculture, are progressing satisfactorily. Assistance was given by representatives of the Fish and Wildlife Service in selecting a more complete and comprehensive set of standard sample skins for classifying the experimental Karakul skins as well as live lambs retained for breeding. All skins taken during previous years have been reclassified in accordance with the new standards.

Rabbit raising.—Raising domestic rabbits for food and fur has received a stimulus from advancing prices, and raising rabbits for laboratory purposes is still found profitable by many breeders. An unsatisfied demand for domestic rabbits suitable for making pneumonia serum has had an encouraging effect on rabbit raising. The Angora rabbit wool produced in the United States also seems to have found a more extensive and dependable market.

Representative pelts of fryer rabbits produced by the self-feeding plan were graded by dealers in raw rabbit skins and by other experts

after dressing the natural long hair. The possibilities of increasing the percentage of fryer-rabbit skins usable in the fur trade is being considered and has much practical value because of the higher prices now being paid for skins.

GEOLOGICAL SURVEY

The Geological Survey, United States Department of the Interior, was created by act of Congress, approved March 3, 1879, for the purpose of classifying "the public lands and examination of the geological structure, mineral resources, and products of the national domain * * *"⁴⁴

The Geological Survey, which is a fact-finding agency, proceeds from the investigation of the sources of basic materials to their analysis. Although its function does not consist in formulating standards, it keeps the established standards and requirements and makes efforts to describe ores, minerals, and structural materials in terms of and in their relations to standards. It examines annually more than a thousand mineral specimens submitted for examination by the public and its reports to the senders include identification of the specimens and further information based on standards expressing probable adaptability of the mineral to different uses. Information is gathered on all metallic and nonmetallic minerals. This information is made available in publications,⁴⁵ mostly on specific areas or districts, by correspondence, and by personal interviews.

The Geological Survey undertakes studies of coal, oil, and gas fields, metallic and nonmetallic mineral deposits, and geologic problems related to engineering projects. It endeavors to place at the disposal of the architect and builder the results of its experience with and knowledge of natural structural materials.

Coal.—The coal fields of the United States have been investigated by the Geological Survey and are described in reports which give information on the distribution, thickness, and quality of the coal deposits. The Survey collects samples of coals for analysis by the Bureau of Mines and those analyses are published in reports on the geology of the areas in which the deposits are found. The Survey has cooperated with the American Society for Testing Materials and the American Standards Association in the establishing of coal classification by rank and grade.⁴⁶

Oil and gas.—The developed oil and gas deposits, also the oil and gas possibilities of untested areas, are investigated by the Geological Survey for the purpose of acquiring information on the location, character, and reserves of these resources. Samples of oil and gas are obtained by the Survey's experts in the areas studied by them and these are analyzed by chemists of the Bureau of Mines. The British thermal unit heating value of gas is determined at the time the analyses of the gas samples are made. Information on the available reserves of oil and gas is essential in determining whether the supply is sufficient to justify the installation of equipment for their utilization.

⁴⁴ "U. S. Geological Survey, Its Origin, Development, Organization and Operations," 205 pp., Bulletin 227, U. S. Government Printing Office, Washington, D. C., 1934 (Out of Print).

⁴⁵ "Publications of the Geological Survey," U. S. Government Printing Office, Washington, D. C., May 1938.

⁴⁶ "Recently Adopted Standard of Classification of Coals by Rank and Grade," by Thomas A. Hendricks, *Economic Geology*, vol. 33 (2), pp. 136-142, March to April 1938.

Deposits of helium-bearing natural gas have been investigated by the Geological Survey and basic information for the determination of the amount of available helium has been acquired.

Ores.—Investigations by the Geological Survey of ores of the different metals involve exploration of the original sources of the ores, classification, location, and description of the deposits and their occurrence, estimation of ore reserves, and studies of the genesis of the deposits.

The Survey, in the dissemination of accurate information, seeks to encourage the development of promising deposits and to prevent expenditure of funds and labor on those which hold no promise of successful exploitation. An important phase of this latter function is to assist in blocking fraudulent promotion enterprises based on misinterpretation and misinformation concerning mineral deposits.

Bauxite.—Bauxite is mainly valuable for the aluminum that may be extracted from it. However, bauxite is used in other ways, for example, as an abrasive, as a pigment, as a refractory, and as a partial source of alum, aluminum sulfate, and several other chemicals used particularly in water purification.

The Geological Survey is in a position to give valuable information as to the location, characteristics, and industrial possibilities of bauxite.

Mica.—The Geological Survey is a source of information regarding the physical and mineralogic characteristics of known deposits of mica, including the relative qualities in each.

Precious stones.—The Geological Survey serves the public in identifying precious stones and in giving information concerning their quality and probable utility.

Fertilizer materials (phosphate, potash, nitrates).—The Geological Survey has made studies of phosphates in this country. As a result of this study it has prepared maps, made analyses, and estimates regarding phosphates whereby a prospector or mining company can determine on what particular tracts of land phosphate is present, and some information regarding its quality and amount. The investigations relative to potash have led to the discovery of minable potash comparable to the best imported grades. Investigations of nitrate show that commercial deposits of natural nitrates probably do not exist in the United States; however, through electrochemical processes of extraction of nitrogen from the air, this country is now not dependent on foreign supplies of nitrates.

Structural materials.—Much information has been made available by the Geological Survey to users of such products as building stone, decorative and monumental stones, lime, sand and gravel, clay and clay products, concrete aggregates, gypsum and other plasters.⁴⁷

In the field of constructional stone materials, study has been made of the relationship of the quarry to quality of stones,⁴⁸ of vermiculite and other insulation material, and clay for brick. The physical properties of granite and marble such as color, texture, and crushing strength are criteria for the commercial grading of granite. The

⁴⁷ "Contributions of the U. S. Geological Survey to Architects," by Earnest F. Burchard, Journal of the American Institute of Architects, Structural Service Book, vol. 1 (2), pp. 18-20, February 1917.

⁴⁸ "Commercial Marbles of Western Vermont," by T. Nelson Dale, 170 pp., Bulletin 521, Geological Survey, U. S. Department of the Interior, Washington, D. C., 1912. (Out of print.)

"Granites of New England," by T. Nelson Dale, 488 pp., Bulletin 738, Geological Survey, U. S. Department of the Interior, Washington, D. C., 1923. (Out of print.)

Survey has shown that petrographic analysis rather than chemical analysis is the logical basis for determining the durability of granite and other building stone. This would base the commercial classification of properties of granites on "use" instead of chemical or mineral composition.⁶⁹ A study was made on the relation of natural features of limestone to commercial grading.⁶⁹ The Geological Survey is represented on several committees of engineering and standardizing societies, such as the American Society for Testing Materials (A. S. T. M.) and the American Standards Association. It has cooperated with A. S. T. M. committees in establishing grades for commercial building stone, the purpose being to broaden the classification so as to eliminate misrepresentation of building materials.

Ceramic raw materials.—Ceramic raw materials include a considerable group of nonmetallic minerals, chief among which is clay. The work on clays has included publication of reports showing the location, character, and general utility of high-grade clays in different parts of the country. Important research on clay materials is being carried on in the laboratories of the Geological Survey. Bleaching clay investigations have led to the discovery of apparently large bodies of high-grade activable clay and to the development of a technique by which comparative studies may be made of the bleaching properties of clays from many different localities. Information on feldspar, another widely used ceramic raw material, has been gathered and published by the Survey.

Refractory materials.—Refractory materials are used not only by the ceramic industries but also by other industries where high temperatures are involved, as in metallurgical or manufacturing processes, or in the finished product. For example, automobile spark plugs, which must withstand brief but rapidly repeated subjection to high temperatures, are made from rock material, or minerals such as andalusite and dumortierite, whose availability is known to the Geological Survey. Magnesite is another refractory to which the Geological Survey has given much attention. This material finds its way into industrial plants but is also widely used in compounds for insulating such commodities as domestic furnaces, and furnace and hot water pipes. The Survey has made inquiries about supplies of materials suitable for making rock wool, one of the common types of insulating materials, and vermiculite and diatomite, and other commonly used insulating materials.

Many other examples could be cited, but the foregoing serve to illustrate the service rendered by the Geological Survey to industry, and through industry to the ultimate consumer.

INDIAN ARTS AND CRAFTS BOARD

Standards for Indian Arts and Crafts.

Among the functions of the Indian Arts and Crafts Board, as defined in the act of August 27, 1935, are those—

to create Government trade-marks of genuineness and quality for Indian products and the products of particular Indian tribes or groups; to establish standards and regulations for the use of such trade-marks; to license corpora-

⁶⁹ "Commercial Granites and the Geology of Granite Deposits," by L. W. Currier, report in preparation, Geological Survey, U. S. Department of the Interior, Washington, D. C.

⁶⁹ "Indiana Oolitic Limestone, Relation of its Natural Features to its Commercial Grading," by G. F. Loughlin, pp. 113-202, Bulletin 811 (c), Geological Survey, U. S. Government Printing Office, Washington, D. C., 1930. 30 cents.

tions, associations, or individuals to use them; and to charge a fee for their use; to register them in the United States Patent Office without charge.

Extensive surveys of the field and interviews with experts, craftsmen, and traders have revealed that, in the field of Indian arts and crafts, no uniform procedure in developing standards for trademarks and certificates can be adopted.

Since these trade-marks were to be created above all to protect the producer from the competition of nongenuine articles and to inform the consumer of the genuineness of his purchase, it was the first duty of the Indian Arts and Crafts Board to investigate what constitutes genuineness in the various lines of Indian crafts production. These inquiries revealed that the factors that are generally considered to determine genuineness of Indian crafts products are varied in the different fields of production and in their respective markets. The only generally accepted criterion of genuineness, as voiced by all consumers and producers alike, is the identity of the maker as a member of the Indian race, or more specifically of that tribe that is traditionally known for the production of his type of crafts. Other factors, such as quality of raw material, type of production method, quality of workmanship, and excellence of style and design, are given varied importance by the different groups of consumers and producers.

From this, it became apparent that no certificate of genuineness could serve its aim without available indication of the factors that constitute genuineness in the given case.

The Indian Arts and Crafts Board's mark for Navajo, Pueblo, and Hopi silver was devised to protect specifically a type of production that is generally considered to be outstanding, because of its traditional workmanship and its design. Since no written regulation can define this type of merit, every piece that receives this mark has to be examined and judged by an expert in the field. To explain the meaning of this mark, explanatory circulars have been prepared for the use of consumers, which are offered free to everyone who submits articles to be stamped. The circulars are intended to be given free to every purchaser of such a piece of jewelry. Since this type of mark applies to only a small percentage of the output, the Indian Arts and Crafts Board is now undertaking to find means of identification for other types of silver products.

The Indian Arts and Crafts Board's certificate of genuineness for Navajo all-wool woven fabrics is not concerned with either design or quality of workmanship, because workmanship in Navajo weaving speaks for itself, and the designs in better fabrics follow an established tradition. The need here was mainly for protection against inferior products made partly with machine-made thread and against fabrics made outside the tribe. This certificate, which is attached to the fabric, therefore states that the piece is entirely produced by Navajo Indians, made entirely of local wool, locally hand-spun, and woven on a native Navajo loom. Since these standards may be checked by anyone familiar with Navajo weaving, any trader who applies for a special license may be authorized to attach certificates.

The Indian Arts and Crafts Board's stamp for Alaskan Eskimo and Indian products, are aimed only to identify the tribal origin of the product and to protect the Alaskan Eskimo or Indian craftsman from the competition of articles made in factories or under workshop con-

ditions. The stamp therefore bears only the inscription "Hand-made—Alaskan Eskimo," or "Hand-made—Alaskan Indian."

The Indian Arts and Crafts Board hopes eventually to be able, through its own standards or through its endorsements of standards established by producer's groups, to develop a system of certificates that cover not only all fields of Indian arts and crafts, but also all those classifications within a field that need identification.

OFFICE OF INDIAN AFFAIRS (INDIAN SERVICE)

Purpose of Preparing Standards and Specifications.

The Indian Service, United States Department of the Interior, has established specifications for supplies, articles, and equipment used in schools, hospitals, and sanatoria, for approximately 9,000 items.⁵¹ To those familiar with conditions existing in the Indian Service some years ago the purpose of preparing standard specifications is at once apparent. They know how indefinitely and inadequately specifications for procurement were prepared in those days. The article to be purchased was merely named and usually samples were called for, leaving it more or less to the discretion of the prospective bidder to determine the character and quality he should offer. The awarding official made his selection from what was placed before him. At that time he proceeded in the consideration of proposals from the standpoint of the cheapest sample offered where a selection could be made of the commodity required which in his opinion was adequate to the Indian Service both in quality and price. This procedure developed into a matter of more or less personal preference. The inadequacy and unfairness of purchasing under such a system, without an accompanying detailed description of the article to enlighten the bidder as to the quality required and at the same time fix a standard for the guidance of the awarding officer, is apparent.

Procedure in Establishing Standard Specifications.

Realizing the inadequacy of such a system, the development and use of detailed specifications in purchasing articles of supply, equipment, and so forth, became an active feature in the operating program of the Indian Service. In the selection of personnel particular attention was given to prospective employees who had some practical or technical experience in purchasing, selling, or using the supplies or equipment which they would handle under the commodity assignments. Progress was slow, but little by little the specifications were improved to the point where inferior goods, when offered in proposals, could be rejected because they did not meet the requirements for which they were to be used. In developing the specifications careful attention was given to the results obtained in practical institutional use. Not only was quality considered, but where necessary, proper sizes of garments and wearing apparel for children of various ages and adults were studied. The results have more than repaid the effort expended.

Inspection and Tests.

The benefit resulting from the use of standard specifications would be largely offset without the inspection and testing of goods and supplies to assure conformance with the specifications. The results

⁵¹ These specifications are prepared by the Purchasing Office of the U. S. Department of the Interior.

of inspection are considered essential in the development of specifications, since through tests and laboratory analyses the necessary corrections in specifications are made. In addition to laboratory tests and analyses, goods and supplies which lend themselves to practical tests are studied during their use. Such practical tests often outweigh any conclusion which may be reached as a result of laboratory tests or analyses.

Cooperation With Other Government Agencies.

In the preparation of standard specifications use was made of other governmental facilities and of the knowledge and experience gained by employees of other departments and activities of the Government. The National Bureau of Standards has been of help, and the facilities of bureaus were used where available; these included the Bureau of Home Economics, United States Department of Agriculture, the Food and Drug Administration, the Bureau of Supplies and Accounts in the United States Navy Department, and certain units in the office of the Quartermaster General of the United States Army. In addition to the research work on standardization conducted by the Indian Service, use has been made of Federal Specifications. Cooperation between the administrative branch of the Indian Service and the purchasing office of the United States Department of the Interior resulted in very definite requirements for the Indian Service as to the type and quality of merchandise to be purchased.

UNITED STATES DEPARTMENT OF LABOR

BUREAU OF LABOR STATISTICS

RETAIL PRICE DIVISION

The Retail Price Division of the Bureau of Labor Statistics collects retail prices for more than 290 commodities and services which are important in retail trade and in the expenditures of the average wage earners' and lower-salaried clerical workers' families. These commodities and services are classified into the following groups: Food; rents; fuel and light; clothing and shoes; yard goods and textile furnishings; furniture and floor covering; household equipment and electrical appliances; drugs, toiletries, and sundries; miscellaneous commodities, including automobiles, tires and tubes, petroleum products, and so forth; miscellaneous services, including transportation, newspapers, medical care, personal care, and similar services.

The major objective of the Bureau is to secure from time to time comparisons of retail prices for identical or comparable qualities of ultimate consumer goods. At present the principal use of the retail price data collected by the Bureau is in computing changes in cost of living. They are also used for many other purposes, however, such as computing retail price indices, publication of average retail prices, limited place-to-place comparisons in living costs, and similar studies.

Prices of food items are collected monthly, and fuel and light items quarterly, for 51 large cities in the United States. Prices of all other items are collected quarterly in 33 of the same cities throughout the country. Quotations for fuel and light are secured by mail; all others by personal visits of field representatives of the Bureau, from department stores, specialty shops, real estate firms, physicians, dentists, hospitals, newspaper offices, transportation companies, and other sources.

The need for specifications to be used as guides for securing retail prices of comparable items from time to time was recognized early in 1933. The specifications were not then, nor are they now, intended to be set up as standards of quality for consumer goods. They are intended only to describe the essential price determining features of the items covered so that bona fide changes in retail prices can be distinguished from changes in the quality of goods.

The foundation for the use of specifications by the Bureau was laid in the summer of 1933 when the Federal Inter-Departmental Retail Price Committee, organized by the Central Statistical Board and consisting of representatives of several Federal Government agencies, developed a set of preliminary specifications for use as a basis of price collection. These specifications were first used officially to serve as a basis for prices collected in November 1933 in computing changes in the cost of living of Federal employees in the District of Columbia. They were used further during the early part of 1934 to make test collections of retail prices in a number of cities throughout the United States.

During January and February 1935 all available data were correlated and additional specifications were developed covering all items for which retail prices are secured by the Bureau. The specifications prepared at this time were used in the March 1935 collection of prices and thereafter with only minor revisions until 1937.

A considerable amount of research work on specifications, especially for clothing, was done in 1937. The research included conferences with manufacturers, trade associations, wholesalers, jobbers, retailers, and others who are familiar with manufacturing processes and marketing and merchandising problems. Over 300 sources were consulted for information, either directly or through special surveys conducted through trade associations. The data were studied and necessary changes were made in the previous specifications. This research work and the information secured from experts on retail merchandising revealed the strata of the retail markets into which various qualities of goods could be classified. The price determining characteristics of each class of goods were examined and specifications were prepared which consisted largely of detailed descriptions of the price determining factors for each item, such as construction, kinds and amount of materials, style, quality of workmanship, whether hand- or machine-made, sizes, brands, and general terms regarding qualities (medium, inexpensive, very inexpensive, and so forth). Separate specifications were developed for two or three different qualities of many items. They were designed to describe the articles sold through the various price brackets which encompass the volume of expenditures for consumer goods.

All specifications are considered only tentative when first prepared. They are then forwarded to trained field representatives of the Bureau who test them in collecting retail prices, not only by using all labeling information given for each item but also by questioning informants regarding details of materials and construction which are seldom given on labels. Through this process, the Bureau has built up an extensive amount of information which is used in periodic revisions of the specifications. This information is supplemented by that secured by members of the research staff of the Retail Price Division, and checked with manufacturers, trade associations, and authorities on retail merchandising before being incorporated into revised specifications. The adequacy of the specifications is checked constantly as new or additional information is received, as the nature of commodities changes, as new articles assume importance in retail trade and family expenditures, and as old articles decline in importance.

In the formulation of specifications, the need for detailed and comprehensive descriptions has been demonstrated. The current tendency is toward the development of two distinct sets of specifications, one set to be used primarily by highly trained representatives of the Bureau in their contacts with well-informed retailers; the other, a considerably less technical set of specifications, to be used in contacts with those informants to whom technical details of construction and materials seem unnecessary.

Pricing by specification has been useful and gratifying. Many of the Bureau's cooperators, in reporting retail prices, who were skeptical at the introduction of these specifications are now interested and eager to assist in the development of more useful specifications. Some have, through study and market contacts, increased their

knowledge of the technical details of the commodities they sell as a direct result of having had their curiosity and interest stimulated by the specifications. Manufacturers and trade associations have voluntarily furnished information far beyond the requests made of them.

WHOLESALE PRICE DIVISION

The regular collection of wholesale price data by the Wholesale Price Division of the Bureau of Labor Statistics began in 1900 by the then "Bureau of Labor" of the Department of Commerce and Labor. The work at that time consisted of bringing up to date the information compiled under instructions of the Senate Finance Committee, issued in four volumes known as the "Aldrich Report," and inaugurated the regular collection of data.

The primary purpose of the collection of wholesale prices has been to show changes occurring between two current periods of time and the trend in price movements over a period of years. With the improvement of the wholesale price series a number of specialized uses has developed.

Over the period of 40 years several revisions have been made in the wholesale price materials issued by the Bureau. The first attempt at a general revision was in 1913-14 incident to the World War. The more important changes at that time were an extension in the coverage and a change in method of calculation. Subsequent revisions have been made in 1920-21, 1927, and 1931. The present weighted index number series of wholesale prices includes more than 1,000 individual price quotations representing over 800 price series. The items are divided into 10 major groups of commodities, 47 subgroups of closely related items, and 5 economic classifications.

The present groupings of the Bureau's wholesale price data are as follows:

COMMODITY GROUPS AND SUBGROUPS

- (1) Farm products: Grains, livestock and poultry, other farm products.
- (2) Foods: Dairy products, cereal products, fruits and vegetables, meats, other foods.
- (3) Hides and leather products: Shoes, hides and skins, leather, other leather products.
- (4) Textile products: Clothing, cotton goods, hosiery and underwear, rayon, silk, woolen and worsted goods, other textile products.
- (5) Fuel and lighting materials: Anthracite, bituminous coal, coke, electricity, gas, petroleum products.
- (6) Metals and metal products: Agricultural implements, farm machinery, iron and steel, motor vehicles, nonferrous metals, plumbing and heating.
- (7) Building materials: Brick and tile, cement, lumber, paint and paint materials, plumbing and heating, structural steel, other building materials.
- (8) Chemicals and drugs: Chemicals, drugs, and pharmaceuticals, fertilizer materials, mixed fertilizers.
- (9) Housefurnishing goods: Furnishings, furniture.
- (10) Miscellaneous: Automobile tires and tubes, cattle feed, paper and pulp, rubber (crude), other miscellaneous.

ECONOMIC CLASSIFICATIONS

- (1) Raw materials.
- (2) Semimanufactured articles.
- (3) Finished products.
- (4) All commodities other than farm products.
- (5) All commodities other than farm products and foods.

In pricing commodities at wholesale, the Bureau has made use of specifications since the beginning of its work. In the earlier days only broad and general specifications were used for identifying the items priced. Changing economic conditions, shifting consumer demands, introduction of technological improvements, and the expanding use of price materials has necessitated broadening and sharpening of specification data. At no time have the specifications used for pricing been intended to be set up as standards of quality, or to be used as standards established by the Federal Government.

The Wholesale Price Division uses specification data in a general way to evaluate price changes, to denote quality changes, and to insure comparability of prices.

The specification data are not predetermined by the Wholesale Price Division but are a result of research conducted in cooperation with trade associations and individual members of the industry. When a particular commodity is to be included in the price reporting service, or when a revision is to be made, field agents of the Bureau discuss with representatives of the industry the proper items to be priced.

Recognizing the need for more detailed specification data, the Wholesale Price Division organized, in the fall of 1934, a Research Unit, one of the functions of which is the improvement of price data. This Unit is now engaged in developing more detailed specifications and the scope of its work is constantly expanding.

It is recognized that adequate specifications should cover all important price determining factors such as construction, kinds, and amounts of materials used in manufacture, type and quality of workmanship, size of sale, marketing channels for distribution, conditions of sale and purchase, terms of trading (including discounts and payment), kinds of buyers and sellers, source of raw materials, amount of fabrication or processing necessary, ultimate use of the articles, type of packaging, number of producers or manufacturers, concentration of production or manufacture, frequency and magnitude of price and quality changes, and type of price (seller's list, transaction, exchange, and so forth).

Recently the Bureau of Labor Statistics prepared detailed descriptions for its price series in connection with price studies of the Temporary National Economic Committee.

CHILDREN'S BUREAU

The Children's Bureau, United States Department of Labor, according to its organic act, "shall investigate and report * * * upon all matters pertaining to the welfare of children and child life among all classes of our people, and shall especially investigate the questions of infant mortality, the birth rate, orphanage, juvenile courts, desertion, dangerous occupations, accidents and diseases of children, employment, legislation affecting children in the several States and Territories." In addition, the Children's Bureau is responsible for administration of the maternal- and child-welfare provisions of the Social Security Act, title V, parts 1, 2, and 3, relative to maternal and child health, crippled-children's and child-welfare services.

The Children's Bureau conducts research studies on various matters pertaining to the health of mothers and children. Some of the studies are made with a view to establishing standards for commodities or equipment of direct value to the consumer in protecting the health and welfare of these mothers and children.

The research studies of the Children's Bureau are initiated in the Bureau itself, or are undertaken at the request of State health departments, State and local health agencies, medical schools, hospitals, or other private and public agencies. The studies are conducted in cooperation with the above agencies or with other Federal agencies.

The Children's Bureau has made studies of the effectiveness of preparations of vitamin D from various sources and in varying amounts in the prevention of rickets in infants and children.

Studies of premature infants are being made which include a study of incubator beds required to maintain within normal limits the body temperature of the premature infant. Numerous types of these incubator beds are in use, although no standards have been established nor have tests been made to determine the performance of these beds in relation to clinical requirements as recommended by the medical profession. The Children's Bureau is at present cooperating with the National Bureau of Standards in a study which involves tests of a number of these beds to evaluate the mechanisms for control of temperature, humidity, and oxygen supply; tests of thermometers, thermostats, and other apparatus supplied by the manufacturers of the beds; and tests for ventilation of beds. These data will be used in developing standards of performance, safety, and economy for incubator beds.

In a popular bulletin, "Home Play and Play Equipment for the Preschool Child," the Children's Bureau has recommended dimensional and quality standards for materials to be used, and detailed instruction regarding construction of play equipment.

There are no generally recognized specifications or performance standards for braces and artificial limbs for crippled children, and as a result many of these appliances are unnecessarily heavy and mechanically inefficient. However, activities in relation to the appliances, on the part of the Children's Bureau, have been restricted to assembling data on prices paid for these appliances by State agencies administering programs for crippled children.

UNITED STATES NAVY DEPARTMENT

The United States Navy Department is one of the country's largest purchasers of materials, using the term "materials" to cover the range from raw materials and agricultural commodities to manufactured products. All of its purchases are made in accordance with the competitive method of buying. This method cannot be applied successfully unless the material to be purchased is described adequately in specifications, and an efficient inspection service is provided to insure that the delivered article conforms to these specifications. The Navy Department has developed both of these concomitant conditions to competitive buying to a high degree with the result that this Department probably buys as economically as any large purchaser of materials in the United States.

So far as the Navy Department is concerned, the use of specifications for buying at least some of its materials dates from the beginning of the Navy. The following is an interesting specification used by the Navy for the purchase of canvas for sailcloth in the year 1800:

The warp and filling are to be wholly of good hatchelled flax and no part thereof of tow, and that there is no sizing to be used in the manufacture of the cloth. But if it should be found indispensable that some kind of sizing should be used, then to guard the public from the evil of paying for what would be of no use, the Navy may have the sizing washed out of one bolt, weighing the bolt before and after this operation, and the weight lost by this process shall be deducted from each bolt delivered to ascertain the true weight to be paid for by the public. It is also agreed * * * that the warp and filling are to be as near the same size as practicable.

An old Navy record, dated December 31, 1794, speaks of the appointment of an inspector "who shall be sworn to reject all which is not of perfect quality," the material referred to also being canvas.

So long as shipbuilding remained an art no great advance was made in the use of specifications for purchasing the materials entering into the construction and equipment of ships. With the advent of steam and iron, shipbuilding became an engineering science and the use of specifications became more important. It was not, however, until the first steel naval shipbuilding program was started in the late eighties followed by the programs in the nineties and culminating in the hurried large-scale buying for the Spanish-American War in 1898 that the absolute need of specifications as a vital part of the competitive method of buying was realized. The extension of the use of standard specifications was necessarily slow because it is not an easy matter to write satisfactory specifications for even simple articles.

The broad considerations which have always governed the Navy Department in drawing up standard specifications may be stated briefly as follows: (a) The stipulations covering the characteristics of the material must be broad enough, on the one hand, to make the material commercially obtainable thus insuring competition, but must be rigid enough, on the other hand, to exclude grades that will not meet the Navy's needs; (b) such detail as tests, chemical composition, per-

formance, and so forth, must be included in the specification, and must be so clearly worded that there will be no doubt in the minds of either the bidders or of the inspector who finally approves the delivery.

While these fundamental requirements for an adequate specification appear self-evident, their description for any particular material or article is not always easy. The decision, in the first place, of what will meet the Navy's requirements is often not simple. For example, a broom that is good enough for use on shore may not be good enough for use on ships because the highly corrosive sea atmosphere may necessitate a more expensive type of binding than is sufficient for even a first-class article for domestic use. In general, United States Navy Specifications call for high grade materials because it has been the experience of the Navy that high quality results in ultimate economy. High quality also is held to be necessary because all possible risks of failure of apparatus at the critical moment of battle must be avoided.

In specifying grade or quality, due consideration is given to the availability of the material in the current market. The Navy Department has at times set a standard which the industry could not meet at the moment but which, due to the Navy's requirements, has led to technological advances in the field involved. For example, the Navy specified steel plates and shapes of domestic manufacture for the ships of the White Squadron, which were built in the late eighties of the last century, before there was a steel industry in the United States capable of producing such material. These specifications led to the development of the steel industry so that such material could be produced with the characteristics stipulated. The beginning of the steel casting industry in the last decade of the nineteenth century was also largely due to the fact that the Navy specified steel castings instead of forgings for the large stem and stern posts of the naval ships built in the early nineties.

The following are some of the articles of interest to the ultimate consumer to which the Navy has devoted considerable study and research, with a view to standardizing their production on a basis of satisfactory quality:

Mattresses.—Because of the wide range in quality of commercially obtainable mattresses for beds and bunks for use on board ship, the Navy undertook some time ago an extensive survey of the field to determine the minimum requirements as to quality and construction which would meet the Navy's needs. A practical test of 12 different commercially obtainable mattresses is being conducted. These are furnished to ships with directions that each mattress is to be assigned to an individual for a period of 1 month, at the expiration of which the mattress is assigned to another individual. A careful record is kept of the favorable and unfavorable reports of the users, and the mattresses are examined from time to time for indications of wear, deterioration, and so forth. Eventually, a specification will be prepared for mattresses which from the point of view of cost, durability, comfort, and other factors, will best meet the Navy's requirements.

Cordage.—Much work had been done on standardizing manila rope and flax signal halyards. Studies concerned with this product have resulted in definite improvement in the service and life of cordage by specifying special treatment of this material.

Surgical gauze and ligatures.—In an effort to apply competitive buying to such materials, it was found that many of the grades on the market were not suitable for use by the Navy. Research and standardization have reduced the number of accepted grades to about seven or eight each. A recent revision of the United States Pharmacopoeia recognizes this decreased number of grades by practically paralleling the standardization set up by the United States Navy Specifications.

Surgical and dental instruments.—Materials and finishes used by manufacturers of surgical and dental instruments are in the process of standardization, as the result of a study made by the Navy Department, with a view to the adoption of standard specifications for such articles.

Cotton sheeting.—Standardization of the maximum of residual shrinkage has changed the practice of manufacturing such articles as mattress covers, bed sheeting, pillow cases, and so forth, used by the Navy. Formerly, such articles were manufactured from unshrunk sheeting, but the investigations of the Navy Department led to the conclusion that there was an economical advantage in using preshrunk sheeting which now forms one of the requirements of standard Specifications.

Rubber-like materials.—The standardization of materials used as substitutes for rubber have received much attention by the Navy Department. This work which was initiated about 10 years ago will be of great benefit to the industry and to the ultimate consumer.

Small hand tools.—An excessive variety of types and qualities have always existed in this field. The Navy Department has for many years taken a very active interest in standardizing such articles as hammers, hand cutting tools, wrenches, screw drivers, and similar tools. Such standardization has resulted in improved quality and serviceability without appreciable increase in cost.

In describing the standardization work of the Navy Department, the activities of the Department dealing with contract plans and specifications for building ships, and with their inspection, are not included, as these functions do not apply to consumer standards.

Procedure in Formulating Specifications.

The Navy uses such a large variety of materials, commodities, and manufactured products that no individual or small group of individuals has sufficient knowledge to prepare specifications for all of them. The primary responsibility for drafting or revising each specification is, therefore, assigned to that bureau of the Navy Department which is the principal user of the material. This bureau is referred to as the "sponsoring bureau" for the specification. For example, the Bureau of Ships sponsors the specifications for steel plates and shapes used in shipbuilding, the specifications for electric conductors; the Bureau of Supplies and Accounts, the specifications for food; the Bureau of Medicine and Surgery, the specifications for surgical instruments; and so forth. When a proposed United States Navy Specification is prepared it may be issued in mimeographed form for immediate use by the originating bureau. It is then forwarded to the Bureau of Supplies and Accounts, through other interested bureaus for such comment and recommendations as they may desire to submit. If the pro-

posed specification meets with the approval of these reviewing bureaus, it is forwarded to the Government Printing Office for printing. If, however, any of the bureaus finds the proposed specification unsatisfactory from any technical aspect, the draft is returned to the originating bureau for further consideration. If parts to which objections have been made are satisfactorily revised, the proposed specification is forwarded to the Bureau of Supplies and Accounts again by the originating bureau with the request that a United States Navy Specification be printed.

The Navy Department Specifications Board, on which each bureau is represented, functions principally as a policy board, and regulates the orderly progress of proposed new specifications and revisions of existing specifications through the proper channels. This Board meets once a month to adjust any final difficulties.

In the Bureau of Ships, the need for a purchase specification originates usually in the Design Branch, in the Procurement Branch, or in the Research Branch. A requested specification may require consideration by all three of these branches. Sometimes, however, this is not necessary; in the case of a request for a specification originating in the Procurement Branch, the technical requirements may not necessitate consideration by either the Design Branch or the Research Branch. In all cases the Standards Section prepares the draft of the proposed specifications.

Chart X illustrates the route followed by a specification for consumer materials during its development in the Navy Department.

The personnel engaged in work on specifications maintains close contact with the National Bureau of Standards and makes frequent use of the facilities and research work of the National Bureau of Standards in preparing specifications.

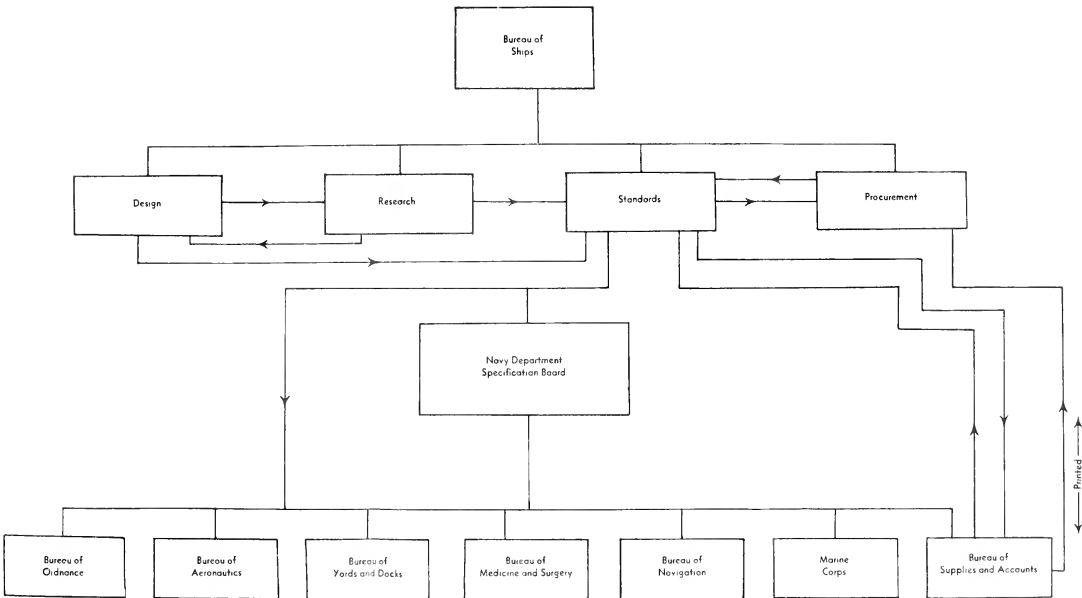
United States Navy Specifications are printed in leaflet form, a separate leaflet being issued for each article, material, or product. This arrangement has been found more economical and satisfactory than publishing the specifications in book form. (A leaflet specification may consist of many pages or of only a single sheet, depending on the amount of description that is necessary to a complete understanding of what is required. The description of acceptance tests or of the method of making chemical analysis called for often forms an important part of the specification.)

By the time the United States entered the World War all important materials used by the Navy, about 800, were covered by standard specifications. Use of these specifications by the Navy Department assisted in the successful conduct of the greatly increased purchasing program, which had to be undertaken at the beginning of the war. Largely because the Navy's purchasing methods, based on competitive bids and standard specifications, had proved so successful throughout the war, a Federal Specifications Board was appointed thereafter to study the feasibility of requiring the use of similar specifications by all Federal Government departments. This Board was later called the Federal Specifications Executive Committee. The Navy Department is represented on this Committee. Federal Specifications were patterned on the United States Navy Specifications. In fact, the United States Navy Specifications were used practically verbatim in preparing many of the early Federal Specifications.

U. S. Navy Department

Development of a Navy Department Specification

Originating in the Bureau of Ships



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Whenever possible, the Navy Department uses Federal Specifications and cancels the corresponding United States Navy Specification. For certain materials, however, the Navy Department finds it necessary to continue the use of its own specifications because the Navy's requirements are frequently more exacting than those of other Government departments. This applies especially to materials which are important in the construction or equipment of warships where the paramount consideration in specifying quality and in prescribing tests is the one of providing maximum guaranty against failure in battle.

Cooperation with Other Agencies.

The Navy Department cooperates with various organizations and engineering societies concerned with specifications, standardization, and inspection of materials, such as the American Society for Testing Materials and the American Standards Association, and participates in the work of their committees. The Navy Department is also represented on the Standards Council of the American Standards Association. As a consumer, the Navy Department is represented on the committees preparing specifications for materials in which the Navy is particularly interested. In this way the Navy Department has a voice in influencing technological progress in the industries and in working for standards that will be of ultimate benefit to the Navy and thereby indirectly to the consumer.

Inspection and Test.

Unless competitive buying, based on specifications, is followed by rigid inspection of the delivered material to insure compliance with the specifications, the whole procedure is valueless. The Navy Department has, therefore, always laid great stress on adequate inspection of the materials which it purchases, and in order to carry out this policy successfully it has built what is perhaps the most complete inspection organization operated by any of the Federal departments.

For this purpose, the continental area of the United States is divided into 12 inspection districts. The administrative head of each district is a naval officer who is called the inspector of naval material of that district. The districts are of very unequal size geographically, but when originally planned some effort was made to keep the inspection activities of the respective districts of about the same volume, but even this was not found entirely practicable. In general, the physical area is smallest where industrial activities are the greatest. For example, the New England and Middle Atlantic States represent 6 of the 12 districts, whereas, the entire South is represented by only 1 district. There are 68 officers, 453 civilian inspectors, and 281 clerks attached to these 12 districts. During the fiscal year 1940, this staff will have inspected material valued at approximately \$250,000,000. Practically all of the material used by the Navy afloat and ashore, whether at navy yards or at private shipyards in building ships, is inspected by this organization at the place of manufacture before shipment. Occasionally material is shipped subject to inspection after delivery, but this procedure is for only a very small part of the total material purchased. Normally, the inspectors of naval material inspect large quantities of material for other Government departments. The very large increase in Navy purchases, due to the present shipbuilding

program, has made necessary the curtailment of this service temporarily.

Research.

The Navy Department has its own laboratories and testing stations for making the chemical analyses and physical tests required by the specifications. In addition, research work is constantly conducted at the Naval Engineering Experiment Station, Annapolis; the Research Laboratory, Bellevue; the Boiler Laboratory, Philadelphia; the Model Basin, Washington; the Naval Aircraft Factory, Philadelphia; and at the various navy yards. This research has a direct influence on the standardization of the materials used by the Navy and on the suitability of newly-developed products for naval use. Indirectly, the ultimate consumer derives benefits from all of these activities of the Navy Department.

UNITED STATES TARIFF COMMISSION

Studies of specific commodities are an important phase of the activities of the United States Tariff Commission. Probably the best description of the kind of commodity studies for which the Commission is responsible is found in the Tariff Act of 1930.

SECTION 332. INVESTIGATIONS.

(d) *Information for President and Congress.*—In order that the President and the Congress may secure information and assistance, it shall be the duty of the Commission to—

(1) Ascertain conversion costs and costs of production in the principal growing, producing, or manufacturing centers of the United States of articles of the United States, whenever in the opinion of the Commission it is practicable;

(2) Ascertain conversion costs and costs of production in the principal growing, producing, or manufacturing centers of foreign countries of articles imported into the United States, whenever in the opinion of the Commission such conversion costs or costs of production are necessary for comparison with conversion costs or costs of production in the United States and can be reasonably ascertained;

(3) Select and describe articles which are representative of the classes or kinds of articles imported into the United States and which are similar to or comparable with articles of the United States; select and describe articles of the United States similar to or comparable with such imported articles; and obtain and file samples of articles so selected, whenever the Commission deems it advisable;

(4) Ascertain import costs of such representative articles so selected;

(5) Ascertain the grower's, producer's, or manufacturer's selling prices in the principal growing, producing, or manufacturing centers of the United States of the articles of the United States so selected; and

(6) Ascertain all other facts which will show the differences in or which affect competition between articles of the United States and imported articles in the principal markets of the United States.

(e) *Definitions.*—When used in this subdivision and in subdivision (d)—

(1) the term "article" includes any commodity, whether grown, produced, fabricated, manipulated, or manufactured;

Kinds of Information.

It will be noted that the emphasis of these sections of the law is on measures of competition between domestic and foreign producers and that such competition is to be evaluated in terms of "articles of the United States similar to or comparable with such imported articles." The study of the comparability of domestic and imported goods requires both a detailed knowledge of the intrinsic quality of the goods and a full fund of information on the methods used in their production. Commodity information obtained by the United States Tariff Commission deals with the description and use of the article; the grades and varieties produced in the United States and imported from abroad; an analysis of the various qualities with particular emphasis on distinctions in use which result from such qualitative differences; detailed information on methods of production in the United States and foreign countries including data on processes of manufacture, machine equipment, and other factors which bear upon either the quality of the goods or the competition in markets in this country.

Information of this kind on each of the thousands of commodities in the dutiable schedules and on the free list of the Tariff Act is available in the publications of the Commission. Current information on these articles is available in the files of the Commission.

Methods of Obtaining Information.

To carry on these studies the staff organization of the United States Tariff Commission includes seven commodity divisions: Agriculture, Ceramics, Chemicals, Metals, Sundries, Textiles, Lumber, and Paper. Each of some 50 "commodity specialists" in these divisions is assigned the responsibility for a designated group of articles. These specialists have had both practical industrial experience and formal education bearing upon the commodities and industries which they handle. There are, for example, chemists, engineers, metallurgists, and other technicians on the staff of the Commission. The commodity divisions, in preparing reports, work in close cooperation with the Economics Division whose function is to insure full coverage of economic aspects of the commodity problems.

Information on these commodities is obtained from many sources. Primary sources are used to a great extent. These include manufacturers, importers, distributors, and others engaged in the trade in the particular commodity for which information is desired. Information is obtained, insofar as practicable, through the fieldwork method by means of personal interviews and direct examination of records; through questionnaires and other direct mail inquiries; and by oral and written testimony submitted to the United States Tariff Commission in connection with complaints and investigations. Secondary sources such as official trade statistics and trade periodicals are also used extensively. In addition other Governmental agencies cooperate with the Commission and make available to it the large amount of information which these branches of the Government collect.

Dissemination of Information.

Commodity information is made available through various channels. Formal reports to Congress under the general powers of the United States Tariff Commission have consisted of tariff information summaries, each of which deals with a specific commodity or related group of commodities and which presents information with respect to uses, United States production, imports, exports, tariff history, and competitive conditions. These summaries were submitted to Congress during two general tariff revisions, that is, in 1921-22 and 1929-30. On January 28, 1933, the Senate directed the Commission⁵² to bring the 1929-30 summaries up to date. Much of this work has been done, but no formal report thereon has been made to Congress. However, a large part of the material gathered by the United States Tariff Commission under this resolution has been made available to those concerned with the negotiation of trade agreements and, more recently, to those concerned with the defense program; some of it has been published in the form of surveys, and digests of information concerning trade agreements. In most cases, commodity digests have been prepared and published by the Commission after the conclusion of a trade agreement.

⁵² S. Res. 334, 72d Cong., 2d sess.

The digests have as their subject matter the commodities with respect to which the United States granted concessions in trade agreements. The information thus made available is similar to that contained in the summaries but usually in an abbreviated form and with emphasis on the factors pertinent to the concession.

In 1936 the United States Tariff Commission initiated a series of commodity or industry surveys of commodities or related groups of commodities important from a tariff point of view.

The basic idea underlying the survey program is that rarely can the tariff problems of any one commodity be isolated; other commodities must inevitably be drawn into the analysis. Where a producing industry makes several related products, it is necessary to consider these products together. Thus, in a survey of the flat glass industry it is necessary to analyze the production and trade of both plate and window glass. Then, too, consideration must be given to the raw materials for the production of the commodity or related commodities. Thus, imports of some raw materials used in making synthetic resins are important, whereas imports of the finished products are not. It is conceivable that a change in the tariff status of a raw material in relation to that of the finished product would greatly affect trade. Finally, the possibility of substitution of one commodity for another is of importance in any analysis of the effects of the tariff upon trade. For example, one chemical would be substituted for another in some applications should there occur any change in tariff status affecting price.

Each survey presents statistical and other factual material required for the analyses outlined above. The commodities and their uses are described; statistics on United States and foreign production and trade are given; the industries and markets in this country and abroad are discussed, together with the factors affecting trade, such as cartels and export subsidies. Each survey, therefore, constitutes a significant contribution to the knowledge of the subject, particularly where the material was obtained largely by direct investigation.

In addition to the above reports of the United States Tariff Commission, investigations and reports on specific commodities are made from time to time in response to congressional resolutions. Furthermore, many reports have been issued under more specific powers of the Commission. For example, in carrying out its functions under the "flexible provision" (sec. 336 of the Tariff Act of 1930) the Commission ascertains the costs of production of similar domestic and imported commodities and reports the differences to the President. These differences constitute the basis for changes in tariff rates. The reports thus issued contain much commodity information, particularly on costs of production and factors affecting costs.

The reports of the United States Tariff Commission, particularly under its general powers, are widely distributed and are used not only by members of Congress and by the President, for whom they are primarily intended, but also by the general public. In addition the Commission, through correspondence and interviews, is constantly supplying information on commodities to individuals and organizations interested in import problems.

UNITED STATES TREASURY DEPARTMENT

PROCUREMENT DIVISION

The Procurement Division of the United States Treasury Department is responsible for the determination of policies and methods of procurement, warehousing, and distribution of property, facilities, improvements, machinery, equipment, stores, and supplies.

Those branches of this office which deal with the standardization, specification, and inspection activities are (1) the Contract and Purchase Branch, and (2) the Stores and Operation Branch. The various subordinate sections more definitely involved in developing the three functions cited fall under these two branches.

Standardization.

Standardization is an element considered in the operation of each specification. It is fundamental that the statement of quality shall be limited to that which is appropriate and necessary to the requirements to be served. That is to say, if a study of a need discloses that the quality originally indicated is deficient or unnecessarily high for the purpose to be served, revision of the specification upward or downward to the level of the requirements, is in order.

The chief responsibility for promoting standardization in procurement work centers in the Federal Specifications Division of the Contract and Purchase Branch. It should be pointed out, however, that the members of the administrative staff and the various operating units of the Procurement Division contribute, from their respective viewpoints as occasion arises, suggestions as to the need for an additional specification, or toward the improvement of an existing one, or to other possibilities of improving standardization. Thus, an interpretation of the provisions of a specification by the Inspection Division, also of the Contract and Purchase Branch, to a vendor in connection with the adjustment of a rejected delivery, may indicate that a difficulty arose as a result of ambiguous language in the specification, or it may disclose that provisions for packing, appropriate when the specification was prepared, are no longer practicable because of new practices generally adopted in the industry. Such information may also be collected by the various administrative or purchasing officers in the course of their duties, or through the activities of the supervisory personnel in the Warehouse Division of the Stores and Operation Branch.

Reports reflecting the need or opportunity for improvements are submitted and are made the subject of study for the purpose of correcting obsolete provisions, ambiguous language, modifying or extending the scope of existing specifications or introducing new ones.

Specifications.

Three types of specifications are developed in the Procurement Division:

1. A Federal Specification which is a formally approved standard of quality and essential characteristics (design, dimensions, composition, physical and chemical requirements, workmanship, finish, performance, etc.) of a material, article, or piece of equipment desired for a particular use by two or more departments or establishments of the Federal Government.

2. A Federal Procurement Division Specification, which is a formally approved standard of quality and essential characteristics of a commodity to be incorporated in an invitation to bid issued by the Procurement Division.

3. A "specification" used in the Procurement Division, which covers an item not covered by a Federal Specification and represents a commodity not in sufficient current demand to justify the development of a Federal Procurement Division Specification. It is referred to merely as "specification."

Preparation of Federal Specifications.

With the installation of the Bureau of the Budget in 1921, it was considered to be desirable to prepare standardized purchase specifications for many of the commonly used articles purchased by the Federal Government; and the Federal Specifications Board was established for that purpose by Circular No. 42 of the Bureau of the Budget, dated October 10, 1921, which was issued by the Director of the Bureau of the Budget, by authority of the President. The Board functioned under the Chief Coordinator, whose office was also set up by Executive order; each department and establishment purchasing materials and supplies in accordance with specifications, designating a representative to serve as a member of the Board. The chairman ex officio was the Director of the National Bureau of Standards. Technical committees were formed, composed of qualified representatives from the various branches of the Government, to formulate the specifications. These specifications, after consultation with the interested industries, were submitted to the departments for comment and criticism, and after consideration of these comments by the technical committees, were approved and promulgated by the Federal Specifications Board. On June 10, 1933, the Federal Specifications Board and several other interdepartmental boards were transferred to the jurisdiction of the newly established Procurement Division, United States Treasury Department. The Federal Specifications Board and several other activities of the Government were abolished by the order of the executive director of the National Emergency Council dated January 24, 1935.

To take the place of the former Federal Specifications Board members, the Director of Procurement, United States Treasury Department, requested the head of each department and establishment to designate a technical liaison with whom the Procurement Division was to collaborate, for that department or establishment, on technical matters. There was also established a Federal Specifications Executive Committee, consisting of the Director of the National Bureau of Standards, chairman; the technical assistant to the assistant director of Procurement Division, vice-chairman; the assistant chief, Specifications Division of the Procurement Division, technical secretary; and the technical liaisons from the Navy Department, War Department, the Department of Agriculture, the Post Office Department, and

Veterans' Administration. Technical committees were formed, composed of specialists from the various branches of the Government.

There are 70 interdepartmental technical committees on Federal Specifications covering the following groups of materials:

Abrasives and polishing materials.	Lumber.
Acoustical correction materials.	Machine screws, bolts and nuts.
Appliances, mechanical and electrical.	Medical and surgical instruments and supplies.
Ball and roller bearings.	Metals.
Beds and bunks.	Motor vehicles.
Brake linings.	Office supplies.
Brick and building tile.	Packing and gasket materials.
Brushes and brooms.	Paints and varnishes.
Builders' and miscellaneous hardware.	Paper and paper products.
Cement, lime, and plaster.	Photographic supplies.
Chemical products.	Pipe and pipe fittings.
Color.	Plumbing fixtures.
Cordage.	Provisions.
Detergents.	Refractory materials.
Drafting equipment and supplies.	Refrigerators.
Electrical supplies.	Road and paving materials.
Feeds and forage.	Roofing bituminous.
Fire alarm systems and electric clocks.	Rubber products.
Hand fire extinguishers.	Safes, burglar resisting.
Fire extinguishing liquid.	Safes, fire and petty larceny.
Floor coverings (nontextile).	Safety equipment.
Floor treatments.	Safety walkways.
Foundry apparatus and supplies.	Screens and screen cloth.
Furniture.	Shipping containers.
Pressure and vacuum gages.	Stitches, seams and stitching.
Dimensional gages.	Storage batteries and dry cells.
Glassware, chinaware, stoneware.	Surveying instruments.
Hair for mattresses.	Tableware and kitchen utensils.
Hand tools.	Tents and tent appliances.
Heat insulating materials.	Textiles.
Inks, typewriter ribbons, and carbon paper.	Thermometers.
Insecticides.	Wearing apparel.
Laundry equipment.	Weighing and measuring devices.
Leather and leather products.	Wire rope.
Lubricants and liquid fuels.	Wood preservatives.

The procedure for the preparation of Federal Specifications is as follows: The interdepartmental need of a specification for a given article or material, for either technical or business reasons, having been decided upon, the subject is then referred to a technical committee composed of officially designated representatives from the various branches of the Government, who are most interested in the particular subject, for consideration of all existing governmental and industrial specifications. A specification is selected, or formulated, which will be suitable for the intended use by all departments and establishments of the Government. The cooperation and advice of interested commercial and industrial concerns is requested and their recommendations are fully considered by the technical committee. The specification, as tentatively agreed upon by the technical committee, is then submitted to all departments and establishments of the Government, through the respective technical liaisons with the Procurement Division, for comment and criticism. All criticisms received are referred to the respective technical committee for consideration.

Specifications submitted in final form by the various technical committees, after consideration of all comments, are recommended by the

chairman of the Federal Specifications Executive Committee to the Director of Procurement for approval, after which they are printed and officially promulgated by the Director of Procurement for use by the various agencies of the Government.

In the preparation of Federal Specifications for material, supplies, and equipment, an effort is made to bring the specifications into harmony with commercial practice wherever conditions permit, to establish uniform nomenclature, and to standardize the types, grades, and sizes of articles purchased by the Government.

Federal Specifications are continually being revised to keep them abreast of the best current manufacturing practice, and the needs of the Government. Up to May 15, 1940, 1,292 Federal Specifications had been promulgated. The procedure of the preparation of Federal Specifications is shown in chart XI.

An index of Federal Specifications,⁵³ and also the specifications listed therein, may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C.

Preparation of Federal Procurement Division Specifications.

Federal Procurement Division Specifications are prepared in the office of the technical assistant to the assistant director, Procurement Division, United States Treasury Department. These specifications are approved by the Director of Procurement, and are primarily for use by that Department but may be used by any other agency. Procurement Division Specifications frequently are preliminary to a Federal Specification. Up to May 15, 1940, 190 Federal Procurement Division Specifications have been issued. These specifications may be obtained on application to the Director of Procurement, United States Treasury Department, Washington, D. C.

Inspection.

The inspection activities of the Procurement Division are centered in the Inspection Division of the Stores and Operation Branch which inspects, in Washington and as occasion requires in the field, supplies and materials delivered on Procurement Division order. On request, it also makes inspections for other governmental agencies. In addition, it makes or has made tests of samples of materials, supplies, and equipment submitted with bids to determine whether the samples comply with the specifications.

When necessary, the Inspection Division investigates requests from various Federal agencies for clearance to buy in the open market items listed in the General Schedule of Supplies⁵⁴ or carried in the warehouse stock of the Procurement Division. In the event that the contract or stock items meet all practical requirements of the need, such clearance to buy in the open market is denied.

The Inspection Division also contributes to the development of new or improved Federal Specifications or Federal Procurement Division Specifications by recommending the formulation of specifications for

⁵³ "Federal Standard Stock Catalog, Section IV, Part I," U. S. Government Printing Office, Washington, D. C., 1940. 15 cents.

⁵⁴ Term contracts are negotiated by the Procurement Division for many thousands of items in regular use by several agencies of the Federal Government. These engagements are usually made for a one year term. Detail as to commodities so placed under contract is circularized to all Federal agencies for their independent use by a catalog entitled "General Schedule of Supplies."

new items or by suggesting modifications or improvements in existing specifications. These recommendations and suggestions are, in many cases, the result of conferences between the Inspection Division and contractors relative to rejected deliveries. These conferences frequently involve the interpretation by the Inspection Division of the provisions of the applicable specification. The Inspection Division also arranges for all technical help necessary for adequate inspection, either through its own limited facilities or through the laboratories of the National Bureau of Standards, the United States Department of Agriculture, or other recognized agencies.

All deliveries made through the Procurement Division Building are inspected by the Inspection Division. Responsibility for inspecting deliveries made in the field is generally fixed on the consignee but occasionally this Division makes inspections at the shipping point or at the factory.

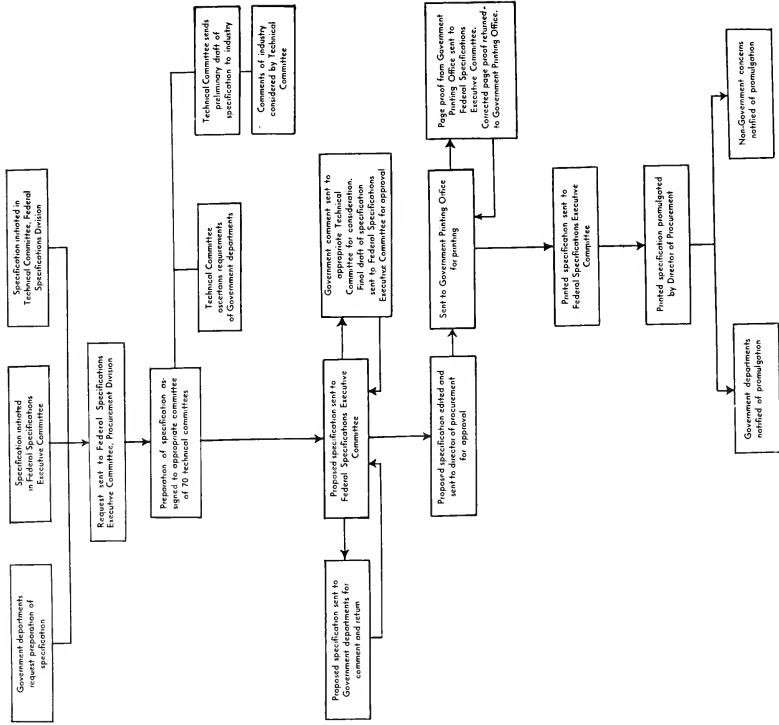
The Inspection Division maintains a sample room where specimens of items included under General Schedule of Supplies contracts are stored and kept available for examination of prospective purchasing officers or for purposes of comparison with delivery samples.

The principal function of the Inspection Division is to assure that all commodities delivered are in conformity with the applicable specifications. In performing this work it—

1. Receives, records, has custody of, displays, and eventually disposes of bidders' contractors' samples;
2. Conducts or arranges for tests and prepares reports thereof;
3. Makes qualitative inspections at the Procurement Division warehouse, at various Treasury and other governmental agencies, and contractors' storage warehouses in the Washington area, and occasionally at points of manufacture or delivery in the field;
4. Investigates quality of, and reported deficiencies in, deliveries to governmental departments and agencies in the Washington area (principally under General Schedule of Supplies contracts); and
5. Conducts interviews with contractors regarding interpretation of specifications and kindred matters resulting from rejected deliveries or other phases of inspection activity.

Inspection may be either an examination by a qualified individual or it may require the use of mechanical or chemical facilities in the laboratory. Many of the items purchased for stock, for instance, are approved largely on the basis of judgment of qualified inspectors. This applies particularly to commodities which are bought regularly and where simple measurement, comparison for color, and examination as to other qualities by experienced inspectors are adequate to establish compliance with specifications. However, a field delivery of heavy equipment may be tested by a selected engineer as to general fulfillment of specifications, including a performance test; or experts may be sent to inspect a large order of furniture or textiles in process at the factory or mill.

U. S. Treasury Department - Procurement Division Procedure Chart of the Preparation of Federal Specifications



VETERANS' ADMINISTRATION

The Veterans' Administration uses Federal Specifications in all its purchases of supplies and equipment, where its needs are satisfactorily met by purchasing items covered by such specifications. It is estimated that 35 percent of the purchases by the Veterans' Administration are made on Federal Specifications and 65 percent on specifications prepared by the Veterans' Administration. In the subsistence group, 98 percent of the purchases are made on Federal Specifications and 2 percent on specifications prepared by the Administration.

In the preparation of specifications by the Veterans' Administration, standardization is an element considered in all instances. The method followed in such cases is the development of requirements of interested services of the Veterans' Administration with the experts in the particular field. The specifications are prepared jointly by the interested service and the supply service. The supply service is under a director who is responsible for purchase, storage, and distribution of all supplies and equipment for all Veterans' Administration activities; accountability for all Government property and auditing of property accounts; operation and management of supply depots; and contracts, leases, and agreements for all Veterans' Administration activities, except construction contracts.

The Veterans' Administration prepares its own specifications on the following kinds and types of equipment and supplies:

Occupational therapy equipment and supplies; physiotherapy equipment; X-ray equipment and supplies; dental equipment and supplies; hospital furniture and equipment; hand tools; machine shop equipment (metal working), machinery (woodworking); agricultural implements, machinery and supplies; rug washing machines; wall washing machines; fire engines and fire fighting equipment and supplies; electrical and engineering equipment and supplies; plumbing equipment and machinery; heating and ventilating equipment and supplies; electrical appliances and supplies; motortrucks (developed from basic Federal Specifications); tractors; motor passenger vehicles; hand trucks (all types); pumps; boiler room equipment; builders' machinery and equipment; paint spraying equipment and supplies; radio receiving and voice transmission equipment; gasoline engines; gasoline pumps and storage tanks; oil storage tanks; hydraulic lifts (auto); hydraulic lifts (dunnage); air compressors (garage); sewing machines; shoe repair machinery and equipment; garage equipment; laundry machinery and equipment; casters, bed and truck; warehouse platform scales (built in); red rope folders; forms, continuous roll and folded type; tabulating cards; smoking tobacco; suits and overcoats; food supplies.

Inspection and Test.

In connection with the inspection of the above listed supplies or equipment purchased by the Veterans' Administration, the facilities of the National Bureau of Standards; Navy Inspection Service; Naval Supply Depot at Brooklyn; United States Government Printing Office; Agricultural Marketing Service, United States Department of Agriculture; Food and Drug Administration, Federal Se-

curity Agency; Director of Mint; and the War Department are used for this purpose.

The Veterans' Administration is represented on the Federal Specifications Executive Committee.

In addition to the above, acting independently of the supply service is the Construction Service of the Veterans' Administration.

The Construction Service is under a director who is responsible for preliminary inspection and engineering work in connection with the selection of sites for new hospitals, homes, and other facilities; preparation of plans, specifications, and estimates covering construction of performance of such work; maintenance of contact with other services, Government departments and agencies to provide facilities as and when required for service; construction contracts; supervision of the maintenance of buildings, grounds, and mechanical equipment under the control of the Veterans' Administration, including motor transportation; and general supervision of maintenance and operation of utilities, heating, lighting, electric power, plumbing, sewage and refuse disposal, water supply, fire protection, refrigerating plants, carpentry, laundry, and telephones. In order to insure the incorporation and utilization of materials of known value in structures erected by the Administration, the Construction Service prepares specifications for materials to be used in those cases where existing Federal Specifications are not applicable. The materials required by these specifications are those which through prior usage by the Veterans' Administration are known to be satisfactory or those on which satisfactory reports have been obtained. The contractor is required to submit samples of all materials used in the structures to the Construction Service for testing. A major part of the tests of the materials submitted are made in the laboratory of the Construction Service and tests of materials for which the Veterans' Administration laboratory is not equipped, such as acoustical materials, insulating materials and compression tests on masonry materials, are made by the National Bureau of Standards. In addition, occasional tests and inspections are made by the United States Navy Department; Bureau of Mines; Public Roads Administration, Federal Works Agency; and private laboratories, on materials used in construction.

UNITED STATES WAR DEPARTMENT

Character of Equipment and Supplies.

The great majority of military equipment is noncommercial and has no counterpart in the market. Even such apparently common articles as clothing and blankets differ from those ordinarily found in the market, particularly for use in the field. It is therefore necessary that suitable articles of equipment and supply be developed by the technical services of the Army. Satisfactory performance at an economical initial and maintenance cost is an important factor.

Quantities of supplies identical with or very similar to those on the market are also used. These include such articles as food, some articles of clothing, rope, forage, brushes, construction materials, refrigerating equipment, hand tools, drugs and medical supplies, photographic supplies, toilet articles and the like.

The Army is a user of goods rather than a producer. Its few manufacturing arsenals and depots can produce only about 10 per cent of war supply requirements of military noncommercial articles. These establishments are most important as centers of technical information concerning the development and manufacture of military equipment. Their production capacity is relatively small, but serves to develop manufacturing processes for items of military equipment, not commonly produced by industry, which may be used in the event that quantity production is required.

Standardization of Equipment and Supplies.

As applied to the military service, the term "Standardization" includes not only the decision as to what is the most advanced and satisfactory type of article of equipment and supply, but applies also to the procedure for selection of the article and specific type to be used. Insofar as possible the basic quality and dimensional standards adopted by industry are followed in the design of all articles of military equipment.

A standard article is simply the best that can be devised at the time. Improvement and development are desired but the standard article is changed only for good reasons and after detailed study and test.

The selection of a standard article of military equipment and supply involves the type needed, the design, the development, and the specification for quantity production. These steps are shown in chart XII.

The preparation of military characteristics, development of articles and decision as to suitability of an article for military use, are functions of the General Staff, and the using supply arms and services. The final decision as to the adoption of a type is a function of the General Staff.

The Assistant Secretary of War is charged with the supervision of procurement. The supply arms and services develop and procure the necessary supplies. They are the Air Corps, Chemical Warfare Serv-

ice, Coast Artillery, Corps of Engineers, Medical Department, Ordnance Department, Signal Corps, and Quartermaster Corps.

The need for a new article or change in an existing article of equipment or supply usually arises in a using arm or service.

When the necessity for an article is determined, the using arm states the need to the supply service charged with its development and procurement. The supply service then prepares the military characteristics in cooperation with the using arm, and forwards them to the Secretary of War for consideration by the General Staff. Upon approval, the supply service institutes a development project and prepares the design or other technical data required, which is concurred in by the using arms and services. Models or samples are then procured, either from a manufacturing arsenal or depot, or from industry. Tests are made by the supply service and using arm, to determine the technical suitability of the article and to eliminate obvious defects and flaws. If these experimental tests are satisfactory, a request will be forwarded to the Secretary of War for consideration of the General Staff, for authority to procure a small quantity sufficient for extended service test. This small number is then issued to units of the using arm for tests under field conditions. If the results are favorable, the procuring supply arm or service, with the concurrence of the using arm, recommends that the article be adopted as standard for the Army. Regulations emphasize that throughout all stages of development work the adaptability of the article to quantity production in an emergency will be an important element of the design. The recommendation for adoption is forwarded to The Assistant Secretary of War for clearance for procurement, since he is charged with the supervision of activities concerning the assurance that items of equipment, insofar as is practicable, are made from commercial materials by commercial processes and adapted to mass production. After approval by The Assistant Secretary of War and by the General Staff, it is then reported as a standard article of equipment and supply for the Army, and the supply arm or service completes the drawings and specifications for quantity production.

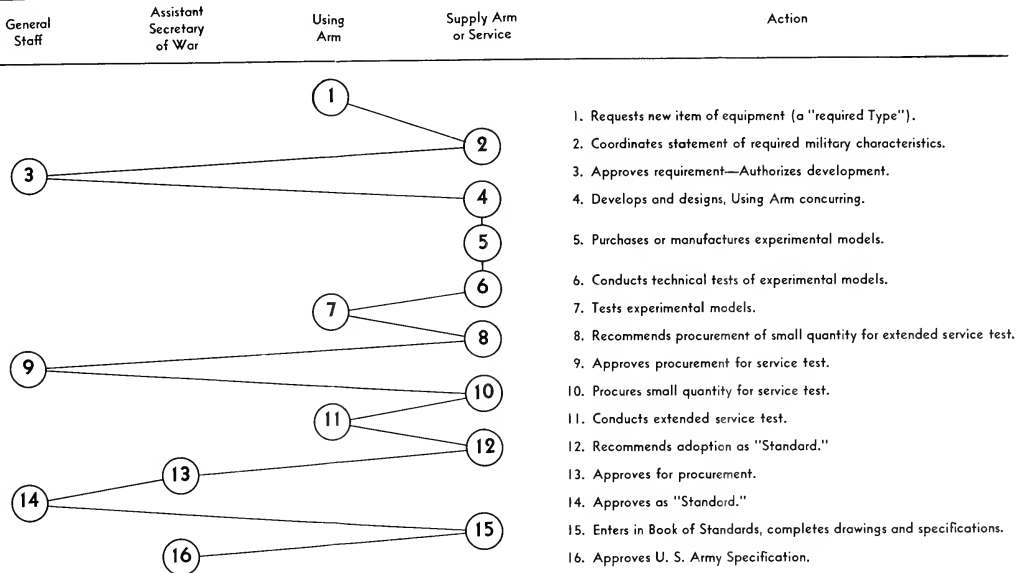
In the case of the army blanket, a definite size, color, weave, and wool content most suitable for warmth, light in weight and serviceable, but not expensive, is desired. The selection of the standard army blanket by the steps outlined above, assured the adoption of the most suitable type available.

Specifications.

The Assistant Secretary of War is charged by regulation "with the supervision of activities concerning the preparation of specifications and the progress of the work." Specifications are prepared by the supply arms and services for the articles which they procure. A specification is defined in Army Regulations as "a clear and accurate description of a material, an article, or service, which it is necessary to procure and the procedure which the purchaser will follow to satisfy himself that the requirements of the specification have been complied with." A specification should be complete. It must cover all requirements either directly or by reference to other specifications. It should omit matter covered by notes on drawings which form part of the specification. It should not contain matter contradictory to specifications referred to as applicable. The preparation of a satis-

U. S. War Department

Steps in Development and Standardization



factory specification is a difficult job. It must meet the requirements for the article, and it must be satisfactory for procurement.

The kinds of specifications used by the Army for procurement are—

Federal Specification.

United States Army Specification.

United States Army Tentative Specification.

Army-Navy Aeronautical Specification.

United States Navy Specification.

Federal Specifications.

Generally they are intended to cover items of material or supply nonmilitary in character, that are commonly procured by two or more Government departments.

The Office of the Assistant Secretary of War acts as a clearing-house for all War Department administrative activities concerned with the preparation, acceptance, rejection, or revision of Federal Specifications. A member of his office represents the War Department on the Federal Specifications Executive Committee. His office arranges for War Department representation on technical committees, charged with or engaged in preparation of specifications of interest to the War Department. The War Department members of these technical committees are appointed from the supply arms and services having paramount interest in the item, as recommended by the chief of the supply arm or service concerned. Proposed Federal Specifications, amendments, and revisions to existing Federal Specifications are referred by the Office of the Assistant Secretary of War to the chief of the supply arm or service, who would ordinarily prepare a United States Army Specification for the same item. He coordinates the specification with all other interested supply arms and services and recommends to the Assistant Secretary of War the War Department's action. The Office of the Assistant Secretary of War then completes the action for the War Department on the specification and returns it to the Federal Specifications Executive Committee.

The War Department is represented on a large majority of the 70 technical committees preparing Federal Specifications.

United States Army Specifications.

These are prepared by the supply arms and services for all standard articles of equipment and supply, and materials used in the construction of such standard articles, if such materials cannot be adequately described in the specification for the articles themselves. Their use is mandatory for all purchasing agencies of the War Department. The existence of an applicable Federal Specification renders the preparation of the corresponding United States Army Specification unnecessary.

The supervision of activities in the preparation of United States Army Specifications is carried out by the Assistant Secretary of War through the Standards Division of his office. His office acts in an administrative and policy forming capacity. It prescribes how a specification should be prepared, how and from whom concurrences are to be secured, and how assurance will be obtained that the specification is adapted to commercial manufacturing methods and mass production. A specification submitted for clearance is accompanied by data

which will indicate its acceptability under policies of the War Department.

The specification must adhere to the military characteristics approved for the item by the General Staff. Throughout the development of the item, its adaptability to quantity production must be a matter of continuous consideration. It is a policy of the War Department to require the adoption of standard commercial items, or their adaptation with the fewest practicable modifications. The design of the item, and its subsequent tests are matters which determine the suitability of the item. They constitute the framework around which the specification is written. Every specification after it is written must be coordinated with other interested arms and services of the War Department before submission to the Assistant Secretary of War. This serves as a check of correctness, and also to unify as far as practicable the specifications used in common by two or more supply arms and services.

A specification submitted for clearance is accompanied by data to show that the item is an adopted standard. Information is furnished as to whether the specification is restrictive in any way that might curtail production, or which might give one or more manufacturers an advantage in the field of competition, and whether industry has been consulted in its preparation.

Information is also required as to any features which have been commented upon unfavorably by industry, but which are deemed essential for retention in the specification in order to meet the prescribed military characteristics.

If a specification is satisfactory to the using or interested arm or service, if it contains no restrictive features, and if it is acceptable to industry, it can be and is cleared promptly for procurement purposes. This clearance makes it a United States Army Specification and it is listed in the Index, an annual publication listing United States Army Specifications and Federal Specifications used by the Army, which may be purchased from the Superintendent of Documents, Washington, D. C. The Index lists over 4,000 United States Army Specifications.

The revision or cancelation of United States Army Specifications is accomplished generally by the same coordinating process that governs the clearance of an original specification. Cancelation normally becomes necessary when the item is made obsolete or when the specification is superseded by an applicable Federal Specification. This work of revising specifications requires almost as much time and effort on the part of supply arms and services as does the preparation of new specifications. Standards do not remain the same over a given period of time. Improvements in design of military equipment and changing methods of commercial manufacture are constantly taking place which require modifications in specifications. Where these modifications are important ones, the revision of existing specifications becomes necessary and is accomplished by the preparation of an entirely new specification to supersede the old one. However, if only a minor change is involved, this does not require complete revision of a specification, but is published in the form of an amendment which becomes a part of the specification until it is revised. Supply arms and services are authorized to prepare and use amendments without the approval of the Assistant Secretary of War's office.

Several specifications may be necessary for one item in order to cover all the elements required for its manufacture. In some cases one specification may cover several items. That is particularly so in the case of drugs where the standard is established by the United States Pharmacopoeia.

United States Army Tentative Specifications.

United States Army Tentative Specifications are prepared and used by the supply arms and services. They are authorized for two purposes—

(a) To cover the purchase of articles required only occasionally or for temporary peacetime use.

(b) To test the procurability of a specification when it appears desirable to do so before preparing it in the form of a United States Army Specification.

They are not required to be submitted to the office of the Assistant Secretary of War for clearance or for any other action. No record of them is kept except with the supply arm or service that prepared them. Tentative specifications show in their title the name of the service which prepared them instead of the title "U. S. Army Tentative Specification."

There is one instance, however, where a tentative specification is used in a different way than just mentioned. This relates to the purchase of motor vehicles. Because of annual purchase and varieties of motor vehicles developed by industry, standardization of motor vehicles is limited to the approved military characteristics for certain definite capacities and performance. Consequently, motor vehicles during any one fiscal year are purchased under tentative specifications which are written around these military characteristics. Because of the volume and importance of this type of purchase, the Assistant Secretary of War made an exception to the usual practice, and requires in the case of tentative specifications for motor vehicles that they be cleared through his office in the same way as United States Army Specifications.

Army-Navy Aeronautical Specifications.

The Aeronautical Board, made up of representatives of the Army and the Navy, has for several years been engaged in standardization of Army and Navy aeronautical material. The Board is now preparing joint specifications for material. They are mandatory in the War Department for use in the procurement of aeronautical material and supplies.

United States Navy Specifications.

Their use is encouraged wherever applicable, and in the absence of a United States Army Specification or Federal Specification, in order to avoid duplication of effort.

Liaison With Other Technical Agencies on Standards.

Contact between the Army and certain national agencies concerned with the promotion of standards for commercial materials and practices is maintained by The Assistant Secretary of War.

The most important of these are the American Standards Association, and two divisions of the National Bureau of Standards, Department of Commerce, namely, the Division of Simplified Practice and

the Division of Trade Standards. The Assistant Secretary of War arranges the necessary War Department representation on the working committees of these national organizations and indicates the agreement or recommendation of the War Department on a proposed standard or practice. The administrative procedure by which this is done is similar to that previously mentioned in connection with the clearance of Federal Specifications. In addition, the supply arms and services maintain contact with many technical societies engaged in standardization work, in order to keep abreast of current practices and adopted standards. By utilizing applicable standards and simplified practices of these general standardizing agencies and of numerous technical and trade organizations, chiefs of supply arms and services may improve the specifications as well as reduce the difficulties of procurement.

Inspection and Test.

The inspection and test of supplies for conformance with specifications is decentralized in the War Department. The chiefs of supply arms and services are responsible for the proper inspection of all supplies manufactured or procured by them or by those under their control. Contracting officers of the supply services are in turn held responsible for inspection in accordance with instructions issued by the chiefs of their respective services or higher authority.

Contracting officers at field establishments (arsenals, depots, and military posts) are required to provide for the necessary inspection on contracts made by them or, as in some supply arms or services, inspection may be made by field inspection officers established in other locations. Depending upon the type of article being procured, and circumstances surrounding the purchase and delivery, final inspection may be either at point of manufacture or at point of delivery. Normally, laboratory tests, when required, and some functioning tests, are made at these field establishments. However, if suitable facilities to conduct the tests required are not available at these establishments, the services of the National Bureau of Standards may be requested.

The Field Inspection Service of the Navy Department, as well as the services of certain other Federal departments, are also available and made some inspection of supplies for the War Department. The "Directory of Inspection Services and Testing Laboratories of the Federal Government," compiled in 1935 by the Procurement Division, Treasury Department, and the National Bureau of Standards, lists these Federal facilities for the use of Government purchasing and contracting officers.

Research.

The activities of the War Department in basic research are decentralized to the supply arms and services. Each service conducts research applicable to the articles of military equipment which the service supplies to the Army. Basic research is confined, principally to that carried out in fields not overlapping those in which scientific research is being conducted. Each service maintains laboratories, where activities are directed toward technical research with the primary purpose of applying scientific principles to the solution of their particular problems, and adapting results attained by scientists throughout the country to design of military equipment.

CHAPTER III

STANDARDIZATION AND LABELING ACTIVITIES OF PRIVATE AGENCIES

In addition to the activities of the Federal Government in the field of standardization, a considerable amount of work in this field is being done by individual companies, trade associations, and technical and professional societies.

An individual company may use purchase or test specifications for the products the company buys, or company standards or specifications for the products the company manufactures or sells. Some trade associations have set up standards, recommended practices and the like for the voluntary use of their membership. Technical and professional societies have established standards for raw materials, finished products, processes, construction, and performance. Some of these standards are nationally recognized.

A number of trade associations and technical and professional societies make use of certification systems, labels and approval media to identify the products conforming to the standards adopted by such organizations.

The description of standardization activities of some private companies, trade associations, and technical and professional societies will serve to illustrate the methods and procedures used by them.

STANDARDIZATION ACTIVITIES OF INDIVIDUAL COMPANIES

The manufacturing industry is confronted with a double problem: The manufacture of standard articles for mass production, and the manufacture of special articles to satisfy the particular requirements of a customer.

The question of short-time deliveries is playing such an important role that the manufacturer ought to be prepared, in accepting an order, to make the engineering design and the drawings, and furnish the shop with the necessary manufacturing information—all in a very short time.

The shop must order the material; the rate department must establish the rate for each operation involved during the manufacture of the article; the time and pay roll departments must determine the amount of money to be paid to the workman; and the cost department must calculate the cost of the finished product.

In order to accomplish this in a short time, all the operations in each department must be performed in a methodic and efficient way, so that overlapping and lost motion may be avoided. Close interrelation between the engineering, production, rate, and cost departments of a company must be established.

When manufacturing special articles, provision must be made for using the maximum number of standard parts available and for making special parts only when necessary. Standard parts eliminate duplication, lower production costs, and speed output in manufacturing.

When parts are standardized, they can be manufactured in great quantities, can be tool made when it is economical to do so, and most of the material can be kept in stock. This is not only profitable to the manufacturer, but ultimately also to the consumer. Standardization helps the worker on the bench to increase his efficiency, by working with the same material, by following the same assembly instructions, and by reading the same drawings. It permits the design engineer to determine readily what standard parts can be used when handling a special order.

The introduction of company standards facilitates the work of the engineering, rate, cost, and other departments. Some of the results obtained at the Sharon plant of the Westinghouse Electric & Manufacturing Co., where a system of company standards was developed by the author, are summarized as follows:

Engineering department: Number of design specifications, for each line of apparatus, reduced from several hundred to only three design specifications.

Rate department: Set-up of standard time values made up once and for all, except for adjustments. The number of rate cards at the time of revision in September 1931, reduced from 11,000 to 600.

Cost department: Standard cost calculated once and for all, except for revision. The number of design specifications and rate cards required for this purpose is exceedingly small.¹

¹ "Industrial Standardization Proves Profitable to Manufacturer and Ultimately to Consumer," by S. P. Kaidanovsky, *Industrial Standardization and Commercial Standards Monthly*, vol. 6 (10), p. 281, October 1935.

Company standards are sometimes referred to as "internal standards" as distinguished from "external standards," such as those established by an entire industry, a technical or professional society, or the Government. However, every well organized company standards program makes use of external standards. In fact, company standards and external standards are very often interrelated. An attempt to develop a company standard frequently indicates the desirability of an external standard of Nation-wide scope, and conversely, a knowledge of existing company standards assists a particular committee in drafting acceptable external standards.

The following description of the standardization activities of the General Electric Co., the Detroit Edison Co., the Bausch & Lomb Optical Co., and that of 12 company members of the Associated Grocery Manufacturers of America, Inc., may serve to illustrate methods and procedures used in company standardization.

The General Electric Co.

The standards department of the General Electric Co., Schenectady, N. Y., was organized in 1938 to coordinate the company's standardization activities. This department cooperates with various organizations establishing standards, such as the American Institute of Electrical Engineers, the American Standards Association, the American Society of Mechanical Engineers, the American Society for Testing Materials, the Edison Electric Institute, the National Electrical Manufacturers' Association, and the National Fire Protection Association.

The principal functions of the Standards Department in the development of internal or company standards are to follow outside standardization activities, assemble best information available on any specific subject, initiate new standards where necessary, advise standardizing committees, coordinate work where more than one group or committee is involved, and edit and publish company standards that are adopted.²

The General Electric Co. has established a number of specific standards committees, but when there is no appropriate committee to which a problem may be assigned, it is referred to an appropriate general committee.

The consideration of a company standard may be suggested by a design or manufacturing department, a particular committee, the standards department, or by a standardizing agency. Before adoption, the approval of the interested committee or committees is required. This system provides for adequate representation and close cooperation between different departments.

General Electric (G. E.) standards are published as recommended practices in a series of G. E. Standards books, classified according to subject and use.

When test methods of the American Society for Testing Materials (A. S. T. M.) are available they are used, otherwise a required test method is developed by the General Electric Co. These methods are assembled in a G. E. test methods book.

Little or no attempt is made by the General Electric Co. to enforce company standards. All G. E. standards are of a temporary nature and are constantly subject to revision in the interest of economy and progress.

²"How Standardization Works at General Electric," by H. W. Samson, *Industrial Standardization and Commercial Standards Monthly*, vol. 13 (3), p. 65, March 1939.

The Detroit Edison Co.

The materials standardization program of the Detroit Edison Co., a public utility, Detroit, Mich., began in 1932. This company adopted a committee standardization system wherein all departments participated in a formulation and use of standards.

A main standardization committee, composed of the chief engineer, acting as the chairman, the general storekeeper, and purchasing agent, was appointed to outline the general policies of standardization and to appoint subcommittees to work on specific problems. This main committee adopted the following objectives:

1. Establishment of a classification of all materials and equipment.
2. Use of a standard terminology in the description of all materials.
3. Establishment of adequate specifications.
4. Reduction of the number of different items purchased and used by the elimination of superfluous types and sizes.
5. Coordination of decisions and A. S. A. (American Standards Association) and other national standards.³

A classification subcommittee grouped all items of materials and equipment into 65 main classes, and further divided them into 353 subclasses of related items. A scope subcommittee then determined those classes which would justify further research. Subcommittees, including representatives from the stores, purchasing, engineering, and the using departments, were set up by the main committee to investigate the classes to receive special study. The objectives of these subcommittees were mainly: Eliminating duplication, obsolete materials, and unnecessary types and sizes; replacing items made to special design with national or industry standards; recommending substitutes which make for better construction or lower cost; writing new specifications when necessary; and setting up standard terminology.

In pursuing these objectives, existing applicable standards were studied. These studies resulted in the publication of a Standards Catalog listing both stock and nonstock standard items and containing other pertinent information.

The enforcement of a standard adopted by the company is not difficult, since every department or interested group participates in its formulation. The actual enforcement, however, is a function of the purchasing department. The buyers of the purchasing department are governed by these policies:

1. Complete elimination of the purchase and use of nonstandard items is not desirable but their indiscriminate use should be eliminated.
2. A requisitioner should not have to wait for committee action before procuring a nonstandard item.
3. New materials and methods should be continually tried so as to keep the company up to date.⁴

In order that the standards may not become too fixed and thus prevent progress, each subcommittee occasionally reviews the purchases under its jurisdiction.

The Bausch & Lomb Optical Co.

The Bausch & Lomb Optical Co., Rochester, N. Y., established a permanent committee, during 1935, to study material specifications. This committee was organized to—

³ "The Detroit Edison Co. Standardizes Its Materials," by Arthur J. Beck, *Industrial Standardization and Commercial Standards Monthly*, vol. 10 (7), p. 184, July 1939.

⁴ *Ibid.*, p. 185.

* * * prepare material specifications, to devise a simple code for labeling and identifying the specifications, and to select additional materials for which the specifications were to be written * * * to review and analyze specifications as written, indicate those materials requiring testing, act on the acceptance of final specifications, and submit them to the management.⁵

The committee is composed of four permanent members: The assistant to the works manager, acting as chairman; the purchasing agent; the head research chemist; and a representative of the engineering department. Other members, specialists in their field, assist this group. This committee designates subcommittees to work on specific problems. Two members of the materials standards department are permanently assigned to edit specifications.

The materials investigated for standardization by the Bausch & Lomb Optical Co. are covered by material purchase specifications and approved material forms.

All material purchase specifications follow the same general outline: (a) Scope, (b) a general paragraph describing the material and how it is to be used, (c) chemical properties, (d) physical properties, (e) material and manufacture, (f) finish, (g) size, (h) tolerances, (i) packing, (j) marking and labeling, (k) testing and inspecting, (l) rejection. * * *

The approved material forms follow a standard outline covering: (a) Name of the material, (b) what departments use it and for what purpose, (c) lists of the suppliers and the particular trade names by which they supply the material, (d) the characteristics of the material, and (e) the frequency and quantities of purchase.⁶

Standard test methods are used in testing purchased materials to assure their conformity to company material purchase specifications. American Society for Testing Materials (A. S. T. M.) specifications, modified A. S. T. M. specifications, various accepted trade practices and their modifications, and test methods developed by the company are used in making these tests.

Articles that are reproduced by the Bausch & Lomb Optical Co. hundreds of times are required to be uniform and to come within a certain standard of perfection. Group tolerances for lenses have been arrived at, which are required to be within the limits of variation suitable to the needs of a particular customer. Spectacle frames were standardized although many styles, shapes, and sizes are required to fit the individual.

Company Members of the Associated Grocery Manufacturers of America, Inc.

The Associated Grocery Manufacturers of America sent the following questionnaire to a few of its nationally known company members:

1. In purchasing your raw materials—materials which make up the ingredients of your finished product—what methods or controls are employed by you to insure uniformity of the quality desired?

2. You manufacture your product to meet certain specifications—what safeguards or controls are used by you to guarantee uniformity of production?

3. What safeguards do you employ to assure you that the finished product meets all specifications and that no defective packages are shipped out?

4. Are you supplying specific information about your product to the public? What is the nature of this information and how do you pass it on?⁷

⁵ "How the Bausch & Lomb Optical Co. Works Out Its Standardization Program," by A. W. Anderson, *Industrial Standardization and Commercial Standards Monthly*, vol. 9 (9), p. 201, September 1938.

⁶ *Ibid.*, p. 203.

⁷ Letter by Mr. Paul S. Willis, president, Associated Grocery Manufacturers of America, Inc., New York City, November 29, 1939.

Twelve companies replied to the questionnaire. The replies contained rather detailed descriptions of their respective standardization activities. The subjects discussed in these replies are here analyzed according to the following classification: (a) Control of the sources of raw materials, (b) purchases based on samples, (c) use of purchase specifications, (d) tests before acceptance, (e) manufacturing specifications, (f) testing of the finished product, (g) packaging specifications, (h) testing of products after sale, (i) research, (j) commodity information.

Control of the sources of raw materials.—Control of the sources of raw materials is exercised by 4 of the 12 companies through close cooperation with farmers; 2 of these companies furnish seeds to the farmers and direct the planting and harvesting of the crops.

Purchases based on samples.—Three companies based their purchases on samples subjected to laboratory tests, one of these companies manufactures a small quantity of the product to determine whether the material under consideration meets the required standards.

Use of purchase specifications.—Nine companies purchase their raw material according to specifications, two of these make use of grades and standards established by the United States Government.

Tests before acceptance to assure conformity with purchase specifications.—The nine companies purchasing by specifications examine products before acceptance to determine whether the specifications have been complied with. In the majority of cases the material is subjected to laboratory tests. The raw materials of one company are tested upon receipt: Meats and poultry are inspected, and tomatoes are graded and inspected by agents of the United States Department of Agriculture; raw and canned vegetables are inspected, piece by piece and grain by grain, by company inspectors. Fruits and vegetables of another company are examined by graders of the United States Department of Agriculture. One company has established standard test methods for its own use. One company requires that raw materials not meeting purchase specifications must have the approval of the company's laboratory before they are used. One company tests raw material at each manufacturing plant and also at the central laboratory.

Manufacturing specifications.—The products of all 12 of these companies are produced according to manufacturing and processing specifications. Intermediate testing during manufacturing process is conducted by each company. In one company, inspectors are stationed at key points and require samples from batches to be taken hourly for laboratory testing.

Testing of finished product.—Each company examines and tests its finished product to verify its conformity to manufacturing specifications. Various tests used include chemical and physical analysis, study of the product under conditions corresponding to those of consumer use, aging tests, and cooking tests. Four companies, in addition, provide for tests independent of the manufacturing plant; one of these companies maintains a central research laboratory for this purpose; and in another company, the test results are reported directly to the home office.

Packaging specifications.—Eight companies package their products according to company specifications. Containers are filled and pack-

aged automatically in two companies. In the other six, the packages are tested to ascertain whether they comply with company specifications.

Inspection of products after sale.—Three companies purchase merchandise from the grocer's shelves for examination and analysis, one of these companies supervises, to some extent, the storage of the products on the shelves of the wholesaler and retailer.

Research.—Four of the 12 companies conduct experimental research for the improvement of the quality of their respective products. An experimental farm is maintained by one company, and a staff assists farmers in producing raw materials that meet company standards. Another company maintains a small factory for research on process standards, and also employs special agents to cooperate with those upon whom the company is dependent for its raw materials in an effort to increase their quality.

Commodity information.—None of the above companies furnish information regarding their products in terms of generally recognized standards or grades. They use various media by which to inform the public about the desirable characteristics of their different products. Of course, they supply on labels all information required by legal regulations.

STANDARDIZATION ACTIVITIES OF TRADE ASSOCIATIONS⁸

The Trade Association Survey made by the United States Department of Commerce for the Temporary National Economic Committee secured schedules in 1938 on all types of association activities from more than 1,300 trade associations of national and interstate scope. These schedules included questions of "standardization and simplification" (in this chapter "standardization" includes "simplification" unless otherwise stated) and "establishment of quality standards," and more than 700 associations replied that they furnished services to members on one or both of these items. Almost 350 associations also provided a "standard business forms and contracts" service. Standardization is often related to other association activities, such as trade practices and uniform cost accounting, in connection with the promotion of uniformity in business relationships.

Many trade associations active in the field of standardization also provide services such as inspection, grading, certification, labeling, and guaranteeing; and also conduct technical research and inspection services dealing not only with the products of the industry itself, but also with those of other industries, such as raw materials and competing products.

Standardization is especially predominant among activities of manufacturing associations. Industrial standardization consists largely of singling out specific products and methods which have been found to be most desirable, and concentrating upon them for the purpose of obtaining the greatest possible production efficiency. Standardization, however, can include not only products and methods, but also terms and contract forms.

A trade association can render services to members and the industry in endeavoring to secure uniformity or standardization of—

Nomenclature	Packaging	Types and patterns
Dimensions	Shipping	Equipment
Quantity	Sales practices	Plant lay-out
Quality	Trade rules	Building codes
Performance	Contract forms	Safety codes
Test methods		

Trade association work in simplification, or the elimination of unnecessary varieties, can pertain to:

Shapes	Composition	Grades
Sizes	Models	Quality

Standardization work can be carried on by any firm and by one or several trade associations in a particular field. However, most of the outstanding progress has been brought about through the close cooperation of hundreds of trade and professional associations with such

⁸ Material on pp. 196-202 is based on data obtained from the U. S. Department of Commerce's report for the Temporary National Economic Committee, known as the "Trade Association Survey."

standardizing bodies as the National Bureau of Standards, American Standards Association, and American Society for Testing Materials.

More than 20 years ago when American industry was mobilized for World War purposes, various surveys by the War Industries Board disclosed an over-diversity of products, as well as a vital need for improved products of highest possible efficiency in the "Win the War" emergency program. The War Industries Board insisted upon immediate standardization in many fields, thus calling for a great amount of standardization activity by trade associations. It was the practice of the Board, in most cases, to deal, as far as possible, with each industry through its national trade association. Drastic reductions were made in grades, sizes, and styles of products.

After the war, American industry was faced with a status of industrial over-capacity, and manufacturers attempted to increase sales by featuring new sizes and styles having "individual appeal," claimed to be improvements over the standardized product. Thus the standards movement was retarded in its early growth. It was not long, however, before the resulting waste became such a burden on many industries that a united movement was fostered by trade associations, technical societies, and governmental agencies to stop this undue diversification trend. Variety is likely to increase most rapidly during a period of depression, accompanied by a buyers' market. Sales departments like to feature something "new and different," and this also applies to the engineering department of a manufacturing firm in the conduct of its development work. If one company yields to a trend away from the standardization program advocated by the trade association of the industry, rival companies are apt to follow as a temporary business experiment.

The harmful effects of over-diversification were given wide publicity in the "Waste in Industry" survey by the Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, Washington, D. C.,⁹ made in cooperation with a number of trade and professional associations and the United States Department of Commerce. About this time aid to industrial standardization and simplification by the present National Bureau of Standards was started, and the Federal Specifications Board was established.

In 1921 the Secretary of Commerce set up the present Division of Simplified Practice and, in 1923, the Division of Codes and Specifications within the National Bureau of Standards.

Surveys of Standardization Activities of Trade Associations.

In 1927 a survey by the American Trade Association Executives¹⁰ indicated that 40 percent of a representative group of associations were by then providing standardization and simplification services to their members.

A Federal Trade Commission study¹¹ of the activities of over 700 associations of manufacturers and contractors for the period 1926-28

⁹ "Waste in Industry," by Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, 409 pp., McGraw-Hill Book Co., Inc., New York City, c1921 (by American Engineering Council). (The American Engineering Council is the executive body of the Federated American Engineering Societies.)

¹⁰ "American Trade Association Executives: Proceedings and Addresses, Eighth Annual Convention," pp. 224-225, West Baden Springs, Ind., October 6, 7, 8, 1927.

¹¹ "Open Price Trade Associations," 70th Cong., 2d sess., S. Doc. 226, pp. 29-35, Government Printing Office, Washington, D. C., 1929.

showed that about 30 percent of their activities were in the standardization field and, for wholesalers' associations, 15 percent.

In 1931 a survey was made by the Chamber of Commerce of the United States relating to activities of trade associations of national and local scope; replies were received from approximately 500 associations. Thirty-three percent of the associations were active in standardization work and 26 percent in simplification. As is generally the case, such activities were much more important in national rather than local programs:

	National	Local
	<i>Percent</i>	<i>Percent</i>
Standardization.....	43	8
Simplification.....	35	4
Certification.....	20	9

During the period of 1937-38 trade association services in the general field of standardization had sharply increased, with 58 percent for all associations; this was found in a survey made by the United States Department of Commerce for the Temporary National Economic Committee. Not all products, however, of even those industries most active in this field were sold on a standardized, inspected, certified, labeled basis. Custom work made in accordance with individual specifications will always be a factor. Also, a certain percent of the products of the most modern factories do not quite meet certain standards, yet are reasonably serviceable. These are sold to markets satisfied with slightly substandard items at lowered prices. In most industries, a large number of the firms are unable financially to purchase equipment and materials of the quality needed to permit competition in the high-quality market. In the lumber industry, for example, thousands of the Nation's sawmills are too small and poorly equipped to turn out most of their products on such a quality basis as is called for by Federal Specifications.

About 58 percent of the trade associations, or over 700, reported, as above mentioned, that they were furnishing some form of standardization service to their members. This was much more prevalent among associations of producers than of distributors. It was an activity of 93 percent of associations of manufacturers in the electrical machinery industry; 90 percent of associations in the paper industry; 89 percent of associations in the furniture industry; 87 percent of associations in the lumber industry and 83 percent of those manufacturing iron and steel products. However, only 26 percent of the associations in the apparel and other finished textile products fields reported standardization activities.

In functional groups other than production, standardization activities are not as common. Some percentages of activities in these groups were:

	<i>Percent</i>
Finance and real estate.....	9
Mining and quarrying, except coal.....	25
Transportation and other public utilities.....	29
Personal business and recreational.....	38
Retail trade.....	49
Wholesale trade.....	51
Construction.....	65

Of the total of more than 700 associations reporting standardization and simplification activities, about 450 stated that it was so important in their programs, that it was regarded as a major activity. This ratio was very high for associations in many industries manufacturing products of lumber, and iron and steel, and low for wholesaling and retailing trade associations:

	<i>Percent</i>
Lumber products.....	72
Iron and steel.....	69
Electrical machinery.....	64
Construction.....	47
Transportation and other public utilities.....	22
Wholesale trade.....	20
Retail trade.....	15

Although hundreds of trade associations are active in standardization work, it may be of interest to mention briefly the activities of some of them.

The anthracite industries recently stated that "more than 100,000 persons are normally employed in the mining and preparation of anthracite coal, and there are about 9,000 retail coal dealers supplying the needs of 6,000,000 homes." As part of a broad trade expansion program, a research and testing laboratory was established and equipment used by the coal industry has been tested. Improvements have been made in efficiency, economy, and convenience, both in old types of equipment and in new types that have been and are still being developed.

The Mixer Manufacturers Bureau, affiliated with the Associated General Contractors of America, reported that there was formerly an uncontrolled competition in sizes, models, and capacities of concrete mixers. The association sponsored a program which has brought about a saving to the buyers of the product as a result of a reduction in waste and premature obsolescence.

The National Electrical Manufacturers Association (N. E. M. A.) has a Codes and Standards Committee which cooperates with the American Standards Association in the development, approval, and promotion of the use of "American Standards." It also cooperates with such organizations as the National Safety Council, International Association of Electrical Inspectors, Associated Factory Mutual Insurance Companies, American Society for Testing Materials, American Welding Society, Underwriters' Laboratories, American Gas Association, National Bureau of Standards, and the International Standards Association. A recent report stated that "standardization is a never-ending process. N. E. M. A. is constantly receiving requests for cooperation in solving standardization problems affecting electrical apparatus and equipment from outside sources." This association is composed of about 70 sections and there are 36 joint committees working with the Codes and Standards Committee whose duty is to assist in—

promulgating standards for rating construction, performance, durability, composition, and other characteristics of their products; also, for manufacturing practices and to provide for identifying compliance therewith.

The American Lumber Congress in 1919 adopted a program for simplification of lumber-grading standards, greater uniformity of similar grades of competing species, and the standardization of sizes of yard and factory lumber. In May 1922 the First General Lumber

Conference was held under the auspices of the Division of Simplified Practice, Bureau of Standards; unanimous resolutions to further standardization work were adopted. At the Second General Lumber Conference, in July 1922, the Central Committee on Lumber Standards was formed to act as an executive organization in drafting concrete recommendations. A larger group, the Consulting Committee on Lumber Standards, was organized by this Central Committee. At the Third General Lumber Conference, held at the United States Department of Commerce in December 1933, recommendations were submitted and adopted, which resulted in the elimination of unnecessary sizes, thereby reducing the number of actual finished yard lumber items nearly 60 percent, and the fixing of definitions of basic grades. Approximately 110 organizations were represented at the 1922 Conference while 168 representatives of lumber manufacturers, distributors, and consumers, including Federal Government agencies, architects, engineers, and other technical experts attended the 1923 Conference. Recommendations were offered by the Central Committee on Lumber Standards at the 1924 and 1925 Conferences which continued work on the American Lumber Standards, and completed standardization of the products of the softwood industry. By 1928 size standardization had been completed and problems relating to quality, especially basic standards for structural material, were undertaken.

The Central Committee on Lumber Standards is playing an important role in the standardization of lumber products.

In 1925 the Secretary of Commerce established the National Committee on Wood Utilization, which existed until 1933. This committee was composed of representatives of a number of Federal agencies and such trade associations as the Aeronautical Chamber of Commerce, American Paper and Pulp Association, American Petroleum Institute, Association of American Railroads, Associated General Contractors of America, and about 40 other national groups. The National Committee on Wood Utilization led in the cooperative development of methods for eliminating waste not only in the fabrication of lumber products, but in logging, milling, drying, seasoning, storage, and transportation. Some of the projects formerly carried on by the committee are now continued by the National Lumber Manufacturers Association and its 15 regional affiliated associations in cooperation with the Forest Division of the United States Department of Commerce.

Since trade associations in the timber products industry are possibly devoting more effort to promoting the use of standard products conforming to Federal Specifications than associations in any other industry, detailed information will be given on some lumber standards. An example of cooperation of trade associations with the Government is the formulation of the Federal Specification for Softwood Lumber and Timber (MM-L-751a).

This specification states in part:

Softwood lumber shall conform to the grading rules of the various lumber associations * * * where such grading rules are approved by the Central Committee on Lumber Standards as in conformance with "American Lumber Standards"; see Simplified Practice Recommendation R-16-29¹² "Lumber" of the Department of Commerce.

¹² This Simplified Practice Recommendation was recently revised; its designation is R16-39.

In recent years softwood lumber has often accounted for as much as four-fifths of the total production of lumber in the United States.

The lumber specification mentioned above covers species, classes, grades, material, workmanship, methods of inspection, and packing. This specification lists a number of national and regional trade associations which are actively cooperating with the Government in grading and inspection work to increase business efficiency and secure and hold the confidence of Government purchasing agencies and the consuming public in the integrity of the association's efforts to sell lumber which conforms to the high standards agreed upon. This Federal Specification states in part:

The grading rules of the following manufacturers' associations are published upon the basis of the American Lumber Standards.

Among the associations cooperating with the Government on this particular Federal Specification are the—

California Redwood Association.

Northern Pine Manufacturers Association.

Southern Pine Association.

West Coast Lumbermen's Association.

The National Hardwood Lumber Association is composed of firms which prepare lumber from various species of hardwood trees. It reported that its standardization program has "enabled all hardwoods to meet in common markets on a price competitive basis."

The Northeastern Lumber Manufacturers Association reported that its activity in standardization work was brought about by the public demand for standardized products in the construction field and by competition of other standardized lumber. The result of the work of this association is increased demand for the inspected and graded products of its members and increased public confidence in its products, since consumers now know what to expect when they specify a particular standardized product.

The Rubber Manufacturers Association has coordinated, to a high degree of efficiency, the standardization and simplification work of the rubber industry. This industry is characterized by a small number of large firms. The Rubber Manufacturers Association reports that large sums have been saved through reduced inventory and production costs, and also by public acceptance of standardized rubber products, such as rubber automobile tires.

The Soft Fiber Institute is one of the large number of associations utilizing the facilities of the American Society for Testing Materials, and representatives from this institute are members of textile and other industrial committees of the American Society for Testing Materials. Laboratory tests are constantly carried on to determine the relative efficiency of various types of yarns.

The Sporting Arms and Ammunition Manufacturers Institute has cooperated with the Ordnance Department of the Federal Government in the standardization of its products, and has for years carried on various tests at the National Bureau of Standards. It reports that there has been marked success in eliminating odd weights and sizes of ammunition, which has simplified manufacturing, wholesaling, and retailing practices in this industry.

The American Institute of Steel Construction, Associated General Contractors of America, Construction League of the United States,

National Association of Builders Exchanges, National Association of Master Plumbers, National Lumber Manufacturers Association, Portland Cement Association, Structural Clay Products Institute, as well as the American Institute of Architects and other professional organizations and public officials such as building inspectors, and the National Association of Housing Officials are cooperating with the National Bureau of Standards in the preparation of building and plumbing codes, carefully developed so as to be suitable for general adoption by State and municipal agencies.

The National Paving Brick Association, a pioneer association in simplified practice work, was organized in 1905 and in 1939 had about 75 percent of the industry's firms in its membership, representing about 85 percent of the Nation's total production of that industry. This association is active in standardization work and has a research laboratory. It is allied in various programs with the Structural Clay Products Institute, whose membership includes manufacturers of common brick, face brick, tile, and similar products. The benefits of simplification were enumerated in a recent report on vitrified paving brick which emphasized the accomplishment of this association in confining most of its production to comparatively few sizes and types.

The Porcelain Enamel Institute has developed several effective standards for both products and processes which are extensively used in the porcelain enameling industry. The managing director states—

The Porcelain Enamel Institute has issued a standard fineness test for milling enamels under the title, "Tentative Screen Test for Wet-Milled Porcelain Enamel." It has also issued a pamphlet on architectural standards, entitled, "Recommended Materials and Practice for Architectural Porcelain Enamel."

Standards have been issued for the following:

- (1) "Test for Resistance of Porcelain Enamels to Surface Abrasion" (A tentative standard.)
- (2) "Test for Acid Resistance of Porcelain Enamels."
- (3) "Reflectance Test for Opaque White Porcelain Enamels."

* * * * *

Standards are not used by this industry as a basis for selling and contractual relations because sufficient research work has not yet been done to make all factors subject to standard grading.¹³

The American Institute of Steel Construction is primarily concerned with rolling mill steel, semifinished for use. The membership of this institute is composed of companies engaged in the fabrication and construction of steel for bridges, buildings, and other structures. The purposes of the institute are—

To further better methods and elimination of waste in the design, fabrication and erection of structural steel, through a cooperative effort based upon simplification and standardization, as suggested by the United States Department of Commerce, to the end—

That the institute's activities may promote greater efficiency in production and selling, and that the mills, architects, engineers, contractors, the public, and members of the structural steel industry, may derive equal benefits therefrom.

That the institute's standard specification, prepared to further uniform practice, may contribute to the public the material reduction in building costs that result from its application;

¹³ Letter by C. S. Pearce, managing director, Porcelain Enamel Institute, Inc., Chicago, Ill., December 5, 1939.

That both buyer and seller may profit from the Code of Standard Practice, recognition of established ideals, and better ethics as applied to all trade relations;¹⁴

* * * * *

The institute is engaged in research and assembles and distributes data and information for the use of architects and engineers in preparing engineering plans for structures in which structural steel is used.

The activities of the institute are mainly of three general types: The simplification of sizes (these have been reduced over 33 percent in recent years); the standardization of uses of steel in construction; and the development of standards of practice, and of codes of safety in steel construction, including fire safety. The major factors considered in standardization as related to public interest are safety, economy, and efficiency. Standards developed by the institute have general interest and wide use.

Many of the members of the institute are serving on standardization committees of the American Society for Testing Materials, the American Welding Society, the National Bureau of Standards, and the American Standards Association. The institute is sponsor of the Committee on Structural Steel and Iron for the American Standards Association.

The institute publishes "Steel Construction,"¹⁵ a manual which is an indispensable tool for those concerned with drawing up specifications for any type of structure in which steel construction is employed. This manual gives dimensions, weights, strength, and related facts for all standardized structural steel. The standards of the American Society for Testing Materials are used in designating physical and chemical characteristics of structural steel.

Matters related to use of sheet steel and steel sheets in small buildings, including residences, have been transferred by the American Institute of Steel Construction to the American Iron and Steel Institute.

The American Gas Association (A. G. A.) includes in its membership companies engaged in the production, distribution, and sale of manufactured and natural gases, and some companies manufacturing and selling gas appliances, equipment, and accessories. This association is conducting extensive research in the field of production, distribution, sale, and use of gas, in its own and commercial laboratories, and in various educational institutions. Research associates are maintained at the National Bureau of Standards. Since 1924, the association has sponsored a program for standardization of gas-burning appliances used in the household. The work of the association in this field is outstanding.

The standardization program has included the creation of a main cooperative committee, designated as the "Approval Requirements Committee"; affiliated technical committees; "and a system of legislation whereby minimum requirements for the safe and satisfactory construction and performances of gas appliances and accessories and installation thereof could be developed."¹⁶ The A. G. A. Testing Labora-

¹⁴ "Steel Construction," p. 15. American Institute of Steel Construction, Inc., New York, N. Y., June 1939.

¹⁵ "Steel Construction: A Manual for Architects, Engineers, and Fabricators of Buildings and Other Steel Structures," 398 pp., American Institute of Steel Construction, Inc., New York, N. Y., 3d ed., 1939.

¹⁶ "Product Standardization," lecture by R. B. Harper, 16 pp., mimeographed, National Institute of Commercial and Trade Organization Executives, Northwestern University, Evanston, Ill., August 19, 1939.

tories in Cleveland, Ohio, with a branch in Los Angeles, Calif., have contributed an essential part to the program of the association by "examining various gas appliances and accessories, as submitted by the manufacturers thereof under contractual arrangements, and determining whether or not these meet the stipulated requirements, and may therefore bear the A. G. A. seal of approval. Certificates of approval are issued to the manufacturers for the type and size of products which have been found to comply with the requirements."¹⁷

The present Approval Requirements Committee, which is also constituted as the Committee on Approval and Installation Requirements for Gas-Burning Appliances of the American Standards Association, has 25 members representing gas utilities, manufacturers, trade associations in related fields, Governmental agencies (U. S. Bureau of Home Economics, National Bureau of Standards, Bureau of Mines, and U. S. Public Health Service) and the American Home Economics Association.

Standards have been established for nearly all types of gas-burning household appliances and for some types of gas-burning commercial equipment. At present 26 standards for gas appliances have been approved by the American Standards Association as "American Standards." These standards are for such appliances as domestic ranges; water, space, and private garage heaters; hot plates and laundry stoves; clothes dryers; gas refrigerators; draft hoods; conversion burners; and various accessories.

The Approval Requirements now in effect represent minimum standards of performance, safe operation, and substantial and durable construction. While the question of safety has always been regarded as of paramount importance in the gas industry, much attention has been paid to the establishment of suitable standards governing details of performance, depending on the class of equipment under consideration.

It has been estimated that approximately 95 percent of all domestic gas-burning appliances offered for sale in the United States meet the Approval Requirements of the American Gas Association.

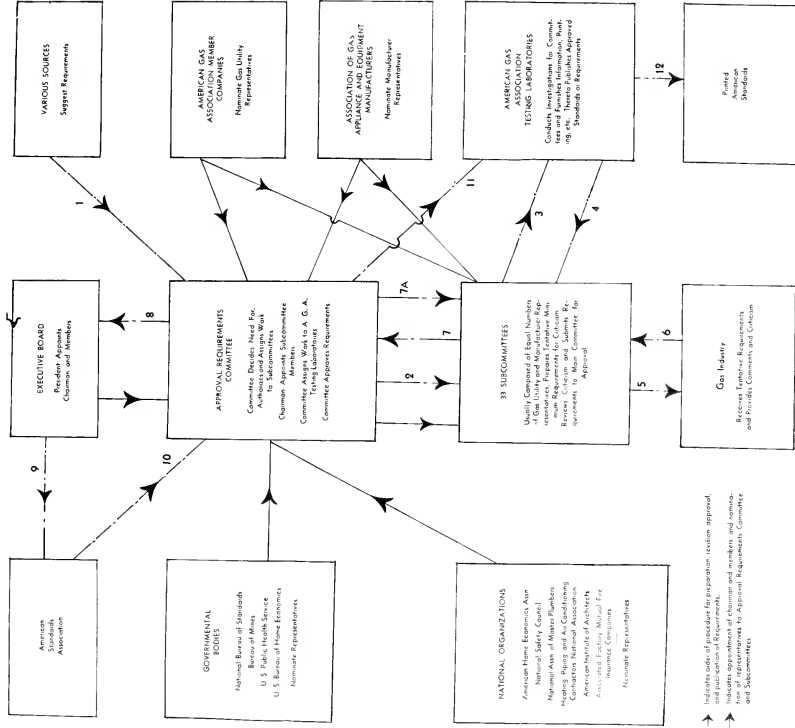
In order to illustrate the development of standards by trade associations, chart XIII, outlining the standardization procedure of the American Gas Association, is given.

The numbers in parenthesis in the following description of procedure for the preparation, revision approval, and publication of requirements, correspond to the numbers in the chart.

The Approval Requirements Committee of the American Gas Association considers requests for standardization from various sources (1) and decides the necessity for standards. This committee authorizes the appointment of subcommittees; the chairman appoints the subcommittee members who have been previously nominated by gas utility executives, by the Association of Gas Appliance and Equipment Manufacturers, and by Governmental bodies and national organizations concerned with standardization. Each subcommittee prepares or revises requirements of standards (2), requests special investigations or research to be made by the American Gas Association Laboratories if necessary (3) and (4), and sends its tentative requirements to the members of the gas industry and others for

¹⁷ "Product Standardization," lecture by R. B. Harper, 16 pp., mimeographed, National Institute of Commercial and Trade Organization Executives, Northwestern University, Evanston, Ill., August 19, 1939.

American Gas Association (AGA) Standardization Procedure



--- 10 --- Indicates order of procedure for preparation, revision, approval, and publication of Requirements.

--- 9 --- Indicates approval of chairman and members and nomination of members to Approval Requirements Committee and Subcommittees.

comment (5) and (6). Following consideration of their suggestions and criticisms, the subcommittee drafts the final recommendations for action by the Approval Requirements Committee (7). If the requirements are approved by this committee they are submitted to the American Gas Association's Executive Board (8), which in turn submits them to the American Standards Association for possible approval as an "American Standard" (9). If the Approval Requirements Committee does not concur in the standard recommended by the subcommittee, the requirements are referred back to the originating subcommittee with instructions for reconsideration (7a). After approval by the American Standards Association the requirements are published as an "American Standard" by the American Gas Association Testing Laboratories (10) and (11).

The National Canners Association was organized in 1907, just 97 year after Appert described the methods he had discovered for preserving perishable foods. The object of the association is "to improve the methods and products of the industry and to increase the consumption of canned foods by establishing confidence in them."¹⁸ The membership of the association is constituted of both individuals and firms, including canners of all kinds of foods packed in hermetically sealed containers and sterilized by heat.

The association maintains laboratories in Washington, D. C., San Francisco, and Seattle in which research is conducted to determine desirable canning practices. Special emphasis is placed on preservation, palatability, and appearance of the canned product.

The association issues a bulletin, which is revised from time to time, of recommendations on processing for nonacid foods. These recommendations are based upon data available from its own research laboratories, the laboratories of allied industries, and those of individual companies. This bulletin is made available to members of the canning industry, so that the information it contains may aid in insuring the wholesomeness of products and in improving their quality.

Although the National Canners Association opposes the grade labeling of canned foods it has cooperated with the Agricultural Marketing Service, United States Department of Agriculture, in developing grades for canned fruits and vegetables, for use within the trade. The association has participated, also, in conferences arranged by the United States Department of Agriculture to develop standards for canned foods under the Federal Food, Drug, and Cosmetic Act.

The position of the National Canners Association relative to can sizes is stated as follows:

The program of simplification and standardization of containers, upon which the association has cooperated with the Division of Simplified Practice of the National Bureau of Standards, has been steadily advanced. The object of the association's work has been to secure a practical simplification and standardization which takes fully into account the technical problems in can making and canning, and which meets the need of preventing consumer confusion and deception.¹⁹

However, the number of sizes of cans appears not to have been decreased, although the National Canners Association states that an

¹⁸ "Your National Association at Work," p. 3, National Canners Association, Washington, D. C., November 1939.

¹⁹ *Ibid.*, p. 17.

increasing proportion of the major canned fruits and vegetables is packed in cans of sizes designated in the Simplified Practice Recommendation²⁰ for each of the various kinds of products. The association has opposed legislation to establish legal can sizes for food products.

An increasing proportion of food products for canning are purchased by canners on a grade basis. Sales by canners to distributors is said by the association to be chiefly on basis of grades, but information as to the grade of the product is seldom passed on to the retailer or to the ultimate consumer.

The National Preservers Association is one of the associations which has secured the assistance of the Federal Trade Commission, and provisions as to the quality of products and labeling were included in the trade practice rules for this industry.

At the request of members of the sardine and tuna fish industries, trade practice conferences were held by the Federal Trade Commission. Trade practice rules relating to sale and distribution, and including definitions of types of pack of sardines and quality grades of tuna fish were promulgated by the Federal Trade Commission.

The National Association of Hosiery Manufacturers initiated its standardization activities in 1922, when it placed a research associate at the National Bureau of Standards. The association now maintains two such associates and a secretary at the Bureau. The research promoted by the association deals principally with the character and performance of the materials used by the hosiery industry.

Important standards developed in recent years by the association include the standard oil content for rayon; standard lubricant²¹ for knitting machines (which will not stain hosiery); minimum twist (of the yarn) requirements for crepe hosiery; and hosiery fabrics defect (which are used abroad). Standards relating to methods of testing hosiery have been approved by the American Association of Textile Technologists and published by the National Bureau of Standards,²² also Commercial Standards for Hosiery Lengths and Sizes²³ and for Regain of Mercerized Cotton Yarn²⁴ have been accepted and are in general use.

The raw silk color standards developed by the association furnish the only available method of classifying raw silk by color, although most of the industry still depends for this operation upon the human eye. Fine and accurate classification of raw silk by color is of importance, since it is intimately related to the uniformity of color in the finished product.

Standards and definitions applying to the construction and inspection of women's full-fashioned silk hosiery²⁵ were prepared by the National Association of Hosiery Manufacturers in 1936. The standards of construction are now outdated but the use of the standards of inspection is constantly increasing. This latter standard furnishes

²⁰ Simplified Practice Recommendation 155-37 (in process of revision).

²¹ "Specifications for Stainless Lubricating Oil for Knitting Machines, Loopers and Seamers," prepared by Research Associate, National Association of Hosiery and Underwear Manufacturers, 4 pp., no date.

²² "Methods of Testing Hosiery," 34 pp., by E. Max Schenke and Howard E. Shearer, C422, National Bureau of Standards, Washington, D. C., 1938.

²³ "Hosiery Lengths and Sizes," Commercial Standard CS46-36, Government Printing Office, Washington, D. C., 1936.

²⁴ "Regain of Mercerized Cotton Yarn," Commercial Standard CS11-29, Government Printing Office, Washington, D. C., 1929.

²⁵ "Standards of Construction and Inspection for Ladies Full-Fashioned Hosiery," 15 pp., National Association of Hosiery Manufacturers, New York City, 1936.

a mechanical means of classifying women's full-fashioned silk hosiery on the basis of differences in quality and character of irregularities.

A trade practice committee of the association is working with the Trade Practice Division of the Federal Trade Commission in developing trade practice rules for the hosiery industry. It is anticipated that rules will be promulgated for the identification of the fiber, and for labeling of hosiery which is not of first quality. In addition to agencies already mentioned, the National Association of Hosiery Manufacturers cooperates with the American Standards Association; the Joint Committee on Raw Silk Classification; the Japanese Raw Silk Intelligence Bureau; the United States Institute for Textile Research, Inc.; and the National Consumer-Retailer Council in furthering the development of standards and labeling practices.

The American Institute of Laundering, the successor to the Laundryowners National Association, has for 20 years been primarily interested in research and dissemination of information among its members. The institute has found that the standards used in laundering services may affect health. Therefore, the institute prepared for the members of the medical profession a popular bulletin²⁶ dealing with this subject. The bulletin includes data on the bacterial content in successive tubs of wash and rinse water through which clothes pass during different washing processes.

The American Institute of Laundering has prepared and issued recommended standard procedures for washroom and finishing practices concerning which the general manager states—

Its engineers and chemists and other technicians are constantly making studies of subjects pertinent to commercial laundering. Following the completion of these studies, they publish reports for the guidance of the membership. Naturally, in work of this type, we have developed information which is on the border line of standards and which is constantly being recommended for adoption by the industry. We have no compulsory standards and serve purely as an educational and research organization.

It has been almost impossible to have standardized names of laundry services, due to the wide variation in names as they are used locally all over the country. We are representing an institution with a membership of nearly 2,200 laundryowners scattered all over the United States and Canada. * * *

It is our best judgment that the laundry industry is adopting more and more of our recommendations with regard to washing and finishing methods in the operation of their plants.²⁷

Incidentally, the institute has accumulated much performance data on various textiles which have proved of value to the textile industry in improving and developing standards for comparable materials.

The National Association of Dyers and Cleaners was organized in 1906. The active membership of this association includes proprietors of dry cleaning establishments or dye works. Nonactive members may include individuals, firms, or corporations concerned with dry cleaning supplies, equipment, or textiles.

In 1930 the association adopted a code of business practices, which defines dry cleaning services. Later unsuccessful efforts were made to include definitions and standards of dry cleaning services in the N. R. A. Code for the Dry Cleaning Industry.²⁸

²⁶ "Health and the Laundry," p. 31, Public Health Section, American Institute of Laundering, Joliet, Ill., 1937.

²⁷ Letter by George H. Johnson, general manager, American Institute of Laundering, Joliet, Ill., December 2, 1930.

²⁸ "Report of the Consumers' Advisory Board of the N. R. A. Recommending Standards for the Dry Cleaning Industry," 22 pp., National Recovery Administration, Washington, D. C., April 1934.

More recently the National Association of Dyers and Cleaners has developed standards for "cleaning room practices" which affects quality of dry cleaning. Such standards are voluntary. As yet no nationally-recognized standards have been established for different grades of dry cleaning services.

The association has investigated methods of dry cleaning and handling of various types of fabrics. These methods are published and made available to the membership in the form of technical bulletins and textbooks and may be regarded as standards of practice. In many instances they include standards of quality for textiles, since fabrics which cannot be handled during the dry cleaning processes, in accordance with these practices, are considered unserviceable. The managing executive of the association states:

We believe members to be more favorable toward standards than in previous years. However, standards of practice are difficult to attain since it involves so many elements over which we have no control. Type of fiber, dyestuffs, atmospheric conditions, the acid condition of perspiration and variations therein are examples of the factors which contribute to the difficulties of standardization.

The development of new equipment by machinery manufacturers, new products, technical research carried on in our laboratory, the maintenance at our headquarters of a school to educate cleaners in proper drycleaning methods, and the greater interest shown by drycleaners in keeping accurate cost records are considered important factors which have contributed to the improvement of the drycleaning industry.²⁹

The experience acquired by this association pertaining to various kinds of fabrics, garments, and household textiles, as in the case of the American Institute of Laundering, has contributed to the improvement of these commodities by manufacturers.

The American Pharmaceutical Association was organized in 1852. Its membership includes pharmacists, druggists, teachers of pharmacy and related subjects, editors of pharmaceutical journals, and others interested in pharmacy. The purposes of the association are:

To advance the science and art of pharmacy; * * * to limit the practice of pharmacy to trained pharmacists; to increase the observance of proper standards of identity, purity, and strength of drugs and medicines and to prevent their adulteration; to regulate the use of habit-forming and dangerous drugs. * * *

The association maintains a well-equipped laboratory to carry on research and testing which contributes to the establishment and improvement of standards for drugs. However the regulation of the labeling of drugs and related products now rests with the United States Food and Drug Administration.

The Committee on the National Formulary is responsible for the periodical revision of the National Formulary,³¹ a publication of the American Pharmaceutical Association which lists standards for preparations sold under an established name such as arnica, turpentine, and zinc oxide paste. These standards are recognized in the Federal Food, Drug, and Cosmetic Act. In commenting on the status of the National Formulary, the secretary of the American Pharmaceutical Association said:

The passage of the Federal Food, Drug, and Cosmetic Act gave the N. F. (National Formulary) * * * a much more important position in the en-

²⁹ Letter by J. M. Matson, managing executive, National Association of Dyers and Cleaners, Silver Spring, Md., December 19, 1939.

³⁰ "American Pharmaceutical Association," p. 1, American Pharmaceutical Association, Washington, D. C., no date.

³¹ "The National Formulary," by Committee on the National Formulary, 556 pp., sixth edition, Mack Printing Co., Easton, Pa., June 1, 1936.

forcement of the act and also gave * * * the power to promulgate standards for drugs if upon request the appropriate committee of revision did not take action within a reasonable time. * * *

Medical progress is now probably greater in 1 year than it was in a decade when the N. F. was established. * * * Formerly the N. F. was revised over a period of a few years, and after the revision was issued, the Committee on National Formulary was practically inactive during the remainder of the decade. Medical progress now requires that revision be a continuous process.³²

The Committee on the National Formulary has 10 members, each of whom is a chairman of a subcommittee dealing with a specific division: Pharmacognosy, chemicals, solution preparation, extractive preparations, solid preparations for external use, bacteriological or biological preparations, external preparations, miscellaneous preparations, pharmacology and posology, and nomenclature. Each chairman is privileged to select his own committee members, but these must be approved by the president of the American Pharmaceutical Association and ratified by the council of the association, which is composed of 18 members. The present members of the Committee on the National Formulary include 7 members of faculties of schools of pharmacy or other divisions of some college or university, 1 hospital pharmacist, and 2 members of commercial firms.

The United States Food and Drug Administration is not represented on any of these committees or on the council of the association, although conferences on questions of mutual interest are held when desired. The members of the American Pharmaceutical Association recognize, however, that, should the Committee on the National Formulary fail to approve satisfactory standards with reasonable promptness, the privilege of establishing these standards might be withdrawn by the Federal Government.

The Committee on the Recipe Book is responsible for the publication of the "Pharmaceutical Recipe Book,"³³ which provides formulas for preparations ordinarily mixed by individual druggists.

The Committee on Unofficial Standards is expected "to formulate standards, so far as it may be found desirable, for such drugs and chemical products for which standards are not otherwise provided."³⁴ The Council on Pharmacy and Chemistry of the American Medical Association is also active in this work.

A committee serves on the Pharmacopoeia Revision Committee of the United States Pharmacopoeial Convention. This organization is responsible for the revision of the United States Pharmacopoeia,³⁵ which gives standards for drugs (or simples, as the profession speaks of them). These standards are recognized in the Federal Food, Drug, and Cosmetic Act.

³² "National Formulary Revision," by E. J. Kelly, *Journal of the American Pharmaceutical Association*, vol. XXVIII, pp. 629-630, October 1939.

³³ "The Pharmaceutical Recipe Book," by Committee on Recipe Book of the American Pharmaceutical Association, 529 pp., second edition, Mack Printing Co., Easton, Pa., 1936.

³⁴ "Constitution and By-Laws," ch. VIII, art. VIII, American Pharmaceutical Association, Washington, D. C., August 1925.

³⁵ "United States Pharmacopoeia," by United States Pharmacopoeial Convention, 676 pp., eleventh revision, Mack Printing Co., Easton, Pa., June 1, 1936.

STANDARDIZATION ACTIVITIES OF TECHNICAL AND PROFESSIONAL SOCIETIES

There are 30 or more technical and professional societies in this country participating in the development of standards and specifications. The types of membership of these societies vary widely. Some societies are composed exclusively of individuals who have met certain rigid professional requirements, while other societies include a combination of individuals, corporations, trade associations, and educational or institutional agencies. Whatever the nature of the membership, each society represents some technical interest common to all members. Many of the engineering and other technical societies have become outstanding in standardization work, and are conducting extensive research programs.

Much of the scientific research is coordinated under the leadership of such agencies as the National Research Council, the Engineering Foundation, the American Institute of Electrical Engineers, and the American Society of Mechanical Engineers. Research workers are maintained at the National Bureau of Standards, educational institutions, or private technical laboratories.

The three outstanding agencies dealing with the standardization of specifications and test methods are the American Standards Association, the American Society for Testing Materials, and the Association of Official Agricultural Chemists.

American Standards Association.

Industrial standardization in the United States had reached by 1918 a stage of development which demanded greater coordination and agreement between industries, technical groups, and governmental agencies (Federal, State, and municipal) than had been attained thus far. Confusion and rivalry among the proponents of different standards, and conflicts in jurisdiction were continually arising as population increased, industry advanced, and governmental activities were extended.

It was fitting that five of the leading technical societies should attempt to solve these problems. The American Institute of Electrical Engineers invited the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Mining and Metallurgical Engineers, and the American Society for Testing Materials to unite in developing a plan for cooperation in standardization work. On October 10, 1918, they formed an agency to serve as a clearing house through which technical, industrial, and governmental agencies might coordinate and develop their standardization activities so as to evolve, eventually, voluntary national standards which would have a relatively wide application. This was first known as the American Engineering Standards Committee. Gradually other groups were brought into this committee. In time the concept of its objectives was broadened, and in 1928 the committee was reorganized and its activi-

ties greatly extended. At that time the name was changed to the American Standards Association. Since then, its procedures have been further modified to provide for the inclusion of representatives of all interests concerned with the development of standards and to include a wider range of projects:

dimensional standards to allow for interchangeability of supplies or to secure the interworking of parts or of interrelated apparatus; specifications for materials and methods of test; definitions of technical terms used in industry; industrial safety codes to make possible uniform requirements in safety devices for machines and other equipment in the fields of both public and industrial safety; industrial health codes for the prevention of occupational diseases; the development of a national building code; specifications for consumer goods sold in retail trade.³⁶

The organization of the American Standards Association is shown in chart XIV.

The primary membership of the American Standards Association includes 72 national technical societies, trade associations, and governmental departments and agencies. In addition, there are some 2,000 industrial concerns which hold membership either directly or by group arrangement through their trade associations.

The association is democratically controlled by its membership. Finances and general policy matters are in the hands of a board of directors made up of 19 executives, each nominated by a different industry. The technical work is supervised by the Standards Council, which is composed of representatives of all the member bodies.³⁷

The association is supported by dues from all members, except Government departments and agencies, and by subscriptions of sustaining members. The total sum, however, represents only a small fraction of the amount industry spends for standardization. Industry supports this work because it realizes and can demonstrate that standardization along suitable lines pays generous dividends.

Major fields in which standards have been and are being developed by the association are: Automotive, chemical, civil engineering and construction, electrical, ferrous materials and metallurgy, nonferrous materials and metallurgy, mechanical engineering, mining, textiles, transportation, wood, and other miscellaneous lines.

The procedure in developing American Standards by the sectional committee method is shown in chart XV.

Over 3,000 men and women are working on the various committees. The procedure of the American Standards Association provides that committees engaged in developing standards for a commodity must include representatives of all groups having a substantial interest in the standard, including producers of materials used, manufacturers of the product, distributors, users of the product, and technical experts. All of these interests should be represented from the beginning of the development of the standard. Before a standard can be approved there must be evidence of its general acceptance by all groups substantially concerned.

The association provides the machinery through which the industries themselves arrive at decisions. It takes up a new project only upon request of a responsible organization or group. The project may deal with an existing standard already in general use, or one which it is proposed shall be generally accepted, or it may

³⁶ "American Standards Year Book," p. 3, American Standards Association, New York City, 1938.

³⁷ "The American Standards Association," *Industrial Standardization and Commercial Standards Monthly*, vol. 10, p. 149, June 1940.

involve the development of an entirely new standard. It may be any one of a wide variety of types: Dimensional standards; specifications for materials; methods of test; performance specifications; methods of analysis; definitions of technical terms; industrial safety codes; industrial health codes; or a national building code.³⁸

Almost 400 standards have been approved to date by the American Standards Association and over 280 are in the process of development. Most of these standards are for products to be sold to and to be used by industry and for production methods employed by manufacturers. In fact, it was not until the reorganization in 1928 that the American Standards Association so defined its program as to include specifically the development of standards for retail goods. The relatively few standards so far approved for goods to be sold to ultimate consumers are—

standards for testing ice refrigerators; standards for methods of testing woven textile fabrics; specifications for dry batteries; specifications for labeling cotton yard goods; and standards covering installation and performance requirements for all the commonly used gas-burning appliances.³⁹

Attempts have been initiated to formulate standards for bed blankets, bed sheets, and shrinkage of cotton textiles, but these efforts have failed because of lack of support by manufacturers. However, the proposed standards on shrinkage have since been included in the Trade Practice Rules for the Shrinkage of Woven Cotton Yard Goods of the Federal Trade Commission.

In October 1936 increasing demand on the part of women's organizations and gradually rising interest in consumer standards within the American Standards Association led to the organization of an Advisory Committee on Ultimate Consumer Goods to coordinate and direct the standardization work on consumer goods. This committee includes representatives of leading national women's organizations, retailers' associations, and interested Federal agencies. Subcommittees of the Advisory Committee on Ultimate Consumer Goods have reviewed the situation with reference to various standardization projects for consumer goods, which, from time to time, have been initiated under the procedure of the American Standards Association, and have selected certain Commercial Standards approved by the National Bureau of Standards which it has recommended to the Standards Council of the American Standards Association for acceptance as American Standards.

Other committees are investigating the need for work in such fields as shoes, sheets and sheeting, boys' clothing, hosiery, household refrigerators, silver plated tableware, waterproof and water repellant fabrics, and color permanence.⁴⁰

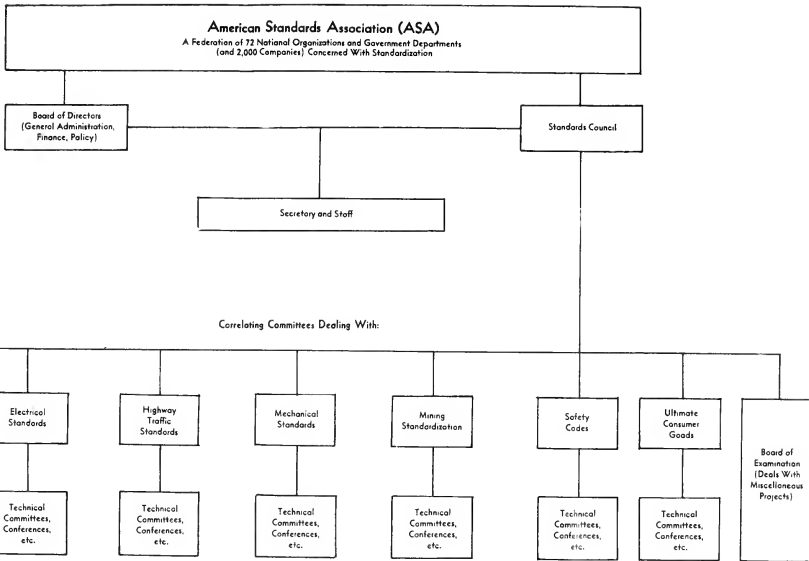
A committee of the American Standards Association is working on the development of standard body measurements to be used as a basis for a uniform system of sizes for children's garments. The standards will be based on a survey of 36 body measurements of 147,000 children between the ages of 4 and 17. This survey was made under the supervision of the United States Bureau of Home Economics and subsidized by the Work Projects Administration.

³⁸ "The Organization and Work of A. S. A. Sectional Committees," p. 2, American Standards Association, New York City, 1939.

³⁹ "Consumer Goods," Industrial Standardization and Commercial Standards Monthly, vol. 10, p. 146, June 1939.

⁴⁰ *Idem*.

CHART XIV



Work on standards is handled by committees or conferences on which all groups concerned are represented. Most of the committees work under the leadership (sponsorship) of one or more of the organizations chiefly concerned.

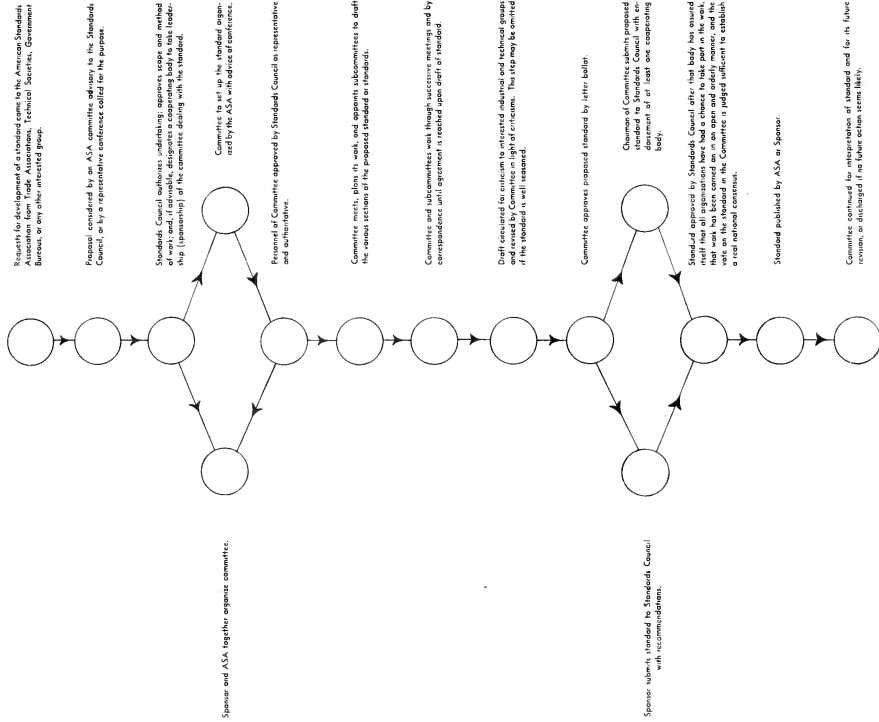
Organization Chart



American Standards Association (ASA)

HOW AMERICAN STANDARDS ARE DEVELOPED

The American Standards Association has four methods of procedure. The most common is the sectional committee method, principal steps of which are given below.



For existing standards or for relatively simple problems of standardization, these other methods are provided by which standards may come before the Association.

- The Existing Standard Method**—Any standard already in existence may be approved as an American Standard provided it is supported by a consensus of the groups concerned. Revisions must be approved by some other method.
- The General Acceptance Method**—A relatively simple standard may be

developed through a conference of the interested groups reinforced by written acceptances.

3. **The Proprietary Standard Method**—A responsible organization having a position of preeminence in the field of the standard may originate the standard. The revision of a standard in the field of the standard may originate under one of the other methods, modify the existing standard or the general acceptance method.

The American Society for Testing Materials.

This society (A. S. T. M.) was organized in 1898 as a section of the International Association for Testing Materials. In 1902 it was incorporated as an independent society, the purpose of which is "the promotion of knowledge of the materials of engineering and the standardization of specifications and methods of testing."⁴¹

The membership of the society is made up of individuals, companies, firms, corporations, associations, laboratories, governmental departments, universities, technical schools, and libraries. It is a national technical society with approximately 4,200 members.

The society has 59 standing committees with a total membership of 3,405. These committees are organized under separate major divisions, such as ferrous metals; nonferrous metals; cementitious, ceramic, concrete, and masonry materials; miscellaneous materials, such as paints, petroleum products, gaseous fuels, coal, timber, paper and its products, rubber products, soaps and other detergents, textile materials, and plastics; and miscellaneous subjects, such as methods of tests, chemical analysis of metals, radiographic testing, nomenclature and definitions, research. The following statement is made concerning the work of these committees:

The standing committees of the society have the broad functions of promoting the knowledge of materials of engineering and the formulation of standard methods of test, specifications, definitions, and recommended practices relating to such materials * * *. The obtaining of accurate technical information on the characteristics of engineering materials is fundamental and serves as a basis for the standardization work, which comprises the following:

1. The development of suitable analytical procedures, sampling techniques, and methods of test for determining the constitution, structure, or properties of materials.

2. The formulation of specifications defining the quality and characteristics of materials.

3. The formulation of standard definitions and systems of nomenclature.

4. The preparation of recommended practices governing certain methods and processes not ordinarily subject to contract.

The scope of activities of each of the individual standing committees is indicated, particularly as to the materials falling within the jurisdiction of each. In general, the committees are interested in both standardization and investigative work, except in those instances where some limitation is definitely indicated.⁴²

The society, which was one of the founding societies of the American Standards Association, is sponsor or joint sponsor of 15 sectional committees functioning under the procedure of that association. These committees deal with a variety of subjects, such as portland cement, drain tile, plastering, copper wire, classification of coal, and methods of testing materials. The society is represented on 34 other sectional committees of the American Standards Association and on 10 technical committees of the International Standards Association. Representatives of the society serve on one or more committees or boards of 17 other organizations.

The American Society for Testing Materials is affiliated with the International Association of Testing Materials.

The A. S. T. M. Standards and Tentative Standards are published by the society. Procedure for promulgation of Tentative Standards

⁴¹ "Year Book," pp. 5-14, American Society for Testing Materials, Philadelphia, Pa., August 1939.

⁴² *Ibidem*.

and A. S. T. M. Standards is shown in chart XVI. The 1939 edition of these standards appears in 3 parts totaling 3,700 pages, and includes 866 standards for materials or test methods:

Part I. Materials.—Ferrous and nonferrous metals, except methods of chemical analysis, general testing methods.

Part II. Nonmetallic materials—Constructional.—Cementitious materials, concrete, masonry building units, ceramics, pipe timber and preservatives, paints, road materials, waterproofing materials, soils, general testing methods.

Part III. Nonmetallic materials—General.—Fuels, petroleum products, electrical insulating materials, rubber, textiles, soaps and detergents, paper, plastics, water, thermometers, general testing methods.

The A. S. T. M. Standards are of exceptional value to industry and consumers. These standards are developed by representatives of a wide variety of interests for their own use in purchasing or production, and are revised promptly as the need arises.⁴³

One of the committees of great interest to ultimate consumers is the textile committee of the A. S. T. M., whose designation is D-13. The functions of this committee are best described in the following excerpt from a letter by Prof. Herbert J. Ball, chairman of the committee:

The committee is organized into subcommittees which deal with every textile fiber and their products, with definitions and nomenclature, methods, machines, humidity, finishing processes, sampling, presentation, and interpretation of data. It has been chiefly instrumental in developing most of the test methods for textiles which are in use today and has formulated 37 separate standards relating to them.

The committee now proposes to add a new subcommittee on household and garment fabrics, whose chief interest will lie in those materials which enter so largely into the construction of ultimate consumer goods. Although it will not deal with the ultimate consumer article itself, it would be concerned with the setting up of definitions, methods of test, and quality standards for the fabric from which such articles are made. Its membership would be composed of producer, consumer, and general interests. Its accomplishments should rest on the firm foundation of scientific tests and data. Through cooperation with the other subcommittees and using a procedure tested by long experience, results may be expected which are practically attainable and mutually satisfactory to those concerned.

The present members of D-13 can supply a vast amount of technical knowledge regarding the production of textiles. The laboratories of its members provide a great variety of testing equipment of both standard and special types. Sources of supply of materials are generously open to the committee for its work. The committee has the benefit of its long experience with work of this character; its reputation is widely known and well established; and it benefits from the universal prestige which the A. S. T. M. enjoys.⁴⁴

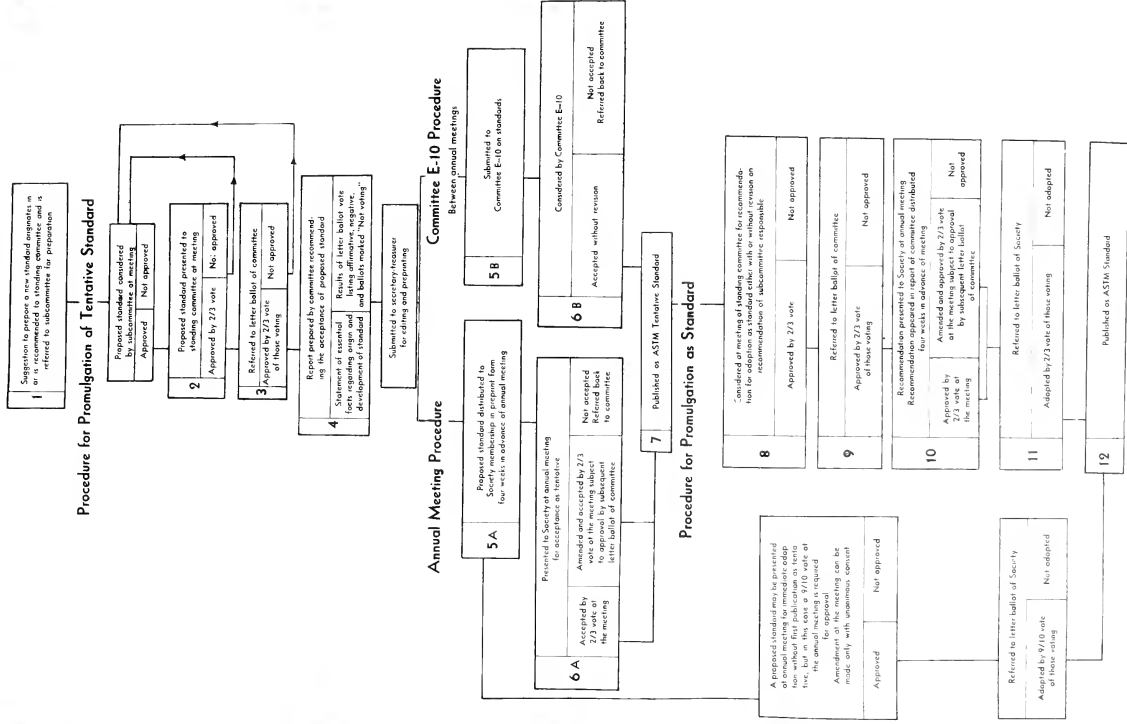
Association of Official Agricultural Chemists.

The Association of Official Agricultural Chemists of North America (A. O. A. C.) was founded in 1884 by several representative agricultural chemists interested in adopting a uniform system for the analysis of commercial fertilizers.

At the first meeting methods for the determination of ammonia, phosphoric acid, and potash in commercial fertilizers were adopted. Later the passage of food and drug, and insecticide and fungicide control legislation by the States and by the Federal Government made it necessary to extend the scope of the association's activities for the reason that the methods adopted by the association were designated as the

⁴³ "Committee D-13 and Consumer Goods," *Journal of Home Economics*, vol. 28, pp. 390-391, June 1936.

American Society for Testing Materials (ASTM) Outline of Standardization Procedure



Note.—Revisions of a standard follow the same procedure as a new Tentative Standard

official methods for the enforcement of such legislation as well as for the control of feeds and fertilizers by the various States.

The membership is institutional, that is, composed of chemists connected with the United States Department of Agriculture; State, or provincial experiment stations; colleges; or bodies charged with official control of agricultural products or farm commodities.

Chemists connected with commercial firms or institutions and others interested in the objectives of the association, who are not eligible for either active or associate membership, may attend its meetings, take part in the discussions and collaborative testing, and, if permission is secured from the executive committee, may present papers.

The objectives of the association are—

To secure, devise, test, and adopt uniform and accurate methods for the analysis of fertilizers, soils, foods, feeding stuffs, dairy products, insecticides and fungicides, and other materials relating to agricultural pursuits; also medical products; caustic poisons; paints, paint materials, and varnishes;

To secure uniformity in the statement of analytical results;

To conduct, promote, and encourage research in chemistry in its relation to agriculture;

To afford opportunity for the discussion of matters of interest to agricultural chemists.⁴⁵

The publications of the association include the "Journal of the Association of Official Agricultural Chemists,"⁴⁶ in which the proceedings of the association are published, and the "Official and Tentative Methods of Analysis,"⁴⁶ which presents methods of analysis for the following: Soils; fertilizers; sewage; agricultural liming materials; agricultural dust; insecticides and fungicides; caustic poisons; naval stores; paints, varnishes, and constituent materials; leathers; tanning materials; plants; beverages (nonalcoholic) and concentrates; malt beverages, sirups and extracts, and brewing materials; wines; distilled liquors; baking powders and baking chemicals; coffee and tea; cacao bean and its products; cereal foods; coloring matters in foods; dairy products; eggs and egg products; fish and other marine products; flavoring extracts; fruits and fruit products; grain and stock feeds; meat and meat products; metals in foods; nuts and nut products; oils, fats, and waxes; preservatives and artificial sweeteners; spices and other condiments; sugars and sugar products; vegetables and vegetable products; vitamins; waters, brine and salt; radioactivity; drugs; bacteriological methods; microchemical methods; and also, a list of definitions of terms and interpretations of results on fertilizers and liming materials.⁴⁷

In the development and formulation of a method of analysis, the procedure of which is shown in Chart XVII, a "referee" is appointed to study any subject for which the association has not yet developed an official method, or a method that seems to require further investigation. The duties of this referee are to direct and conduct research

⁴⁵ "Constitution," Journal of the Association of Official Agricultural Chemists, vol. XVIII, p. 96, February 1935.

⁴⁶ Journal of the Association of Official Agricultural Chemists, Association of Official Agricultural Chemists, Menasha, Wis.

⁴⁷ "Official and Tentative Methods of Analysis of the Association of Official Agricultural Chemists," 710 pp., Association of Official Agricultural Chemists, Washington, D. C., 1936.

⁴⁸ Ibid., pp. 683-690.

on methods and subjects assigned to him, to prepare and distribute samples and reagents to collaborators, to present at the annual meeting of the association the results of work done and recommendations of methods based thereon, and to direct and encourage general discussion at the meeting.

Methods to be adopted as official, or changes to be made in official methods, must be recommended by the referee for such action at two annual, but not necessarily consecutive, meetings of the association. Final action on adoption does not follow first action automatically; the referee must recommend the second (final) action.

Methods to be adopted as tentative require only one recommendation on the part of the referee and publication of the methods in the proceedings of the association.

Departures from this regular method of procedure for the adoption of methods can only be made by vote of the active members of the association to suspend the bylaws involved.⁴⁵

A similar procedure is followed in adopting tentative and official definitions or interpretations of a fertilizer. The adoption of a fertilizer definition or interpretation as "tentative," or an amendment of a "tentative" fertilizer definition or interpretation must be recommended by a Committee on Definitions of Terms and Interpretation of Results on Fertilizers and must be published in the proceedings of the association. To be adopted as "official" or for an official fertilizer definition or interpretation to be amended, appropriate recommendation by the committee is required at two annual meetings.

Other Technical and Professional Societies.

In order to suggest the diversity of the standards with which technical and professional societies are concerned, to indicate the cooperation existing among these societies and other agencies, and to give an idea of the extent of the use of the standards established by the societies, a brief account of a few typical societies follows.

The American Home Economics Association, a professional association of trained home economists, has chapters in each State, the District of Columbia, Puerto Rico, and Nova Scotia.

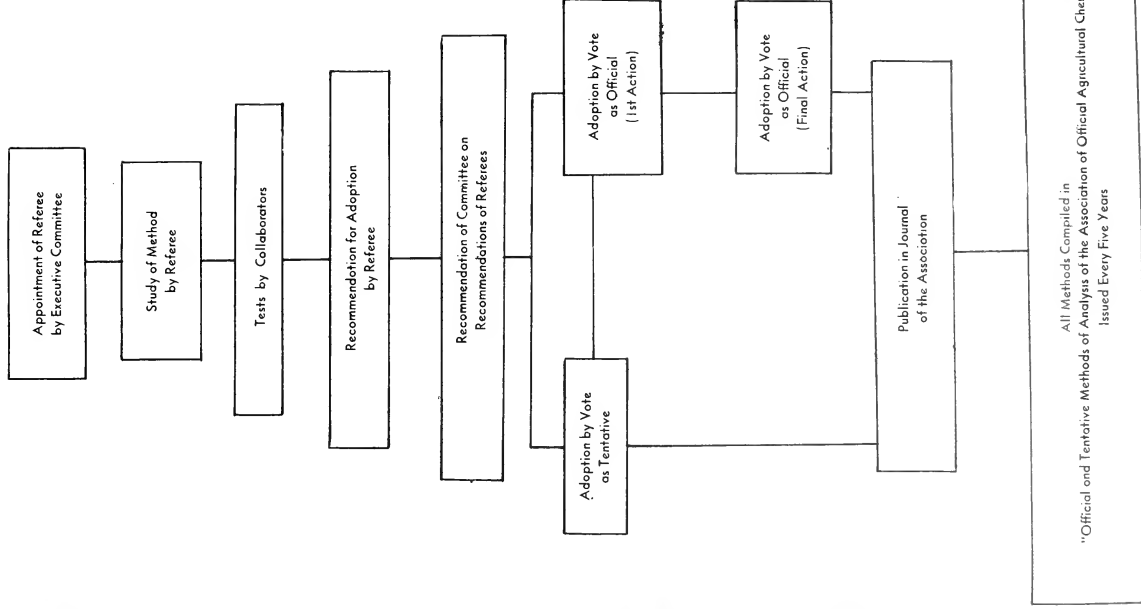
The association's interest in standards, grades, and informative labeling of commodities sold at retail is of long standing. In 1919, following the World War, when textile fabrics were high in price and unreliable in quality, the textile section of the American Home Economics Association started a program to promote the use of informative labels in the marketing of fabrics. The association endeavored to gain the cooperation of the textile industry, to further the research required for the establishment of minimum standards for textile fabrics, and to encourage the education of consumers in the intelligent use of these standards. Special studies were made of women's habits in buying fabrics and garments, of the wearing qualities of bed sheets, and of the wearing qualities of silk of known composition.

The American Home Economics Association, realizing the need of research on the performance characteristics of fabrics, conferred with textile specialists and members of the industry. As a result, the first abrasion machine for testing the durability of fabrics was built at the National Bureau of Standards. Under the auspices of the

⁴⁵ "Report of Committee on Recommendations of Referees," *Journal of the Association of Official Agricultural Chemists*, vol. XVII, n. 43, February 1934.

Association of Official Agricultural Chemists

Procedure Chart for the Adoption of a Method of Analysis





National Research Council, conferences were arranged with textile experts and representatives of the textile industry. The industry failed to support this effort. In order to stimulate research in this field, the association, in 1926, established fellowships in textile research for graduate home economics students. Data from these studies later proved of significant value in conferences on standardization.

As early as 1922 the association cooperated with the Division of Simplified Practice of the National Bureau of Standards in a survey relating to standardization of sizes of bed blankets. In 1926 a standing committee was appointed by the association to cooperate with this Division and the functions of this committee gradually extended to include work on quality and performance standards, grades, and informative labeling of consumer commodities. Efforts were made by the association to strengthen the consumer aspects of home-economics education. The association sought the cooperation of manufacturers and retailers in providing information to consumers.

Representatives of the association have participated in numerous conferences of the Division of Simplified Practice and the Division of Trade Standards of the National Bureau of Standards, in Trade Practice Conferences of the Federal Trade Commission, and in conferences of other governmental and private agencies. Association representatives appeared at code hearings of the National Recovery Administration, and at hearings on marketing agreements of the Agricultural Adjustment Administration, in support of informative labeling, truthful advertising, acceptable standards, and fair prices for consumer commodities.

The association has been a member of the American Standards Association since 1929 and is represented on the A. S. A. Standards Council. At the request of the American Home Economics Association, conferences were called by the American Standards Association to consider the establishment of standards for household refrigerators, bed blankets, bed sheets, and weighted silk.

The American Home Economics Association, a charter member of the National Consumer-Retailer Council, has contributed toward the cooperation of consumers and retailers in promoting standards and informative labeling of consumer commodities.

The Journal of Home Economics of the American Home Economics Association has published articles and editorials on standards and labeling of consumer commodities, related buying problems, and consumer education. The association has published leaflets on special commodities, which illustrate the type of information considered necessary in purchasing household supplies and equipment. A study outline on consumer purchasing, a forerunner of various similar outlines by other agencies, was also published. Its consumer-education service has proved exceptionally valuable in keeping interested persons informed as to the latest developments in the field of standards, grades, labeling, and consumer education.

The American Association of Textile Chemists and Colorists was organized in 1921. It has individual, corporate, and sustaining members totaling approximately 2,400.⁴⁹

⁴⁹ "1939 Year Book of the American Association of Textile Chemists and Colorists," p. 699. Howes Publishing Co., New York City, 1939.

The purposes of the American Association of Textile Chemists and Colorists are—

To promote increase of knowledge of the application of dyes and chemicals in the textile industry.

To encourage in any practical way research work on chemical processes and materials of importance to the textile industry.

To establish for the members channels by which the interchange of professional knowledge among them may be increased.⁵⁰

The association's research committee has 25 subcommittees, with 3 research associates and 2 research assistants working under its direction on various projects, such as wash fastness tests for dyed or printed cotton, silk, and dyed wool; fastness to light; fastness of dyed materials to perspiration, to acids and alkalies; waterproofness of fabrics; analysis of fiber mixtures; shrinkage of textiles; and deterioration of textile fibers exposed to light.

In speaking of the work of the association, the chairman of the Committee on Research Program has stated:

While the activities of this association are closely allied with the textile manufacturing and distributing branches of the industry, the research committee of the association has endeavored at all times to give the ultimate consumer full consideration when establishing standards of fastness.⁵¹

The Society of Automobile Engineers was organized in 1905. In 1910 it took over the work previously carried on by the Mechanical Board of the Association of Licensed Automobile Manufacturers, which had been gathering data on various materials used by its members. The society then appointed the first standards committee in the automotive industry. This committee had 16 divisions dealing with problems relating to such products as aluminum and copper alloys, ball and roller bearings, carburetors, frame sections, and springs and fastenings for solid wheels. In 1917, in order to consolidate and coordinate standardization work in the automotive industry, this society combined with the Society of Tractor Engineers, the American Society of Aeronautic Engineers, and engineers interested in boat and gas engines to form the Society of Automotive Engineers.⁵²

The Society of Automotive Engineers (S. A. E.) has approximately 3,000 individual members. Its purpose is—

To promote the arts, standards, and engineering practices connected with the design, construction, and utilization of automotive apparatus, all forms of self-propelled or mechanically propelled mediums for the transportation of passengers or freight, and internal-combustion prime-movers.

In its standardization work the Society of Automotive Engineers is primarily concerned with engineering designs. It listed in the 1939 S. A. E. Handbook⁵³ 18 divisions of its Standards Committee and 2 special committees. The divisions are: Aircraft; aircraft engine; axle and wheels; ball and roller bearings; Diesel engine; electrical equipment; gasoline engine; iron and steel; lighting; lubricants; motor-coach and motortruck; nonferrous metals; parts and fittings; passenger car; production; screw threads; tractor and equipment; and transportation. The special committees are: Methods of Expressing Limits and Tolerances; and Patents.

⁵⁰ "1939 Year Book of the American Association of Textile Chemists and Colorists," p. 45, Hoves Publishing Co., New York City, 1939.

⁵¹ Letter by L. A. Olney, Lowell, Mass., September 13, 1939.

⁵² "History of Automobile Standardization," S. A. E. Journal, p. 698, June 1930.

⁵³ "S. A. E. Handbook," pp. XXI-XXVII. Society of Automotive Engineers, New York City, 1939.

In addition to its own committee work, the society is a sponsor of 11 sectional committees of the American Standards Association and is also represented on 29 other sectional committees. These committees deal with standardization of parts, methods of tests, and safety. The Society of Automotive Engineers is also represented on 18 committees of the American Society for Testing Materials and cooperates in the standardization work of 20 other organizations.

The S. A. E. Standards and Recommended Practices are used by a wide range of industries. The extension of their use, however, is said to depend on economic and other factors in the individual plant. The standards most commonly accepted are the ones for parts, such as spark plugs, which are manufactured in one factory and used in the assembly of products in different plants.

The S. A. E. Standards which may be used outside of the automotive industry are usually submitted to the American Standards Association for approval as American Standards, but those restricted to use in the automotive industry remain only S. A. E. Standards.

The progressive development of the society's activities is indicated in the following statement:

As mass production rapidly became the fundamental basis of automobile manufacturing, the society in 1926 initiated standardization in automotive production engineering. This new field of standardization has since become a national project for all industries and the society is cooperating in this work also under the procedure of the American Standards Association.

Progress in automotive design soon made possible fleet operation of motortrucks and motor coaches, and the society undertook standardization in the motor transport field, the first standards relating specifically to these operations being adopted in June 1931.

Soon thereafter the regular manufacture of passenger car or "house" trailers became an established industry that included several of the automotive manufacturers. The first trailer committee was organized in December 1936 by the society, with the cooperation of the trailer manufacturers, and the first trailer standards were adopted in January 1938.⁵⁴

The American Institute of Electrical Engineers (A. I. E. E.) was founded in 1884. The purpose of the institute is the advancement of the theory and practice of electrical engineering. The institute is the national society of the electrical engineering profession.

The standards developed by committees of the institute are recognized throughout the United States as the authoritative sources of information on the "terms and conditions which characterize the rating and behavior of electrical machinery and apparatus, with special reference to the conditions of acceptance tests."⁵⁵

The first A. I. E. E. Standards, developed by a committee of seven, were adopted in 1899. Since that date standardization activities have been continued and extended as experience has demonstrated the importance of standardization in the development of the electrical industry. The American Institute of Electrical Engineers is one of the founders of the American Standards Association. A large proportion of the A. I. E. E. Standards have been submitted to the American Standards Association and approved as American Standards.

The Illuminating Engineering Society (I. E. S.) was founded in 1906. It has both individual and sustaining members. The latter may be a company, firm, association, or individual interested in the

⁵⁴ "S. A. E. Handbook," p. V, Society of Automotive Engineers, New York City, 1939.

⁵⁵ "A. I. E. E. Standards," p. 2 (A. I. E. E. No. 1), American Institute of Electrical Engineers, New York City, April 1925.

purposes of the society. The society seeks "the advancement of the theory and practice of illuminating engineering and the dissemination of knowledge related thereto."

Twelve technical committees of the Illuminating Engineering Society composed of 225 members are concerned with the following projects:

The development of testing specifications for lighting equipment; the formulation of specifications for I. E. S. certified portable lamps, including the I. E. S. better-sight lamp; improvement of lighting conditions in the home; the codification of street and highway lighting principles and practice; school lighting and industrial lighting practice, including recommendations covering lighting requirements for the seeing tasks in approximately 10 major industries; and the publication and distribution of lighting data covering practically every phase of applied lighting technique.

Other projects include the work on light in architecture and decoration; the relation of adequate light to human safety and its effect on production in industry; the motor vehicle lighting code; aviation lighting requirements and practices; the nomenclature of illuminating engineering with definitions of the terms used; the correlation and dissemination of information on natural lighting; the nomenclature, classification, and properties of illuminating glassware and the Society's work in the field of lighting education.⁵⁶

The Illuminating Engineering Society is represented on 7 sectional committees of the American Standards Association and committees dealing with lighting or related problems of 14 other organizations.

The society has developed standard specifications for I. E. S. better-sight lamps. Lamps which meet these specifications are identified on the market by certification tags issued by the Electrical Testing Laboratories, which follows a testing plan to insure continuing compliance with I. E. S. specifications. These specifications cover construction and performance with special reference to definite standards of illumination.⁵⁷

The American Society of Mechanical Engineers (A. S. M. E.) initiated its standardization work in 1885 by appointing a Standardization Committee on Pipe and Pipe Threads. Its standardization activities have been almost continuous from that date and are conducted as follows:

The technical committee activity of the society is supervised by four standing committees and one special committee, viz, the committees on research, standardization, power test codes, safety, and boiler code. These committees cooperate fully with industry, with similar committees of other societies, and with such organizations as the Engineering Foundation, the American Standards Association, and the International Electro-technical Commission.⁵⁸

This society is a founder of the American Standards Association. It is an outstanding organization in the promotion of dimensional standardization and is the sponsor or joint sponsor of many American Standards Association committees dealing with the standardization of screw threads; gears; surface qualities; bolt, nut, and rivet proportions; fire-hose couplings; safety codes; pressure piping; and small tool and machine tool elements, and so forth. A large proportion of A. S. M. E. Standards has been submitted and approved as American Standards.

⁵⁶ "Illuminating Engineering Society: Its Objectives and Activities," p. 5, Illuminating Engineering Society, New York City, no date.

⁵⁷ "Specifications for I. E. S. Portable Lamps," 10 pp., Mimeographed, Illuminating Engineering Society, New York City, 6th ed., November 10, 1938.

⁵⁸ "Aims and Activities," p. 3, American Society of Mechanical Engineers, New York City, no date.

The A. S. M. E. Standards, as those of similar professional societies, are widely accepted and used by many industries as well as by governmental agencies.

The American Chemical Society (A. C. S.) was organized in 1876, reorganized in 1891-92 to further national cooperation, and was granted a Federal charter in 1938. This charter states:

SECTION 2. That the objects of the incorporation shall be to encourage in the broadest and most liberal manner the advancement of chemistry in all its branches; the promotion of research in chemical science and industry; the improvement of the qualifications and usefulness of chemists through high standards of professional ethics, education, and attainments; the increase and diffusion of chemical knowledge; and by its meetings, professional contacts, reports, papers, discussions, and publications, to promote scientific interests and inquiry, thereby fostering public welfare and education, aiding the development of our country's industries, and adding to the material prosperity and happiness of our people.

SECTION 4 That the American Chemical Society shall, whenever called upon by the War or Navy Department, investigate, examine, experiment, and report upon any subject in pure or applied chemistry connected with the national defense, the actual expense of such investigations, examinations, experiments, and reports to be paid from appropriations which may have been made for that purpose by Congress, but the society shall receive no compensation whatever for any services to the Government of the United States: *Provided*, That the title to any and all inventions and discoveries made in the course of such investigations, examinations, and experiments that, in the opinion of the Secretary of the Navy or the Secretary of War, involve the National defense, shall vest in the Government of the United States, and the Government of the United States shall have unlimited license under all other inventions and discoveries.⁹⁹

The American Chemical Society has over 24,000 members, who have completed required college training in chemistry or chemical engineering or the equivalent and who have been actively engaged in some form of chemical work. The American Chemical Society—

leads in establishing standard specifications and analytical procedures for chemicals and chemical products. Use of its specifications for analytical reagents is increasing. At present American Chemical Society committees are engaged in developing standards for (a) reagent chemicals, (b) apparatus, (c) analysis of commercial fats and oils, (d) soap and soap products, (e) examination of water and sewage, (f) biological stains, (g) vitamin research, and (h) methods of analysis.¹⁰⁰

The society has established standards for chemical equipment and apparatus, as well as standards for chemical reagents, which are widely used. These standards have been approved and used by the United States Government.

The discussion of standardization activities of technical and professional societies could be considerably extended. However, the few examples presented illustrate accomplishments in the development of standards through cooperation of organized groups.

The mere listing of a few additional technical societies will serve to indicate the areas of other activities and potential contributions.

The American Society of Heating and Ventilating Engineers is in a key position to guide the establishment of standards in an industry in which rapid developments are taking place.

The American Society of Sanitary Engineers, in cooperation with other groups, is promoting desirable standards in plumbing equipment.

⁹⁹ An Act to incorporate the American Chemical Society," 2 pp., Public No. 358, 75th Cong., ch. 762, 1st sess., H. R. 7709, January 1, 1938.

¹⁰⁰ "What It Is Doing for Chemists," p. 6, American Chemical Society, Washington, D. C., no date.

The American Institute of Architects is represented on many committees concerned with the development of standards for materials, dimensions, and codes for building of all kinds.

The American Institute of Mining and Metallurgical Engineers, the American Railway Engineering Association, the American Society of Civil Engineers, and others are organizations which have been and are participating actively in standardization programs.

Medical and Dental Organizations.

There are several medical, surgical, and dental associations which have established standards of materials and practices for use of their respective professions. These standards are of immediate value to those requiring medical or dental treatment and also to the public at large, because many of these standards contribute to the furtherance of public health.

The American Medical Association, the American College of Surgeons, the American Dental Association, and related associations have been active in promoting the improvement of the education and practical training of physicians, surgeons, and dentists. They have also established standards for physical and other equipment of educational institutions and clinics in which this training is provided.

The American Medical Association (A. M. A.) is active in the improvement of quality and standardization of medical products primarily for use by the medical profession. The committees of the association whose activities relate to standards are the Council on Pharmacy and Chemistry; the Council on Physical Therapy; the Council on Food, originally a subcommittee of the council on pharmacy and chemistry; the Advisory Committee on Advertising of Cosmetics and Soaps; and the Bureau of Investigation.

The Council on Pharmacy and Chemistry was created in 1905 to protect the public and the medical profession against fraud, undesirable secrecy, and objectionable advertising of proprietary medical articles. The council judges (on the basis of scientific and clinical study) products claimed to have therapeutic values. The products accepted⁶¹ by the council are described in the *Journal of the American Medical Association* and are included in *New and Nonofficial Remedies*,⁶² which is revised and published annually; approximately 900 accepted articles are listed in the 1939 edition. Statements are issued for both accepted and rejected articles, and each edition of *New and Unofficial Remedies* includes a list of articles appearing in the previous issue but excluded in the current edition.

The Council on Physical Therapy, created in 1925, investigates and reports on the merits of nonmedical apparatus and devices, offered for sale to physicians, hospitals, and the public; 232 items are listed in the "Apparatus Accepted" list.⁶³ This council has established standards of practice and standard definitions and terms used in physical therapy.

The Council on Foods checks the health claims made for manufactured foods by their producers. The council's findings are made known

⁶¹ "Official Rules of the Council on Pharmacy and Chemistry of the American Medical Association," 38 pp., American Medical Association, Chicago, Ill., January 3, 1940.

⁶² "New and Nonofficial Remedies," 617 pp., Council on Pharmacy and Chemistry, American Medical Association, Chicago, Ill., 1939.

⁶³ "Apparatus Accepted by the Council on Physical Therapy," 78 pp., Council on Physical Therapy, American Medical Association, Chicago, Ill., September 1938.

to the medical profession through the Journal of the American Medical Association. Producers of foods which meet the requirements of the council are granted the use of a "seal of acceptance." This service is not available to producers of individual brands of natural foods, such as eggs, fresh fruits, or vegetables. Approximately 3,800 foods are listed in the 1939 issue of Accepted Foods.⁶⁴

The Advisory Committee on Advertising of Cosmetics and Soaps was recently formed to advise the manager of the Journal of the American Medical Association concerning advertisements of cosmetics and soaps which are submitted to him.

The Bureau of Investigation has for its primary objective the collection and dissemination of information on "patent medicines," quacks, medical fads, and various other phases of pseudo-medicine. It collects its information through original investigations and research; data received from Federal, State, and municipal agencies; information in technical and other journals; and from reports of special commissions.

The American College of Surgeons is a society of surgeons of North America and South America. This society is actively engaged in standardization work. In 1930 it published the first authoritative work on the standardization of surgical dressings, relating to the most desirable quality, size, and shape.

In 1931 the Division of Simplified Practice, Bureau of Standards of the United States Department of Commerce, approved the report, thereby making the standards authoritative. At the same time a committee was appointed to make further studies, to keep in touch with changing conditions, and to make such recommendations as might become advisable from time to time. The American College of Surgeons in its first Manual of Surgical Dressings included these recommendations, as well as information relative to manufacture, sterilization, storage, and other matters pertinent to the use of surgical dressings. In 1933 a preliminary report of the committee was presented to and approved by the American Hospital Association. It is thus that the movement for standardization of surgical dressings was initiated. The work has since been carried on through the cooperative activities of the American College of Surgeons, the American Hospital Association, and the Division of Simplified Practice, Bureau of Standards of the United States Department of Commerce.⁶⁵

The 1940-41 Yearbook of the college gives a classification of surgical dressings on the basis of function and essential characteristics. The items covered include sponges; abdominal packs; sterile gauze dressings; pads; cotton balls; gauze drains, such as cigarette drains and tampons; bandages; and binders. Standard dimensions are furnished for different sizes of the first five of these items.

The College has also developed standards for hospitals.⁶⁶ These deal with personnel and its organization; minimum standards for different types of hospital services including cancer clinics; clinical laboratories; obstetrical, X-ray, physical therapy, and out-patient departments; anesthesia; traumatic surgery; treatment of fractures; nursing service; and medical records; as well as standards for the small hospital.

The American Institute of Homeopathy published the first Homeopathic Pharmacopoeia in 1897. The fifth revision of this Pharma-

⁶⁴ "Accepted Foods and Their Nutritional Significance," 492 pp., Council on Foods, American Medical Association, Chicago, Ill., 1939.

⁶⁵ "American College of Surgeons 1940-41 Year Book," 1,077 pp., American College of Surgeons, Chicago, Ill., 1940.

⁶⁶ "Manual of Hospital Standardization," 96 pp., American College of Surgeons, Chicago, Ill., no date.

copoeia⁶⁷ was published in 1938 and, as stated in the preface, "is designed to furnish directions for the selection and preparation of remedies which are thoroughly adapted to the purpose of homeopathic prescribing." It is for the use of the pharmacist as well as the physician.

The standards for drugs in the Homeopathic Pharmacopoeia are recognized in the Federal Food, Drug, and Cosmetic Act.

The American Dental Association (A. D. A.) has been active in the standardization of materials used in dental practice. It promotes research on these materials through research fellowships maintained at the National Bureau of Standards.

The Council on Dental Therapeutics is a standing committee of the American Dental Association. This committee accepts and rejects articles coming within its purview on the basis of available scientific evidence. Acceptance of an article does not connote a recommendation. * * * On this basis the council designates its favorable action on a product "acceptance" rather than "approval." It should also be noted that the major portion of the council's work is directed to the dental profession.⁶⁸

Products must meet a set of definite requirements before the seal of acceptance may be used.⁶⁹ The American Dental Association publishes Accepted Dental Remedies, prepared by the Council on Dental Therapeutics.⁷⁰

The appreciation of the work of the council is indicated by the increasing number of inquiries received, many of which ask for a list of safe dentifrices.

The American Hospital Association plays an active part in standardization. It has invited the cooperation of the National Bureau of Standards in developing Commercial Standards for various products such as clinical thermometers, rubber sheeting; surgeon's latex and rubber gloves, and mattresses. The association has sponsored the Simplified Practice Recommendations for hospital beds, china, hospital textiles, plumbing fixtures, and surgical dressings.

The American Hospital Association is an associated member of the American Standards Association and is represented on its committees dealing with products used in hospitals.

⁶⁷ "The Homeopathic Pharmacopoeia of the United States, Fifth Revised Edition," 68 pp., published under the direction of the Committee on Pharmacopoeia, American Institute of Homeopathy, by O. Clapp and Sons, Boston, Mass., 1938.

⁶⁸ "Letter by Harold L. Hansen, secretary, Council on Dental Therapeutics, American Dental Association, Chicago, Ill., January 19, 1940.

⁶⁹ "Official Rules of the Council on Dental Therapeutics of the American Dental Association," 35 pp., Chicago, Ill., July 1939.

⁷⁰ "Accepted Dental Remedies," 304 pp., Council on Dental Therapeutics, American Dental Association, Chicago, Ill., 1939.

CERTIFICATION OF PRODUCTS BY TRADE ASSOCIATIONS AND TECHNICAL AND PROFESSIONAL SOCIETIES

Consumers often have very unsatisfactory experiences with the goods they purchase. The major reason for this seems to be lack of useful information concerning the character and performance value of retail merchandise. Therefore, it is easy to understand the consumer's request for some assurance of the quality of the products he buys, and the manufacturer's effort to devise some means by which to gain the consumer's confidence in his product. This has led to the adoption by different agencies, both public and private, of various methods of certification or guaranty of commodities. These methods have ranged from Federal or municipal inspection of commodities and quality or grade-marking programs, to guaranties by irresponsible agencies.

An extensive study of certification and labeling was made by the American Standards Association and reported in 1932. This was "A factual survey of the methods and results of certification and labeling in the marketing of commodities as practiced by trade and technical associations and governmental bodies."⁷¹

The certification and labeling activities of over 60 agencies were surveyed. The report covers a wide range of commodities and services including lumber, foods, drugs, dental supplies, electric wiring, heat installations, mattresses and pillows, mirrors, paper products, steel, textiles, tile, wallpaper, various appliances, and miscellaneous materials.

The Certification Plan developed by the National Bureau of Standards provides means whereby those who make purchases through contracts are enabled to identify firms which are willing to certify that their goods meet certain Federal Specifications or Commercial Standards. This plan is described in detail on page 91.

Provisions are included in numerous Commercial Standards and in some Simplified Practice Recommendations developed by industries in cooperation with the National Bureau of Standards which require the labeling of products to indicate their adherence to a specific Commercial Standard or Simplified Practice Recommendation. A few examples follow.⁷²

The Mirror Manufacturers Association adopted a specification covering five grades of plate-glass mirrors which was promulgated as Commercial Standard CS27-30. This was later revised (CS27-36) to include "shock" or common window glass mirrors, and to eliminate two grades. The association recommended to mirror manufacturers that polished plate-glass mirrors be labeled as follows: Red for "A" quality; blue for "No. 1" quality; and green for "No. 2" quality with the words:

⁷¹ "Certification and Labeling Activities in 60 Commodity Fields," by P. G. Agnew, and J. W. McNair, A. S. A. Bulletin, vol. 3, pp. 1-23, January 1932.

⁷² Material on pages 225-233 is based on data furnished by the National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

We guarantee this mirror to be manufactured of polished plate glass and to be of ----- quality as specified in Commercial Standard CS27-36, issued by the National Bureau of Standards, U. S. Department of Commerce.

Shock mirrors shall be labeled as follows: Yellow for "A" quality with the words:

We guarantee this mirror to be made of ----- common window glass.
* * *

The Tile Manufacturers Association has adopted uniform grade names and a color scheme for grade-marking, and certificates to accompany packages of various types of tiles manufactured to comply with the Simplified Practice Recommendation R61-30. If required in the architect's specification, typical samples of each kind and grade of tiles as indicated and proposed to be used, and shop drawings shall be submitted to the architect for approval. Each sample shall be marked with the name of the manufacturer and the grade of the tile. Approved samples shall be retained by both the architect and the tile contractor. Before setting any tiles, the tile contractor shall furnish to the architect a certificate of grade, properly filled in on the form of grade certificate issued by the association. The certificate shall be signed by the manufacturer of the tiles; shall state the grade, kind, and full quantities of tiles; and give identification marks for all packages of tiles furnished under the contract. Packages shall be branded with corresponding shipping marks, and shall be subject to inspection by the architect or his representative before being opened.

The Institute of Book Cloth and Impregnated Fabrics Manufacturers in cooperation with the Book Manufacturers Institute and the Employing Bookbinders of America, has sponsored the establishment of Commercial Standard CS57-40, for book cloths, buckrams, and impregnated fabrics for bookbinding. In connection with this Commercial Standard, manufacturers of starch-filled and impregnated bookbinding fabrics shall place on their fabric a label to the effect that—

These goods are manufactured to conform with Commercial Standard CS57-40 issued by the United States Department of Commerce.

Through the joint cooperation of the Southern Cypress Manufacturers' Association, the Red Cedar Shingle Bureau, and the California Redwood Association, a quality standard has been established for tidewater red cypress, red cedar, and California redwood shingles. Shingles produced by members of the California Redwood Association may be readily identified by a label which appears on each bundle. This label reads:

Shingles No. 1 grade. These shingles are guaranteed by the manufacturer, inspected for and certified by the California Redwood Association to meet all the quality requirements of Commercial Standard CS31-38 for redwood shingles as issued by the United States Department of Commerce. 100 percent edge grain, heartwood 200 percent.

The Red Cedar Shingle Bureau maintains a corps of trained inspectors who visit the plants at irregular intervals to check on the quality of shingles. In addition to labels for the No. 1 grade which meet the requirements of Commercial Standard CS31-38, labels are also issued and placed on bundles of shingles for No. 2 and No. 3 grades. These latter grades were established by the Red Cedar Shingle Bureau.

The American Walnut Manufacturers Association has adopted a certification mark "American walnut certified veneers" and maintains an inspection service and issues a certificate of inspection for each shipment which states that the walnut veneers have been rigidly graded and inspected by an independent inspector whose name appears on the certificate. It further states that veneers are certified to comply with the requirements of Commercial Standard CS64-37 for quality, workmanship, thickness, full measurement, and the true representation of the flitch by the samples.

The Hardwood Dimension Manufacturers Association has developed a guaranty certificate which reads as follows:

This hardwood dimension lumber has been manufactured by a member of the Hardwood Dimension Manufacturers Association and is guaranteed by the undersigned to conform to Commercial Standard CS60-36 issued by the National Bureau of Standards, United States Department of Commerce. The certificate is signed by the manufacturer using it.

The National Oak Flooring Manufacturers' Association promoted the establishment of a Commercial Standard for white oak and red oak flooring. The association has adopted a label by which manufacturers and the association jointly certify full compliance with the Commercial Standard CS56-36. The label applied to bundles of oak flooring states:

This oak flooring is guaranteed and marked for grade by the manufacturer, is inspected and certified by the National Oak Flooring Manufacturers Association to meet all requirements of the Commercial Standard CS56-36 as issued by the National Bureau of Standards of United States Department of Commerce.

The Douglas Fir Plywood Association has adopted a certificate of inspection which is signed, sealed, and sworn to by an inspector of the association. The certificate contains a statement that the inspector certifies that the plywood so inspected—

complies with the grade specification of Commercial Standard CS45-38 of the United States Department of Commerce.

In addition to products for which Commercial Standards are available, many organizations provide certificates, labels, or guaranties for products which conform to grading rules, standards, or specifications formulated by these organizations.

The activities of these organizations in the field of certification follow:

The National Hardwood Lumber Association is engaged in establishing and maintaining grading rules covering hardwood lumber. A staff of bonded inspectors in the principal producing and consuming centers of the country are authorized to issue certificates on lumber shipments.

The Mahogany Association, composed of American firms that import genuine mahogany logs and manufacture them into lumber and veneer, licenses manufacturers to use labels issued by the association and to affix these labels to furniture made of genuine mahogany. Contracts between the manufacturers and the association contain penalty clauses in the form of liquidated damages for willful misuse of the labels. Labels are issued in two colors. The red label on a piece of furniture indicates that it is made of solid mahogany lumber, whereas the blue label means that the furniture is made of solid mahogany lumber for frame parts and of mahogany plywood for larger surfaces.

The association states that it has been found that the penalty contract automatically enforces proper use of the labels and that during the 2 years they have been in use not a single violation has come to the attention of the association.

The Maple Flooring Manufacturers Association permits members to use its trade-mark on maple, beech, or birch flooring which is standardized by the association. The quality of flooring is guaranteed by the association when approved by an accredited inspector, provided the grade name and species of the wood is stamped on each bundle of flooring. The association has inaugurated a "car card plan" by which it furnishes certificates to manufacturers who, in using them, guarantee the contents of sealed cars to be in conformity with the grading rules of the association.

The Southern Cypress Manufacturers' Association maintains an inspection department for the purpose of grading and inspecting lumber manufactured by member mills to insure purchasers that the lumber is graded and shipped in accordance with the official grading rules of the association, which conform to American Lumber Standards. Under proper supervision member mills are licensed to stamp their cypress with the official trade-mark and grade marks which have the approval of the association. Inspectors of the association will officially grade and mark cypress for nonmember mills. Manufacturers of specialized products, such as special millwork and woodwork and wood tanks, may have their products inspected and officially stamped to indicate that the material is of first quality or grade.

The Northern Hemlock and Hardwood Manufacturers Association has adopted a system of certified shipments of lumber whereby it licenses lumber firms to manufacture, grade, and ship lumber in accordance with the standard rules of the association. Only firms having competent lumber inspectors may be licensed. Under the terms of the contract a licensed firm agrees to place in each car of hardwood lumber shipped the association's licensed shipment form properly filled out to show the correct grade and tally of the lumber in the car, and to seal it within the association's envelope. The buyer is thus furnished with a certified copy of the original inspector's statement of the amount and grade of lumber loaded into the car at the original shipping point. The licensed manufacturer further agrees with the association that in case of complaint the buyer shall unload the car and submit his tally report to the firm within 5 days after unloading. The association may revoke the license of any manufacturer where it is found that improper or incompetent use is made of the shipment forms, or where the terms of the contract have been breached, or for any other reasons determined by the board of directors of the association.

The Southern Pine Association has adopted a grade-marking plan conforming to the requirements of American Lumber Standards, which were formulated under the auspices of the United States Department of Commerce. Each piece of lumber is branded with the standard grade name, the producing mill's name or identifying number, and the symbol "SPA," which indicates that the association has supervised the grading.

The Western Pine Association has established official grade, trade, and species-marks applied to ponderosa, Idaho, and sugar pine, larch-Douglas fir, white fir, Engelman spruce, red cedar, and incense cedar

lumber. Lumber sold by members of this association may be graded under the association's rules established by its bureau of grades. Rules are standard for the region.

The Northern Hemlock and Hardwood Manufacturers Association, the Southern Pine Association, and the Western Pine Association employ experienced lumber inspectors who check on the manufacturers' grading and inspection work. These inspectors may hammer-brand, or designate by some other distinguishing mark, each piece of lumber approved.

The Society of Automotive Engineers (S. A. E.) provides a list of manufacturers whose products conform to the S. A. E. Standards published in the S. A. E. Handbook.

The Illuminating Engineering Society (I. E. S.) has formulated specifications for electric lamps satisfactory for individual desk work or reading, which will endure over a reasonable period of time with a minimum of casualty and fire hazard. Lamps manufactured in conformity with these specifications may, after examination and approval by the electrical testing laboratories, have the I. E. S. approval tag attached to them.

The American Glassware Association has inaugurated a plan whereby glass reflectors used in lamps manufactured to meet the I. E. S. specifications are labeled to indicate that these reflectors have been tested with instruments provided by the Electrical Testing Laboratories. Each reflector is stamped with the name of the manufacturer and the words: "Conformance Certified. Electrical Testing Laboratories. IES Standard."

The Underwriters' Laboratories test devices and materials with relation to fire and casualty hazards and grant the use of a label to those approved.

The American Zinc Institute licenses its members to use the seal of quality on galvanized sheets, to indicate that special care has been used in making the sheets and that the zinc coating is extra heavy—2 ounces per foot.

The Cast Iron Pipe Research Association has adopted a symbol, a letter Q with a check, which is stenciled on each length of pipe produced by the members of the association.

The American Hot Dip Galvanizer Association has adopted an official insignia, in the form of a tag or sticker, for the use of its members on products conforming to the specifications of the association.

Steel Barrel Manufacturers Council maintains its own policing system to prevent unscrupulous deterioration of members' products or the substitution of inferior material in the manufacture of steel barrels. All members have pledged to adhere to the standards developed by the council, or those established by the Interstate Commerce Commission, or those which are embodied in the rules of the Railroad Consolidated Classification Committee, and certify to purchasers that barrels manufactured by them comply with the requirements of these standards.

Safe Manufacturers' National Association (S. M. N. A.) conducts a label service designed to protect the public against unwarranted claims relative to the fire resistance and/or burglary resistance of products of the fire-resistive safe industry. Members of the association submit

their products to the association's Technical Advisory Committee for Testing and Classification. The S. M. N. A. labels are applied to these products with ratings stamped or etched in the lower left-hand corner as, for example: "SMNA Rating—1-Hr. Exposure." The test requirements for fire-resistive safes are those which have been established by the National Bureau of Standards and by the Underwriters' Laboratories and adopted by the association.

The Rail Steel Bar Association permits its members to use a uniform identification mark on rail steel reinforcing bars produced by them. The use of this mark, which is protected by registration, signifies a willingness on the part of manufacturers to certify that bars produced by them comply with the standards of the association. The association maintains a cooperative program of research for the purpose of improving methods and quality of products. Each mill is visited by the association's metallurgist at intervals for purposes of general inspection and policing.

The National Warm Air Heating and Air Conditioning Association has adopted a symbol which installers may display in their places of business if they are members of the association and pledged to install furnaces according to the standard code as published by the association. Such installations are triply endorsed—by the installer, the furnace manufacturer, and the association.

The Oil Burner Institute has adopted a seal used by its members on their oil burners, letterheads, and advertising and sales literature. The institute's seal on equipment is evidence that it complies with the standards of the institute and that the manufacturer's efficiency has been approved by recognized authorities acceptable to the board of directors of the Oil Burner Institute; that a fixed minimum number of installations have been made and proper endorsement of the equipment received from users; and that standards established from time to time are constantly maintained.

The American Gas Association (A. G. A.), through its Approval Requirements Committee, has established safety and performance requirements for gas-burning appliances and accessories. These requirements must be met before the manufacturer is authorized to attach, to an individual appliance or accessory, the A. G. A. seal of approval.

The American Petroleum Institute (A. P. I.) grants to manufacturers the right to place its official monogram on equipment standardized by the institute. This is subject to submission of a statement as to past experience of the manufacturer, and a notarized guarantee that the material so marked complies with the American Petroleum Institute Standards. The institute reserves the right to revoke the use of its monogram for any reason deemed sufficient by the board of directors.

The National Association of Ice Industries has adopted for the industry a seal of approval which will identify ice refrigerators and other ice-using appliances that have been subjected to tests by the association and which conform to carefully determined standards of construction and performance established by the association. This seal on an ice refrigerator or ice chest is a guarantee that it has been carefully tested by the technical department of the National Association of Ice Industries and has been found upon test in a testing laboratory to meet the requirements, both as to construction and performance, set up and unanimously approved by this association and the National Association of Ice Refrigerator Manufacturers.

The National Association of Ice Refrigerator Manufacturers has established minimum construction requirements for ice refrigerators for the purpose of insuring satisfactory and economical operation. Ice refrigerators which conform to these requirements may have attached the association's insignia, which states that the refrigerator is—manufactured by certified member according to specifications of the National Association of Ice Refrigerator Manufacturers.

The United States Shellac Importers Association has inaugurated a plan for the sampling of all shipments of shellac imported into the United States. The plan provides for a standardization bureau which shall examine each importation of shellac. An examination committee, composed of representatives of member firms, is entrusted with the duty of examining samples of the various grades of shellac and determining their quality in accordance with the official rules and regulations of the association. The examination committee issues certificates on each lot examined, stating grade, mark, lot number, name of vessel, date of examination, and the committee's award.

The Gunned Industries Association has organized the Certified Products Bureau, which is the administrative division of the association. The objectives of the bureau are to establish minimum specifications for kraft sealing tape, and to provide a "certified products label" for the use of members of the association on products which conform to these specifications. The facilities of a national testing laboratory, are used to test products selected in the market for compliance with the bureau's requirements.

The National School Supplies and Equipment Association has inaugurated a certification and labeling program whereby all janitor supplies used in schools are properly labeled as conforming to standards promulgated and adopted by the association. The manufacturers or distributors of janitor supplies may submit samples of their regular supply products for certification purposes. These samples are tested in the laboratory of the association, and if they conform to the established standards, the companies are privileged to use the certification seals. The association also makes use of labels to identify school furniture complying in color with the standards established by the industry under the auspices of the National Bureau of Standards, United States Department of Commerce.

The National Door Manufacturers Association, Inc., has established minimum standards for wood preservatives. Any manufacturer or distributor of architectural wood products may enter into a license agreement to use the association's seal of approval. The primary provision of this agreement is that the licenses shall conform strictly to the association's minimum standards in treating all products to which the seal is affixed. The seal of approval is to be branded, by hot brand, on all products which are treated in conformity with these minimum standards. The seal shows the number of the licensee and the wording "Toxic-Preservation; Approved, National Door Manufacturers Association."

The National Association of Furniture Manufacturers has established a Design Registration Bureau for its members, and issues a "design registration label" for use on designs which members claim to have originated and to own exclusively. The association states that most furniture manufacturers will not knowingly copy a design which another manufacturer claims to have originated.

The Window Shade Institute has adopted a label for use on window shades made from window cloth and shade rollers purchased by the members of the institute. The label may be affixed to the window shade either by the manufacturer or jobber. It bears the statement "Made by a member of the Window Shade Institute."

The National Venetian Blind Guild has a registered trade-mark which is used in conjunction with their guild seal tag. This tag is affixed to each blind shipped by members of this guild. The statement on the label is—

Standard Warranty—This Blind is guaranteed to conform to the standard specifications of the National Venetian Blind Guild, Cleveland, Ohio.

The Sanitary Institute of America has adopted specifications dealing with the process of sterilization and grading of wiping cloths. The Institute has adopted an official label, the presence of which on a bale of industrial wipers represents a guaranty that the contents of the bale conform to the specifications. The label reads:

The wiping cloths contained in this bale or package have been produced and packed according to specification of the Sanitary Institute of America.

Each member of the institute issues an affidavit certifying that he, as a manufacturer of the particular bale or package of wiping cloths, has complied with all rules and regulations of the State and city health departments along with the regulations of the Board of Underwriters and city sealer. The manufacturer also certifies that the wipers contained in a given shipment are correct in weight, and that he has complied with all of the recommendations of the Sanitary Institute of America. The institute relies chiefly upon the integrity of its members for the enforcement of specifications.

The National Association of Finishers of Textile Fabrics has made arrangements with a commercial testing laboratory to conduct tests of goods finished by members to determine the degree of fastness to light and washing. Licensed finishers whose goods receive an "A" or "B" rating for fastness to light and washing are granted the use of the association's "Nafal Label," showing that the particular dyeing from which the sample was taken has passed the requirements and tests of the association's standard for colors. The license to use the label is automatically revoked if, by a majority opinion of the executive committee of the association, it has been found that the label was used in a manner contrary to the provisions of the license agreement.

The International Silk Guild, Inc., distributes, to manufacturers of pure dye silk, tags or labels stating that the fabrics to which they are attached are "All pure silk"; these tags or labels, bearing the name of the guild, constitute a guaranty that the silk is genuine. The term "pure dye silk" is used as defined in the Rules and Definitions on the Marking of Fabrics established at a trade practice conference under the auspices of the Federal Trade Commission. The guild reports that all fabrics are tested to see that they come within the ruling of the Commission.

The National Association of Lace Curtain Manufacturers has adopted a seal of quality which is used by its members to indicate that lace curtains manufactured by them are guaranteed by the association to be of a specified quality.

The Underwear Institute does not issue quality labels or certificates; however, its members observe the rule established at a conference held under the auspices of the Federal Trade Commission with respect to

the use of the word "wool." The percentage of wool is stated on garment and container and wherever the word "wool" is used on the label or in advertising; and further, that unless the material in question is all wool (less 3 percent tolerance) the percentage of wool is stated.

The Tanners' Council of America has sponsored the use of labels for the luggage industry. These labels are used on top grain cowhide and seal, and split cowhide and seal. In consideration for receiving permission to use the official labels manufacturers of luggage sign an agreement with the council concerning the type and kind of luggage on which the labels are to be placed. In the event a manufacturer violates this agreement, it is understood that he shall return to the council all labels which he may have purchased, provided the demand for their return is made.

The Rice Millers Association has established laboratories for the inspection and analysis of rice. The use of these facilities enables the industry to sell its product on the basis of origin of growth, quality, grade, and condition, and makes possible the issuing of certificates of such findings by the association.

The National Macaroni Manufacturers Association requires that all products manufactured by its members must be subjected to chemical tests and analyses at the association's laboratory to determine whether or not they comply with the association's standards and specifications, which are in line with those established by the Food and Drug Administration.

The New England Council has conducted a farm marketing program to encourage producers to grade and pack their products according to official State standards, and to identify them by means of quality labels placed on the containers in which the goods are packed. Permission to use the New England quality label must be obtained in each State from the State commissioner of agriculture, and it may only be used on goods packed in accordance with official State grades. Each State department of agriculture maintains an inspection service and employs trained field inspectors to examine graded and labeled products in order to determine whether or not they comply with the grade requirements.

The Council on Foods of the American Medical Association grants, on application, the use of its seal to manufacturers of food products, which comply with the requirements of the council. The council deals chiefly with processed foods, the sale of which is largely promoted through advertising. No food is accepted if the manufacturers' claims of nutritive and health values are considered false or misleading. Approximately 3,800 food products have been accepted by the council.

The Council on Pharmacy and Chemistry of the American Medical Association provides a similar service for medical products and grants use of a seal to manufacturers of products accepted by the council.

The American Dental Association grants a seal of acceptance to manufacturers of dental products which meet the requirements of the association.

Testing and approving institutes are maintained by several periodicals which grant approvals to various products used by ultimate consumers.

This description of certification activities might be extended to include many more organizations. These activities deal with many different commodities such as lumber, metal, textile, heating and other

kinds of equipment, furniture, foods, and medical and dental products. Similarly, a wide variation in types of certification, approval, acceptance, and labeling plans is noted. Certified products may be identified by a card, label, stamp, or other means.

Certification may refer to certain characteristics of a product which are of no particular value to consumers, or, on the other hand, it may refer to factors of quality and performance of importance to consumers.

Some of the methods of certification indicate that the certified products conform to widely recognized standards, grades, or specifications; for other methods no information is given on what standard the certification is based.

Some organizations may approve and certify a product after only a superficial inspection or inadequate laboratory test; while others grant approval based on scientifically conducted tests made in conformity with nationally-recognized methods.

It has been found that not all agencies issuing such approvals have been reliable. Sometimes the name of an approving agency has been misleading and has implied a technical character which the agency did not possess; or in some cases the name may have been chosen with the express purpose of deriving the benefit of confusion with the name of some thoroughly reputable agency. Evidence of such unfair trade practices is provided in complaints and cease and desist orders issued by the Federal Trade Commission against agencies which have falsely approved or guaranteed goods or services.

The study on certification and labeling made by the American Standards Association in 1931 and referred to on page 225 was undertaken at the request of the Committee on Certification and Labeling of the Board of directors of the American Standards Association. In a preliminary report presented by this committee to the board the following recommendations were made:

1. Any program of certification, labeling, or grade marking, in order to be adequate, should be based upon specifications which are publicly available and nationally recognized.

2. It is for the group or groups substantially concerned with the specifications to decide whether there is to be certification or labeling; and the A. S. A. itself cannot directly take any primary responsibility in respect to such activities.

3. Any certification or labeling program should be effectively supervised by a properly qualified body: e. g., a trade association, or a testing laboratory, operating under proper administrative management.⁷³

In 1936 the Association of Consulting Chemists and Chemical Engineers submitted to the American Standards Association a proposed recommended practice on public approval and certification procedures. Subsequently a Committee on Valid Certification was authorized by the Council of the American Standards Association. This committee, composed of representatives of a number of organizations of varied interests, has drafted a Recommended Practice in Public Approval and Certification Procedures which is now under discussion.

In conclusion it may be said that any agency which undertakes to certify or guarantee products should be competent and responsible, that standards to which the products comply should be identified and made available, and that adequate provisions should be made for testing the products at stated intervals to assure continuing adherence to standards on which approval is based.

⁷³ "Report of the Committee on Certification and Labeling," by Howard Coonley, A. S. A. Bulletin, vol. 3, p. 24. January 1932.

CHAPTER IV

STANDARDIZATION AND SIMPLIFICATION OF PRODUCTS AS AFFECTED BY STATE LEGISLATION

Quality standards and labeling requirements are embodied to some extent in existing State legislation. The types of laws containing these requirements include the following: (1) a general "food and drug" law; (2) separate laws governing special types of foods or drugs, for example, meat, dairy products, eggs, fruits and vegetables, poisons and narcotics; (3) laws governing a variety of consumer goods that are neither foods nor drugs, for example, gasoline and oil, fertilizer, seeds, insecticides, gold, silver and platinum articles, bedding and upholstery and a few other items.

Some State laws are concerned with labeling requirements only, some with quality standards, and others with both. There is a great deal of variation among these laws. Not only do they differ as to stringency of regulation, but even those which impose approximately the same degree of regulation do so in different ways.

Perhaps the best method of indicating the range of these State laws is to consider in detail two examples, one illustrating a field where almost complete uniformity among the States (as well as more detailed regulation) has been effected, and the other where heterogeneity of requirements exists. These examples are fertilizer and new bedding and upholstery.

The difference which exists between the respective uniformity and nonuniformity in requirements for these two commodities may be partly the result of a difference in the degree to which there has been cooperation between industrial and scientific groups and enforcement officials in obtaining more uniform legislative regulation. In the case of fertilizer, there was cooperation between industry, State control officials, the American Chemical Society, and the Association of Official Agricultural Chemists. In the case of bedding and upholstery, this type of cooperation is still in its initial stages.

The desire for uniformity in State bedding and upholstery laws and for regulation, in areas where none existed, led to the authorization, by the Standards Council of the American Standards Association, of a sectional committee to develop such standards. This committee includes representatives of manufacturers, retailers, consumers, and State officials and is concerned with—

Development of standards covering the identification and disclosing the percentage composition of filling material; grades of such filling material; identification of the finished article to show whether it is in whole or in part made from new or second-hand material; and methods of labeling to make this information available to distributors and consumers.¹

¹"A. S. A. Authorizes Work on Bedding Standards." *Industrial standardization and Commercial Standards Monthly*, vol. 9 (4), p. 93. April 1938.

The standardization and simplification of fertilizers, the reduction of the number of grades, the development of standardization of nomenclature, the standardization of chemical methods for determining plant-food content in fertilizers by the American Chemical Society, the standardization of analytical methods for designating various plant-food elements in fertilizers by the Association of Official Agricultural Chemists, the increase in plant-food content, and the standardization of bag sizes is given below in chronological and rather detailed form to illustrate how the cooperation of industry, science, and legislation has resulted in the adoption of standards.

A chart analyzing the sanitation and labeling provisions for new bedding and upholstery, and a summary of these provisions, indicates the lack of standardization in an industry of great importance to consumers. However, the cooperation of the National Association of Bedding and Upholstery Enforcement Officials with the American Standards Association (in which the manufacturers, distributors, and consumers are represented) in the establishment of standards may be the beginning of greater standardization in the bedding and upholstery industry.

STANDARDIZATION AND SIMPLIFICATION OF FERTILIZERS

Almost continuously since the enactment of the first State fertilizer control law in Massachusetts in 1869 efforts have been made to introduce simplification and standardization in the control laws of each of the several States as they have been enacted or amended. The fertilizer industry has always believed that a uniform law could be drafted to control the sale and distribution of fertilizers and fertilizer materials that would be suitable for the conditions in any State. Such a uniform law should adequately protect the consumer; and at the same time protect honest manufacturers from unfair practices of unscrupulous competitors and from unfair purchasers. It should not place useless and unnecessary requirements on manufacturers or requirements that cannot be enforced, yet should require for the purchaser disclosure of such information as may be useful to him in the use of the goods purchased.

Methods have been developed for making a quantitative determination of all the plant-food elements in a fertilizer but it is sometimes difficult or even impossible to determine quantitatively certain of the components that may be used in the formulation of mixed fertilizers. It would therefore be difficult to enforce a law requiring the detailed quantitative disclosure of all the ingredients of a fertilizer mixture.

The fertilizer industry has drafted a model law which is believed adequate to protect both consumer and producer, to be easily and completely enforceable, and to furnish all necessary information to enable the purchaser to select the fertilizer best suited to his needs of crop and soil. State control officials and legislative bodies have used this proposed draft as a basis for legislation in many States. There are now 47 States with fertilizer control laws; only Nevada is without one. Chart XVIII gives a summary of the principal requirements of these 47 laws and indicates their approach to uniformity.

Reduction in the Number of Grades of Fertilizer.

It has been recognized for many years that an uneconomic situation existed in the large number of grades of fertilizer being offered for sale. The grade of a fertilizer is represented by the integers representing the percentage content of the three primary plant-foods in the fertilizer. For example, a 5-10-5 grade of fertilizer indicates that the fertilizer is guaranteed to contain not less than 5 percent of nitrogen, 10 percent of available phosphoric acid, and 5 percent of available potash. As each figure changes, a different grade is represented. An almost unlimited number of combinations of the three figures is possible. A survey of the grades of fertilizer offered for sale in the various States, made in 1934, indicated that over 1,000 separate and distinct grades of fertilizer were being used in the United States. The State of Florida alone has recorded sales of 425 separate grades.

It is a generally accepted fact, recognized by practically all agronomists, that the fertilizer needs of any one State for all its crops on any of its soils can be satisfied with from 10 to 25 different grades of fertilizer. The needs of the country as a whole, in like manner, can probably be satisfied with 50 to 75 grades. In 1934, for instance, 71.9 percent of the entire country's tonnage of fertilizer was represented by 25 grades, and 95 percent by 175 grades. The final 5 percent included 878 more grades.

As early as 1925 the control official of the State of Texas arranged a conference with fertilizer producers to decide on a list of fertilizer grades which by common consent would be the only grades registered and sold during the following year. Each year a similar conference is held, now in conjunction with the neighboring States of Arkansas, Louisiana, Mississippi, and Oklahoma. In Texas the accepted list for the current year contains but 22 grades. A number of other States and groups of States have followed this example and have adopted lists of grades that will be recommended by State experiment stations, and the sale of these grades will be featured by the manufacturers. In some instances State laws now provide that such a list may be established each year by the control official and the sale of other grades prohibited.

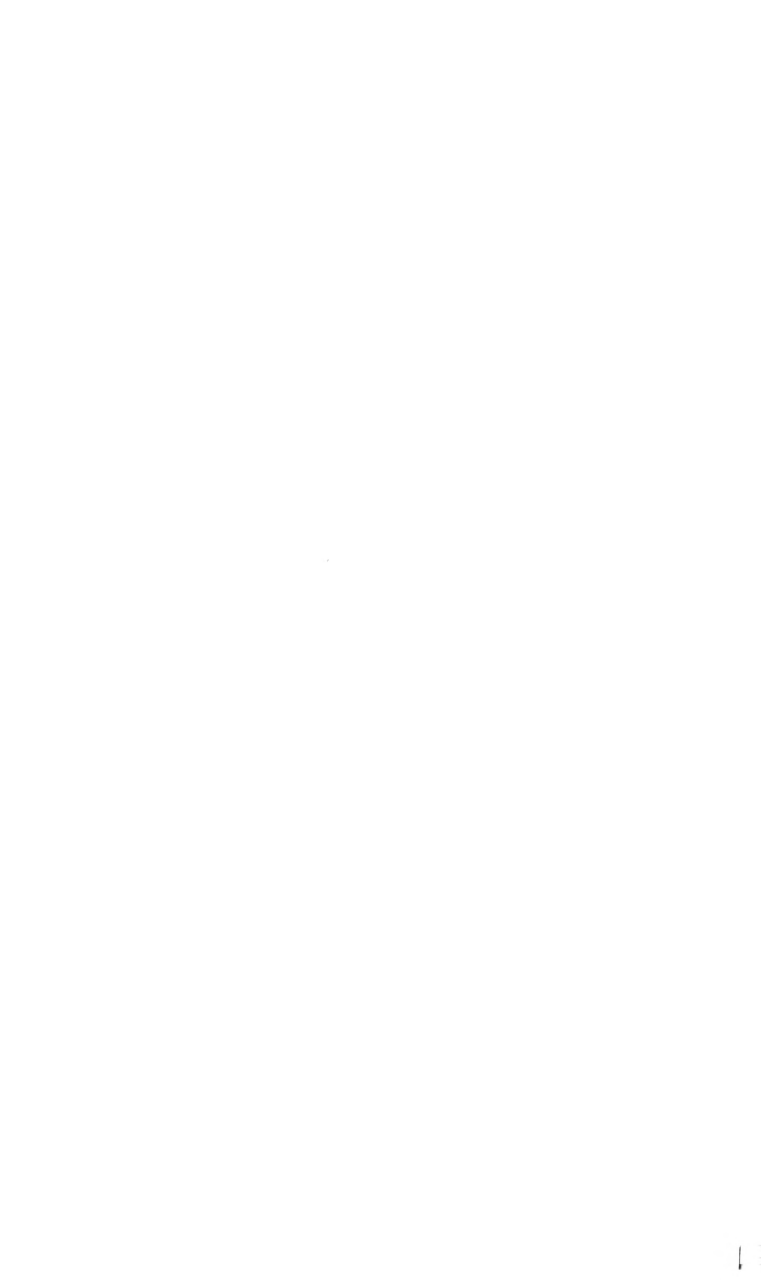
Such standardization is of considerable economic importance. It obviates the necessity of the manufacturer being prepared to ship a multitude of unnecessary grades, and not only relieves him of that expense but permits him to ship the smaller number of grades with much greater efficiency and cheaper cost, all of which results in lower consumer prices.

Development of Standardization of Nomenclature.

The fertilizer control laws of the various States, as is to be expected, differ in many details as agricultural conditions or the opinions of legislators and control officials determine. Since the early days, effort has been constantly made by the industry to have uniform nomenclature used, and wherever possible to have labeling requirements of adjacent States uniform. Considerable variation occurred in these requirements. Some States required guaranties to be made in terms of nitrogen, phosphoric acid, and potash, and in that order; some required the phosphoric acid to be stated first; and others required the guaranty in terms of ammonia instead of nitrogen. Some laws required that the percentage of plant-food be guaranteed in whole numbers only; others permitted fractions.

In the fall of 1927 a fertilizer conference was called at Louisville, Ky., by a group of editors of farm papers. To this conference were invited editors of the farm papers, agronomists, State control officials, and representatives of the fertilizer industry. Over 80 individuals attended. The question of uniformity of State control law requirements was a major topic of the conference. After extensive discussion, it was voted to recommend to all States that guaranties of plant-food in fertilizers be required in terms of available phosphoric acid, nitrogen, and potash, and in that order and in whole numbers only.

In September 1928 a second conference was held at West Baden, Ind., to discuss progress made since the first conference. It developed that little progress on uniformity of guaranties had been made because of extensive opposition to the order of statement of guaranties. After



discussion, this second conference passed a resolution recommending that the guaranties be expressed in the order of nitrogen, phosphoric acid, and potash (known as the N-P-K order).

In 1928 the Association of Official Agricultural Chemists adopted as tentative the N-P-K order and officially adopted this order in 1930.

In 1931 there were 26 States requiring the guaranty in terms of nitrogen, and 17 States permitted or required the guaranty in terms of ammonia, 2 of them requiring both. By 1931 at least 15 States prohibited fractional guaranties. In May 1931 a conference between the control officials of the 13 Northeastern States and fertilizer manufacturers doing business in those States resulted in further uniformity. By July 1931 there were 35 States that required nitrogen only to be guaranteed; 36 required the N-P-K order, and 23 permitted guaranties in whole numbers only.

Efforts to establish complete uniformity were continued, but necessity for legislative action in certain States and inability to obtain such action in every case delayed complete uniformity until 1939, when the South Carolina Legislature passed a fertilizer law, thus making the fertilizer laws of 47 States (Nevada has no fertilizer law) uniform in requiring guaranties in terms of nitrogen, phosphoric acid, and potash, and in the N-P-K order. By 1939 fractional guaranties were prohibited in at least 38 States.

State control officials and industry representatives are continuing their efforts toward the achievement of still greater uniformity in control requirements. Frequent conferences have been held on the subject, and it is believed that slow but continuous progress will result. The goal is to have such a degree of uniformity that one standard method of designation on bags of fertilizer would satisfy the labeling requirements of all State control laws.

Standardization of Chemical Methods for Determining Plant-Food Content in Fertilizers Through the American Chemical Society.

The fertilizer division of the American Chemical Society meets each year and affords an opportunity for the presentation of technical papers on fertilizer. In a measure, it acts as a clearing house for new subjects to be presented for the consideration of the Association of Official Agricultural Chemists. Chemists connected with fertilizer industry, with State experiment stations and control laboratories, and with the various Federal agencies engaged in fertilizer research meet to discuss common problems of analytical technique in order to develop uniform procedure for the chemical evaluation of agricultural commodities and supplies. Such developments as need official recognition are then referred to the Association of Official Agricultural Chemists for action.

Standardization of Analytical Methods and Terms for Designating Various Plant-Food Elements in Fertilizer Through the Association of Official Agricultural Chemists.

In 1922 a group of chemists representing the fertilizer industry suggested to the Association of Official Agricultural Chemists of North America (a body composed of those State and Federal officials who are engaged in agricultural research or in the enforcement of the feed, fertilizer, and food control laws) the establishment of a forum for the discussion of technical fertilizer problems. As a result, this association formed a Committee on Definitions of Terms and Interpretation

of Results on Fertilizers and Liming Materials. This committee meets each year during the annual meeting of the association for the discussion of definitions of fertilizer terms and such other matters as may be presented. An opportunity is thereby afforded the technical men of the industry, persons engaged in agricultural research, and officials administering State laws to meet on common ground and voice their opinions and recommendations.

The committee, after a complete hearing, prepares, in executive session, official definitions for the various fertilizer terms, establishes official standards for various fertilizer materials, and makes official interpretations of terms and phrases used in the industry. These matters are referred as recommendations to the Association of Official Agricultural Chemists for adoption as official standards. The laws of many States provide that the methods of analysis and the recommendations of this association shall govern the practice of the control officials, in which case these methods and interpretations have the effect of law.

Since the first meeting of the committee in 1923, up to and including the 1939 meeting, 60 fertilizer and liming materials have been officially defined by name and identified by specifications, and 28 terms have been officially defined or interpreted. Through these channels not only has uniformity and standardization been achieved but a measure of official and even legal standing has also been obtained.

The Association of Official Agricultural Chemists also has adopted official methods of analysis for all determinations that are necessary to be made in connection with the sale and use of fertilizer. They have also adopted official methods to be used in the collection and preparation of all samples that are to be used in determining whether or not the guaranties required by any law have been met. The chemists of the fertilizer industry have cooperated in the development of these official methods.

Increase in Plant-Food Content.

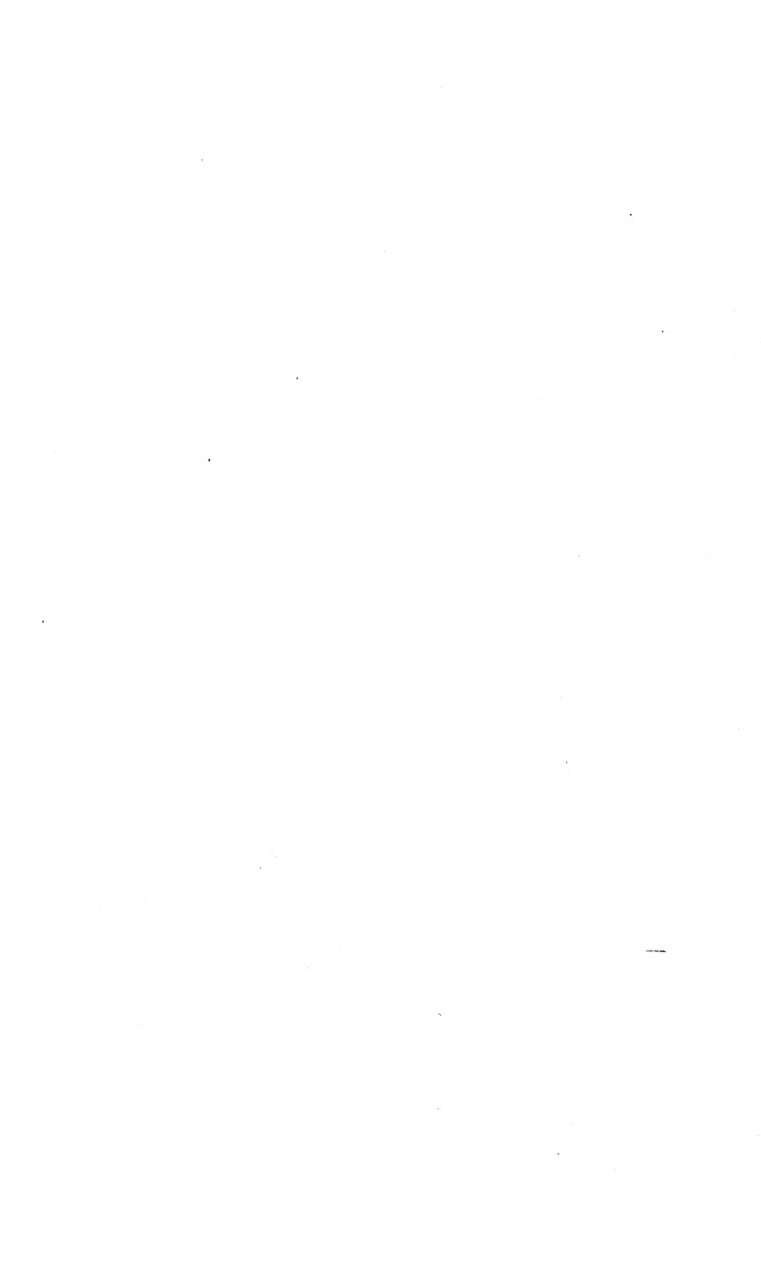
The cost of handling a ton of fertilizer is the same, regardless of its plant-food content. It takes just as many bags to hold a ton of fertilizer containing 12 units of plant-food as it does to hold one containing 24 units. The freight costs are the same on each; also, labor expense, selling expense, accounting, and many other items are calculated on a ton cost. Within limits, then, the cost of each pound of plant-food delivered on the farm is reduced as the concentration of total plant-food in the fertilizer is increased. The United States Department of Agriculture and certain of the State experiment stations for years have recommended to customers that they buy fertilizers of higher plant-food content. The fertilizer industry believes in the sound economics of such practice, and is on record as favoring the inclusion of a requirement in all State laws as to the permissible minimum plant-food content of mixed fertilizers, recommending that such minimum be not less than 16 percent. As of 1939, the laws of 14 States prohibit the sale of fertilizers containing less than 16 percent total plant-food, and six additional States prohibit less than 14 percent.

That these recommendations regarding higher plant-food content are being accepted is evidenced by figures furnished by the United States Department of Agriculture which show that the average plant-food content of complete mixed fertilizers in 1880 was 13.4 percent;

in 1900, 14.1 percent; in 1925, 16.0 percent; in 1930, 17.8 percent; and in 1935, 18.2 percent and it is estimated that it will reach approximately 19 percent in 1940.

Standardization of Bag Sizes for Fertilizer.

The standardization of package sizes in the fertilizer industry has never been an important problem. State laws requiring a tax stamp or tag to be affixed to each bag or package, to evidence payment of the tonnage inspection fee, naturally required even-weight bags in each ton. Custom established the 200-pound bag in the greater part of the country, and the 100-pound in the remainder. Variations were the 125-pound and the 167-pound bag. Smaller sizes, containing 50 pounds, 25 pounds, 10 pounds, 5 pounds, and 1 pound, were used only for the city lawn and garden trade. Practically 100 percent of fertilizer for the farm trade is shipped in one of the first four sizes, with the 100-pound and 200-pound sizes predominating. When paper bags were first introduced for fertilizer shipments, the use of a somewhat smaller bag was found necessary to carry better and to be less subject to damage, and an 80-pound size was chosen. Better quality paper bags now permit the 100-pound size, which is almost universally used.



SANITATION AND LABELING REQUIREMENTS FOR NEW BEDDING AND UPHOLSTERY

A survey of State laws dealing with provisions regulating the manufacture and sale of bedding and upholstery, and with Federal and State court cases in this field shows wide variation in the laws of the States surveyed.²

Chart XIX on sanitation and labeling requirements for new bedding and upholstery, based on this survey, reveals that 37 States, including the District of Columbia have laws regulating the manufacture and sale of new bedding or new bedding and upholstery. Thirty-six of these laws apply in terms to mattresses; 30 to comforters, quilts, or quilted pads; 28 to cushions or pillows; and 11 to upholstered furniture in general, with some other laws, applying only to specified types of furniture, such as "upholstered springs," "lounges," and sofas." In addition, the laws of a few States apply to articles of bedding in general, or to articles "similar" to those specifically mentioned in the laws.

Sanitation requirements regarding the use of materials in the manufacturing of bedding are of more than one kind. There are prohibitions to be found in 13 States against the use of second-hand or shoddy material, while the laws of 21 States specifically permit the use of such material if it has been sterilized. Similarly, in 17 States with bedding laws, the use of contaminated material is specifically prohibited, while in 8 States the use of such material when sterilized is permitted. There are qualifications in 4 States prohibiting certain uses or prohibiting certain kinds of contaminated or second-hand material and permitting others.

²"Survey of State Laws and Judicial Decisions on Bedding and Upholstery," prepared by S. Mermin and J. Mayer, S. P. Kaidanovsky, Technical Director, Consumer Standards Project, pp. vii+160, Division of Consumers' Counsel, Agricultural Adjustment Administration, U. S. Department of Agriculture, and Work Projects Administration, Washington, D. C.

CHART XIX.—Sanitation and labeling re

[This chart was prepared by the staff of the Consumer Standards Project, Consumers' Co
Agriculture, and Work

	Alabama	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Georgia	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana
I. COVERAGE														
A. Bedding:														
1. Mattresses.....	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2. Comforts or quilts.....	X	X	X		X	X	X	X	X	X	X	X	X	X
3. Pads or quilted pads.....	X	X	X	X	X	X	X	X	X	X	X	X	(1)	X
4. Pillows.....		X	X	X	X	X	X	X	X	(3)		X		X
5. Cushions.....	X	X	X	X	X	(4)	X	X		X		X	X	
6. Upholstered springs or box springs.....		X	X		X	X		X	X			X	X	
7. Miscellaneous other articles named.....			X	X	X	X	X					X	X	
8. Articles (unnamed) which may be used for sleeping or reclining purposes.....			X	(5)	(6)						X			
B. Upholstery:														
1. Upholstered furniture (in general).....			(2)		X			X						
2. Miscellaneous articles named.....														
C. Articles filled exclusively with sterilized feathers are specifically excluded.....														
	X								X	X		X		
II. RESTRICTION ON USE OR SALE OF MATERIALS														
A. Second-hand material:														
1. Prohibited.....	X		(16)							X	X			X
2. Permitted if sterilized.....			(16)		X	X	X	X				X	X	
B. Contaminated material:														
1. Prohibited.....			(16)	X			X		X	X	X	X		X
2. Permitted if sterilized.....		X	(16)		X				X				X	
III. GENERAL LABELING REQUIREMENTS														
A. Positive requirements—as to description of materials:														
1. Qualitative (label shall show)—														
(a) Whether new or second-hand (e. g., "All new material"; "Second-hand material").....														
	X	X	X	X	X	X	X	X	X	X	X	X	X	
(b) Whether "Sweepings" or "oily sweepings" are used.....														
(c) Whether damaged, waste, or other inferior material is used.....														
			X							X				
(d) "Felted cotton" or "felted liners" when such material is used.....														
			(22)											
(e) "Cotton liners" when such material is used.....														
(f) A statement of materials used.....														
	X								X				(23)	
(g) "Kind" of materials.....														
										X				
(h) "Kind" of materials used in filling.....														
						X								X
(i) "Kind and Character" of materials.....														
				X							X			
(j) "Description" of materials used.....														
							X							
(k) "Description" of materials used in filling.....														
		(24)									X	X		
(l) "Name" of materials.....														
					X									
(m) "Name" of materials used in filling.....														
	X							X						
(n) "The contents".....														
	X													
(o) "Quality" of materials.....														
(p) "Grades" of materials used in filling.....														
														(25)

See footnotes at end of table.

quirements for new bedding and upholstery

nsel Division, Agricultural Adjustment Administration, United States Department of
Projects Administration]

Maine	Maryland	Massachusetts	Michigan	Minnesota	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New York	North Carolina	Ohio	Oregon	Pennsylvania	Rhode Island	Tennessee	Texas	Utah	Vermont	Washington	Wisconsin
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	(2)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x	(4)	x	x	x	x	x	x	x	x
x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
x	(7)							(7)	(7)	(7)					x	(7)		x		(9)		
x	x					(11)				(12)				x	x	x				x	(13)	(10)
			(14)		x				(13)				(13)				(15)		x			
x	x	x	x	x	x	(17)		x		(18)	(19)	(17)		(20)	(15)	(18)		x	(17)	x	x	x
		x		x			x		x	x	x	x	x			x	x	x		x	x	x
x	x	x		x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
		x			(21)									x		x						
			x				(23)			(24)			x				x				x	(25)
x	x								x						x	x				x	x	
				x	(26)					(27)	x	x							x			
					x								x				x					x
														(29)								(28)

See footnotes at end of table.

ments for new bedding and upholstery—Continued.

State	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
Maine																						
Maryland																						
Massachusetts																						
Michigan																						
Minnesota																						
Missouri																						
Montana																						
Nebraska																						
Nevada																						
New Hampshire																						
New Jersey																						
New York																						
North Carolina																						
Ohio																						
Oregon																						
Pennsylvania																						
Rhode Island																						
Tennessee																						
Texas																						
Utah																						
Vermont																						
Washington																						
Wisconsin																						

* See footnotes at end of table.

(45)

CHART XIX.—Sanitation and labeling require

	Alabama	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Georgia	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana
III. GENERAL LABELING REQUIREMENTS—continued														
C. Negative requirements:														
1. General:														
(a) Prohibitions against misleading labels	x	x	x		x	x	x	x	x		x	x	x	
(b) Prohibitions against tampering		x	x	x	x	x	x	x	x	x	x	x	x	
(c) Information other than that specified in the law is not to appear on the required label						x								
(d) No terms describing filling materials may be used other than terms stated in administrative regulations														
2. Specific:														
(a) Word "felt" not to be used unless material processed by felting machine	x	x	x			(51)				x		x	x	
(b) Word "hair" not to be used unless material is composed totally of animal hair			x											
(c) Words "curled hair" not to be used unless material is composed of all curled hair						(51)								
(d) Word "silk" not to be used in description of kapok			x											
(e) Word "floss" not to be used if filling contains material not described as kapok			x											
(f) No tolerances other than commercially accepted tolerances are permitted in case of terms: "All," "100%," "Pure," etc.					x									
(g) No variance is allowed for material described as "All," "Pure," "100%," or terms of similar import.														
IV. FORM, SIZE, AND COLOR OF LABEL														
A. Size of label (shall be not less than)—														
1. 4 by 8 inches														
2. 4 by 5 inches			(55)											
3. 4½ by 3 inches														
4. 4 by 3 inches														
5. 3 by 3 inches			(56)											
6. 3½ by 2½ inches										x				
7. 3 by 2½ inches						(58)		x	x		x	x		
8. 3 by 2 inches		x		x										
9. 6 square inches						(60)	x							
10. 3 by 1½ inches						(62)								
11. The size sufficient to provide plainly for description of materials														
B. Color of label (to be)—														
1. "White"														
2. "White" if material is all new			x											
3. "Red" if material is second-hand			x											
4. "Yellow" if material is sterilized			(51)											
5. "Yellow" if material is second-hand														
6. The same color stock throughout														
C. Material of label: (4)														
1. Cloth			x	x		x		x			x		x	x
2. Muslin or linen					(65)				x				x	x
3. "Permanent"		x							x				x	x
4. Cloth lined	x									x	x			
5. Cloth backed														
6. Paper								x						x

See footnotes at end of table.

CHART XIX.—Sanitation and labeling require

	Alabama	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Georgia	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana
IV. FORM, SIZE, AND COLOR OF LABEL— continued														
C. Material of label—Continued.														
7. Durable material.....														
8. Not paper-faced.....					X									
9. Stamping or printing, etc., label on the article itself is permitted in lieu of a separate tag.....														
D. Size of lettering:														
1. Statements as headings shall be in 24 point type.....			Δ											
2. Labels shall be in "large" type....				X										
3. Statements shall be not less than 1/8 inch high.....					X			X			X			
4. Statements as to new or second- hand shall be not less than 1/8 inch high.....		X							X			X		
5. Statements as to filling material shall be not less than 1/8 inch high.....		X				X			X			X		
6. Words "shoddy material" when required to be on label shall not be less than 20-point type....										X				
7. Words "second-hand material" shall be not less than: (a) 20-point type..... (b) 24-point type.....														X
8. Material which is waste, second- hand, shoddy, or subject to contamination shall be enumer- ated on (yellow) label in type not less than 1/4 inch high.....														
9. Word "second-hand" shall be not less than 1/2 inch high (on addi- tional label when article con- tains second-hand material).....														
E. Sample form of required label is set out in the statute.....		X									X	X		
F. Form of label shall be prescribed by administrative body.....														
G. Label shall be approved by admin- istrative body.....			X		Δ									
H. Material used shall be described in such manner as administrative body shall prescribe.....							X							

1 Mattress pad.

2 Couch pads.

3 Cushions, quilts, or similar articles.

4 Bags, cases or coverings which are filled, etc.

5 "Other articles of bedding" in addition to those specifically covered.

6 "Substantially similar" articles to those specifically covered.

7 "Similar articles" to those specifically covered.

8 "Bedding."

9 Including children's furniture.

10 Anything containing upholstery.

11 Couches or lounges.

12 Bedsprings, cots, lounges, and sofas.

13 Settees, couches, day beds, davenport, and overstuffed chairs.

14 Word "exclusively" is omitted.

15 Words "exclusively" and "sterilized" are omitted.

16 Certain uses of second-hand and contaminated material are prohibited and others permitted. Also, administrative body may prohibit the use of excessively damaged or otherwise unfit filling material.

17 Prohibits use of shoddy.

18 Certain kinds of second-hand materials are prohibited, and others permitted if sterilized.

19 Applies to abandoned filling material.

- ³⁴ When article sterilized by other than owner, label shall show the sterilizing permit number and the date of sterilization.
- ³⁵ Date of sterilization.
- ³⁶ What germicidal treatment, if any; date any such treatment was performed; and number of required permit.
- ³⁷ Applies where second-hand material is used in upholstery.
- ³⁸ When mixed.
- ³⁹ Approximate percentages when mixed.
- ⁴⁰ When mattress is of cotton, felt, wool, kapok, silk floss, floss, or hair.
- ⁴¹ When mattress is of cotton, felt, wool, kapok, or hair.
- ⁴² See sample form, sec. 59-1808 of code.
- ⁴³ "Finished" size. Comforter labels shall show "cut" size. Decorative, boudoir, and fancy cushion need not show size.
- ⁴⁴ "Measurement."
- ⁴⁵ Name and address of maker or his registered factory number.
- ⁴⁶ Applies to nonresident manufacturers and wholesalers with no usual place of business in the State.
- ⁴⁷ This appears to be an additional label.
- ⁴⁸ Applies to tags furnished by the administrative body for use on "comforts, bunk quilts, cushions, and pillows."
- ⁴⁹ When article contains more than one kind of material, and administrative rules require amount of materials to be stated on label, a variance of not over 10 percent shall not be deemed misleading.
- ⁵⁰ Also prohibits use of other than standard definition, practice, or terms of classification, where a standard classification exists concerning any commodity.
- ⁵¹ When used exclusively.
- ⁵² Word "felt" not to be used if filling includes any material not felted and filled in layers; unless all materials used are plainly set forth.
- ⁵³ The word "totally" is omitted.
- ⁵⁴ Applies to the separate label on articles containing second-hand material.
- ⁵⁵ Applies to label on upholstered furniture having loose cushions or pillows, including studio couches.
- ⁵⁶ Applies to bedding labels and to labels required when article has been sterilized.
- ⁵⁷ This appears to be an additional label.
- ⁵⁸ Applies to decorative, boudoir, and fancy cushions or "similar articles."
- ⁵⁹ Applies to bed springs, cots, lounges, and sofas.
- ⁶⁰ Applies to mattress or pillow tags.
- ⁶¹ Applies to mattresses or pillows. Commissioner may require smaller or larger tags on other articles.
- ⁶² Applies to indelible stamp on slip seat chairs and benches or upholstered stools and similar articles.
- ⁶³ Also if material is waste or shoddy.
- ⁶⁴ When 2 or more items under this topic are indicated for 1 State and are in apparent conflict, a choice is permitted among these items.
- ⁶⁵ Applies to upholstered furniture.
- ⁶⁶ Sec. 7251 (cc) provides for muslin or linen labels, and sec. 7251 (hh) 27 provides for cloth or cloth backed labels.
- ⁶⁷ Use of cloth is optional in case of upholstered furniture.
- ⁶⁸ Or material of like durability.
- ⁶⁹ When words "second-hand material" are required on the label.

The many variations in labeling requirements constitute the most striking differences in these laws. Thirty-three States have laws requiring a statement as to whether the materials used are new or second-hand. In 13 States it is provided that the label must indicate whether material required to be sterilized, has been sterilized; but, depending on the State involved, the date of sterilization or the number of the sterilizing permit, or both, may also have to be indicated. In California this information would have to appear on a separate sterilization label.

Thirty-two States have requirements, variously worded, that the label give a "description," or the "names," or the "kind," or the "contents" of the materials used; some require only the name of the materials used in the filling. A few States have more specific requirements relating to this type of labeling information. Alabama, Ohio, Tennessee, and Wisconsin, for instance, have laws requiring that a statement regarding "quality" of the materials be given. California, Oregon, Texas, and Wisconsin have laws providing that the "grade" of filling materials be specified.

Information regarding the quantity of material used, as distinguished from the preceding disclosure of quality, is also required to be indicated in some States. California, Ohio, Oregon, and Tennessee laws provide that the quantity or amount of each material appear on the label, and nine States have laws requiring a statement of the "proportion" or "percentage" of materials. The size of the article

must be specified in California and Oregon; and these States, in addition to Alabama, Indiana, Michigan, and Washington, have laws which require that the total weight of the article be given.

Identification of the manufacturer or vendor is required in seven States, the address as well as the name of the manufacturer or vendor is to be specified in nine other States, name and address of only the manufacturer in five States, name and address of only the vendor in one State, and name of the manufacturer or vendor and successive vendors in three States.

The registry number of the manufacturer is an additional identifying mark required in 10 States, and shall appear on an adhesive stamp attached to the label, as in the case of 4 States, or shall appear otherwise on the label.

The date of delivery from retailer to customer must be given on the label in Connecticut and New York; the Massachusetts' law requires that the date of delivery within the State by a nonresident be specified.

In nine States the label must show that the article complies with the State law. In California, Connecticut, New York, and North Carolina the label must be approved by a State administrative body. In the District of Columbia, Pennsylvania, and Texas, labeling information is to appear in such manner as is administratively prescribed. On the labels in Delaware, Maryland, and New Jersey no information may appear other than that specified in the law.

In addition to the differences among the States as to what shall appear on the label, there is a large number of variations in the specific matters of form, size, and color of labels. There are 10 different minimum sizes of labels prescribed in the various laws: 4 by 8 inches, 4 by 5 inches, $4\frac{1}{2}$ by 3 inches, 4 by 3 inches, 3 by 3 inches, $3\frac{1}{2}$ by $2\frac{1}{2}$ inches, 3 by $2\frac{1}{2}$ inches, 3 by 2 inches, 3 by $1\frac{1}{2}$ inches, and 6 square inches. The most common minimum size prescribed is 3 by 2 inches, which occurs in 8 State laws, there being 22 States which have laws providing for labels of not less than a specified minimum size.

A specific sample form of the required label is given in the laws of nine States.

The color of the label is to be white in Texas, it is to be white in California, New York, North Carolina, and Pennsylvania only if the material used is all new. If the material is second-hand, the label must be red in California, but yellow in New York, North Carolina, Oregon, and Pennsylvania. A yellow (separate) label in California signifies that the material has been sterilized.

There is generally a requirement in the State laws that the label be made of some durable material. The laws of 8 States specify "cloth," in 13 States a choice is permitted between a "cloth" label and some other kind, usually a "cloth lined" or "cloth backed" label. "Muslin or linen" labels are required in the laws of 15 States, in 7 of which the choice of some other material, usually paper in the case of upholstered furniture, is permitted. The use of a paper tag is permitted in Kentucky, Ohio, Tennessee, and Wisconsin, and is permitted on upholstered furniture in Massachusetts, Rhode Island, and Vermont. A few State laws require the labels to be "cloth lined," "cloth backed," "permanent," or of "durable material," or not paper-faced. New Hampshire and New Jersey laws permit stamping or printing on the article itself in lieu of a separate label.

The most common provision regarding the lettering on the label is the provision in 16 States that the letters be not less than one-eighth inch high. In 5 of these States, this applies to all statements on the label, but in the remaining 11 States it applies only to certain statements concerning the filling material, such as statements indicating that the material is new or second-hand. Headings are to be in 24-point type in California; and the same is true in Washington in cases where the phrase "second-hand material" is required on the label. The minimum size of letters in phrases indicating the presence of second-hand or shoddy material is one-fourth inch in Oregon, one-half inch in Texas; 20-point type in Kentucky and 24-point type in Washington.

The laws of most of the States contain prohibitions against deception in labeling. Twenty-nine States have enacted laws prohibiting misleading labels. The laws of 32 States prohibit the tampering with labels. In addition to the foregoing general prohibitions against misleading labels and tampering, a provision that the term "felt" is not to be used unless the material has been processed by a felting machine is common to 13 States, and in 5 States other terms such as "hair," "curled hair," "silk," and "floss" may be used only if their meaning is that as specified in the statute. New York laws permit no variance when such terms as "all," "pure," "100," et cetera, are used, while the Connecticut law permits commercially accepted tolerances when these terms are employed on the label.

CHAPTER V

METHODS AND PROCEDURES IN GOVERNMENT PURCHASING

The duty and responsibility for making purchases for the Federal Government, with the exception of purchases for the Army, Navy, and Marine Corps, is placed upon the Procurement Division, United States Treasury Department.

Chart XX, entitled "The Development of Centralized Purchasing in the Federal Government," lists, in chronological order, the various acts, orders, or reports, relative to purchasing by the Federal Government, shows the department, office, board, or committee responsible for the purchasing, and gives the duties of and procedures used by these agencies. It is interesting to note that the first act dates from May 1792, when Alexander Hamilton, then Secretary of the Treasury under President Washington, made one of the earliest studies of centralized purchasing for the Federal Government.

There is an essential difference between the Federal Government and private procurement, and the major restrictions of the Federal Government purchasing are as follows:

1. *Contracts are awarded only to manufacturers and regular dealers.*—These terms are defined as follows:

A manufacturer is a person who owns, operates, or maintains a factory or establishment that produces on the premises the materials, supplies, articles, or equipment required under the contract and of the general character described by the specifications.

A regular dealer is a person who owns, operates, and maintains a store, warehouse, or other establishment in which the materials, supplies, or equipment of the general character described by the specifications and required under the contract are bought, kept in stock and sold to the public in the usual course of business.

2. *Purchases are made on specifications.*—These specifications set the standard of quality desired, and are binding alike on all bidders. This feature insures an equitable relation between quality and price which puts all bidders on a common ground.

3. *Requirements are given wide publicity.*—The wants of the Government are made public long enough in advance of the time set for the formal opening of bids to allow all interested bidders sufficient time to prepare and submit their bids. Advertising takes the following forms:

(a) Advertising in newspapers;

(b) Advertising by notices placed in public places;

(c) Advertising by means of distribution of proposal forms to known sources of supply.

4. *Competitive bidding.*—Bids are invited and received on the common basis of specifications and general conditions binding on all alike.

5. *Bid bond required except under certain conditions.*—The bid bond is a guaranty by authorized sureties that the bidder will, within the time specified in his bid, enter into contract and give proper bond for its performance.

6. *Sealed bids.*—Bids are received up to the hour specified for the opening; then publicly opened, read, and recorded. Bids received after the hour set for the formal opening, unless delayed through no fault of the bidder, are returned unopened.

7. *Bids must be formal.*—Bids shall be prepared on the forms provided for the purpose, and must be formal in all respects. They shall be signed on behalf of the bidder by a person authorized to do so.

8. *Bids of competitors are available after opening date for examination by interested parties.*

9. *Preference is given to articles of domestic manufacture or production.*

10. *Award is made to the lowest satisfactory bidder.*—The lowest satisfactory bidder is that bidder who is either a manufacturer or a regular dealer and who offers suitable material, in a formal bid, at the lowest price.

11. *As a general rule, contracts are reduced to writing and signed by both parties.*

12. *Performance bond is required under certain circumstances.*—The performance bond, with authorized security, indemnifies the Government against the failure of the contractor to perform all the terms of the contract.

13. *Deliveries are rigidly inspected to determine compliance with the specifications and the terms of the contract or order.*¹

Negotiated Contracts.

Though as a general rule bids are invited and awards made to the lowest responsible bidder, negotiated contracts may be used in cases in which competition either is out of the question or may be detrimental to the national interest. Items of normal usage ordinarily are purchased on a competitive basis whereas articles of a special or secret nature may be purchased through negotiated contracts.²

The principal steps observed in the purchasing by the Procurement Division, United States Treasury Department, the Navy, and the War Department are presented first in this chapter. This is followed by the description of the results of three surveys: (1) A survey of State purchasing methods and procedures, (2) a survey of county purchasing methods and procedures, and (3) a survey of municipal purchasing methods and procedures. The surveys of State and municipal purchasing methods were made in May 1940 for the purpose of this monograph through the courtesy of the Council of State Governments and the American Municipal Association, respectively. The survey of county purchasing methods was made in 1939 by the National Bureau of Standards, United States Department of Commerce, and the results were made available for the purpose of this monograph.

¹ "Selling to the Navy," by the Navy Department (Bureau of Supplies and Accounts), pp. 1-2, Washington, D. C., 1940.

² Letter by Charles Hines, colonel, U. S. Army, Secretary, Army and Navy Munitions Board, Washington, D. C., August 1, 1940.

PROCUREMENT METHODS AND PROCEDURES OF THE PROCUREMENT DIVISION, UNITED STATES TREASURY DEPARTMENT³

Major Functions of the Procurement Division.

The Procurement Division, United States Treasury Department, is charged with the determination of policies and methods of procurement, warehousing, and distribution of Government property, facilities, machinery, equipment, stores, and supplies; the performance of all activities incident to the purchase in definite quantities of those supplies for which requirements can be anticipated and consolidated; the negotiation of contracts for those supplies of the departments and establishments for which requirements cannot be consolidated in definite quantity purchase but for which common contracts can be made with advantage to the Government; and the warehousing and distribution to the departments and establishments of supplies maintained as stock items in the Procurement Division building.

In addition to these definite purchasing and warehousing functions, the Procurement Division is responsible for—

(a) The preparation and maintenance of the Federal Standard Stock Catalog, involving the analysis of commodity records so as to develop uniformity of nomenclature, to provide standard arrangement for storage and issue of warehoused stock, to assign precise designations for individual items, and to establish and maintain uniformity in the cataloging of supplies;

(b) The preparation and maintenance of Federal Specifications;

(c) The coordination of all matters pertaining to contract forms and general policies pertaining to contract procedure;

(d) The coordination of the Government's freight, express, and other traffic activities within the continental limits of the United States;

(e) The coordination and supervision of the disposition of surplus property in Washington and in the field, and of property seized and forfeited under the Federal Alcohol Act and the Liquor Law Repeal and Enforcement Act of 1935, and firearms seized and forfeited under the National Firearms Act; and

(f) The maintenance of an accounting activity to clear vendors' bills in payment for deliveries made on Procurement Division orders, to effect reimbursement to the Procurement Division's capital account for purchases made for other Federal agencies, and to maintain financial records of the business of the Procurement Division.

The principal procurement operations are the negotiation of term contracts and actual purchasing, or procurement otherwise, as by transfer of surplus property, of supplies used in various Government

³Material obtained from the Procurement Division, U. S. Treasury Department, Washington, D. C.

establishments, exclusive of realty, and also excluding the requirements of the Army, Navy, and Marine Corps.

This centralization of procurement responsibility is based on the fact that large quantity procurement, made possible through consolidation of requirements of various Federal activities, offers certain economies and advantages to the Government consumer, important among which are—

Minimizing overhead cost by eliminating the duplication which attaches to the large volume of small purchases represented by one term contract or purchase of a corresponding consolidated procurement;

Standardization of character and quality of requirements through study of actual needs and establishment of standards accordingly, as reflected by adequate specifications;

Lowest prices consistent with proper standards and a competitive market; and

Better opportunity to apply effective inspection practices.

These general functions of the Procurement Division are accomplished in part by delegation of authority to certain other agencies and in part by actual handling of details through this division and its field offices.

The fundamental of competition which governs all procurement negotiations is that proposals must be invited from a wide field of potential suppliers and award must be made to the lowest responsible bidder meeting the specifications and conditions. In the case of relatively small purchases, exemption from strict observance of this rule is given by statute, such exemptions varying with different appropriations from \$50 to \$300.

"Procurement" as applied to the activity of the Procurement Division has a broad meaning. It includes, together with certain related activities, two particular features: (1) The contractual function under which sources of supply for standard materials are established for terms up to 1 year, and (2) actual purchasing either from established term contracts or in the open market.

Specialization of functions.

Standard nomenclature.—All supplies purchased by the Government are precisely identified and cataloged according to a prearranged system to assure the use throughout the Government service of standard commodity nomenclature, to facilitate the establishment of uniform records and promote comparable analyses thereof, and to provide a uniform plan for storage. As of January 1, 1940, about 500,000 items have been so cataloged.

Classes.—This large commodity field is treated under "classes" of related articles. There are about 60 such "classes"; e. g., "Class 5—Flags and bunting," "Class 58—Railway, dock, and fire-fighting apparatus."

Item identification.—The identification of the individual item consists first of the number of the class, followed by the initial letter of the article, then the number which is assigned to the article itself, supplemented by subordinate numbers or letters as the elaboration by types or size requires. Thus, 1 ounce glass-stoppered bottles, of a certain description, in lots of one dozen would be "57-B-7530-(a)"; in gross lots it would be "57-B-7530-(b)," etc.

Commodity groups.—As a matter of practical operation, the handling of the technical activities of contracting and purchasing is

organized so that related commodity classes are associated and assigned to groups of specialists, hereafter identified as "Commodity groups," whose interests are concentrated on items within their respective fields. This arrangement promotes expert knowledge and skillful treatment in perfecting specifications, in effecting adjustment, in buying against account in the event of failure of timely or acceptable delivery, and in handling other details relating to the transactions. There are a number of such commodity groups, one handling, for instance, class 29 (toilet articles and all accessories, outfits, and parts), class 51 (acids; chemicals; drugs; gases; soaps; abrasive materials; cleaning, cutting, and polishing compounds), and class 57 (hospital, laboratory, and surgical apparatus; and all accessories, outfits, parts, and supplies).

The following is a list of items contracted for by the Procurement Division:

- Acids; chemicals; drugs; gases; soaps; abrasive materials; cleaning, cutting, and polishing compounds.
- Agricultural implements and all accessories, outfits, and parts.
- Airplane accessories.
- Ammunition; ammunition details; blasting-apparatus; bombs.
- Arms, small; and all accessories, outfits, and parts.
- Athletic equipment, recreational apparatus, sporting goods, special wearing apparel.
- Bakeshop and kitchen apparatus and utensils: Aluminum utensils; galley gear; tinware; and all accessories, outfits, and parts.
- Bathroom and toilet fixtures; and all accessories, outfits, and parts.
- Bolts, nuts, rivets, screws, washers.
- Books, blueprints, charts, drawings, libraries, maps, newspapers, periodicals, professional publications, etc.
- Boots; shoes; leather and rubber clothing.
- Brooms, brushes.
- Building materials: Asphalt, brick, cement, glass, granite, gravel, lime, millwork, roofing material, sand, stone, tar, tiling, etc.
- Caps; hats; gloves; men's and women's furnishings.
- Cordage: Hemp; jute; oakum; twine; including manufactured articles.
- Dry goods: Bedding, buttons, curtains, cushions, draperies, findings, floor coverings, linoleum, oilcloth, textiles, trimmings, upholstery materials, yarns, etc.
- Duck; canvas; tentage; including manufactured articles.
- Electric apparatus and all accessories, outfits, and parts.
- Electric cable and wire (insulated).
- Engine room and fire room fittings, supplies, and tools.
- Fire-surfacing and heat-insulating materials.
- Flags, bunting.
- Food: Groceries, ice, provisions, subsistence.
- Forage; bulbs and roots; plants, shrubs, and trees; seeds.
- Fuel: Charcoal, coal, coke, dust fuels, gas, gasoline, oil (fuel), wood, etc.
- Furniture.
- Gaskets; hose; packing; rubber (sheet and strip); hose fittings; tubing (flexible); including manufactured articles.

Hardware (builder's general).

Hospital, laboratory, and surgical apparatus; and all accessories, outfits, parts, and supplies.

Instruments of precision of all accessories, outfits, and parts.

Leather: Belting, harness, saddlery, including manufactured leather articles.

Lighting apparatus (nonelectric) and all accessories, outfits, and parts.

Lumber; timber; (barrels, boxes, cases, crates) wooden; railroad ties; including manufactured lumber.

Machinery and equipment.

Metal in bars (flat, hexagon, octagon, round, square); billets, ingots, pigs, slabs.

Metal in plates and sheets.

Metal shapes (angles, channels, half-rounds, I-beams, T's, Z's, etc.); structural metal.

Motor vehicles; bicycles; trailers; and all accessories, outfits, and parts.

Office equipment: Adding machines, cash registers, file cases, numbering machines, typewriters, etc.

Oils (illuminating and lubricating), greases, and all lubricants.

Paints; paint ingredients.

Pipe fittings.

Pipes, tubes, tubing (nonflexible).

Pumps and their parts.

Radio and sound-signal apparatus and all accessories, outfits, and parts.

Railway, dock, and yard equipment; including fire-fighting (and meteorological) apparatus.

Rope, wire; and wire, bare; including manufactured articles.

Stationery: Bags, paper; books, blank; boxes, paper; cartons; drafting-room, office, and printer's supplies.

Tableware (barracks, crews' mess, hotel, hospital, officer's mess, ship-saloon): Aluminum ware; chinaware; glassware; silverware.

Textile clothing; knitted goods.

Tobacco products: Cigars; cigarettes; and all accessories, outfits, and supplies.

Toilet articles and all accessories, outfits, and parts.

Tools, hand.

Tools, machine (bending rolls; drop hammers; drills; grinders; lathes; milling machines; planers; presses; punches; riveters; rolling machines; saws; shears, etc.); and all accessories, outfits, and parts.

Vehicles (animal- and hand-drawn); and all accessories, outfits, and parts.

Inspection.—Stress is laid on the importance of inspection. Without competent inspection, all of the effort of careful specification writing and attention to other details designed to assure compliance with the requirements would be fruitless. Rigid examination of deliveries prior to acceptance and payment is the vital and concluding step of procurement. Occasionally, in connection with orders placed by the Procurement Division, it is necessary to send inspectors to

examine deliveries in the field or to inspect commodities in the process of manufacture.

The Procurement Division inspection facilities are available to other Government agencies upon request.

A pamphlet entitled "Directory of Inspection Services and Testing Laboratories of the Federal Government," prepared in collaboration with the National Bureau of Standards, has been made available to Government purchasing offices.

Deliveries to Procurement Division.—All commodities received in the Procurement Division Building are inspected as to quality and quantity by trained personnel. With many commodities, qualitative inspection is accomplished promptly in the Procurement Division, either on the basis of the expert knowledge of the inspectors or through chemical or physical tests made in the inspection laboratory. Where the simpler technical facilities available in this Division are inadequate to an exhaustive analysis that may be necessary the inspection office arranges for appropriate tests through the National Bureau of Standards, the United States Department of Agriculture or elsewhere. In either case an authoritative inspection is accomplished.

Field deliveries.—Normally deliveries outside of Washington must be inspected by the consignee, for which purpose data is supplied as a basis for checking on the acceptability of the commodity received. In some instances this information is in the form of a copy of the invitation to bid; in others it may be the detail given in the General Schedule of Supplies or on the delivery invoice supplied by the purchasing officer. Frequently, in the case of General Schedule items, a delivery sample may be forwarded to the Procurement Division in Washington for comparison with the official sample so as to determine acceptability.

Character of Procurement Transactions.

Procurement, as organized in the Procurement Division, may be either (1) the negotiation of a term contract; or (2) the purchase of a definite quantity in the open market, hereafter referred to as a "spot" purchase; or (3) a stock (warehouse) transaction, the distinctions between which are explained as follows:

General Schedule of Supplies (term contracts).—Under this category term contracts are negotiated for many thousands of items in regular use by several agencies; e. g., furniture, chemicals, hardware, auto parts, etc. These engagements are usually made for a 1 year term, though occasionally market conditions make it necessary to accept proposals for a shorter period. New contracts are made annually for each item so long as general demand is sustained. Items found to be inactive are dropped.

Detail as to commodities so placed under contract is circularized to all Federal agencies for their independent use by a catalog entitled "General Schedule of Supplies." This catalog contains all information essential for ordering purposes and cites the conditions of the contract. It is issued in sectional form by classes. The issue of the various classes is staggered so as to spread the work involved evenly over the year and thus avoid the congestion which would be apt to occur if the whole publication were made as one volume on any one date.

Items covered by the General Schedule of Supplies may not be purchased by Government offices in Washington from sources other than prescribed in the schedule, and the degree to which the same

principle is mandatory on offices in the field is stated in each class schedule.

Samples of many items covered by these contracts are maintained for examination by agencies contemplating purchase and also as a standard against which deliveries may be compared.

The approval of items for inclusion within the General Schedule of Supplies is a responsibility of the Director of Procurement and is based on probable demand as well as on the character of the item itself. Items for such consideration are usually developed within the Procurement Division in its normal activities but also frequently through recommendations of the using agencies.

The General Schedule of Supplies activity is a major feature of Government procurement and not only saves the using agencies the labor, cost, and delay incident to individual advertising, but assures appropriate price and quality standards, and facilitates inspection of deliveries. Some 50,000 principal items are covered by these contracts, and purchases made from them by Government agencies aggregate about \$60,000,000 annually.

The majority of term contracts are those which are included in the General Schedule of Supplies. However, some term contracts are made for the use of but one agency; e. g., for the Procurement Division in replenishing its warehouse stock so as to establish a source of supply for an item on which new stock is expected to be required frequently.

Open market (spot) purchases.—These are definite quantity transactions, initiated by orders from requisitioning offices, for items which are not covered by General Schedule of Supplies or other term contracts. Such a purchase may be a buy of very simple character; it may be the procurement of a single piece of special apparatus, such as a complete dental office on an auto trailer unit; it may represent a consolidation of orders from 2 or 3 agencies for the same item; or it may represent a large purchase of a common article, as for instance, 980 trucks for 1 agency.

Many of these transactions are actions to which the specialized facilities of a large buying organization, such as personnel particularly qualified in specification and inspection work, can be advantageously applied.

Stock.—Under this activity, commodities of most common use (standard foodstuffs, office supplies, janitor's materials, etc.) are warehoused in the Procurement Division Building to meet such requirements of all agencies in the District of Columbia area and also to supply many field activities. About 1,800 different items, inventorying at approximately \$600,000, are thus made available for immediate delivery. Issues aggregate over \$3,500,000 annually.

Purchase of stock by the Procurement Division warehouse is initiated by a special requisition originating in the warehouse. The purchasing of such requirements may be affected either by (a) ordering from an existing term contract, or (b) establishing a term contract so as to provide a suitable source for reordering, or (c) making a spot purchase where replenishment is not imminent or potentially frequent. Items are added as new demands are established, and discontinued as diminished use indicates.

Issue of stock from the warehouse is a simple withdrawal transaction, initiated by an acceptable requisition.

Procurement Procedure.

Purchase against a term contract.—This type of transaction, whether against a General Schedule or other term contract, is a simple action involving only the drawing of an official order and related documents, under a routine as stated in paragraphs 7 to 13 of the procurement steps discussed immediately following.

Negotiation of a contract.—This type of transaction follows a fixed procedure designed to assure, in conformance with statutory and administrative requirements, timely deliveries complying with the specifications and other terms of the purchase contract. This fundamental applies whether the transaction relates to the negotiation of a General Schedule, or other term contract, or to a spot purchase.

The full course of a procurement transaction is represented by a spot purchase, which includes all steps from the preparation of specifications, invitation, award, issue of purchase order, inspection, payment detail, and various intermediate and subsequent documentation or action.

In the case of a term contract negotiation (General Schedule of Supplies or otherwise) the Procurement Division action is completed when the award is made and potential users are informed, ordinarily by issue of a covering section of the General Schedule of Supplies as a basis for issue of purchase order and related documents independently by the using agency.

The following presents, in order of their occurrence, the principal steps taken in a complete purchase transaction. Certain minor variations as to style of documents, number and distribution of copies, etc., which occur in practice, are not included in this statement of fundamentals.

Principal steps.—1. Mailing list: Timely procurement of satisfactory commodities requires knowledge of dependable sources of supply. In the Procurement Division such information is available through the maintenance of a current mailing list sufficiently comprehensive to assure offers on a competitive basis. Accordingly, a feature of every transaction maturing into an invitation to bid is the establishment from the mailing list of that group of potential bidders applicable to the commodity involved. Access to such a mailing list simplifies observance of the statutory requirements for advertising.

2. Requisition: Upon receipt, this originating authority is recorded, reviewed as to its general sufficiency and authenticity and referred to the commodity group responsible for buying the particular commodity involved.

3. Invitation to bid: An invitation to bid is a request for quotations on supplies. Its preparation is of fundamental importance and first in order of attention. Each invitation includes several standard features, important among which are: (1) General conditions which stipulate observance of applicable statutory requirements, such as those fixing hours and wages, those prohibiting child labor, and those providing restrictions to insure delivery of goods of American origin; and also include provision by which, in the event of contractor's default, the Government may purchase in the open market and hold the contractor responsible for any resulting loss; (2) special instructions or conditions that relate to the particular transaction, i. e., packing, handling, delivery, etc.; and (3) the specifications which set forth

fully the qualities required, which detail of description always includes citation of a Federal Specification, in whole or in part, where such specification is applicable. The preparation of an invitation to bid is accordingly a specialized function.

4. Bid opening and tabulation: Bid opening is public and begins at the time specified in the invitation. A clear announcement is made of the identity of the invitation and of the offer of each bidder, as to price, discount, and other basic information. Following the public reading, the bids are tabulated in such manner as to present those common elements which are necessary for consideration in readily comparable arrangement.

5. Award: All bids received on a given invitation, together with their tabulation, are next examined by the commodity group under whose supervision the transaction is being conducted. It evaluates the various offers and determines which of those meeting all requirements is the lowest in price. Award is then made to the bidder so qualifying.

6. Guaranty: Performance guaranties may be required in the case of certain term (indefinite quantity) contracts, or in connection with spot purchases, where the sum involved exceeds \$2,000. Such guaranties are in amounts representing a schedule percentage of the probable aggregate amount involved. Bid guaranties evidencing the good faith of bidders may also be required. In lieu of sureties executed on standard forms provided for those purposes, certified checks or Federal obligations may be accepted.

The steps discussed in sections 1 to 6 preceding cover the major phases of procurement so far as the negotiation of term contracts is concerned, the final action in such transactions being the circularization of the results through notice in the class of the General Schedule of Supplies affected, or otherwise where the General Schedule is not involved.

Procurement procedure involving spot transactions necessarily requires additional steps, such as order placement and other actions, as follows:

7. Purchase order ticket: In order to facilitate the issuance of properly worded purchase orders and related documents, the commodity group details on a "Purchase Order Ticket" all information essential to adequate description, delivery conditions, etc., for the guidance of the typing pool which handles the mechanics of document preparation.

8. Routing: Since shipment of Federal property must be on Government bills of lading, when a purchase is made f. o. b. shipping point the traffic section is required to furnish appropriate routing.

9. Purchase orders: With the information supplied on the purchase order ticket and the routing, the purchase order is drawn and forwarded to the responsible commodity group for examination and signature. Purchase orders are prepared in multiple copy, the various carbons being distributed to an approved list of accounting and administrative offices.

10. Delivery invoice: An invoice on which delivery is to be acknowledged is prepared coincidental with the issue of the purchase order. Under one procedure followed the delivery invoice is a separate document, while under another it is a part of the multiple-form purchase order. Under both practices, however, copies are supplied to the con-

signee and to administrative or accounting offices in accordance with a fixed distribution list.

11. Bill of lading: Where the purchase is made f. o. b. shipping point, covering Government bill of lading is prepared in multiple copy and distributed under standard instructions.

12. Inspection: Except in unusual transactions, as where in large purchases inspection is made in process or at shipping point, consignees are responsible for the examination of deliveries and for reporting the result of such examination. Official acknowledgment that delivery meets contract requirements must in all cases be on file before payment may be recommended.

13. Payment: The vendor's bill may be submitted on the regular Government voucher form or on the firm stationery. It must include certifications as to compliance with those conditions (as to American origin, observance of wages and hours laws, etc.) cited on the reverse of the purchase order which are applicable to the transaction. Upon receipt in the accounting office, the vendor's bill is associated with a copy of the purchase order, the contract and evidence of acceptable delivery. It is then audited and, if in order, available discount is taken and the account forwarded to a disbursing office for payment.

In concluding this brief explanation of Government procurement practices, it should be mentioned that when public exigencies require immediate delivery, as for the protection of life or property, purchases may be made without observance of the requirement governing competition, but payments covering such transactions must be supported by evidence justifying the noncompliance.

PROCUREMENT METHODS AND PROCEDURES OF UNITED STATES NAVY DEPARTMENT ⁴

The Bureau of Supplies and Accounts.

The Navy, one of the largest of the procurement agencies of the Federal Government, in general, adheres to a centralized purchasing system. The Bureau of Supplies and Accounts, under the direction of the Paymaster General of the Navy, is the Navy's central purchasing office for supplies and materials. The common requirements of the various naval activities are consolidated, prepared into schedules or invitations to bid and purchased in quantity lots for delivery to the major activities.

The Bureau of Supplies and Accounts acts administratively on requisitions for materials which are to be purchased by offices located elsewhere than in Washington. Purchases in the so-called field usually comprise items found necessary to meet a specific project (as distinguished from standard supplies for general issue), articles required to meet an emergency, products of a perishable nature, and articles required in such small quantities that consolidated procurement would not be justified.

Thus the Bureau of Supplies and Accounts is the centralized purchasing agency and either procures directly or has supervision over the purchase of all materials required by the Navy, except—

The Bureau of Yards and Docks prepares schedules, open bids, and makes contracts for public rooms (i. e. buildings, dry-docks, etc.) involving both labor and material in construction.

The Bureau of Ordnance purchases ammunition, arms, and gun forgings.

The Judge Advocate General of the Navy, in conjunction with the *Bureau of Ships*, contracts for the construction of ships at private shipyards.

The Marine Corps performs all its own purchase functions.

Navy requirements.—The general range of the Navy's requirements can best be presented by the following list of *standard classes* into which the Navy supplies are segregated for accounting and store-keeping purposes.

Acids, chemicals, cleaning compounds, soaps, etc.

Aircraft and aircraft materials.

Automotive and railroad supplies.

Belting, gaskets, hose, leather, packing, and rubber.

Boilers, engines, etc.

Boat and ship supplies.

Boats, life rafts, etc.

⁴ Material obtained from the U. S. Navy Department.

Brooms and brushes.
Building materials.
Cordage, hemp, oakum, twine, etc.
Drygoods—clothing, textiles, etc.
Drygoods—gloves, insignia, shoes, etc.
Electrical accessories, wiring, and illuminating devices.
Electrical accessories and equipment.
Fire surfacing and heat insulating materials; foundry apparatus.
Forest products.
Fuel.
Furniture.
Hand tools.
Hardware—general.
Instruments of precision, including accessories, outfits, and spare parts.
Iron and steel.
Lighting apparatus (nonelectric).
Machine tools, accessories, outfits, and parts.
Musical instruments, accessories, and parts.
Machinery and equipment for navy yard use.
Mess gear and galley equipment; laundry apparatus.
Nonferrous materials.
Oil, grease, and lubricants.
Ordnance equipment.
Paints, varnishes, etc., and ingredients.
Plumbing and steam fittings, bathroom accessories, valves, etc.
Provisions.
Pumps.
Radio equipment, accessories, parts, and supplies.
Recreational apparatus.
Sheet metal products.
Stationery, office equipment and supplies.
Wire and wire rope; electric cable and wire.

There are about 60,000 items of supplies and equipment in common use by the Navy. These are practically all listed in the N-Navy Department Supplement to the Federal Standard Stock Catalog. All items appearing in this catalog have a standard nomenclature and a standard stock number for use within the service. The standard nomenclature is based on the plan of arranging the descriptive words in order of importance. Thus, white cotton canvas is known as "Canvas, cotton, white," followed by number and grade, and a standard-thread steel machine screw with flat head is known as "Screws, machine, steel, flathead, standard," followed by diameter, threads per inch, and length.

The standard stock number is made up of the standard class number, first initial of the nomenclature, and serial number. Thus, canvas, cotton, white, No. 4, medium, is standard stock number 24-C-6. This standard naming and numbering is an insurance against misunderstanding and error. These standard designations are not generally used in schedules and other papers furnished to the public because of the possibility of confusion with commercial terms.

Much of the N-Navy Department Supplement to the Federal Standard Stock Catalog can be procured from the Superintendent of Docu-

ments under the names of individual parts and classes. For a complete list see Price List 75, Federal Specifications, Federal Standard Stock Catalog, issued by the Superintendent of Documents, United States Government Printing Office, Washington, D. C., to whom application for the price list and orders for items covered thereby should be addressed.

Acceptable List of Approved Materials.—The Navy Department maintains a list of products which require test prior to purchase. This list of products with the names of the manufacturers and trade or other identifying data concerning the products which have been tested and approved comprises the Acceptable List of Approved Materials.

When materials requiring test and approval prior to purchase are included in a schedule inviting bids, the specifications and the general conditions on the schedule specify that the Government reserves the right to reject bids on brands or products which have not been subjected to the required tests and found satisfactory. The specifications and schedule invite the attention of manufacturers and bidders to this requirement, and urge them to forward samples of such products which they may propose to furnish to the Government in the future, in order that the tests may be made.

Such tests are made at the expense of the manufacturers; this includes the furnishing of samples and costs of transportation to and from point where tests are made. If samples submitted prove unsatisfactory, consideration is given to the request of manufacturers for additional tests only after it is clearly shown that changes have been made in the product with reference to the method of manufacture, etc., which the Navy considers sufficient to warrant conducting additional tests.

The commodities purchased under the prior-test or acceptable list method are limited as far as possible to products which come within one or more of the following classifications:

1. Products requiring elaborate testing apparatus which is not available to test the individual deliveries.
2. Products which require a long time for testing.
3. Products of such character that testing upon delivery does not indicate the lasting qualities or performance value.
4. Products which cannot be tested completely without destruction.
5. Products which are purchased on performance, or work value, where it is necessary to set up factors which show the relationship between performance and price.
6. Products requiring costly tests which cannot be applied to individual deliveries.

The listing of a product on the Acceptable List of Approved Materials does not preclude inspection of actual deliveries.

The Acceptable List of Approved Materials is a restricted publication; it is not distributed outside the naval service.

Principal Steps of Procurement Procedure.

Purchase requisitions.—The form on which one bureau or office of the Navy makes a request on the Bureau of Supplies and Accounts for the furnishing by purchase or from stock certain material and supplies is designated by the term "requisitions." These requisitions require

official approval depending upon the circumstances; those for purchases are finally approved by the Bureau of Supplies and Accounts, either for bureau purchase or purchase by a local purchasing officer near the point originating the requirement.

Advertising.—The required supplies covered by an approved purchase requisition are purchased after advertisement, and competition is required by Federal statute.

Schedules, proposals, or invitations to bid.—When the approved requisition is in hand the "schedule" is prepared for distribution to prospective bidders. The "schedule" forms the basis of subsequent transactions of a formal nature.

Schedules are prepared in mimeograph or printed form and include the essential data with appropriate blank spaces for entry of bids.

A guaranty is required by Federal statute and is to the effect that the bidder will execute the required contract and give bond for faithful performance of same if his offer is accepted. Guaranty is required when the total amount of all classes on which bid is submitted exceeds \$500.

Specifications and plans.—Most Navy supplies are purchased on the basis of standard specifications: Federal Specifications and United States Navy Specifications which describe in detail the quality, grade, size, etc., of the article desired. Use of such a specification tends to standardize the Navy's material, puts all bidders on equal footing, assists inspection, eliminates questions and dispute. When there is no standard specification the required particulars are set forth in the schedule.

Openings of bids; awards.—Bids having been submitted, they are opened publicly and currently by the officials of the Navy purchasing agency. Bidders or their representatives may be present at these openings, which are public in character.

Awards are made to the lowest responsible bidder except in a few cases of statutory exemptions.

Contract, Bureau order, or order.—After award is made a formal contract is prepared when the amount involved is over \$500. This contract is required to be reduced to writing and signed by the contracting parties with their names at the end thereof. A bond for faithful performance is required to accompany the contract.

Purchases amounting to less than \$500 may be made without formal contract or bond. The informal order placed by the Bureau of Supplies and Accounts in such cases is called "a bureau order;" if placed by a field purchasing activity it is called an "order."

Inspections.—Before material may be accepted and paid for by the Navy it is required that it may be inspected, and passed as to the quality and quantity, by a responsible official.

Proper and adequate inspection and test are essential to efficient purchasing. Inspection and test are particularly important when purchases are made under the competitive system of bidding. Few commodities are invariably uniform in quality; it is inevitable that some vendors will deliver a better quality than others. The best specifications and procurement procedures are of little value without intelligent and thorough inspection.

It cannot be assumed that the record of reliability of a bidder is a guaranty that the material he proposes to furnish will comply in all

respects with the specification requirements. Conceding the good intention in the great majority of cases, there always exists the possibility of errors in manufacture or of shipment, variations in count of quantity, etc., which are discoverable only by adequate test and inspection. Proper specifications and the contract indicate what the Navy wants; adequate inspection and test insure that it obtains what it has purchased.

The inspection activities of the Navy are in charge of commissioned officers of the Navy who are well qualified by training and experience for the service of inspection. These officials are designated as Inspectors of Naval Material. In the Navy inspecting system the United States is divided into 12 inspection districts. These inspection districts are based on (1) the concentration of basic industries, and (2) transportation facilities. Assigned to these inspection districts are experienced civil personnel competent to inspect apparatus and material not only for naval and marine use, but for general commercial use.

The responsibility for the inspection of the Navy material lies exclusively with the respective bureaus for which the material is purchased. The Bureau of Supplies and Accounts at the purchasing agency has no cognizance over the inspection of material, except as to those items of which it also has technical cognizance.

Bureau cognizance is a very broad term to cover the allocation of inspection duties among the various bureaus. It may be helpful, however, to outline in most general terms, cognizance over some items.

Bureau of Aeronautics: Airplanes, engines, aeronautical equipment, etc.

Bureau of Ordnance: Arms, armor, ammunition, etc.

Bureau of Medicine and Surgery: Medicines, hospital supplies, instruments, etc.

Bureau of Supplies and Accounts: Provisions, clothing, fuel, etc.

Bureau of Yards and Docks: Public works and other utilities on shore.

Bureau of Ships: Hull materials, anchors and cable, rigging, canvas, winches, propelling machinery, electrical appliances, radio, navigational instruments, etc.

Bureau of Navigation: Libraries, recreational items, etc.

All these Bureaus maintain inspection forces both in the field and in the navy yards.

Shipments.—Contractors must give particular attention to instructions pertaining to shipment in order to avoid misunderstanding and delay.

Payments.—Delivery having been completed and inspection concluded, the contractor is naturally interested in obtaining prompt payment. He is advised in the contract where to submit his invoices or dealers bills, which must contain all necessary data for identification.

PROCUREMENT METHODS AND PROCEDURES OF THE UNITED STATES WAR DEPARTMENT⁵

So far as practicable, the War Department decentralizes its procurement activities. Each War Department procuring agency is interested in specialized products which are assigned to the depots or field purchasing offices.

Procurement Planning.

1. The procurement planning agencies are engaged in planning for the procurement of supplies and equipment which will be needed by the Army during a war or other major national emergency. Military requirements are computed in advance. They are apportioned by the supply arms and services to procurement districts. The procurement planning officers in these districts search the areas to which they are assigned for the productive capacity necessary to meet requirements. Individual plants are surveyed, production studies are made, and in agreement with the management, plants are allocated for particular production during an emergency.

2. The management of plants having facilities which are considered suitable for the production of military equipment are asked to communicate with the officer in charge of the procurement district which is nearest the plant for detailed information regarding this activity.

Procurement planning agencies of the War Department:⁶

Air Corps: Purchases all flying equipment and the necessary facilities for operating the air bases.

Chemical Warfare Service: Purchases items having to do with toxic gases, gas defense appliances, incendiary war materials, and the development of equipment for use in that type of service.

Corps of Engineers: The military branch buys the materials and equipment used for field work in connection with a mobilized army. (The nonmilitary branch is in charge of the maintenance of the rivers and harbors throughout the country.)

Medical Department: Purchases all articles required for the treatment of patients and for general hospital use; also for the veterinary service and the inspection of perishable foodstuffs.

Ordnance Department: Procures all items of ammunition, weapons, fire control instruments, tools, machinery, and supplies used in arsenals and for maintenance of ordnance.

Quartermaster Corps: Purchases a great variety of items required by the personnel of the Army, classed as subsistence, clothing, motor vehicles, machinery, and supplies, etc.

⁵ Material obtained from the U. S. War Department, Washington, D. C.

⁶ "National Defense. Procurement Planning, Purchasing, and Contracting," 14 pp., by the Bureau of Foreign and Domestic Commerce, United States Department of Commerce, Washington, D. C. (Revised), August 1940.

Signal Corps: Purchases general equipment for communications, photographic purposes, meteorological studies, etc.

Coast Artillery Corps: Purchases scientific laboratory equipment and submarine mine equipment and supplies.

Purchasing Methods.

1. *After advertising.*—All normal purchases of the War Department are made after advertising for bids. Purchasing officers prepare circular proposals and invitations to bid. These papers list the items to be purchased, list the applicable specifications, state delivery points and dates, and furnish all the information necessary for a prospective bidder to calculate his costs and submit a bid. Bids are required to be submitted by a stated time in sealed and properly addressed envelopes. Bid bonds are frequently required with the bids. At the stated time, the purchasing officer, in the presence of those bidders who desire to be present, opens the bids. As a result of this procedure, the purchase contract is awarded to the best advantage of the Government. Circular proposals are given wide distribution in order to secure the maximum competition. Newspaper advertising is frequently used. Several commercial concerns publish daily information regarding invitations issued by the various purchasing agencies of the Government.

2. *Without advertising.*—A great portion of the requirements of a military force are articles which are not in ordinary commercial production. These are such items as weapons, ammunition, and numerous special articles of transportation and communication equipment. For some of these, the entire applicable productive capacity of the country is insufficient to meet the requirements as to quantity and delivery dates. Several procurement projects are so large that no one commercial concern is equipped to meet the requirements of any of them. In order to secure the productive capacity required and in order to prevent disastrous delays to the present national-defense program, the Congress has authorized the award of contracts under special circumstances without advertising. Since this procedure is resorted to only in order to accelerate and to prevent delays to the present procurement program, contracts of this sort are awarded to those facilities known by the purchasing agency to be capable of the required production. The awards are made with a view of distributing the production load over available productive capacity. The negotiation of such contracts will be resorted to in those cases only where time and other considerations will not permit the award of a contract as the result of advertising.

3. *Open market.*—Purchasing officers of the War Department may purchase to the amount of \$500 or less in the open market. Such purchases are made, with minor variations covered in the regulations, in a manner common among businessmen. Purchases in excess of this amount may be made without formal advertising when authorized by the chiefs of the respective arms or services. Informal quotations are requested from several convenient sources of supply. The purchase order is issued to secure those terms which are most advantageous to the Government. Price and discounts, quality, and delivery are considered. Purchases of this sort are made, in general, at posts and stations to meet maintenance requirements when local procurement

by purchase offers advantages over procurement by requisition on military supply depots.

Purchasing Agencies.

Actual purchasing activity of the War Department is specialized and decentralized. The greater volume of purchases is made by the depots and arsenals of the Army. These specialize to a great extent in the articles purchased.

Local Purchases.

The Quartermaster, the Ordnance officer, the Medical Supply officer, the Signal officer, the Engineer Supply officer, the Chemical Warfare officer, and the Air Corps Supply officer at Army posts where the activities of each are located purchases materials, supplies, and equipment. These local purchases are to cover requirements of the post when supplies required are readily procurable and no advantage would exist from consolidation and procurement by a depot.

Civilian Conservation Corps.

Purchases for the operation and maintenance of Civilian Conservation Corps establishments are made under the supervision of the War Department.

Items Purchased by the War Department Against Procurement Division, Treasury Department, Contracts.

1. Such items are: Tires and tubes; office furniture, filing cases, and similar equipment; gasoline, and several less important items. Other items contracted for by the Procurement Division, Treasury Department, may be purchased against such contracts by the Army when it is advantageous to do so.

2. Stock piles of strategic and critical raw materials authorized under recent acts of Congress are being purchased under the supervision of Procurement Division, Treasury Department.

Items Purchased by the War Department Against Navy Department Contracts.

Such items are lubricating oils and certain fuel oils.

STATE PURCHASING METHODS AND PROCEDURES

In order to get some idea of the extent to which the States make use of written purchase specifications and scientific testing of commodities in their buying, a questionnaire was prepared for the purpose of this monograph and sent by the Council of State Governments to the 48 States.

This questionnaire consisted of the following items:

1. Name of the purchasing agency.
2. Independent agency or part of what State department.
3. Name and title of the chief officer.
4. For what bureaus, commissions, departments, and institutions are purchases made by the agency?
5. Are purchases made and contracts based on written specifications, or by trade-name or brand?
6. How are standards and specifications formulated (that is, by a specifications committee, by the purchasing agency itself, or otherwise)?
7. What use is made of the specifications of national trade or technical associations, or of the Federal Government?
8. Classes of commodities for which standards and specifications have been prepared.
9. What arrangements are made for testing samples submitted with bids?
10. Are commodities tested after delivery to ascertain that they conform to the purchase specifications?
11. Is a testing laboratory maintained? If so, what kind of tests are conducted?
12. Is use made of (a) college or university or (b) private or commercial testing laboratories?

Extent of Centralized Purchasing in States.

Among the 42 States replying to the questionnaire, 38 States reported centralized purchasing. Table 2 shows the coverage of the questionnaire, replies received, number of States not replying, number and percent of States reporting centralized purchasing, and number and percent of States reporting no centralized purchasing.

TABLE 2.—*Extent of centralized purchasing in States*

States	Number of States	Percent of replies	Percent of total
Total.....	48		
Replying.....	42		87.5
Not replying.....	6		12.5
Reporting centralized purchasing.....	38	90.5	79.2
Reporting no centralized purchasing.....	4	9.5	8.3

¹ Arkansas, Delaware, Georgia, Idaho, Kansas, and Louisiana.

² 2 purchasing agencies were reported for the State of Iowa: Purchasing department of board of control, and executive council.

³ Mississippi, Nevada, New Mexico, and South Carolina.

Status of State Purchasing Agencies.

Among the 38 States reporting centralized purchasing, 11 States have an independent State purchasing agency, while in 26 States the purchasing agency is part of a State department.¹ Table 3 gives the names of the States and the status of the State purchasing agency.

TABLE 3.—*Status of State purchasing agencies*

[Based on 38 States]

Type of agency	States	
	Number	Percent
Independent State agency.....	11	29.0
Part of a State department.....	26	68.4
Not specified.....	1	2.6
Total.....	38	100.0

¹ Arizona, Florida, Maryland, Missouri, Montana, New Hampshire, North Carolina, Tennessee, Utah, Vermont, and West Virginia.

² Alabama, California, Colorado, Connecticut, Illinois, Indiana, Iowa (purchasing department, 1 of the 2 purchasing agencies in the State, is a part of the board of control), Kentucky, Maine, Massachusetts, Michigan, Minnesota, Nebraska, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Texas, Virginia, Washington, Wisconsin, and Wyoming.

³ New Jersey.

Departments of Which State Purchasing Agencies are a Part.

Among the 26 States where the State purchasing agency is part of a State department, 8 States have the purchasing agency as part of the department of finance, 3 States as part of the executive department, and 3 States as part of the board of control. Table 4 shows how purchasing agencies are distributed through different departments and gives the names of the various departments and the names of the respective States.

TABLE 4.—*Departments of which State purchasing agencies are a part*

[Based on 26 States]

State department	States	
	Number	Percent
Department of finance.....	8	30.70
Executive department.....	3	11.55
Board of control.....	3	11.55
State administrative board.....	2	7.70
Administration.....	1	3.85
Board of supplies.....	1	3.85
Commission on administration and finance.....	1	3.85
Coordination and finance.....	1	3.85
Department of finance, budget, and business.....	1	3.85
Department of finance and control.....	1	3.85
Executive council.....	1	3.85
Property and supplies.....	1	3.85
State board of public affairs.....	1	3.85
Tax commission.....	1	3.85
Total.....	26	100.0

¹ Alabama, California, Illinois, Kentucky, Maine, Ohio, South Dakota, and Virginia.

² Indiana, New York, and Wisconsin.

³ Iowa, Oregon, and Texas.

⁴ Michigan and North Dakota.

⁵ Minnesota.

⁶ Wyoming.

⁷ Massachusetts.

⁸ Rhode Island.

⁹ Washington.

¹⁰ Connecticut.

¹¹ Colorado.

¹² Pennsylvania.

¹³ Oklahoma.

¹⁴ Nebraska.

Bureaus, Departments, Commissions, and Institutions for Which Purchases Are Made by the State Purchasing Agency.

Among the 38 States with centralized purchasing, purchases in 22 States are made by the State purchasing agency for the State departments, bureaus, institutions, etc.; purchases in 13 States are made for these same agencies with few exceptions; and purchases in 2 States are made for State penal and charitable institutions. Table 5 shows the types of bureaus, departments, and institutions for which purchases are made and gives the names of the different States.

TABLE 5.—*Bureaus, departments, commissions, and institutions for which purchases are made by the State purchasing agency*

[Based on 38 States]

Bureaus, departments, institutions, etc.	States	
	Number	Percent
State departments, bureaus, institutions, etc.	1 22	57.9
State departments, bureaus, institutions, etc., with few exceptions.....	2 13	34.2
State penal and charitable institutions.....	3 2	5.3
Code departments, boards, and commissions.....	4 1	2.6
Total.....	38	100.0

¹ Alabama, Colorado, Connecticut, Iowa (executive council makes purchases for State penal and charitable institutions; purchasing department of board of control makes purchases for all other State institutions, departments, and bureaus, etc.), Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Vermont, West Virginia, and Wisconsin.

² California, Indiana, Kentucky, Maine, Michigan, Missouri, Ohio, Nebraska, New Hampshire, Utah, Virginia, Washington, and Wyoming.

³ Arizona (capitol building and grounds in addition to State penal and charitable institutions) and Florida.

⁴ Illinois.

Extent to Which States Use Written Specifications.

Among the 38 States with centralized purchasing only 7 States use written specifications exclusively, 6 States use written specifications in most cases, while 24 States use trade-names and specifications. Table 6 shows the extent of the use of written specifications, and gives the names of the States.

TABLE 6.—*Extent to which State use written specifications*

[Based on 38 States]

Extent of use of written specifications	States	
	Number	Percent
Use of specifications exclusively.....	1 7	18.4
Use of specifications in most cases.....	3 6	15.8
Use of trade-name and specifications.....	2 24	63.2
Specifications never used.....	4 1	2.6
Total.....	38	100.0

¹ Alabama, Connecticut, Illinois, Massachusetts, New York, South Dakota, and Virginia.

² Colorado, Indiana, Nebraska, Oklahoma, Rhode Island, and Wisconsin.

³ Arizona, California, Florida, Iowa, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, and Wyoming.

⁴ North Dakota (trade-name and brand).

How Specifications Are Formulated.

Among the 38 States reporting centralized purchasing, there are 9 States where specifications are formulated by the State purchasing agency; 16 States where specifications are formulated by the purchasing agency in cooperation with the departments concerned, committee, or specialists; and 4 States by a specifications committee. Table 7 shows in detail how specifications are formulated in different States.

TABLE 7.—*How specifications are formulated by State purchasing agencies*

[Based on 38 States]

Formulation of specifications	States	
	Number	Percent
By purchasing agency.....	19	23.7
By a specifications committee.....	4	10.5
By departments concerned.....	2	5.3
By purchasing agency in cooperation with departments concerned, committee, or specialists.....	16	42.1
Other.....	7	18.4
Total.....	38	100.0

¹ Alabama, Arizona, Iowa, Maine, Montana, Oregon, South Dakota, Texas, and Wyoming.

² Connecticut, New Jersey, Virginia, West Virginia.

³ Colorado and Missouri.

⁴ California, Florida, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, North Carolina, Ohio, Pennsylvania, Tennessee, Utah, Vermont, Washington, and Wisconsin.

⁵ Includes "various ways" (Illinois): "specifications based on experience and tests made by the testing division of the University of Nebraska" (Nebraska); "Bureau of Standards" (New York); "no specific specifications, sometimes make use of Government specifications" (North Dakota); "have no set type or brand to buy" (Kentucky); "United States and Department of Agriculture specifications largely used, also Bureau of Standards, and from scientific department of the State of Oklahoma" (Oklahoma); "Department of Public Works and Purchasing Standardization Committee" (Rhode Island).

Extent to Which States Use Specifications of the Federal Government and of National Trade or Technical Associations.

Among the 38 States with centralized purchasing, 13 States use specifications of the Federal Government or of the national trade or technical associations extensively or frequently, and 13 States use only when applicable. Table 8 shows the extent of use of nationally recognized specifications and gives the names of the States.

TABLE 8.—*Extent to which States use specifications of the Federal Government and of national trade or technical associations*

[Based on 38 States]

Extent of use of specifications	States	
	Number	Percent
Extensively or frequently.....	13	34.2
Whenever applicable.....	13	34.2
Only for reference and comparison.....	5	13.2
Very little.....	7	18.4
Total.....	38	100.0

¹ Colorado, Connecticut, Indiana, Maine, Maryland, Michigan, Nebraska, New Jersey, New York, North Carolina, Ohio, Oklahoma, and Oregon.

² Arizona, California, Illinois, Kentucky, Minnesota, Missouri, North Dakota, Pennsylvania, South Dakota, Texas, Utah, Vermont, and Wisconsin.

³ Alabama, Tennessee, Washington, West Virginia, and Wyoming.

⁴ Florida, Iowa (Federal Specifications are used on meat), Massachusetts, Montana, New Hampshire, Rhode Island, and Virginia.

Commodities for Which Written Specifications Have Been Prepared by One or More States.

The following is a list of commodities for which written specifications have been prepared by one or more States:

Asphalts.	Metals.
Athletic goods.	Motor oils.
Baby chicks.	Motor vehicles.
Badges.	Nursery supplies (shrubs, etc.)
Bedspreads.	Office supplies and furniture.
Belting (leather, rubber, and canvas).	Oils.
Bituminous material.	Packing (steam, water pump, etc.)
Blankets.	Paint.
Brick.	Paint brushes.
Building material.	Paint (license plate).
Cans and canning supplies.	Paper.
Cement.	Photo engravings.
China and silverware.	Piling.
Clothing.	Pine cleaner.
Coal.	Pipe (concrete).
Cotton.	Pipe (vitrified).
Creosote.	Plumbing equipment and supplies.
Culverts.	Power plant grease and oil.
Dairy equipment and supplies.	Printing.
Disinfectants.	Putty (steel sash).
Drugs.	Road machinery and equipment.
Dry goods.	Road materials.
Enamel (license plate).	Revenue stamps.
Electrical equipment.	Revolvers and holsters.
Feeds and grains.	School equipment and supplies.
Fertilizer.	Seeds.
Fire extinguishers.	Sewing and tailoring supplies.
Foods and food products.	Sheets and sheeting.
Fuels.	Shoes.
Fumigants.	Signs, sign parts, and sign markings.
Gasoline.	Soap.
Glass (window and plate).	Spray materials.
Gravel.	Steel (license plate).
Hardware.	Tar.
Hose (garden, steam, and water).	Textiles.
Hospital equipment and supplies.	Tires.
Household equipment (furniture, carpet and rugs, refrigerators, etc.).	Tobacco.
Insecticides.	Tools, small.
Janitor supplies.	Towels and toweling.
Kitchen equipment and supplies.	Trees.
Laboratory equipment and supplies.	Twine (binder).
Laundry equipment and supplies.	Varnish.
Light bulbs.	Waxes.
Lumber.	Wild game.

Arrangements Made for Testing Samples Submitted With Bids.

It is interesting to note that the arrangements made for testing samples submitted with bids are very different throughout the 38 States with centralized purchasing. The following illustrates the facilities used by various States for this purpose:

Alabama: "Some tested in own laboratory, some submitted to outside laboratories."

Arizona: "Left to the executive officer and institution stewards."

California: "Division of Highways Laboratory, Department of Agriculture Inspection Service on meats, Pure Food and Drug Laboratory."

Colorado: "Highway Laboratory tests equipment, oils, asphalt, etc."

Connecticut: "Samples with bids, tested in State laboratories, such as Highway, Agricultural Experiment Station, etc. Some use of Commercial Laboratories where special equipment not owned by the State is required."

Florida: "State Chemist is used where possible, also U. S. Bureau of Standards."

Illinois: "Private and State agencies."

Indiana: "Groceries are tested by the bureau and State Board of Health. Meats are inspected by Bureau of Agricultural Economics."

Iowa:⁷ "Most commodities are tested by the Purchasing Agent. Corn and peas are tested by an expert tester, butter by the State Agricultural Department. Occasionally the state Chemist tests various items, such as seeds, etc."

Kentucky: "Samples are tested when needed in the laboratories of the University of Kentucky and the Highway Department."

Maine: "Laboratory facilities at University of Maine, and the use of industrial laboratories for textiles."

Maryland: "Federal Bureau of Standards, Federal Bureau of Mines Laboratory make some tests."

Massachusetts: "The Purchasing Bureau maintains its own laboratory for testing samples."

Michigan: "Purchasing Agents' experience and Michigan State College."

Minnesota: "Samples are tested by individual testing agencies, Highway Department Testing Laboratory, Agricultural Testing Laboratory, U. S. Department of Agriculture for meats."

Missouri: "State laboratories."

Montana: "Samples are tested in state and college laboratories. Some items are tested in commercial laboratories."

Nebraska: "All tests are made by the testing division of the University of Nebraska if there is any question of quality."

New Hampshire: "The facilities of the State Highway Department and State University are available when required."

New Jersey: "If specifications of bid require samples for testing, said samples are tested by various agencies at command of State Purchasing Department."

New York: "Samples are not submitted with bid, except in a few cases, at which time the samples in question are tested by the Bureau of Standards."

North Carolina: "Our own testing laboratories and utilize those of other State departments and those of our colleges."

North Dakota: "Some samples are sent to the State laboratories for testing."

Ohio: "Require samples to be submitted with bids on most food products, and on any other products where feasible. Laboratory tests made at discretion of Supt. of Purchases and Printing. All flour tested through private tieup."

Oklahoma: "Bureau of Standards, Board of Health, Board of Agriculture, and laboratories of state institutions and departments."

Oregon: "State Lab."

Pennsylvania: "Laboratory controlled and in laboratories, Pennsylvania, Department of Property and Supplies, Bureau of Standards."

Rhode Island: "State Materials, Engineer; other State Laboratories."

South Dakota: "Samples are tested by Testing Laboratory."

Tennessee: "Certain institutions and departments are equipped for testing samples of articles they request."

Texas: "On articles where quality is unknown we either test them in this office, or send them to one of the state owned laboratories."

Utah: "Very adequate system, no central warehouse. We sometimes put our men at mfg. plant for paint, etc., otherwise just go on the judgment of this office and using agency."

Vermont: "Various Food stuffs tested at Vermont State Hospital, Waterbury, Vt. We use the Highway Testing, Agricultural and Extension Service Laboratories."

Virginia: "State Laboratory—Bureau of Standards, Washington, D. C. All groceries are purchased by samples and samples are tested when purchase is made."

⁷ Purchasing Department of Board of Control, one of the two purchasing agencies in the State.

Washington: "In all instances where purchases made as per sample, comparison is made of deliveries with original sample. Laboratory tests made of samples of nearly all purchases of consequence based on specification."

West Virginia: "Tests conducted by testing laboratories."

Wisconsin: "Use commercial testing laboratories, Federal Government agencies, technical laboratories at educational institutions and Highway Testing Laboratories."

Wyoming: "State Laboratory."

Use of Tests To Determine Compliance With Specifications.

Among the 38 States with centralized purchasing, tests are regularly made on all commodities in 22 States, while tests are never made in 1 State. Table 9 shows the extent of the use of tests and gives the names of the States.

TABLE 9.—*Use of tests to determine compliance with specifications by State purchasing agencies*

[Based on 38 States]

Extent of use of tests	States	
	Number	Percent
Tests regularly made on all commodities.....	1 ²²	57.9
Tests regularly made only on large orders.....	2	5.3
Tests regularly made only on certain commodities.....	3 ⁷	18.4
No tests regularly made.....	4 ⁶	15.8
Tests never made.....	5 ¹	2.6
Total.....	38	100.0

¹ Alabama, Arizona, California, Connecticut, Florida, Illinois, Maine, Massachusetts, Minnesota, Missouri, Montana, Nebraska, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, Texas, Utah, Vermont, and West Virginia.

² Colorado and Washington.

³ Indiana, Kentucky, New Hampshire, New Jersey, Ohio, Tennessee, and Wisconsin.

⁴ Iowa, Maryland, Michigan, North Dakota, South Dakota, and Virginia.

⁵ Wyoming.

Testing Laboratories of State Purchasing Agencies.

Among the 38 States with centralized purchasing, 13 States maintain testing laboratories and 25 do not maintain such laboratories. Table 10 shows the extent of maintaining testing laboratories and gives the names of the States.

TABLE 10.—*Testing laboratories of State purchasing agencies*

[Based on 38 States]

Testing laboratories of purchasing agencies	States	
	Number	Percent
Purchasing agencies maintaining testing laboratories.....	1 ¹³	34.2
Purchasing agencies not maintaining testing laboratories.....	2 ²⁵	65.8
Total.....	38	100.0

¹ Alabama, Iowa (Executive Council, one of the two purchasing agencies, maintains a testing laboratory), Massachusetts, Minnesota, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, South Dakota, West Virginia, and Wyoming.

² Arizona, California, Colorado, Connecticut, Florida, Illinois, Indiana, Kentucky, Maine, Maryland, Michigan, Missouri, Montana, Nebraska, New Hampshire, North Dakota, Ohio, Oklahoma, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wisconsin.

TABLE 11.—Types of Tests Made and Commodities Tested in the Laboratories of 13 States Where Purchasing Agencies Maintain Testing Laboratories

State in which agency is located	Type of test or commodity tested
Alabama.....	Highway materials, feeds and food commodities.
Iowa ¹	Ink, soap, seeds.
Massachusetts.....	All kinds of tests.
Minnesota.....	Physical and chemical tests.
New Jersey.....	Paper, carbon paper and ribbons, textiles.
New York.....	Analytical tests.
North Carolina.....	Analysis and practical tests.
Oregon.....	All kinds of tests.
Pennsylvania.....	Organic and inorganic, physical tests.
Rhode Island.....	Road oils, fuel oils, coal, cement, stone, etc., dairy and poultry feeds, milk, eggs, etc.
South Dakota.....	Tests for moisture and ash content in coal, dirt in sand, size of gravel; chemical analysis of paint, etc.
West Virginia.....	All kinds of tests.
Wyoming.....	Chemical analysis and strength tests.

¹ Executive Council, one of the two purchasing agencies in the State.

Types of Testing Laboratories Used by the States.

Among the 38 States with centralized purchasing, 17 States use college or university and private or commercial laboratories and 8 States use college or university testing laboratory. Table 12 shows the type of testing laboratory used and gives the names of the States.

TABLE 12.—Types of testing laboratories used by the States

Type of laboratory	States	
	Number	Percent
College or university.....	18	21.1
Private or commercial.....	23	7.9
College or university and private or commercial.....	17	44.7
Other.....	9	23.7
None.....	1	2.6
Total.....	38	100.0

¹ Colorado, Kentucky, Michigan, Nebraska, New York, Virginia, West Virginia, and Wyoming.

² Alabama, Florida, and Rhode Island.

³ California, Illinois, Indiana, Iowa, Maine, Massachusetts, Minnesota, Missouri, Montana, New Hampshire, New Jersey, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, and Utah.

⁴ Includes "local Highway Department and university laboratories" (Arizona); "State University, Health Department and State Roads Commission, and private testing laboratories" (Maryland); "State Chemical Laboratory" (South Dakota); "Highway, Health and Agriculture Department Laboratories" (Tennessee); "State owned laboratories" (Texas); "Highway Testing, Agricultural and Extension Service Laboratories" (Vermont); "State Highway Department, University of Washington, and State College Laboratories" (Washington); "Commercial testing laboratories, Federal Government agencies, college or university laboratories, and highway testing laboratories" (Wisconsin); "Highway Dept., Agricultural Experiment Station, Health Dept., Dairy and Food, Dept. of Agriculture, and University of Conn., as well as commercial laboratories (Connecticut).

⁵ North Dakota.

Results of the Survey.

An analysis of the returned questionnaire indicates that the following 38 States report a centralized purchasing agency.

Alabama	Illinois	Massachusetts
Arizona	Indiana	Michigan
California	Iowa	Minnesota
Colorado	Kentucky	Missouri
Connecticut	Maine	Montana
Florida	Maryland	Nebraska

New Hampshire	Oregon	Vermont
New Jersey	Pennsylvania	Virginia
New York	Rhode Island	Washington
North Carolina	South Dakota	West Virginia
North Dakota	Tennessee	Wisconsin
Ohio	Texas	Wyoming
Oklahoma	Utah	

It is to be expected that the State purchasing agency should work closely under the supervision of the Governor, or probably under his appointed head of the finance department. In the majority of the States the purchasing agency is connected with the department of finance or its equivalent.

Purchases are generally made for all State departments, bureaus, and institutions. In a few States purchases are made only for State penal and charitable institutions.

Almost all orders for State supplies are placed by means of written specifications. However, few States are using standard specifications, since, in the majority of the cases supplies are ordered by brand or trade name. In many instances the brand is used only as a description, or a guide to the buyer, and it is understood that another brand of equal merit may be substituted. Sometimes purchase orders which mention a brand must include at least three brands, any of which may be supplied.

As a general rule, the formulation of specifications for purchases is left to the purchasing agent or agency, often with the advice of the department for which the purchase is being made, or with technical assistance if it is available. Only in a few States are specifications prepared by a special committee appointed for this purpose.

It is interesting to note that in 26 States Federal Specifications or nationally recognized specifications are used extensively, frequently, or wherever possible.

Almost all of the States have set up specifications on at least certain items, such as foodstuffs, highway materials, gasoline and oil, and construction materials.

In most of the States some effort is made to test samples of materials before placing the order, or upon delivery. Thirteen States have testing laboratories in connection with their purchasing agencies, and in some of the States the testing facilities of the purchasing agency laboratories are supplemented by commercial or university laboratories.

The results of this survey show that much could be accomplished if the present purchasing methods of the States were placed on a scientific basis. The utilization of standards and specifications established by the Federal Government or by nationally recognized standardizing agencies, used tentatively for a trial period in the original form and modified when necessary to meet local requirements would undoubtedly improve the quality of the goods purchased and result in savings to the States. It seems that the testing facilities of tax-supported colleges or universities should be used most extensively to ascertain that the commodities delivered conform to the purchase specifications.

COUNTY PURCHASING METHODS AND PROCEDURES

A survey of purchasing methods used by counties was made in 1939 by the National Bureau of Standards, United States Department of Commerce. A questionnaire was sent to the official in charge of purchasing in each of the 3,070 counties in the country requesting the following information: The establishment of purchasing agency; method of appointing a purchasing agent; the extent of purchasing for county agencies; whether purchases are made on contracts based on written specifications or by trade-name or brand; how standards and specifications are formulated; adoption and use of specifications of national technical organizations and those of the Federal Government; arrangements made for testing samples submitted with bids and samples of deliveries; maintenance of testing laboratories by counties; and, use made of the facilities of college or university testing laboratories.

A total of 1,177 replies was received from counties in every State except Delaware. Of this number, 430 were not considered because of failure to give any information of value. The discussion which follows is based, therefore, on returns from 747 counties, or approximately 25 percent of the total number of counties.

This survey shows that the authority of counties to make purchases of equipment, materials, and supplies needed for the operation of their governments is derived from acts passed by State legislatures.

Centralized Purchasing.

Centralized purchasing, defined by Dr. Russell Forbes, commissioner of purchase, New York City, as "the delegation to one office of the authority to buy supplies, materials, and equipment needed by all the operating branches of an organization," occurs in not more than 75 counties. California leads all States in the number of counties which have adopted the centralized system of purchasing by the establishment of purchasing departments and the appointment of purchasing agents in accordance with the political code of that State; 18 counties in California have already adopted the centralized form of purchasing.

In North Carolina, county purchasing agents have been appointed to handle purchases of materials and supplies in nine counties.

Under an act passed by the Legislature of Wisconsin relating to county officers acting as purchasing agents, the county boards in six counties have appointed purchasing agents. Two counties have also appointed purchasing agents, but their purchases are limited to materials and supplies needed for courthouse purposes only.

In Ohio full-time or part-time purchasing agents are employed in seven counties. Perhaps the outstanding system of centralized purchasing in Ohio is in effect in Hamilton County. All purchases for all administrative departments and institutions of the county are handled by the purchasing department. There are no laws in the State of Ohio requiring centralized or coordinated purchasing by counties. The plan of Hamilton County is extralegal by resolution of the board

or county commissioners, by approval of the city council of the city of Cincinnati, and by the board of education, through a committee known as the coordinating committee of Hamilton County. This committee consists of the city manager of Cincinnati, the president of the board of county commissioners, the president of the board of education, and a member of the board of trustees of the University of Cincinnati.

In Michigan five counties have employed purchasing agents who devote their full time to purchasing problems. In Iron County, the chairman of the board of supervisors appoints a purchasing committee at each annual meeting. In Kalamazoo County, the purchasing department, which is under the direction of the finance committee, purchases for all departments of the county which are not incorporated bodies.

Although the General Assembly of Virginia passed an act in 1932 with respect to county purchasing, replies to the questionnaire received from counties in this State show that only four have adopted the centralized system of purchasing. Arlington County has made rapid progress in its system of centralized purchasing which was installed about 9 years ago. The three other counties have also made some progress in the use of centralized purchasing methods.

Recognition should be given to the fact that a large number of counties in this country are small both geographically and in size of population. The establishment of a purchasing department and the maintenance of a purchasing agent in a majority of these counties might constitute an undue burden on the taxpayers with the result that any savings which might be effected by centralized purchasing may be offset by the maintenance of a purchasing department. Presumably, the General Assembly of Virginia considered this fact in the act of 1932 relative to county purchasing by the inclusion of the following section:

The board of supervisors of any two or more adjoining counties shall have power to appoint, in accordance with the provisions of this section, a joint purchasing agent. Such joint purchasing agent shall carry out the provisions of this act as they shall apply to each of the counties concerned. He shall be subject to rules and regulations mutually formulated and agreed upon by the county boards which designate him as their joint purchasing agent.

No counties in Virginia, according to replies received, have taken advantage of this plan. It would be interesting to note the effect in savings which a plan of this nature would bring to a group of counties adopting it. There is no doubt that under proper administration and careful procedure in buying it would produce beneficial results.

In Alabama three counties reported that they maintain purchasing departments. In Tuscaloosa County, a resolution adopted by the board of revenue in 1930 provides that no department of the county shall buy anything, but shall send its requisitions to the purchasing agent, who shall make all necessary purchases. By an act of the State legislature approved in 1935 there was created in Henry County a purchasing agency "dealing with and having reference to all purchases" for the county.

In North Dakota, purchasing boards or committees have been established in five counties, and all purchasing is centralized in these boards or committees.

In New York State several counties have also centralized their methods of purchasing. In Chemung County, a purchasing department was established by the county board with the appointment of a county agent who makes purchases for all county departments. A similar arrangement has been made in Chenango County, and the county purchasing agent does the buying for all departments except highways. The same is true in Erie, Jefferson, Madison, Oneida, Nassau, and Westchester Counties. In Genesee County, a purchasing committee, operating under the direction of the board of supervisors, handles all ordinary purchases for the county departments. The department of purchase of the city of New York buys all materials, supplies, and equipment required by all the agencies of the five counties within greater New York; namely, New York, Kings, Queens, Bronx, and Richmond. This includes equipment and foodstuffs for the sheriffs' jails and office furniture and supplies as well as stationery for the various county officers.

Purchasing departments have also been established in several counties of the following States: Arkansas, Connecticut, Florida, Georgia, Idaho, Kansas, Kentucky, Nebraska, New Jersey, Oregon, Texas, and Utah.

Replies received from two-thirds of the counties in Vermont indicate that centralized purchasing is in effect in that State. Counties present their requirements to the State purchasing agent who, in turn, does practically all of the buying. Some purchasing is done by the county courts in each county, but it is limited solely to materials needed for repairs to jails and courthouses.

Purchasing Procedure.

Purchasing as it is conducted today is quite different from that of a quarter of a century ago. It has developed into a science in the sense that persons who are engaged in it must possess at least a fair knowledge and understanding of the technical problems involved in connection with the purchasing of commodities or services. The elements entering into purchasing are many and require sound judgment on the part of those who do the buying. There is no doubt that a good purchasing department with a competent personnel can effect real savings to an organization whether industrial or governmental.

Purchasing in the county actually begins when the head of a department or an institution notifies the officers in charge of purchasing of his needs. While such notification may and probably often does take the form of a mere verbal request, it is properly done by submitting a written requisition. After the requisition has been approved sources of supply are informed what material or service is required. This is done in various ways, the most common of which is direct request for quotations or bids. The ultimate responsibility for approving invoices for payment in counties is usually the function of the county board.

Use of Standards and Specifications.

Obviously, in order to make an intelligent bid, the bidder ought to be fully informed as to what he will be expected to furnish. Such details are generally predicated upon certain standards and specifications established by Federal, State, and local governments, and by various national technical societies and trade associations. Of course, all commodities used by a government cannot be standardized, but many can be

and are, with a resultant reduction in cost and an improved delivery service for the purchaser.

It is a significant fact that approximately 70 percent of the 747 counties, whose returns were considered, reported the use of standards and specifications on which contracts for purchases are based.

In more than 30 percent of the counties either the county engineer, county auditor, or superintendent of highways drafts the specifications, chiefly for road and bridge construction and the necessary materials. In many counties purchases for county roads and highways are procured in accordance with specifications prepared by the State highway departments.

Purchasing agents, purchasing boards, or committees prepare specifications for materials, supplies, and equipment in about 10 percent of the counties reporting. The county boards, or officials designated by them, formulate the specifications in 32 percent of the reporting counties. In a number of counties specifications are prepared by the various departments, and in others by technical officers in cooperation with the using agency.

The following is only a partial list of the commodities for which written specifications have been prepared by one or more of the counties replying to the questionnaire:

Automobiles	Office equipment and supplies
Building materials	Office and janitorial supplies
Canned goods	Oils
Clothing	Paper
Drugs	Pipe
Foods	Printing
Fuel oil	Road machinery and equipment and
Gasoline	materials
Gravel	Sand
Greases	School supplies
Hardware	Scrapers
Highway materials	Shoes
Hose	Stationery
Lamps	Steel
Lumber	Tires

Approximately 15 percent of the counties state that they have adopted and use Federal Specifications as a basis for contracts for purchase, while 10 percent employ standards and specifications prepared by national technical organizations. More than 20 percent of the counties rely on trade-brands or trade-names as a guide to purchases. It should, of course, be borne in mind that certain counties indicate the use of some or all of the methods referred to, depending upon the nature of the commodity procured.

It is believed that, with a few exceptions, it would be advantageous for county officials who are in charge of purchasing to utilize Federal Specifications tentatively throughout a trial period. It is suggested that they be used first in their original form and modified later when necessary to meet special conditions or requirements.

Use of Testing Laboratories.

Comparatively few counties of the United States report the maintenance by their own governments of laboratories for testing and inspection of commodities, or the employment of commercial, university, or other laboratories for such purposes. Of the 162 counties in 28 States reporting the use of laboratories for testing commodities

purchased by the county, 14 maintain their own laboratories and conduct various kinds of tests; 17 employ the service of commercial testing laboratories; 88 utilize the facilities of college or university laboratories, mostly for tests and inspection of materials and equipment used in road construction; and 43 employ their State highway laboratories mostly for tests and inspection of materials and equipment used in road construction.

It would seem, from the results obtained from the survey, that too few counties are taking advantage of the testing facilities of tax-supported colleges or universities for the purpose of determining whether commodities purchased comply with the requirements relative to quality and grades as specified in the contracts or with the specifications on which contracts are based.

It is conceivable that a cooperative arrangement could be effected whereby county agencies would utilize the facilities of State-owned institutions to conduct certain kinds of analyses and tests. In all probability, a number of State-owned colleges and universities do maintain equipment for testing, but the counties are not making use of available services. There is no question that the use of commodity acceptance testing will have a tendency to lessen the disadvantages of accepting second-grade or off-grade materials and at the same time will result in savings which may be utilized by the counties in rendering other services to the taxpayers.

Results of the Survey by the National Bureau of Standards.

The results of the survey show that with certain exceptions, county purchasing methods leave much to be desired. Nothing can be gained from the rule-of-thumb method which prevails in a number of counties. On the other hand, much may be accomplished if counties would revise their present purchasing methods and place them on a scientific basis. An ideal county purchasing department is one which has put into effect a centralized system of purchasing whereby all purchases for county needs are handled by the purchasing department in charge of a competent purchasing agent; the maintenance of a library of current standards and specifications covering various classes of commodities; and one which owns or may utilize proper laboratory facilities for the testing of deliveries to determine their compliance with the requirements of the standards or specifications on which contracts are based.

It is evident that there are limits to the feasibility and efficiency of a completely centralized purchasing system in small or sparsely settled counties. For them it might well be an expensive luxury, except in the purchase of the more commonly used materials. The solution may lie in county consolidation, or in cooperative purchasing, whereby two or more adjacent counties would pool their requirements and purchase on joint contracts.

Survey by the Governmental Committee of the National Association of Purchasing Agents.

In addition to the survey made by the National Bureau of Standards the National Association of Purchasing Agents' Governmental Committee sent out a questionnaire to each county clerk in the United States, to obtain information as to county purchasing laws, practices, and administrative organizations. The replies received from this

survey formed a basis for a study entitled, "County Purchasing,"⁸ by Joseph W. Nicholson, city purchasing agent, Milwaukee, Wis.

A county model law was proposed by the National Association of Purchasing Agents in 1931, and in the pamphlet "County Purchasing," this model law is reproduced with the recommended changes and exceptions suggested by Mr. Nicholson.

Section 12 of this model law deals with the establishment of a standardization committee for each county.

There shall be in each county a standardization committee which shall be composed of _____.⁹ The members of this committee shall serve without additional compensation.

It shall be the duty of the standardization committee to classify the requirements of the county government for supplies, materials, and equipment; to adopt as standards the smallest number of qualities, sizes, and varieties of such supplies, material, and equipment consistent with the successful operation of the county government; and to prepare, adopt, promulgate, and enforce written specifications describing such standards.

In the preparation and revision of any such standard specification, the standardization committee shall seek the advice, assistance, and cooperation of the county departments and agencies concerned, to ascertain their precise requirements. Each specification adopted for any commodity shall, insofar as possible, satisfy the requirements of the majority of the county departments and agencies which use the same. After its adoption, each standard specification shall, until revised or rescinded, apply alike in terms and effect to every future purchase and contract for the commodity described in such specification; provided, however, that the county purchasing agent, with the approval of the county board, may exempt any county department or agency from use of the commodity described in such standard specification.

⁸"County Purchasing," by Jos. W. Nicholson, 61 pp., The National Association of Purchasing Agents, 11 Park Place, New York City, 1940.

⁹"The personnel of this committee should be adapted to the structure of the county government of each State. It should include a member of, or representative of the county board, the county highway engineer or his representative, a representative of the county's penal and charitable institutions, a representative of the county school system if school supplies are to be purchased through the county purchasing office, and the county purchasing agent who should be chairman and should be present at all meetings."

MUNICIPAL PURCHASING METHODS AND PROCEDURES

While much has been written with regard to municipal purchasing problems and principles, especially the theoretical advantages of centralized purchasing, it is only very recently that there has been available any considerable amount of factual material concerning actual purchasing practices in American municipalities. In fact, the first comprehensive study along this line seems to have been that which was made in 1939 by the Governmental Group of the National Association of Purchasing Agents and the International City Managers' Association. For the purposes of that study a comprehensive questionnaire was circulated among all cities of over 30,000 population in the United States. The findings were presented in an article published in the "Municipal Year Book of 1940."¹⁰

Growth of Centralized Purchasing.

Among other interesting facts brought to light by this survey is that centralized purchasing has had an extremely rapid and constant growth in American cities during the past 20 years. Of 118 cities with a centralized purchasing procedure replying to the questionnaire, 38.2 percent adopted centralized purchasing during the last decade, 8 cities being added to the list in 1939. Moreover, all but 23.6 percent of these cities adopted centralized purchasing within the past 20 years. The details concerning the rate of growth of centralized purchasing in such cities are given in table 13.

TABLE 13.—*Growth of centralized purchasing in 118 cities of over 30,000 population*

Year adopted	Number of cities by population groups					Percent of total
	Over 500,000	200,000 to 500,000	100,000 to 200,000	30,000 to 100,000	All cities over 30,000	
Before 1907.....	0	0	1	0	1	0.8
1907-9.....	0	0	1	2	3	2.5
1910-19.....	5	8	4	7	24	20.3
1920-29.....	3	3	7	32	45	38.2
1930-39.....	3	5	9	28	45	38.2
Total.....	11	16	22	69	118	100.0

Extent of Centralized Purchasing.

Of the 194 cities replying to the questionnaire, 125,¹¹ or 64 percent, reported that procurement of materials and supplies was centralized,

¹⁰ "The Municipal Year Book 1940," pp. 194-201, International City Managers' Association, Chicago, Ill., 1940. The National Association of Purchasing Agents, and the International City Managers' Association have generously made available for the present purposes the executed questionnaires and the other data collected in that survey.

¹¹ The article contained in the "Municipal Year Book for 1940," cited above, shows a figure of 123. However, several questionnaires were returned following the publication of the "Year Book," and the figure here given is based on these supplemental returns.

as against only 69 cities reporting that purchasing was not centered in one office. As would be expected, the extent of the use of centralized purchasing has a direct relationship to the size of municipality; all of the very largest cities reported its use, with the percentage of municipalities reporting centralized purchasing systems decreasing constantly with each smaller population group. While the extent to which centralized purchasing is practiced in the 116 cities of over 30,000 population that did not reply to the questionnaire (see table 14), is little more than a matter of conjecture; it may be presumed that a large proportion do not have this system, but in any event information from the whole could hardly be expected to change the picture in this particular. Table 14 shows the extent of centralized purchasing at the close of 1939 in cities of over 30,000 so far as can be determined from the replies to the questionnaire.

TABLE 14.—Extent of centralized purchasing in cities over 30,000, as of Dec. 1, 1939

Population group	Total number of cities in United States	Cities replying		Cities reporting centralized purchasing		
		Number	Percent of total	Number	Percent of replies	Percent of total ¹
Over 500,000.....	13	11	85	11	100	85
200,000 to 500,000.....	28	17	61	16	94	57
100,000 to 200,000.....	52	34	65	25	74	48
30,000 to 100,000.....	217	132	61	73	55	34
All cities over 30,000.....	310	194	63	125	64	40

Questionnaire Relating to Use of Standards.

In order to gain some idea concerning the extent to which American municipalities make use of written specifications and scientific testing of commodities in municipal buying, in May 1940 a special questionnaire was prepared, for the purpose of this monograph, and sent by the American Municipal Association to 100 municipalities of various population groups and representing all sections of the country. Specifically, this questionnaire requested information as to (1) whether purchases are made on written specifications or by trade-name or brand; (2) how standards are formulated; (3) the extent to which use is made of specifications prepared by national technical organizations and the Federal Government; (4) the arrangements which have been made for testing samples of commodities both when submitted with bids and after delivery; (5) the extent to which testing laboratories are maintained; and (6) the use made of the facilities of college or university testing laboratories as well as those of private or commercial institutions. Table 15 shows the coverage of this questionnaire and the percentage of returns received, and upon which returns the present study is largely based.

TABLE 15.—Coverage and returns of questionnaire relating to use of standards by municipalities

Population group	Number of questionnaires sent	Number of returns			Percentage of returns		
		Complete	Incomplete	Total	Complete	Incomplete	Total
Over 500,000.....	6	6	0	6	100	0	100
200,000 to 500,000.....	6	5	0	5	83	0	83
100,000 to 200,000.....	6	4	0	4	67	0	67
30,000 to 100,000.....	34	16	2	18	47	6	53
10,000 to 30,000.....	24	14	0	14	58	0	58
5,000 to 10,000.....	24	9	1	10	38	4	42
Total.....	100	54	3	57	54	3	57

It is necessary to note at least two important qualifications in the accompanying data. In the first place, the number of municipalities from which information has been secured, though well distributed both by population groups and by sections of the country, is entirely too small to warrant the assumption that the picture presented is representative or typical of the whole of each of these respective population groups. Furthermore, most of the municipalities covered in the accompanying tabulations practice centralized purchasing at least to a limited extent, and it may be assumed that these municipalities, on the whole, make a greater use of written specifications and laboratory tests in connection with the buying of supplies and equipment than do those municipalities which have not adopted centralized purchasing. In spite of these limitations, however, the replies received to the questionnaire reveal many interesting facts and give at least some indication of the extent to which American municipalities are resorting to scientific methods in purchasing the commodities required for their needs.

Use of Written Specifications in Municipal Purchasing.

Approximately 34 percent of the municipalities replying to the questionnaire report the use of written specifications either exclusively or to a very large extent in purchasing municipal supplies. As was to be expected, the cities in the larger population groups make a far greater use of written specifications than do the smaller communities; however, it is interesting to note that a large percentage of the municipalities in the very small population groups makes extensive use of written specifications, a few of those with populations ranging from 5,000 to 10,000 reporting that practically all of the commodities purchased are bought on written specifications. Some 44 percent of the municipalities in all the population groups covered by this survey report that purchases are made on written specifications and by trade-name or brands, but many indicate that whenever trade-names are given in advertisements for bids or on requisitions it is always understood "that competitive articles are not barred." It seems particularly significant that 19 percent of all the municipalities covered in this survey report that major commodities purchased are bought "largely on written specification," while 15 percent of these municipalities report that such purchases are made on written specifications exclu-

sively. Even more interesting, however, is the fact that only 7 percent of all the municipalities surveyed fail to make any use of written specifications, and these are restricted to the smallest population groups. Table 16 shows a breakdown by population groups of the extent to which specifications are used by these municipalities in purchasing supplies and equipment.

TABLE 16.—Extent to which municipalities use written specifications in purchasing supplies and equipment

Population group	Municipalities reporting										
	Number of municipalities surveyed	Use of specifications exclusively		Use of specifications in most cases		Use of trade-name and specifications		Little use of specifications		Specifications never used	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Over 500,000.....	6	2	33.33	2	33.33	2	33.34	0	0	0	0
200,000 to 500,000.....	5	1	20	2	40	2	40	0	0	0	0
100,000 to 200,000.....	4	1	25	0	0	3	75	0	0	0	0
30,000 to 100,000.....	16	1	6.25	3	18.75	7	43.75	4	25	1	6.25
10,000 to 30,000.....	14	3	21.43	1	7.14	6	42.86	3	21.43	1	7.14
5,000 to 10,000.....	9	0	0	2	22.22	4	44.45	1	11.11	2	22.22
Total.....	54	8	15	10	19	24	44	8	15	4	7

¹ This city reports that "written specifications are compiled and advertisements made only when purchase exceeds \$500."

Formulation of Standards and Specifications.

The great majority of the municipalities reporting indicate that the central purchasing agency, where one exists, has the responsibility of formulating the standards and specifications used in the purchasing of commodities. Sixteen percent report that standards and specifications are formulated by using departments, four percent report that specifications are prepared by a special committee set up for that purpose, and six percent use Federal Specifications exclusively. In those cases where special committees have been created they are usually composed of the purchasing agent, if any, a representative of the city engineering department, and a technician or chemist connected with the city testing laboratory. The city of St. Louis, Missouri, reports that its standards and specifications are formulated by a "Board of Standardization."¹² This Board is composed of the city comptroller, the supply commission, and the president of the board of public service (the membership of which board includes, in addition to the president, the directors of the departments of public utilities, streets and sewers, public welfare, and public safety). Several municipalities report, incidentally, that the establishment of special committees for the formulation of standards and written specifications is now under way. Table 17 shows, by population groups, the general practices with regard to the formulation of standards and specifications.

¹² The work of the Board of Standardization of Department of Purchase, city of New York, was not reported in this survey.

TABLE 17.—How specifications are formulated by municipalities

Population group	By purchasing agency		By a specifications committee		By using departments		Federal Specifications used exclusively		Other plans	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Over 500,000.....	3	50	1	16.66	0	0	1	16.67	1	16.67
200,000 to 500,000...	4	80	0	0	1	20	0	0	0	0
100,000 to 200,000...	1	25	0	0	1	25	0	0	2	50
30,000 to 100,000...	5	33.33	1	6.67	1	6.67	2	13.33	6	40
10,000 to 30,000.....	5	38.5	0	0	5	38.5	0	0	3	23
5,000 to 10,000.....	3	43	0	0	0	0	0	0	4	57
Total.....	21	42	2	4	8	16	3	6	16	32

¹ "Board of Standardization" (see explanation in text).

² This city reports that specifications are prepared "by the purchasing agent, also by using departments and, when necessary, by both."

³ In one case specifications are formulated by "the purchasing agent, the engineering department, and the city chemist;" in the other city, jointly by the using department and the purchasing agent.

⁴ Specifications are formulated in these cities as follows: (a) By purchasing agent subject to approval of "board of contract and purchase;" (b) by engineering and purchasing departments; (c) by the using departments and the purchasing agent; (d) same; (e) by the purchasing committee of the city council and the head of the department involved; (f) by the purchasing agent and the head of the department involved.

⁵ Specifications formulated in these cities as follows: (a) By the engineering department and the purchasing agent; (b) by the department head, the purchasing agent, and the city manager; (c) by the engineering department in all cases where structural requirements are involved, and by the purchasing agent in all other cases.

⁶ Only seven municipalities in this population group gave information on this point. Percentages here given are figured on basis of these seven replies.

⁷ Specifications formulated in these four municipalities as follows: (a) By the city council; (b) same; (c) by a committee of the city council and the purchasing agent; (d) same.

Commodities for Which Specifications Have Been Prepared.

Many of the cities reporting indicate that written specifications have been prepared by them to cover nearly every type of commodity commonly purchased for municipal use. The following is only a partial list of the commodities for which written specifications have been prepared by one or more of the municipalities replying to the questionnaire:

Alloys (Various)	Foods
Alum	Gasoline
Asphalts	Granite Curbing
Asphalt Binder	Grass Seed
Brick	Gravel
Brushes	Hospital Supplies
Bulbs (Flowering)	Hydrants
Cable	Iron
Carbon (Activated)	Jute
Castings	Lead
Catch Basins	Light Bulbs
Cement	Lime
Chemicals (Filtration)	Lumber
Chlorine	Manhole Covers
Coal	Manhole Frames
Cotton Goods	Motor Equipment
Drugs	Motor Trucks
Electric Power Units	Office Supplies
Expansion Joint Material	Oils
Electrical Supplies	Paint
Fencing	Paper and Allied Products
Fertilizer	Paving Materials
Filter Alum	Pipe (Cast Iron)
Fire Engines	Pipe (Concrete)
Fire Hose	Pipe (Vitrified)

Poles (Light)
 Printing
 Road Machinery and Equipment
 Sand
 Soap
 Soda Ash
 Steel
 Stone

Street Signs
 Street Sweepers
 Tar
 Tires
 Tree Surgery
 Uniforms
 Valves
 Waterworks Supplies

Use of Specifications Prepared by the Federal Government and National Trade or Technical Associations.

Of the 52 municipalities replying to the question concerning the use of specifications of the Federal Government and national trade or technical associations, about 80 percent used these specifications for one or more purposes. The replies indicate that extensive use of specifications prepared by the Federal Government, as well as those prepared by national trade and technical associations, is made in at least two important respects—first, as guides for the preparation by municipalities of their own written specifications, and, second, as the specifications actually used for requisitioning municipal supplies and commodities. Some cities report that they try to incorporate in their own specifications those of the Federal Government plus those of trade or technical associations so as to make the local specifications, as one city purchasing agent termed it, “liberal yet positive.” On the other hand, 6 cities report that they make very little use of either specifications prepared by the Federal Government or those of national trade or technical associations because of the fact that there are “too many local conditions prevailing.” Table 18 shows the breakdown by population groups.

TABLE 18.—*Extent to which municipalities use specifications of Federal Government and of national trade or technical associations*

Population group	Municipalities reporting use of specifications of Federal Government and of national trade or technical associations								Municipalities never using such specifications	
	Total (used for any purpose)	Used where applicable		Used only for reference purposes		Used both as local specifications and reference		Used very little for any purpose		
		Number	Percent	Number	Percent	Number	Percent	Number		Percent
Over 500,000.....	6	2	33.33	3	50	1	16.67	0	0	0
200,000 to 500,000.....	5	1	20	2	40	1	20	1	20	0
100,000 to 200,000.....	4	2	50	1	25	1	25	0	0	0
30,000 to 100,000.....	13	1	7.68	3	23.08	6	46.16	3	23.08	3
10,000 to 30,000.....	9	3	33.33	3	33.33	1	11.11	2	22.23	3
5,000 to 10,000.....	4	1	25	3	75	0	0	0	0	5
Total.....	41	10	24	15	37	10	24	6	15	11

Testing for Compliance With Specifications.

If the replies to the questionnaire may be accepted as indicative of the trend throughout the country, it would seem that American municipalities are now resorting to extensive use of tests to determine whether samples of commodities submitted with bids, and supplies and equipment actually delivered after purchase, comply with the representations made by the vendors.

Of the 47 municipalities replying to the question concerning the use of tests, only 7, or 15 percent, report that they never test commodities after delivery to ascertain if they conform to specifications. However, 14 municipalities, all of which have less than 100,000 population, report that they do not make tests regularly but only at infrequent intervals, or, as 1 purchasing agent states, only "when we are suspicious." Several others regularly test only a few special items, such as coal, fire hose, gasoline, and oils of all kinds. It is significant, however, that all but one of the cities of over 100,000 population reporting regularly test all purchases for compliance with specifications, and that one tests all "coal, gasoline, oils, soaps, chemicals, and building materials" and also other commodities "when deemed necessary." Table 19 shows, by population groups, the extent to which the municipalities, from which information was obtained, make use of tests to determine whether purchases comply with specifications and with the representations made by the vendors.

TABLE 19.—Use of tests by municipalities to determine compliance with specifications

Population group	Number of municipalities	All major items regularly tested		Tests regularly made only on few special commodities		Tests not regularly made on any commodity		Tests never made	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Over 500,000.....	6	5	83	1	17	0	0	0	0
200,000 to 500,000.....	5	4	80	1	20	0	0	0	0
100,000 to 200,000.....	1	1	100	0	0	0	0	0	0
30,000 to 100,000.....	15	3	20	2	13	7	47	3	20
10,000 to 30,000.....	13	5	38.46	2	15.39	5	38.46	1	7.69
5,000 to 10,000.....	7	2	28.6	0	0	2	28.6	3	42.8
Total.....	47	20	43	6	13	14	30	7	15

¹ This city reports that "coal, gasoline, oils, soaps, chemicals, and building materials are all tested; other commodities tested only when deemed necessary."

Even in the matter of samples submitted with bids a large percentage of municipalities report that tests are regularly made, at least on all major items, to determine compliance with specifications. Nearly all cities of over 100,000 population from which information was received report that samples submitted with bids are tested in all cases where compliance with specifications cannot be accurately determined merely by personal inspection and measurements. All cities of over 100,000 population report that tests of samples are made. Only 3 cities in the population group between 30,000 and 100,000 report that tests are never made. Of the 13 cities surveyed with populations ranging from 10,000 to 30,000 only 1 reports that no tests are made, while in the smallest population group (5,000 to 10,000) only 3 of the 7 municipalities reporting state that tests of samples are never made.

In conducting such tests wide use of college, State, and private or commercial testing laboratories is made, and 1 city in close proximity to Washington, D. C., reports that tests which cannot be made by the city laboratory "are made at the National Bureau of Standards." Several cities report that arrangements have been made with the State highway department to test certain supplies and equipment,

especially road and street construction materials, purchased for the department of public works. While nearly all of the cities of more than 100,000 population maintain some kind of testing laboratory, the smaller municipalities, for the most part, depend upon the facilities of private or commercial laboratories or those of colleges and universities. Moreover, most of those cities which maintain their own laboratories make some use of private or college laboratories, either for the conducting of tests requiring more facilities than are provided at the city laboratory or for the making of tests so that the results may be compared with those obtained at the city laboratory. Three cities in the 10,000 to 30,000 population group report that the laboratory facilities maintained by the State highway department are used for testing certain kinds of supplies, chiefly road and street construction and maintenance materials. Another city in this same population group reports an arrangement which many other municipalities may find possible for local application. This city advises that much use is made of the laboratory facilities of a local hospital which is maintained jointly by the city and the State. Table 20 presents detailed information concerning the ownership of testing laboratories which municipalities of various population groups use in testing supplies and equipment.

TABLE 20.—Ownership of testing laboratories used by municipalities

Population group	Municipalities reporting use of laboratories owned by—			
	Municipality	Private or commercial interests	Colleges or universities	Other public agencies or Government units
Over 500,000.....	6	5	4	11
200,000 to 500,000.....	3	3	3	0
100,000 to 200,000.....	4	4	1	0
30,000 to 100,000.....	3	10	5	0
10,000 to 30,000.....	2	9	6	14
5,000 to 10,000.....	1	2	2	0
Total.....	19	33	21	5

¹ This city reports that tests which cannot be made in the city's own laboratory are made at the National Bureau of Standards.

² One of these cities reports that some use is made of the laboratory facilities of the local hospital which is owned jointly by the city and the State; the other three report that arrangements have been made with the State highway department to test certain road and street construction and maintenance materials.

Of the 6 cities with more than 500,000 population which were included in this survey, 3 report that their city laboratories are equipped to make "nearly all kinds" of tests of commodities and materials purchased for municipal use. Another city reports that tests are made at the city laboratory "on nearly everything except fire brick and complex electrical goods." The fifth city reports that "building materials and foods" only are tested at the city laboratory, while the sixth tests "building materials only" at the city's testing laboratory.

Of the 5 cities surveyed in the population group ranging from 200,000 to 500,000, 1 does not maintain a testing laboratory and 2 others are equipped to make chemical tests only at their city laboratories. The other 2 report that their city-maintained laboratories are prepared to make "nearly all kinds" of tests.

All 4 of the cities in the population group between 100,000 and 200,000 included in this survey report that they maintain city testing laboratories, although one states that its testing facilities are "very limited." Another reports that 2 separate laboratories are maintained by the city, 1 for testing of "coal and water treatment materials," and the other for the testing of "paving and sewer materials." A third city in this group reports that its city laboratory makes tests of lime, alum, oils, gasoline, and all road materials (except road oils), also clay and concrete pipe." The fourth city reports that tests are made of "foodstuff, cloth, paper, et cetera" at its laboratory.

None of the cities of less than 100,000 population included in the survey reports the maintenance of a testing laboratory equipped to test all city purchases; most of those which do maintain their own laboratories report that these are "chemical laboratories only."

Improvements in Purchasing Practices Shown in Recent Years.

This survey reveals that American municipalities, especially the larger cities, have made definite progress during recent years in improving their purchasing practices, and, consequently in effecting substantial savings to their taxpayers. We have already noted¹³ the rapid growth of centralized purchasing in cities of over 30,000 population during recent years, and while the movement perhaps has not been so rapid in the smaller municipalities there nevertheless has been a decided trend in this direction. Along with the increase in centralized purchasing, and closely related to it, have come, among others, the following improvements in municipal buying practices and methods: The adoption of standards, thereby reducing the number of kinds, types, brands, and sizes of commodities; the use of specifications stating the precise grade and quality of the commodities to be purchased, thereby facilitating competitive bidding and simplifying the inspection of goods delivered; purchasing in large volume or on contract to obtain quantity prices; and bona fide competitive bidding.

Many outstanding examples of savings that have been realized under each of these improvements in purchasing practices are included in the data collected in recent surveys. A few illustrations of each are listed below:

Adoption of standards.—New York City is now conducting a project which will reduce the number of printed forms used by city departments from 15,000 to 5,000 and the number of different sizes of such forms from 360 to 170. These changes will, it is estimated, save the city approximately \$200,000 a year in printing costs.

Use of specifications.—The city of Milwaukee has reduced the cost of its soap purchases approximately 75 percent by formulating specifications instead of buying by brand or trade-name without knowledge of the ingredients of the product purchased.

Provision for bona fide bidding.—New York City reduced the cost of printing the city budget by \$27,500 when it first asked competitive bids on this work. Milwaukee once received bids ranging from \$172 to \$600 for repairing a fountain with 4 pieces of granite of a particular size, shape, and color. Though outside the municipal field, a further classic example of possible savings through requiring competitive bidding should be mentioned here. This is the estimated saving of \$2,000,000 which the State of Ohio effected last year through

¹³ P. 289, supra.

insistence upon bona fide competitive bidding, nearly \$500,000 of which was saved on purchases of hot-mix road material alone.

Quantity buying.—The city of Milwaukee reportedly saves 7 or 8 cents a gallon on gasoline by providing storage facilities for several carloads and buying when the price is low.

Development in Cooperative Purchasing.

No review of the developments of recent years in municipal purchasing practices would be complete without some mention of at least a few major experiments in cooperative buying. The success with which some of these experiments have been carried out has prompted one authority to state that "one of the most encouraging trends in municipal purchasing is the growing appreciation of the possibilities of intermunicipal purchasing arrangements."¹⁴

In several cases school districts in the United States and Canada have cooperated in purchasing supplies and equipment. An outstanding example is the Kansas School Purchasing Association, which was established in 1930 and now includes over 500 schools, some of them in Nebraska and Oklahoma. This association secures special prices from vendors but sells to its members at the market prices. Then at the end of the year it declares a dividend to its members. This dividend amounted to 20 percent of sales in 1937.

Another interesting cooperative purchasing arrangement is that of Hamilton County, Ohio, the city of Cincinnati, the public library, the University of Cincinnati, and the city school district, all of which have established the "coordinating committee of the purchasing agents of Hamilton County." Joint contracts and informal agreements entered into during 1939 by this committee amounted to a total value of \$575,000. In a single year (1937) the savings on coal purchases alone made under this cooperative arrangement were estimated at \$50,000.¹⁵

A further important cooperative purchasing arrangement is the system which has been set up in seven States whereby cities or counties or both may purchase through the State agency. These States, in the order of the adoption of such plans, are: Michigan and New Hampshire (1919), Virginia (1924), Wisconsin (1929), West Virginia (1935), Pennsylvania (1937), and Alabama (1939). In every case purchasing through the State agency is optional with the local authorities. The usual arrangement is that the State central purchasing agency, in making its own contracts, provides that local governments may buy at the same price if they so desire; the State agency provides information on specifications and prices but assumes no further responsibility. Substantial savings are reported by most of the municipalities which have taken advantage of the purchasing facilities provided by these States.

A particularly significant development in this connection is the cooperative purchasing arrangements which have been worked out by several of the State leagues of municipalities. Among the leagues which have undertaken cooperative purchasing for their member municipalities are those in Arkansas, Colorado, Kentucky, Maine, Michigan, Missouri, Nebraska, North Carolina, Oregon, South

¹⁴ "Municipal Purchasing," by Joseph W. Nicholson, *The Municipal Year Book, 1939*, pp. 34-38, International City Managers' Association, Chicago, Ill., 1939.

¹⁵ "Cooperative Purchasing in the United States and Canada," by Carlton Chute, *National Municipal Review*, vol. 27, p. 501, October 1938.

Dakota, Wisconsin, and Virginia. Municipalities by "pooling" their orders in this way are reported in some instances to have purchased certain supplies at less than 50 percent of the prevailing market price.

Need for Further Improvements in Purchasing Practices.

The facts which have been presented in this brief review of municipal purchasing practices would seem, on the whole, to show that at least the larger American municipalities are making rapid strides in the improvement of purchasing techniques and procedures. On the other hand, the survey has revealed that the situation in many quarters leaves much to be desired.

In the first place, a large number of even very large cities have not adopted centralized purchasing. In many of these it is still contended that such a system is not justified from the viewpoint of economy, that the cost of operating a purchasing department would be greater than the amount saved by centralized purchasing. While this contention may be sound as applied to municipalities in the smaller population groups, it would seem to be of extremely doubtful validity with reference to large cities. At any rate, the experiences of the cities which have practiced centralized purchasing for several years do not bear out the contention. It is interesting to note in this connection that the survey made by the National Association of Purchasing Agents and the International City Managers' Association in 1939 revealed that the average cost of operating the central purchasing departments of 75 cities of over 30,000 population in 1938 amounted to only about 1 percent of the value of purchases.¹⁶

Secondly, it is apparent from the reports received from some of the cities covered in this survey that their purchasing authorities either do not have full knowledge of the work that the Federal Government and certain national technical associations have done, and are doing, in establishing standard specifications, or that for some other reason they are not making adequate use of such specifications. For example, a member of the purchasing committee of a city of approximately 20,000 population reported that he had never heard of any such specifications but "would like to have copies * * * if we may be advised where to apply." Another city with a population of approximately 76,000 reported that such specifications "are on file, but no need for same at this time." Certainly the small municipality which seeks to prepare its own specifications should make use of, at least for reference purposes, the standard specifications already published by the larger units of Government and other agencies, especially those adopted and promulgated by the Federal Specifications Executive Committee, of which there are now more than 1,300 in use. Many of these Federal Specifications may be easily adapted for municipal purchases, even if they cannot be used in their original form.

It would seem also, from results obtained from this survey, that many cities are not taking full advantage of laboratory facilities of tax-supported colleges or universities in testing commodities purchased to determine whether they comply with the quality and grade required by the contracts or specifications. Many municipalities situ-

¹⁶ "The Municipal Year Book, 1940," p. 196, International City Managers' Association, Chicago, Ill., 1940.

ated near colleges or universities which now maintain adequate testing equipment are not making use of this available service. Moreover, even where publicly-supported educational institutions do not have such facilities at present it is entirely possible that a concerted request by municipal agencies for the service would result in its establishment, at least on a cost basis. Apparently, however, municipal officials, with a few notable exceptions, have done little or nothing as yet toward encouraging tax-supported colleges and universities to establish such testing laboratories.

As time goes on, American municipalities, regardless of size, in their search for ways and means of furnishing the public services which their citizens demand at the least possible cost to the taxpayers, will find it necessary to effect maximum economy in procuring the supplies, materials, equipment, and contractual services necessary to carry on the various municipal activities. Inasmuch as the expenditures for such commodities and services constitute nearly one-third of the expenditures for current operations of the average municipality, they demand the careful and constant attention of municipal officials throughout the country. Thus it is to be expected that more and more attention will be given to practices and procedures which promote economy in municipal purchasing. To enable municipal officials to evaluate properly the efficiency and economy with which the purchasing in their respective municipalities is now being handled, and to plan improvements in the present systems, it is necessary that they have comprehensive factual information as to those purchasing practices and procedures which have proved their value in actual operation. It is, therefore, hoped that many future detailed studies of actual purchasing methods and practices will follow.

CHAPTER VI

INDEPENDENT PURCHASING AGENCIES AND TESTING LABORATORIES, COMMODITY TESTING AND RATING AGENCIES

The importance of correct application of economic and engineering principles to purchasing is now being generally recognized.

The modern purchasing agent is an economist—and probably also an engineer—who studies his materials and products, their sources, methods, and costs of production, markets, and price trends.¹

In addition to the efforts of the Federal Government, States, counties, and cities toward the adoption of scientific methods of procurement, private agencies are also much concerned with the improvement of their purchasing methods and procedures. Purchasing agents of private companies, educational, eleemosynary, and other institutions, with the help of their respective professional organizations, endeavor to introduce scientific methods in their purchasing. The description of the activities of some independent purchasing agencies will serve to illustrate the progress being made in this direction.

Many of the private companies or institutions do not have their own testing laboratories to ascertain that the materials and supplies they buy conform to their purchase specifications. Therefore, they are using for this purpose the facilities of private commercial laboratories. These laboratories afford an opportunity to the small manufacturer or retailer to find out the facts about the products he deals with which otherwise are only available to large concerns able to maintain their own testing laboratories.

The large department stores and mail-order houses have their own testing laboratories. These laboratories help the store buyer in his selection of merchandise by the testing of samples from different sources and ascertain that the quality of the merchandise delivered to the store is maintained.

The ultimate consumer can subscribe to the services of commodity and rating agencies, which provide simple, usable information about consumer commodities, covering quality, performance, and price.

The description of the activities of some testing laboratories and of the commodity testing and rating agencies will illustrate the facilities available to manufacturers, retailers, and consumers in determining and appraising the quality of consumer goods.

¹"Principles of Scientific Purchasing," by Norman F. Harriman, p. vii, McGraw-Hill Book Co., Inc., New York City, 1928.

INDEPENDENT PURCHASING AGENCIES

National Association of Purchasing Agents.

The National Association of Purchasing Agents has approximately 5,000 members, including representatives of manufacturers of industrial and consumer products and some 200 purchasing officials of States and municipalities.

The National Association of Purchasing Agents does no basic research on materials or their development. All of its present activities deal with policies and procedure of value to purchasing agents.

Six or seven years ago the association had committees actively carrying on work in the standardization and simplification of various lines of commodities of interest to members of the purchasing profession such as classification of coal for steam generators, an outline for the scope of specifications to be used in ordering shipping containers made of corrugated fiberboard, standard nomenclature for shipping containers, standard methods of testing cotton goods, and a standard code for marking steel in bars.

Recently the National Association of Purchasing Agents decided to eliminate the initiation of standardization projects from its activities, feeling that the recognized standardization agencies, such as the National Bureau of Standards, the American Society for Testing Materials, the American Petroleum Institute, and many trade associations were better organized to handle standardization projects and that the contribution of the National Association of Purchasing Agents might best be made through cooperation with these agencies. When the association has a project requiring consideration by one of these agencies it has no difficulty in securing their cooperation. This is true, alike, of projects dealing with standardization, inspection, grading, certification, and labeling of products.

The National Association of Purchasing Agents has developed standard contract forms in cooperation with other organizations. Frequently, the association's assistance is requested in the development of a satisfactory contract form by a trade group; such assistance is always willingly given because of the belief that buyer and seller usually can arrive at mutually satisfactory terms through friendly cooperation and that well-drafted contract forms contribute to such cooperation.

In the development of a procedure for centralized purchasing in governmental agencies, the National Association of Purchasing Agents was probably the original sponsor. Nearly all States and most large cities now have centralized governmental purchasing and, either directly or indirectly, were assisted by the association through its special Committee on Governmental Purchasing.

Educational Buyers Association.

The Educational Buyers Association, New York City, is composed of procurement officers of over 350 educational institutions, compris-

ing colleges and universities, including municipal and State, as well as some private secondary schools and boards of education. Educational institutions operating under State and municipal regulations are often compelled to buy completely on the basis of competitive bidding, and have set up specifications which are patterned after the Federal Specifications.

The Product Testing Committee of the Educational Buyers Association prepares periodic reports on commodities of general usage in which are shown the valuable and detrimental characteristics of these commodities as determined by laboratory test. Eight of these reports were sent to the membership during the past year. The subjects of these reports were chosen for test by a questionnaire and are as follows: Product testing aids, linoleum and floor brushes, fire extinguishers, adhesives and paste, flags, calking lead, red writing ink, garden hose, toilet paper, blotting paper, chalk, antifreeze solutions, glue for wood-working, paper towels, and typewriter ribbons.

The facilities of the educational institution at which a member of the association is located furnish an opportunity for individual laboratory tests, the results of which are often forwarded to the executive secretary of the Educational Buyers Association for transmittal to the entire membership of the association. This type of activity is purely voluntary. At sectional meetings, planned and held throughout the year, and at the annual convention, much of these individual findings are exchanged.

The "Homemade Products" column in the association's confidential "Bulletin" is of most practical help to the membership. This feature permits alert educational buyers to cut their costs and improve the quality of the products used. The range of items extends from insect-control preparations to diving boards and asphalt pavements.

The application of the principle of cooperation is not exclusively intra-association. The Educational Buyers Association joins with other reputable consumer groups in projects for establishing standards. Most recently the Educational Buyers Association has agreed to assist the American Hospital Association in the development of adequate consumer standards for sheets, pillowcases, and sheeting.

One of the services of the association to its members is the help provided in establishing specifications and also indicating test method procedures to ascertain that the materials delivered conform to the specifications, or calling the members' attention to standard methods of analysis developed by such standardizing bodies as the American Society for Testing Materials.

Because many privately endowed institutions are small, it would be economically unsound to set up elaborate systems of specifications and testing for their own use. The Educational and Institutional Cooperative Service, Inc., organized by the Educational Buyers Association, and known as the E and I Cooperative, was formed for the purpose of enabling members to make advantageous purchases of nationally distributed products. This organization sets its standards before it makes its contracts with distributors and, when advisable, uses an independent laboratory to test merchandise before the contract is consummated, to see that the standards specified are maintained.

The E and I Cooperative has entered into some 50 different contracts for commodities in general use in educational institutions. A contract

is entered into with the vendor only after exhaustive trial of the vendor's product has occurred at several member institutions which are set up to determine the value both by actual use and laboratory tests.

Hospital Bureau of Standards and Supplies.

The Hospital Bureau of Standards and Supplies, New York City, founded 30 years ago and incorporated January 13, 1934, is a cooperative purchasing association of some 207 voluntary hospitals.

The Bureau renders a fourfold service to its members:

(a) *Quotation or inquiry service.*—It furnishes its member institutions with the most economical prices available from a Nation-wide standpoint on medical, surgical, household, kitchen, laundry, engineering, and other hospital supplies, and on some foodstuffs.

(b) *Buying service.*—It works out buying arrangements whereby these goods can be purchased on the basis of the requirements of the entire group instead of on those of the individual hospital.

(c) *Technical service.*—Its Research Department determines the relative merits of major hospital items and recommends selections on both a quality and price basis. It studies hospital practices in the use of materials and points out methods of obtaining greater economies. It offers a technical consultant service on special problems.

(d) *Special information service.*—When requested it secures information on sources of supply, prices, use-value, etc., of comparatively unknown or highly specialized items.²

Members usually purchase less than one-half of their required needs through the bureau. The total savings to members are estimated at \$350,000 per year, not considering savings made due solely to distribution of purchasing information by the bureau.

The Hospital Bureau of Standards and Supplies recognizes that any intelligent comparison of prices must take into consideration the question of quality and that all too often comparisons are made without the standard or grade being known, or on the assumption that an item is of a given standard where it may be actually either above or below the standard. In 1939 a standardization program was inaugurated to undertake three chief lines of activities:

1. To test and report on those brands and types of products used in large quantities in hospitals.
2. To prepare specifications on the basis of such tests and special service requirements as determined by hospital needs.
3. To check the shipments of hospital supplies for the purpose of determining their compliance with specifications.³

The program embodies the use of recognized standard test methods where they exist, and where necessary the development by the bureau of its own test methods; testing of products purchased in large quantities to ascertain compliance with specifications; study of actual wear or use requirements for particular products; and upon completion of laboratory tests and surveys to determine the use requirements, preparation of purchase specifications. Where specifications are available from Government or municipal sources, the bureau will use these as a basis in preparing its own specifications.

The bureau has already completed performance and other tests on the following items: Gauze, bandage rolls, absorbent cotton, cellulose,

¹ "Hospital Bureau of Standards and Supplies, Inc., What It Is and What It Offers," p. 1, New York City, 1940.

² "Research Program of the Hospital Bureau," p. 1, Hospital Bureau of Standards and Supplies, New York City, 1940, mimeographed.

sanitary pads, paint, and thermometers. Preliminary work has been completed on blankets, sheets, syringes, paper towels, and toilet tissue.

The bureau purchases all kinds of special, surgical, household, kitchen, laundry, engineering, and other supplies commonly used by an institution and also a large number of staple groceries, including canned and packaged foodstuffs (about 2,000 items in all). It does not handle any fresh foodstuffs.

Standards, specifications, and test methods from Federal, municipal, and nongovernmental agencies are used by the bureau, as well as reports of products by brand name, prepared by testing laboratories and commodity testing and rating agencies.

TESTING LABORATORIES

The American Council of Commercial Laboratories.

The American Council of Commercial Laboratories is an association of 20 independent commercial laboratories widely distributed throughout the country. Some of these members maintain a number of branch laboratories in different cities.

The objects of the council are the promotion of scientific analysis, testing, inspection, or research and advancement of the welfare of the independent scientific laboratories which associate themselves for this purpose.⁴

The council disseminates among its members information concerning the economic, promotional, and other values of laboratory services; seeks to maintain the services of members on a high plane of reliability and encourages cooperation among its members to increase services to clients.

Members of the council agree to maintain certain policies designated to further the council's objectives. Listed among these are policies which directly affect the quality or standard of services performed for their clients and others:

To assert competency only in work for which they are adequately equipped and for which adequate experience is available or adequate preparation has been made.

To refrain from rendering services where they will aid enterprises which may be fraudulent or contrary to the public welfare.

To endeavor in reports to make clear the significance and limitations of findings reported.

To safeguard reports as far as is possible against misinterpretation or misuse, and to contend against such misinterpretation or misuse.

To oppose incompetent and fraudulent analysis, testing, inspection, or research.

To cooperate so far as reasonably practicable in the activities of professional and scientific societies and related associations and to make to them contributions of personal services and of suitable technical information insofar as this may be done without violating the rights and interests of clients.

To render services upon request one for another where equipment or experience is lacking, or where economy or promptness of results can be gained thereby.⁵

A laboratory may be dropped from membership for conduct at variance with the above policies. However, the member laboratory is first given an opportunity to be heard before an arbitration committee; if the arbitration committee so recommends to the executive committee the membership must be canceled.

Services of commercial laboratories.—Member laboratories of the council engage in research, analysis, inspection, testing, surveys, and statistical analysis. They investigate and report upon raw materials, finished products, devices, and processes. They render reports, con-

⁴ "By-Laws," p. 1, American Council of Commercial Laboratories, New York City, revised December 1938.

⁵ *Ibid.*, p. 4.

sulting services, and expert testimony. Their services are intended to result in quality control, economy, good contractual relations, and compliance with specifications.

Fundamentally services of commercial laboratories consist in the utilization of specialized equipment and specialized knowledge, skill, and experience in the determination of properties and characteristics of materials, or of performance and value of devices and products.⁹

The function of these testing laboratories consists in testing products for their clients to determine that the products are made in accordance with specifications. They also assist clients in the certification of their products which meet certain quality or performance specifications. It is understood that most independent laboratories prefer to have specifications or standards formulated by competent representatives of all having a proper interest in the subject. Where suitable specifications are not available, however, tentative specifications sometimes are prepared by these laboratories pending the establishment of standards by recognized standardizing agencies. For example, such specifications were recently prepared by the Electrical Testing Laboratories for electric flat irons and vacuum cleaners.

Each testing laboratory retains its own name, independent management, and freedom to conduct its work within the policies of the council. The services of the commercial testing laboratories tend to obviate most of the disputes as to quality of products and their compliance with specifications which may arise between buyer and producer. Contributing to the individuality of the member laboratories is the number of different pursuits followed by laboratories. Some laboratories engage in consultation, furnish experts for court testimony, and render services in the way of plant and process development. Others confine themselves to fact finding and avoid expression of opinion. Furthermore, one laboratory may specialize in electrical equipment, while another may select textiles for its field work. It is not unusual for one laboratory, when approached by a client for service which it is not prepared to render to acquaint the client of this fact and to use, in cooperation with its own, the services of an associate commercial laboratory that has equipment and scientific personnel to provide the service desired.

Clientele of commercial laboratories.—The services of these laboratories afford an opportunity to the small manufacturer or retailer to ascertain facts about products which would otherwise only be available to larger organizations able to maintain their own laboratories. Purchasers find in independent laboratories a means of insuring compliance with specifications and of selecting products which best serve their purposes. Fulfillment of contractual obligations may be assured to the satisfaction of both seller and buyer through such independent services. Bankers, investment houses, insurance companies, transportation and advertising agencies, are also among the clients of these testing laboratories.

Cooperation with other agencies.—Most of the member laboratories participate actively in the research work of technical societies. Members of their staffs serve on committees of these organizations and

⁹ "Independent Laboratory Services," by the American Council of Commercial Laboratories, p. 3, New York City, 1938.

derive therefrom much that enhances the technical competence of the services of their organizations.

*Underwriters' Laboratories, Incorporated.*⁷—Underwriters' Laboratories, Inc., sponsored by the National Board of Fire Underwriters, is a nonprofit organization maintaining and operating laboratories for the examination and testing of devices and materials.

The Underwriters' Laboratories "define and publish standards, classifications, and specifications for materials, devices, construction, and methods affecting life, fire, and casualty hazards."

The Underwriters' Laboratories, Inc., have several engineering councils: Fire Council, Casualty Council, Electrical Council, and others. Copies of standards and reports submitted to the above councils are filed with the National Bureau of Standards.

The majority of underwriters in the United States, and many Federal, State, and municipal authorities, and architects, building owners and users either accept or require listing by Underwriters' Laboratories, Inc., as a condition of their recognition of devices and materials having a bearing upon life and fire hazards, and upon accident prevention.

There exist permanent arrangements between Underwriters' Laboratories, Inc., and the National Bureau of Standards, whereby, in the event of a fixed difference of opinion on an engineering or technical matter between Underwriters' Laboratories, Inc., and any of its clients, the question at issue may be submitted to the Bureau for decision.

The standards of Underwriters' Laboratories, Inc., have been drawn up to provide specifications and requirements for construction and performance under test and in actual use of materials and appliances submitted to the laboratories. Approximately 150 of these standards and sets of requirements have been issued.

The label service consists of inspections of devices and materials at the factories by inspectors of Underwriters' Laboratories, Inc., and the manifesting of goods found to conform to Laboratories' requirements by labels (which may be in any form or of any material adapted to the product and its use), whereby they may be identified at all times. All such labels (Manifests of Inspection) include the words "Underwriters' Laboratories, Inc., Inspected," and are obtainable only from Underwriters' Laboratories, Inc. Label service includes listing in the published records of Underwriters' Laboratories, Inc.

The J. C. Penney Research and Testing Laboratory.

The J. C. Penney Research and Testing Laboratory, New York City, was established in the early part of 1930. Its purpose was to aid in sound buying of merchandise and to insure the greatest possible dollar value.

The work of the laboratory covers all lines of commodities handled by the J. C. Penney Co., such as ready-to-wear, yard goods, sheets, blankets, shoes, hosiery, and so forth. A variety of tests are made on all these items. Judgment as to the worth of any given article is not based on one test, but the article is evaluated by compilation of all the factors possible to obtain by test methods. The laboratory

⁷ "Underwriters' Laboratories, Inc., Organization Purposes and Methods," 19 pp., Chicago, Ill., 1937, ed.

is equipped to do both physical and chemical testing, and some types of biological testing.

The laboratory helps the buyer in his selection of merchandise by the analysis of samples from different sources. After this selection is made, it then becomes the duty of the laboratory to follow subsequent shipments to ascertain that the quality of the product is maintained throughout the period of the contract and is in accordance with the sample submitted. The laboratory also examines returned goods to find out if the article has been mishandled by the customer or if there is an inherent fault in the article which has not been shown up through previous analyses. If such a fault is present, efforts are begun immediately to correct it.

The laboratory is continually carrying on research with a view to improving merchandise, especially textile finishes.

Members of the staff of the laboratory spend considerable time at the various mills throughout the country working in close cooperation with the actual manufacturers for continued improvement of merchandise.

Naturally, through this work various standards have been developed. Where Government standards exist, these are used as a basis for the laboratory work. The laboratory has worked in close cooperation with the National Consumer-Retailer Council, the Advisory Committee on Ultimate Consumer Goods of the American Standards Association, the National Bureau of Standards, Bureau of Home Economics of the United States Department of Agriculture, the National Better Business Bureau, the American Society for Testing Materials, and other organizations, in an endeavor to produce sound standards and standard methods of tests.

Macy's Bureau of Standards.

The Macy's Bureau of Standards is primarily interested in the adaptability, performance, durability and care of merchandise sold by its store and makes investigations of these factors from the consumer's point of view. The bureau develops test methods simulating such factors as the "warmth" of blankets and garments, or wear of fabrics. Studies are made of composition and construction of fabrics and their effect upon the factors enumerated above; such as the effect of yarn count, fabric construction and napping on the warmth and durability of blankets. Research of this kind frequently requires the development of special test equipment; such as thermal transmission apparatus, abrasion machines, and others.

Many standards have been developed for merchandise sold under Macy's brand names.

The establishment of these standards is preceded by a study of the deficiencies of merchandise available on the market, the means for improving the quality of the article, and an evaluation of the different types of the article available.

Manufacturers are frequently asked to modify the quality of their merchandise to conform to the results of these preliminary studies.

In many instances it is essential to visit mills and other manufacturing establishments for the purpose of inspecting manufacturing processes in order to assist manufacturers in the improvements and development of merchandise such as improved umbrella cloth of spun

silk, pyroxylin coated material for house slippers, and washable Roman-striped hose.

Testing.—The testing of commodities serves the following purposes :

- (a) The analysis and comparison of commodities offered by manufacturers to obtain facts as to content and to determine best value.
- (b) The conducting of tests on merchandise to ascertain durability and performance.
- (c) The gathering and classification of all information for the purpose of developing specifications for merchandise.
- (d) The assurance of correct description of merchandise in advertising copy.
- (e) The comparison of products sold in other stores with merchandise sold by Macy's.
- (f) The examination of returned goods so as to adjudicate complaints and to determine weaknesses and flaws in the merchandise.

The commodities tested include: Clothing, home furnishings, accessories, foods, drugs, cosmetics, jewelry, insecticides, and antiseptics.

Services of the bureau.—The bureau makes studies and recommendations for more effective garment cleaning, rug cleaning, fur cleaning, waterproofing, mothproofing, etc.; prepares informative labels to be affixed to merchandise; assists in the training of buying, selling, and management personnel; gives lectures for student groups at high schools and colleges, for consumer groups of adults, and various business groups; arranges visits to the bureau for these groups; and supplies information to various home economic groups in colleges and universities throughout the United States.

The subject of terminology is being given special intensive study, with the object in view of developing simplified understandable means for conveying information to the consumer so as to enable him to evaluate the merchandise he is buying in terms of adaptability, performance, durability, and to understand how to care for it.

The bureau cooperates with technical associations such as the American Society for Testing Materials, American Association of Textile Chemists and Colorists, American Association of Textile Technologists, National Consumer-Retailer Council, Advisory Committee on Ultimate Consumer Goods of the American Standards Association, and Federal, State, and municipal agencies.

Technical Laboratories of Sears, Roebuck & Co.

The Sears, Roebuck & Co. has maintained its own laboratories and a staff of technicians since 1911. The company is not engaged in basic research; however, it sets up minimum standards on certain feature value items which it carries. These standards are arrived at through agreement among the general merchandise office, the buyers, the merchandise comparison office, and the technical laboratories. It is stated by the company officials that these minimum standards are not below standards generally accepted by the respective industry.

The Sears, Roebuck & Co. maintains one of the largest, privately owned, merchandise testing laboratories in the country.

The primary function of the technical laboratories is to aid buyers in the selection of merchandise. It augments the information received

from the manufacturers and also recommends needed improvements and developments. In addition, a merchandise development department not only follows through on the findings of the technical laboratories in many cases but also is constantly working with a view toward incorporating improvements in the merchandise sold by the company.

The technical laboratories are supplemented in some cases by outside agencies and provide technical aid on all the merchandise carried to the buyers of the company; the technical work is performed by the laboratories only on their request.

The Sears, Roebuck & Co. gives special attention to its own trademarked goods. The characteristics of the products receiving attention is dependent upon the use to which they will be subjected by the customers. If an item is to withstand abrasion, it is subjected to various kinds of abrasives; if it is to resist heat, it is subjected to heat; if it is to resist cold, it is subjected to cold or is frozen.

Because the goods are bought from thousands of sources and are received at over 500 points in the company, it is possible to make only a perfunctory inspection of merchandise at the point of receipt. In addition, however, the merchandise comparison office maintains a constant spot-check inspection on all commodities.

The Sears, Roebuck & Co. cooperates with the following organizations in the development of standards: The National Bureau of Standards, the American Standards Association, the American Society for Testing Materials, American Society of Textile Colorists and Chemists, National Consumer-Retailer Council; also with the American Home Economics Association, Association of American University Women, General Federation of Women's Clubs, and with the United States Department of Agriculture on various projects.

COMMODITY TESTING AND RATING AGENCIES

Consumers' Research, Inc.

Consumers' Research, Inc., whose offices and laboratory are located in Washington, N. J., was organized as Consumers' Club in 1927 and originally incorporated in December 1929, under the laws of the State of New York, as a membership corporation to provide unbiased information and counsel on merchandise bought by the ultimate consumer.

Types of service.—After experimenting for a number of years with different methods of presenting information to ultimate consumers, two types of service were decided upon beginning October 1934, as the most satisfactory and convenient method of presenting Consumers' Research material in accordance with subscribers' expressed wishes and criticisms.

Consumers' Research Bulletins: All of the bulletins list products by brand name as "recommended," "intermediate," and "not recommended." Whenever possible, price classifications are also given, prices being rated as 1, 2, and 3; 1 being low, 3 high. The quality judgments are completely independent of price classifications.

This service is available only to individuals, who are required to sign the confidential pledge before their subscriptions are entered. Each subscriber to the bulletin service receives the current Annual Cumulative Bulletin and all other monthly bulletins issued during the year for which his subscription is in effect. Bulletins are mailed to subscribers monthly, between the 10th and 15th of the month, except during July and August. There are no bulletins issued in July and August because these 2 months are spent in compiling and preparing data for the 240-page Annual Cumulative Bulletin, which appears in September each year. This issue and five of the monthly bulletins are confidential in nature and are marked, "The analyses of commodities, products, or merchandise appearing in this issue of the Consumers' Research Bulletin are for the sole information of subscribers." Four of the monthly bulletins are nonconfidential and may also be obtained as a separate service called the General Bulletin service which is described below.

The General Bulletin service: The General Bulletin is issued quarterly, in October, January, April, and June, and is not confidential.

Subscriptions are open to libraries, schools, and other organizations, and to any individual who does not wish to subscribe to the regularly monthly bulletin service. The volume year runs from October through June, and subscriptions are accepted for that period only. Single copies of the bulletins of this service are also available to nonmembers.

Sources of information.—The technical judgments and recommendations of Consumers' Research are based upon its own technical tests and investigations, and knowledge of its technical staff or experts; upon data published by the Federal and State Governments pertaining to

consumers' goods; upon data issued by the State and national medical associations, and other research and investigating bureaus, associations, corporations, or individual experts; in certain cases, upon advice from users who have made observations of their experiences with, or possess special knowledge of, the product in question, and whose views, in the opinion of the technical experts of Consumers' Research, are deserving of consideration by other consumers; upon tests or investigations which are made available for the use of Consumers' Research by various qualified noncommercial experts, technicians, and scientists.

At one time Consumers' Research published the monthly magazine Consumers' Digest. This presents in a more popular form information on commodities, general buying advice, and news of especial interest to consumers. Consumers' Digest is now published by Consumers' Institute of America, Inc., which also has its headquarters in Washington, N. J. Only products which can be listed as recommended, or rated with a qualified recommendation, are listed in Consumers' Digest.

Consumers' Union of United States.

Consumers' Union, Inc., located in New York City, was formed in February 1936 under the laws of New York State as a nonprofit membership corporation set up to provide consumers with simple, usable information about consumers goods and services, covering quality, price, and wherever possible, labor conditions in the factories producing such goods. Quality and price ratings are not affected by the reports on labor conditions, according to the policy of the organization.

Services.—Consumers' Union, an organization of 85,000 members, publishes monthly Consumers' Union Reports in full and abridged form. The full reports contain ratings and discussions of higher-priced commodities, while the abridged reports, designed primarily for low-income families, omit ratings on high-priced products. Consumers' Union also publishes an Annual Buying Guide, which is a compact booklet rating many hundreds of products and designed for quick reference in shopping.

The information published in the monthly reports is not confidential. Only the material included in the Annual Buying Guide and certain other special reports is made confidential. This is done primarily for legal reasons since there is no explanation in the Annual Buying Guide of the methods of test employed nor space given to the qualifications accompanying the recommendation of certain products as in the monthly reports. All confidential material is for the sole use of members and their immediate families.

Merchandise is rated in the reports and Annual Buying Guide by brand names in three groups: "Best buys," "also acceptable," and "not acceptable."

Sources of information.—The ratings of products represent the judgments of the technicians of the staff of Consumers' Union or of consultants whose technical competence and freedom from commercial bias are approved by Consumers' Union. Ratings are based on laboratory tests, on controlled tests under conditions of use, on the opinion of qualified authorities, on the experience of a large number of persons with the products being studied, or on a combination of all these factors.

Intermountain Consumers' Service, Inc.

Intermountain Consumers' Service, Inc., 435 Marion Street, Denver, Colo., is a nonprofit research and information agency organized in December 1932 under the laws of the State of Colorado for the purpose of supplying ultimate consumers with reliable comparative data as to the price and quality of consumers' goods.

Services.—Intermountain Consumers' Service supplies to members, through its Consumers' Buying Guide, a handbook of buying issued in installments during the year, scientific and technical information and counsel, based on its own tests or the findings of experts. Goods are listed as recommended, not recommended, and unclassified, giving brands and names of manufacturers in full and using the rational grade symbols A (first quality), B (second quality), and C (third quality). Reasonableness of the price of a commodity is indicated by the numbers 1 (fair price), 2 (high price), 3 (excessive price). Where standards and specifications of significance to ultimate consumers are available, these are used as gauges of quality, and where they are lacking, new standards and specifications, which give adequate consideration to the factors of importance to consumers, are evolved.

Sources of information.—The recommendations of Intermountain Consumers' Service are based on tests conducted by it, on current scientific literature, on the counsel of consultants, and on governmental and other approved unbiased sources of commodity information.

CHAPTER VII

CONSUMER BUYING AND THE EXTENT AND CHARACTER OF COMMODITY INFORMATION AVAILABLE

The consumer who purchases commodities on the retail market is in a very different position from that of the purchasing agent who buys for the Federal Government, a State, a county, a municipality, or a large commercial establishment. The consumer has to depend upon the information concerning commodities that he can obtain for himself or that the retailer is willing and prepared to give him. The individual consumer cannot afford to have commodities tested to determine their compliance with given standards or specifications. Because the consumer knows so little regarding different commodities, he often makes uneconomical and otherwise unsatisfactory selections, buys erratically, and fails to develop sound buying habits.

Standards, grades, and informative labels may be used effectively in providing consumers with information concerning commodities. However, standards and labels are employed to a very limited extent in retail selling, although manufacturers, retailers, and the trade press, as well as consumers, are giving more consideration to the use of standards and labels than formerly.

The extent and character of commodity information available to consumers vary from store to store, in different sections of the country, and for different groups of commodities.

The Individual Consumer as a Buyer.

The buying practices of consumers have been given much consideration as the number and variety of commodities have increased, and as the price range has enabled consumers to select from a greater number of commodities. Those responsible for the sale of the products of mass production have sought new ways of influencing the consumers' choices of commodities. Meanwhile, consumers have gradually become more conscious of their inefficiency as buyers and have tried to discover means of improving their buying practices.

The individual consumer is influenced by a variety of motives in making choices between different types of commodities such as a stove, a rug, a davenport, or a radio. If he decides to buy a stove, a selection must then be made from a variety of available stoves, and he must consider such factors as price, quality, style, and his own particular needs. Each of these choices may be either largely emotional or largely rational.

Many of those responsible for the sale of specific commodities have recognized that consumers are susceptible to emotional appeals and have relied almost entirely, if not wholly, on such appeals in their sales campaigns. At the same time consumers, confronted by an array of relatively inexpensive commodities, have long since cast

aside, as no longer applicable under present conditions, the generally respected buying habits and guides followed by past generations, and have thereby increased their susceptibility to various kinds of sales promotion. Consequently, consumers have been confused and, more or less futilely, have been seeking new guides to aid them in trying to decide whether or not they should include given commodities among their purchases, how much they should pay for them, and how to identify the ones best suited to their needs.

At present the buying habits, if such they may be called, of most consumers are influenced in a variety of ways. Often, quite unconsciously, consumers are swayed in their choices by what they previously purchased; familiarity with a given commodity inclines many to select one that is similar, and this familiarity may be established either through use of a commodity, seeing other people use it, or through some form of aggressive advertising. If, however, experience with a commodity has been distinctly unsatisfactory, this may serve to stimulate search for another in the hope that it may prove more acceptable.

The salesman's recommendation is usually given considerable weight by the consumer who wants to keep his purchases in line with what other people are buying. Often, such a person is influenced by advertising which purports to represent what social leaders and other prominent people have selected. The consumer, who is eager to wear only "the latest" style, selects a "high" style and is especially responsive to new designs, new materials, new colors, and new combinations.

There is a tendency to point out, as typical of all consumers, the characteristics manifest by young and inexperienced buyers. The lack of information, poor judgment and ineptness in buying of the high school girl, the young bride, or the mother with her first baby are repeatedly cited as evidence that the consumer is neither vitally interested in selecting and purchasing commodities on a rational basis nor capable of developing the ability to do so. It should be recognized, however, that many mothers of large families on low incomes display remarkable astuteness in buying, despite their difficulties in obtaining useful information concerning commodities. Nevertheless such persons are almost completely ignored in portraying the characteristics of consumer buyers. Nor are the homely, practical rules, which these women have evolved out of their own hard experiences, often publicized by the student of consumer psychology, as a means of aiding less experienced consumers in improving their buying habits.

One of the very serious handicaps of the consumers who select commodities for individual and household use is that they are unskilled buyers. Wesley C. Mitchell, in commenting on the position of the household buyers, has said:

* * * The housewife, who does a large fraction of the world's shopping, is not selected for her efficiency as a manager, is not dismissed for inefficiency, and has small chance of extending her sway over other households if she proved capable. She must buy so many different kinds of goods that she cannot become a good judge of qualities and prices, like the buyers for business houses. She is usually a manual laborer in several crafts, as well as a manager—a combination of functions not conducive to efficiency.¹

¹"Business Cycles; The Problem and Its Setting," by Wesley C. Mitchell, p. 165, National Bureau of Economic Research, Inc., New York City, 1927.

Another difficulty is that consumers who buy commodities at retail, for individual or household use, in addition to buying many different kinds of commodities, must purchase a considerable proportion of them in very small amounts.

In addition to the lack of specific training for buying, consumers' desires for new, expensive, and nonessential commodities, far more than for necessary commodities, have been stimulated by the various devices employed in high pressure selling. Hence, if consumers are to choose wisely they need more education in planning expenditures, and useful, reliable, and easily understood information concerning available commodities at the time they are making their purchases.

Business psychologists and advertisers who have considered the buying habits of consumers are not alone in recognizing the importance of problems related to consumer purchasing. Thoughtful consumers have been deeply concerned over the conditions chiefly responsible for the erratic and unpredictable character of much of consumer buying.

Reactions of Consumer Groups to Buying Problems.

An indefinite number of examples could be cited of groups of consumers who have tried to learn more about commodities and to improve their buying practices. In 1929, a group of homemakers, most of whom were college graduates, attempted to aid one another in their buying problems. Information on a variety of household commodities was sought from such sources as clerks and buyers in local stores, manufacturers, both private and governmental research agencies, and testing institutes sponsored by magazines. The outcome of this study was thus summarized by a member of this group:

The result of our two years' efforts are mostly negative. Our purchasing problems are not solved. We were not even able to establish a basis upon which we could judge the articles, because information was not made available to us. Our efforts, however, were not entirely in vain. Through our discussions, we learned much that was of value to us * * * and above all, we have come to the conclusion that to insure wise buying the manufacturers must place on the goods reliable labels to indicate essential factors of quality and performance.²

Recently, certain members of this same group of homemakers have stated that the opportunity for a customer to obtain information about commodities sold at retail has not materially changed during the 10 years since the above study was begun, although a small amount of more specific information does appear occasionally on labels.

Manufacturers and retailers encourage the belief that consumers are not interested in selecting products on the basis of durability or performance characteristics. It has been asserted repeatedly by representatives of manufacturers and retailers that women do not want commodities, in which style is a factor, to be durable. This point of view is emphasized in the statement that—

Imitations follow originals in such rapid succession that those who want to distinguish themselves from the masses are hard put to it to keep ahead. Hence, style changes. Hence, the decline of the ideal of durability. Even those who can afford to buy good materials are content with whatever will hold its appearance as long as the style lasts. Distinction is to be found, not in the quality of one's purchases, but in their multiplicity and frequency.³

² "What Homemakers Learn About Purchasing Household Goods," by Mariana T. Nelson, vol. 24 (6), p. 520, *Journal of Home Economics*, June 1932.

³ "Economic Behavior, An Institutional Approach," by Willard E. Atkins and others, vol. 2, pp. 18-19, Houghton-Mifflin Co., New York City, 1931.

The assertion that women do not want commodities to last too long has been made so many times that many consumers are inclined to accept it as true. However, to test the validity of the contention of representatives of the silk trade that consumers are interested only in the style features of silk fabrics, a study was made to determine the reasons which caused 100 silk dresses to be discarded by their wearers, who were women on various economic levels residing in communities of different sizes.

The following reasons were given for having discarded the dresses: 66 were discarded solely because the fabric was no longer wearable (55 because of splitting, the remainder because of fading or shrinking); 25 were discarded because the fabric was no longer wearable, together with other reasons; 7 were discarded solely because they were out of style; and 2 were discarded solely because the garment fitted poorly.

In collecting the dresses the investigator learned that most of the women interviewed were displeased if the silk in their dresses had broken. Many stated that they would like to be able to recognize a good piece of silk, because they would prefer to make over out-of-style dresses for children or to give them to someone who could derive further good from them rather than to have them go to pieces after but a short period of wear.⁴

There is abundant evidence, which might be gathered by unprejudiced investigations, that if articles of clothing in which style is an important factor have been wisely selected and are becoming to the wearer, they are generally discarded with regret, and only after they are no longer wearable.

Standards and Grades for Consumer Commodities.

The types of standards of special value to consumers include standards of measure, composition, construction, quality, and performance. Standard methods of testing commodities and standards terminology by which various characteristics and grades of commodities may be designated are also important.

Standards of measure.—Standards of measure, such as length, volume, or weight, are indispensable to the consumer in identifying the amount of a given commodity which is being purchased. It is often not enough that information be available to the exact measure by length, volume, or weight of the contents of packaged commodities offered for sale but that these measures be such as to facilitate comparison of the amounts and prices of these commodities.

Innumerable illustrations might be cited of the difficulties consumers have in determining comparative prices of fabrics of different and unusual widths when sold by the yard, of commodities in glass jars, cardboard boxes, tin cans, or other commercial containers for which no dimensional standards have been established. Confusion resulting from unnecessarily large numbers of different sizes and shapes of containers was illustrated by a display at the hearings before the Temporary National Economic Committee on May 11, 1939. The 21 containers of tomato juice, purchased in 1 market, differed as little in dimensions as one-sixteenth of an inch and in net contents as one-half ounce, and represented 17 different sizes by dimensions, 15 different fluid volumes, and 13 different prices. In no 2

⁴ "Clothing and Household Goods for the Consumer," by Pauline Berry Mack, vol. 173, p. 39, *The Annals of the American Academy of Political and Social Science*, May 1934.

containers was the combination of size, net weight, and price identical.⁵

Standards of composition.—Standards of composition are also important in comparing commodities. These standards deal with such factors as the fiber or fibers present in fabrics, the kind of metal or wood in a given piece of furniture or equipment, and the kinds and proportions of constituents in drugs or cosmetics. Although water is a natural and desirable constituent of many commodities, the relative proportion of water in a commodity is significant to the consumer. If an excessive proportion of water is added in such diverse commodities as cleaning fluids, foods, medicines, alcohol, or paints, the serviceability of a given volume of these different products will be greatly reduced.

Unless standards of composition are established and observed in the production of commodities and information based on standards is used in selling them, commodities may be adulterated by the admixture of foreign, inferior, or harmful substances. Adulteration may occur in practically any kind of commodity without being detected by more than a few consumers. The control of adulteration "depends first upon standards—that is, accepted uniform definitions and requirements; and second, upon an active and coordinated system of inspection, examination, and tests based upon these standards."⁶

Standards of construction.—Standards of construction relate to how a commodity is made. For a bed blanket the standard of construction might include the length and width of the blanket, the weight in ounces per square yard of fabric, and number of yarns per inch in the warp and filling. For an ice refrigerator a standard of construction might include outside and inside dimensions of the box, the method of constructing the framework of the box and of anchoring the insulating material, the dimensions of the ice compartments and storage space, space between shelves, and requirements relative to the tightness of the doors.

Standards of quality.—Standards of quality facilitate the comparison of a combination of characteristics of commodities of different grades. Such standards or grades should be defined by carefully phrased specifications which take into consideration a composite of significant characteristics.

Grades are especially helpful to consumers if there is a considerable range in the quality of a given line of commodities, and if the commodities are complex and have characteristics which the consumer cannot determine readily for himself. The consumer must make selections from many commodities which are covered by opaque wrappers, have hidden parts, or have characteristics which cannot be judged by sight, touch, or other physical senses. Many of these commodities may resemble one another so closely as to seem identical and yet be strikingly different in quality and in the service they will provide.

It is important to bear in mind, however, that it would be a disservice to consumers, especially those in the lower income brackets, to adopt standards for only high quality, expensive commodities and to permit these high priced commodities to force the lower, less expensive, commodities off the market.

⁵ "Problems of the Consumer," hearings before the Temporary National Economic Committee, pp. 3347-3348, Part 8, 76th Cong., 1st sess., May 10, 11, 12, 1939.

⁶ "Adulteration," by F. J. Schlink, *Encyclopedia of Social Sciences*, vol. 1, p. 467, the Macmillan Co., New York City, 1937.

Standards of performance.—Standards of performance are exceptionally useful buying guides for the consumer because they provide concrete facts about the service a material or appliance may be expected to render when it is subjected to standard conditions of use. In commenting on the use of performance standards or specifications for commodities, Lyman J. Briggs has stated that—

So far as numbers are concerned, the great majority of specifications which deal with quality and only indirectly with dimensions have been formulated by consumer organizations, and consist largely of statements of what the buyer requires of the seller. Between dimensional standards as advocated by progressive producer organizations and quality specifications as advocated by consumer organizations an effective compromise is being found in performance specifications. An increasing tendency to base specification requirements upon performance in service rather than upon the composition of materials of manufacture is a noteworthy development of the present time.⁷

Where standards of performance are not available the consumer can often gain some insight into probable performance of a commodity and how to use and take care of it, by learning as much as seems pertinent relative to its dimension, composition, construction, and quality. Standards of construction are of special value if commodities are complex, have many component parts, are made of a variety of materials, and if imperfections are concealed by finishing processes. Adequate standards of performance are not yet available for such commodities as refrigerators, stoves, overstuffed furniture, and many others; therefore, standards of construction for these articles are of particular significance.

Informative Labels for Consumer Commodities.

For many years, leaders who have given thoughtful consideration to consumer needs for reliable information concerning commodities have urged that essential information be provided on labels attached directly to commodities or to their containers or wrappers. Representatives of the American Association of University Women, the American Home Economics Association, and the General Federation of Women's Clubs on the National Consumer-Retailer Council have recommended to their respective organizations the consideration of a "Platform for Consumer-Business Relations" which includes the following statement relative to informative labels for commodities:

The most satisfactory method for communication of information from manufacturer, through retailer, to consumer is a label attached to the product. Labels are useful only insofar as they state sufficient facts about the construction, grade, performance, or serviceability of the product to enable the consumer to judge relative values, and instruct the consumer on methods of care which prolong the usefulness of the product.⁸

For many commodities the ideal label should indicate the quality of the product by grade and include such additional information as will enable the consumer to select the commodity best suited to his needs.

In 1938, the Committee on Labeling, of the National Consumer-Retailer Council, composed of representatives of both consumers and retailers, "sought through suitable sampling, opinions of consumers,

⁷ "Uncle Sam Helps the Housewife," by Lyman J. Briggs, *The Retail Executive*, vol. 12(21), p. 16, New York City, May 22, 1940.

⁸ "Tentative Platform for Consumer-Business Relations," *Bulletin of the American Home Economics Association*, vol. 23(3), p. 14, American Home Economics Association, Washington, D. C., February 1940.

retailers, and manufacturers as to what information would be contained on the labels"⁹ for blankets, mattresses, cotton sheets, terry towels, kitchen knives, window shades, men's hosiery, men's shirts, woven piece goods, women's hosiery, slips and petticoats, and women's dresses. Without exception, consumers checked the largest number of items on which they considered it desirable that information be provided on the labels of these commodities. While the number of items checked by retailers was somewhat less, manufacturers checked fewer items than either the consumers or retailers.

A large proportion of the labels now found on commodities supply only fragmentary information which is quite insufficient for the consumer's needs. For most part, even the guaranties or certification on labels apply to only one or two characteristics of a commodity, such as color permanence or shrinkage in fabrics, the finish on a piece of furniture, or the stainless property of the steel in a knife.

Information Available to Consumers in Retail Markets.

The situation in the retail market merits careful consideration from the point of view of the degree to which consumers are able to make selections from available commodities on the basis of useful, reliable information.

It is generally recognized that information provided for commodities may vary in character and amount in establishments of different types, such as retail stores, specialty shops, small and large department stores, large stores with branches in the same or adjacent towns or villages, chain stores, consumer cooperatives, and mail order houses. It also varies between stores of the same type in different sections of the same town and, from time to time, in the same store.

During May and June 1939 a committee of the American Home Economics Association conducted an exploratory survey through local committees in a dozen widely scattered States to check on the amount of information available for a few selected articles in retail stores on labels or counter cards, or from clerks.¹⁰ The national committee suggested men's shirts, women's hosiery, electric irons, and canned foods as the commodities on which data were to be gathered, and a brief check list was prepared for each of these commodities. Data were gathered by almost 1,000 persons in the State of Washington, by 150 in Arizona, while 15 to 40 persons participated in the survey in 10 other States. These data were summarized by State committees. The returns give some indication of the information to be found in retail stores. However, there was much variation in the amount of information available in different States.

Commodity information provided on labels and counter cards.—Men's shirts: Neck size was given in 80 to 100 percent of cases; sleeve length in over 50 percent of cases; residual shrinkage, 50 percent of cases in Arizona, 35 percent in Washington, and a much lower percentage in other States.

⁹ "A Study of Informative Labeling, Based on a Survey Made by the National Consumer-Retailer Council," by S. P. Kaldanovsky, and G. W. Hervey, 170 pp., Consumer Standards Project, Consumers' Counsel Division, Agricultural Adjustment Administration, United States Department of Agriculture, and Works Progress Administration, Washington, D. C., June 1939.

¹⁰ "Information About Merchandise Available to Customers in Retail Stores," by Alice L. Edwards, *Journal of Home Economics*, vol. 31 (10), pp. 701-2, December 1939.

Women's hose: Size of foot indicated by number was given in most cases; full-fashioned or circular knit in over 50 percent; ringless in almost 50 percent; number of threads in 35 to 40 percent.

Electric irons: Model number, wattage, voltage, and name of manufacturer were given in approximately 90 percent of cases; weight, guaranty of performance, and Underwriters' Laboratory label in over 50 percent of cases.

Canned foods: Name of food, net contents in practically all cases, and style of pack in 65 percent of cases.

Commodity information supplied by store clerks.—Clerks in the store, according to the reports from each of the 12 States, gave more information concerning men's shirts and women's hosiery than for electric irons or canned foods. The factors about which information was most frequently given for men's shirts and hosiery were the kind of fiber; and color permanence to light, perspiration, and washing. For hosiery, information was also provided concerning the length of the leg and whether the hose were firsts or seconds. Little information beyond that available on labels was given for electric irons and canned goods. However, comments from some of those who collected data indicated clerks had often supplied inaccurate information.

Commodity information not provided.—Items for which little information was available from either label, counter card, or clerk included the strength of the fabric in men's shirts, the color permanence, to washing and perspiration of women's hosiery, performance tests for electric irons, and the quality grades of canned foods.

Growing Interest in Consumer Problems.

The trade press is giving more consideration than formerly to informative labeling and advertising and the problems which need to be solved in connection with their use. Beginning in the spring of 1937, one issue of *The Retail Executive* has annually contained a section called "The Consumer Wants To Know." This section has presented the point of view and activities of consumers, retailers, manufacturers, and technical groups with respect to the use of standards, grades, and informative labeling for retail commodities.

An increasing number of manufacturers are developing more informative labels for their products. And such manufacturers are found in almost every industry—textile, clothing, household equipment, furnishings, utensils, food, cosmetic, and many others.

According to investigations made by this publication [*The Retail Executive*] in the textile-apparel fields, it appears that the relatively slow growth of labeling among manufacturers has been due in part to the fact that stores have not demanded this kind of labeling. In addition, some manufacturers, while professing a sympathy with the consumer's demand for more facts indicate perplexity as to just what should be put on the labels. They make the point that such data would necessarily be technical and therefore likely to confuse the average consumer rather than inform [him].²¹

Nevertheless, reference in this same article is made to eight prominent manufacturers in the textile and clothing field, who have adopted the policy of using informative labels on their products. For example, the label used on fabrics manufactured by one firm:

²¹ "More Producers Turn to Informative Labeling," *The Retail Executive*, vol. 12 (21), p. 8, sec. 2, New York City, May 22, 1940.

* * * bears on it complete information regarding fiber content; special characteristics, and color-fastness, both as to washing and to light. Performance of the material is interpreted in terms of use, and all standard tests.¹²

The manufacturer of a popular priced line of men's clothing places labels on suits which state that:

* * * the suit has been laboratory-tested for its ability to maintain a crease over a long period of time without constant pressing; ability to withstand ordinary dry cleanings without puckering, cockling, or loss of color; ability not to shrink out of fit when caught in a rainstorm; for resistance to perspiration of both fabric and lining; ability to recover its shape on hanging after it has been confined to packing.

The label further gives complete fiber content and other factual information about the cloth, interlining, sleeve head, hair cloth, shoulder pads, canvas, pocketing, piping, tape, buttons, thread, body lining, sleeve lining, and under-collar cloth.¹³

A few large retailers have developed extensive programs of informative labeling. Among them are Gimbels, of Philadelphia; Macy's, of New York; Marshall Field, of Chicago; Lit Bros., of Philadelphia; and Kaufmann, of Pittsburgh. Various mail order companies are furnishing more specific facts in their catalogs and on labels for specific commodities than formerly. The informative labeling program of Sears, Roebuck & Co. of Chicago has been characterized as the largest in "point of the quantity of goods labeled."¹⁴

The merchandising division of the National Retail Dry Goods Association has made a recent survey of the attitude of retailers and the practices of retail stores relative to the use of labels on garments.¹⁵ In answer to the question, "Is the demand for merchandise labeling in your community strong, moderate, or negligible?" approximately 7 percent of the retailers reported the demand was strong; 42 percent that it was moderate; and 51 percent that the consumers' demand for labels on merchandise was negligible.

The retailers were also asked whether they removed the fiber identification tags placed on rayon dresses by manufacturers. Approximately 4 percent of the retailers reported they removed these tags, 53.5 percent reported they usually removed the tags; 2 percent that they usually removed the tags on low priced dresses; 2.5 percent that they removed the tags from about half of the dresses; 37.5 percent that they seldom removed the tags; and only 0.5 percent reported they never removed the manufacturers' fiber identification tags from rayon dresses.

Information Available to Consumers on Selected Commodities.

No exhaustive studies, from the consumers' point of view, have been made of the character and extent of commodity information available to consumers. The following presentation of information provided for selected commodities in a few commodity groups is an attempt to illustrate the type of guidance consumers may obtain in their purchasing.

Food.—The information on foods available to consumers tends to be a fragmentary and inadequate guide for wise selection. This is

¹² "More Producers Turn to Informative Labeling," *The Retail Executive*, vol. 12 (21), p. 8, sec. 2, New York City, May 22, 1940.

¹³ *Ibid.*

¹⁴ "Sears, Roebuck & Co. Promotes Informative Labels," *Title of Advertising and Marketing*, vol. 14 (14), p. 3, New York City, July 15, 1940.

¹⁵ "A Survey of Fiber Identification in Dresses," by Merchandising Division, National Retail Dry Goods Association, New York City, 18 pp., August 1940. Mimeographed.

true though more standards, grades, and labeling requirements have been established for foods than for any other group of commodities.

In most retail markets, the handling and sale of food is subject to at least some regulation to insure that it is safe for human consumption. Therefore, from experience, consumers expect the foods they buy to be free from harmful substances and safe to use, providing the foods are properly cared for after removal from the market.

An individual responsible for household purchasing has a better opportunity to develop skill in buying foods than in making most other purchases because most foods are bought at frequent intervals, are used promptly, and products similar to those which have proved satisfactory may still be available when new ones must be selected.

Sanitary conditions in food markets, the quality of the foods, and the amount of information available are influenced, to a considerable extent, by the way in which the food laws and local regulations are enforced. However, even in the better markets, the consumer is left to rely largely on his own judgment and experience when it comes to selecting many of these commodities. Little, if any, of the information he is able to obtain will enable him to distinguish between the different grades of packaged commodities.

Some markets have food products graded, packed, and labeled in accordance with standards developed by the New England Council, and adopted by each of the six New England States. The grade names, requirements, descriptive terms, and standards used on the labels of these foods are similar to those approved by the Agricultural Marketing Service of the United States Department of Agriculture.

Occasionally the consumer may find butter, cheese, eggs, fresh fruits and vegetables, dried fruits, or a few other products which have been graded and labeled in accordance with United States Standards or United States Tentative Standards. For the most part, however, these standards and grades are used in transactions between producer, wholesaler, and retailer, and this information is not passed on to the customer in the retail market.

In practically every market only a very minor proportion of canned fruits and vegetables are grade labeled, although there are striking differences in the firmness of the pack, flavor, and general quality characteristics of these canned foods which could be indicated by grades already established. No information is provided as to the relative flavor and strength of such commodities as spices or flavoring extracts, or the grades of coffee, tea, or dozens of other commodities which are sold largely by brand.

In general, the attractiveness and palatability of many commercially prepared foods have improved greatly during recent years. Nevertheless, most housewives cannot tell how the food values of these manufactured products, which are displayed on the retail counter, compare with corresponding foods prepared from ingredients commonly used in the household kitchen. This is true of many canned and packaged foods for which standards of identity have not been established, such as baked beans, sandwich filling, bakery products, and frozen desserts.

The Committee on Definitions and Standards of the International Association of Ice Cream Manufacturers, at the invitation of the United States Food and Drug Administration, has prepared a set of "Suggested Federal Definitions and Standards of Identity for Frozen

Desserts"¹⁶ for use in developing the definitions and standards to be used in interstate commerce.

As a result of regulations, authorized by the Food, Drug, and Cosmetic Act, the manufacturers of commercially prepared foods, entering interstate commerce, for which no standards of identity have been established, must list the ingredients on the label of each of these products.

The consumer may find in the local market meat shipped from without the State, inspected by Federal inspectors for wholesomeness and bearing the circular official purple stamp "U. S. Insp'd & P's'd." (United States Inspected and Passed). In Seattle, Wash., beef, mutton, and lamb, sold on the local market must be graded for quality and stamped, with the United States grade stamp, by Federal meat graders. In a few markets of a number of large cities, meat graded by United States graders is available. The consumer frequently fails to recognize the difference between the Federal inspection stamp and the United States grade stamp. In some markets certain kinds of fresh meats are stamped with grades established by individual meat packing companies for use in marketing their own products. The basis of these company grades is not passed on to the public, so the consumer does not know the factors considered in grading such meat. Company grade stamps are sometimes confused by the consumer with the United States grade stamps.

Although many consumers are unaware of the fact, all food which has entered into interstate commerce is subject to the regulations of the various Federal laws related to foods, including the Food, Drug, and Cosmetic Act. As this act was only passed in 1938 and all of its provisions were not effective until July 1, 1940, the regulations authorized by the act are as yet not in full force. Therefore, even well informed consumers are still uncertain as to information and safeguards for food, which this act is designed to provide. A wall chart presenting the provisions of the Federal Food, Drug, and Cosmetic Act in a form which facilitates quick reference to the law and permits ready comparison of the provisions applicable to foods, drugs, devices, and cosmetics, respectively, has been prepared by the Consumer Standards Project, Consumers' Counsel Division, Agricultural Adjustment Administration.¹⁷

The regulations established under the Food, Drug, and Cosmetic Act require that labels on packaged foods provide the following:

The name and address of the manufacturer, packer, or shipper.

An accurate statement of the quantity of contents.

If composed of two or more ingredients, and it is not a standardized food, the common or usual name of each ingredient must be listed.

The labeling of special dietary foods must bear information considered necessary to fully inform purchasers.

Artificial flavoring, artificial coloring or chemical preservative in foods must be listed in the labeling.

All the information required by the act must be shown in the labeling in a form easily noticed and readily understood.¹⁸

¹⁶ "Suggested Federal Definitions and Standards of Identity for Frozen Desserts," by the Committee on Definitions and Standards, 2 pp., International Association of Ice Cream Manufacturers, Washington, D. C., November 16, 1939.

¹⁷ "Chart Analysis of Federal Food, Drug, and Cosmetic Act," 1 p., Consumer Standards Project, Consumers' Counsel Division, Agricultural Adjustment Administration, U. S. Department of Agriculture, and Work Projects Administration, Washington, D. C., 1940.

¹⁸ "Consumer Protection by the U. S. Food and Drug Administration," p. 1, U. S. Food and Drug Administration, April 1940, multigraphed.

In addition to the above, certain practices which might deceive the consumer are also prohibited:

Food labels must not be false or misleading in any particular.

Damage or inferiority in a food must not be concealed in any manner.

No substance may be added to a food to increase its bulk or weight or make it appear of greater value than it is.

A food must not be sold under the name of another food.

Imitations and food substandard in quality must be so labeled. A substance which is recognized as being a valuable part of a food must not be omitted.

Food containers must not be so made, formed, or filled as to be deceiving.¹⁹

There is a wide variation between the laws which the different States have enacted regulating commerce in foods within the respective States. Since the enactment of the Federal Food, Drug, and Cosmetic Act, nine States—California, Connecticut, Florida, Indiana, Nevada, New Jersey, New York, North Carolina, and Virginia—have passed practically uniform laws regulating foods which are patterned closely after the Federal Act. Previously Louisiana enacted a very similar law. The law passed in North Dakota, the first one passed, is similar to the uniform law enacted by the nine States listed above, but it is not as broad in scope.

Drugs and cosmetics.—The Food, Drug, and Cosmetic Act of 1938 is bringing about some significant changes in the merchandising of drugs and cosmetics and requires that those entering into interstate commerce or sold in the District of Columbia must comply with certain regulations which previously were nonexistent. These regulations are for the most part related to the health and safety of the user. The regulations established under the authorization of the new act require that the labels on drugs must provide the following information:

The name and address of the manufacturer, packer, or distributor.

An accurate statement of the quantity of contents.

A statement of the quantity or proportion of certain habit-forming drugs together with the statement "Warning—May be habit forming."

The common or usual name of the drug when the drug is composed of two or more ingredients, the common name of each active ingredient, and the amounts of certain ingredients listed in the act.

Adequate directions for use.

Warnings against unsafe use by children.

Warnings against use in diseased conditions where cautions are necessary to insure against danger.

Warnings against use in an amount or for a length of time or by a method of administration which may make it dangerous to health.

All the information required by the act must be shown in the labeling in a form easily noticed and readily understood.²⁰

There are further regulations designed to protect the consumer from deceptive practices. These provide that—

Drug labeling must not contain false or misleading statements.

A drug must not be an imitation or offered under the name of another drug.

Containers for drugs must be so made, formed, or filled as to prevent deception.²¹

The labels on containers of drugs listed in the United States Pharmacopeia, the National Formulary, or supplements thereto, include the designations U. S. P. and N. F., respectively.

¹⁹ "Consumer Protection by the U. S. Food and Drug Administration," p. 1, U. S. Food and Drug Administration, April 1940, multigraphed.

²⁰ *Ibid.*, p. 2.

²¹ *Ibid.*, p. 3.

There is also more rigid control, than formerly, over the sale of certain dangerous habit-forming drugs in that they may now be dispensed only on the written prescription of a physician.

Other than the assurance of their safety, which presumably is now provided by the law, the consumer is given little information about the composition of toilet goods, the products of an industry second only to foods in the amount it spends on advertising. However, efforts are being made by the Toilet Goods Association to aid its members in maintaining the purity of materials used in toilet preparations.

Proposed standards for three important raw materials used in cosmetics—mineral oil, petrolatum, and paraffin—have been adopted by the scientific advisory committee of technical men working with S. L. Mayham, director of the board of standards of the Toilet Goods Association. These proposed standards * * * are now being submitted to all known suppliers of these materials for criticism and suggestions. It is expected that the suggestions of the suppliers will enable the committee to establish the final "T. G. A. Standards," for these materials early in the fall.²²

Under regulations authorized by the Food, Drug, and Cosmetic Act, the name and addresses of the manufacturer, packer, or distributor and an accurate statement of the quantity of contents must be stated on the label of a cosmetic. Furthermore, all the information required by the act must be shown in a form easily noticed and readily understood. The labels on cosmetics need not include a list of the ingredients, but they must not be false or misleading in any particular, neither may the containers of cosmetics be misleading as to the amount of their contents.²³

Although, as a result of the new act, changes are taking place in the practices of selling drugs and cosmetics, it is too early to determine fully what all of these may be, how adequately they will meet consumer needs for information about individual products, or what additional standards for these products may eventually prove desirable or necessary. Only minor consideration is given to economic protection, although the listing of ingredients and prohibition of the use of deceptive containers contribute to this.

The health, sanitary, labeling, and packaging requirements for drugs and cosmetics manufactured within a State will, as in the case of locally produced foods, be determined by the laws of that State. Since the enactment of the Federal Food, Drug, and Cosmetic Act, 8 States—California, Connecticut, Florida, Indiana, Nevada, New Jersey, New York, and North Carolina—have enacted laws regulating drugs which closely resemble the Federal act. Previously Louisiana, North Dakota, and Virginia had passed laws regulating drugs which conform closely to the Federal act, although the North Dakota law, the first one enacted, is less broad than the others. Laws regulating cosmetics have been passed by Wyoming and all of the above 11 States except California.

Textiles and garments.—Very few grades or standards for textiles or clothing are in use today, and no legislation comparable to that regulating food, drugs, and cosmetics has been enacted. The labels on both textiles and clothing are inadequate buying guides, although, as the result of trade practice rules promulgated by the Federal Trade

²² "Material Standards on Cosmetics Chosen," *New York Times*, August 14, 1940.

²³ "Consumer Protection by the U. S. Food and Drug Administration," p. 3. U. S. Food and Drug Administration, Washington, D. C., April 1940, multigraphed.

Commission, more labels are now providing information as to fiber content and shrinkage of fabrics.

Less than a hundred years ago spinning and weaving were a regular part of the activities of most efficient households. Many housewives were experienced in selecting and preparing the fiber, in spinning the yarn, and in weaving cotton, linen, or woolen fabrics. Since then industry has taken over the manufacture of practically all fabrics. This transfer has been accompanied by rapid changes in every aspect of textile production. However, the textile industry has given little consideration to the development and use of standards and grades for fibers based on their performance value in textiles used by consumers. Advances in textile chemistry, in dyes and dyeing, new finishes, new control over shrinkage, and the production of new synthetic fibers are among the more striking recent developments in the industry.

Staple fabrics: Methods and machinery employed in the production of the more staple fabrics, such as cotton sheeting, are subject to less change than in the production of fabrics in which style and fashion play a more important part. The characteristics and performance values of staple fabrics may be, and often are, known by the manufacturer.

Textile experts consider that classification and grading of sheets and sheeting are now possible and feasible. Nevertheless, the consumer who seeks to buy sheets at retail finds no clear classification and grades as a guide in selection. The size of sheets is usually stated on the labels. Labels may also indicate whether the sheets are cotton, linen, or rayon; muslin or percale; light, medium, or heavy weight; the thread count; or, very infrequently, the breaking strength of the warp and filling of the fabric. Similar information, but for fewer factors, may be stated on labels of pillowcases, blankets, towels, table linen, and other more or less staple articles in which style is not a major factor.

Some household articles, such as sheets, table linen, and chinaware, show two different lines of development. Those purchased by hospitals, restaurants, and hotels are becoming more standardized. Those sold to families or individuals are being constantly varied, if not in size, then in pattern, color, and quality.²⁴

Relatively efficient methods of controlling shrinkage of fabrics and reasonably permanent dyes have been developed. Standards for shrinkage and color permanence might easily be established and approved if substantially interested groups were willing to agree on the provisions of the respective standards. An increasing amount of information relative to shrinkage or "stretchage" (which is particularly significant for certain types of fabrics) and color permanence is being supplied to customers, as well as information as to the fiber content. Although such information may be provided on labels, it is frequently supplied only by the salesperson, in which case, it may prove to be inaccurate.

Style fabrics: The customer who purchases at retail is able to gain only meager facts concerning "style fabrics" or garments made from them. Incessant striving, by textile manufacturers, to capture a market by some new design or novelty weave has often interfered with the perfecting of a given weave before its production is dis-

²⁴ "Economic Behavior, an Institutional Approach," by Willard E. Atkins, and others, vol. 2, p. 15, Houghton, Mifflin Co., New York City, 1931.

continued. Many times a manufacturer, before determining whether the proper relationship exists between the breaking strength of the warp and filling of a novelty weave and for what uses it may be best suited, discontinues its production and begins the manufacture of a new fabric. The manufacturer hesitates to modify his looms to adapt them to the production of a new weave. He cannot afford to do so if the new fabric is to be produced only for a season or less. Hence a novelty fabric is usually woven on what might be called a "general purpose" loom and not one especially adapted to the production of the particular fabric.

Color: Color is receiving great emphasis as a style factor in textiles, clothing, and clothing accessories.

The Textile Color Card Association of the United States was organized in 1915 to promote the standardization of colors to be used seasonally in style goods, such as clothing and clothing accessories. The association issues a Textile Color Card of America to its members late in the winter and early each spring which displays the colors selected for use in the fall, and another issued in the late summer or early fall includes the colors recommended for the coming spring.

Following this initial selection of colors, the various textile manufacturers make up fabrics in the colors each decides to offer. From these fabrics the Color Coordinating Committee of the National Retail Dry Goods Association, composed of buyers and stylists from different stores and shops, selects fabrics of various colors which in the judgment of the committee will be most generally used during a particular season. The fabrics are arranged on these cards in series for dress coats, dress costumes, casual and sports suits and coats, silk and rayon dresses, wool dresses, shoes, handbags, and gloves.

The advantages or disadvantages to consumers of the standardization of colors used in fabrics for clothing and clothing accessories depend in part upon good judgment and proper recognition of consumer needs in the selection of colors. The consumer may benefit but not necessarily so, because of greater ease in selecting harmonizing color and, incidentally, through improvement of taste in colors. A few years ago, the colors in green, selected for wear that particular spring, clashed with the green colors of the previous spring. Fabrics or accessories harmonizing with the greens of the previous spring were not available on the market. As a result, women who had costumes left over from the former season, but with certain accessories worn out or too shabby to wear, found it impossible to replace these accessories in harmonizing colors. Instead of buying a whole new ensemble, as manufacturers had hoped, many women either replaced missing items in black or a neutral shade, or did without. The failure to provide some fabrics and accessories in what might be called transitional colors proved detrimental to both manufacturers and consumers alike.

Garments: Garment making is an even more recent emigrant from the home than weaving. Every kind of garment worn commonly by men, women, or children is now produced commercially. In general, the quality of these commercially produced garments has greatly improved in recent years. At present, only a very limited number of garments are custom made.

The size and fit of a garment, the material, workmanship, and style are all important factors for the customer to consider in determining

the suitability of a particular garment for his needs. Naturally, style is of most importance in garments for outer wear.

Although proper sizes and fit of all garments are essential to ease and comfort, manufacturers of different types of garments have failed to develop a system of sizes and nomenclature applicable to the various kinds of garments so that an individual may select readily those that fit him. Confusion in the designation of the sizes of different children's garments has been exceptionally inconvenient to those who choose children's clothes.

By careful observation, the consumer can discover the methods used in constructing most garments. It is not so easy to predict how the garment will wear, for although labels may indicate the kind of fiber in the fabric, insufficient information is available as to serviceability, particularly in garments made from novelty or style fabrics. However, it is to be expected that information as to serviceability will not be made available for garments until more standards are established for the fabrics themselves.

At least in a few instances, more specific information has been available for the women's dresses sold in basements of department stores than for those sold in exclusive departments in the same store.

Information relating to fiber content of knit underwear is usually available. In contrast, information as to the fiber content of women's and girls' fancy knit blouses and sweaters is less frequently provided. It appears that the manufacturer of such garments buys yarns to produce a novel or stylish effect with little concern for wear, color permanence, or fiber content.

Household utensils, equipment, and furniture.—The customer who purchases household utensils, equipment, and furniture at retail has to depend to a great extent on his own judgment and experience. Very little specific information is made available to him by either the manufacturer or retailer.

Practically every standardizing agency, dealing with industrial materials and products, contributes to the development of standards which are or may be used in connection with the production of some kind of household utensils, equipment, or furniture. These standards may be used in manufacturing the commodity, may be dimensional standards, may set some performance or safety requirements, or may provide methods of finishing or testing the article.

Utensils: The consumer is supplied with few, if any, standards and grades to indicate the relative performance value of different qualities of such materials as glass, earthenware, steel, and aluminum used in making the tableware and utensils displayed on retail counters. Nevertheless, many significant physical characteristics of these various kinds of materials are known to members of the particular industry. The customer is often unable to determine the relative merits of different utensils and distinguish between those made from a dependable material and others made of cheaper material or of an imitation of a better one.

Due to improvements in the manufacturing processes of glass its heat resistance has increased. If measured on a scale of 10, the degree of heat resistance of ordinary table glassware measures about 2, while Pyrex glass is 6. A new glass to be on the market by 1942 or earlier will reach 9—a degree of heat resistance to make this new glass suitable

for use in utensils subjected to more strain than can be withstood by glassware now in use.²⁵ At present the customer is usually given only a general statement and not specific information as to the heat resistance of glassware.

Another illustration is found in the kitchen utensils made of aluminum. The Aluminum Co. of America has determined the important physical and chemical properties of all of the more common aluminum alloys the company produces.²⁶ This information is available to manufacturers who wish to select aluminum alloys for use in producing kitchen utensils. However, no system is available by which the customer at the retail counter is provided with reliable information concerning the distinctive properties of the alloy from which different utensils have been made. Neither is it usual to make easily available information as to the gage or relative thickness of the metal in the various utensils.

Gas and electric equipment: Much of the household gas-burning and electrical equipment is guaranteed for safety, but it is often difficult or even impossible to determine the relative cost of operation before making a purchase. Exterior appearance and gadgets are featured extensively in selling such important and expensive equipment as gas and electric stoves and refrigerators. Price tends to be stressed for these and lesser items of household equipment, such as electric irons and fans, as the measure of quality. In contrast, I. E. S. electric reading lamps are manufactured to meet construction and performance standards and are labeled so that consumers can identify these lamps on the market.

Furniture: Articles of furniture are purchased infrequently, hence the buyer for a household has less experience in selecting furniture than most other articles. It is generally recognized that the products of different manufacturers vary greatly in quality. An amateur in buying furniture usually experiences exceptional difficulty in obtaining the information that is essential in making satisfactory selection.

Standards or grades have been established for some of the materials used in the production of furniture, such as the different kinds of lumber, glue, mirrors, mohair fabrics, and grades of cotton used in upholstered furniture.

At various times, over a period of years, consideration has been given to the establishment of furniture grades. Because of the wide range in types of construction and materials used, it has been the consensus of opinion in the industry that it is not practical to set up grades for furniture. * * *

Some manufacturers attach tags or labels to their furniture, indicating that it is made of walnut, mahogany, or other wood. This appears to be done largely at the instigation of the groups manufacturing walnut and mahogany which are interested in publicizing their respective products.

Some use is made of tags showing that the leather used in leather-covered articles is "top-grain," etc. Such tags are used largely at the instigation of the leather producers.

* * * It is the general practice of furniture manufacturers to advise dealers as to the kind of wood used in furniture that they purchase, also with respect to upholstery covers and quality of mirrors.²⁷

²⁵ Based on a statement of a member of the staff of the American Glassware Association, New York City, November 11, 1933.

²⁶ "Alcoa Aluminum and Its Alloys," 113 pp., Aluminum Co. of America, Pittsburgh, Pa., 1938.

²⁷ Letter by J. C. McCarthy, assistant secretary, National Association of Furniture Manufacturers, December 4, 1939.

Years ago consumers often experienced considerable difficulty in finding mattresses or springs in suitable sizes to use with particular bedsteads. As a result of the standardization of sizes of these commodities previous confusion and inconveniences have been eliminated.

Floor coverings: The carpet industry which has tended to proceed along traditional and individualistic lines, nevertheless, has a few distinct methods of knotting or tying in the pile threads recognized for centuries. Competition of other floor covering materials has served recently to focus the attention of manufacturers of woven pile carpets on the value of standards. As a result, the members of the Institute of Carpet Manufacturers of America adopted standards, effective July 1939, defining "wool" and the use of this term by the industry, and requiring the disclosure of the fact on a label if the pile of the carpet is all wool, or, if a mixture, the declaration of the kinds of fiber and approximate percentage of each. The standards also include provisions relative to statements to be specified on a label regarding the sizes of rugs and proper methods of maintenance and care. Such labels may serve as a buying guide, but are not as adequate as the labels prepared a few years ago by one manufacturer for three different grades of rugs which he produced. These labels provided specific information on practically all significant facts about the rugs, enabling the consumer to recognize readily the differences between the grades.

For years manufacturers have produced battleship linoleum for the Government conforming to Federal Specifications. Indirectly the existence and use of these specifications has been advantageous to consumers because manufacturers have also improved the quality of the linoleums produced for the retail trade. Manufacturers have also developed other desirable competing products. For the most part only isolated facts, in contrast to standards, grades, or other information, are made available to consumers for any of these products.

Household maintenance.—Conformity to a reasonable standard of household maintenance necessitates expenditures for occasional re-decoration and for daily and weekly care of the house and its furnishings and equipment. However, there are few standards, grades, or informative labels for the materials and equipment required in re-decorating a house, or apartment, or in its routine care.

Wall paper: There is a wide variation in the performance value of different wall papers. The durability of the paper itself, the permanence of the colors, the cleanability, and washability are some of the more significant characteristics concerning which the consumer needs information. Such terms as "color fast," "cleanable," and "washable" are frequently used in describing specific wall papers. A Commercial Standard for wall paper was adopted in 1929 which included a minimum standard for color permanence and weight of the paper. Thereafter, wall paper conforming to the Commercial Standard CS16-29 was usually stamped with the label of the Wall Paper Association guaranteeing its compliance with the Commercial Standard. The members of the Wall Paper Institute, organized to take the place of the Wall Paper Association, in 1938 adopted trade regulations including a reaffirmation of the Commercial Standard CS16-29 with slight modification of provisions relative to the weight

of paper. The institute proposes to revise the Commercial Standard and to add standards for washability of wall paper. However, at the present time, consumers cannot obtain sufficient information concerning wall paper.

Paint: The Federal Specifications for paint are used not alone in Federal Government purchasing. At least one mail order house lists in its catalog paints which meet Federal Specifications. This firm, as well as a few others, lists the ingredients on the labels of some of its paints.

The National Paint, Varnish and Lacquer Association has opposed the setting-up of minimum standards and grades for paint sold at retail. However, the association is engaged in valuable research on materials used in paints and related products, and makes tests on their performance. Tests on toxicity of the various products are conducted and results are released promptly to members of the association. Use of new materials has resulted in the development of quick drying products which has greatly reduced the cost of production in automobile and other factories.

It is estimated that at least 90 percent of the materials used in making paints are purchased by manufacturers on A. S. T. M. specifications. However, the consumer has no equally reliable specifications or grades to guide him in selecting paints on the retail market.

Cleaning equipment and supplies: Most items represent a small outlay, but when considered on an annual basis the total cost may amount to a considerable sum. Brooms, brushes, mops, carpet sweepers, and dusters, are some of the more usual items of equipment (excluding vacuum cleaners which are relatively expensive). The selection of these different items of equipment represents a real problem for the inexperienced consumer. More specific information about each item than is usually provided is required to make economical and practical selections.

Most cleaning supplies, such as soap, alkalies, abrasives, metal polish, and furniture and floor polishes, are sold under brand names. Although they differ widely in ingredients, suitability for various uses, and relative economy, the chemical composition is seldom provided on labels. Furthermore, some of these products are offered for sale in containers of such sizes as to make it difficult for the customer to compute readily the relative cost of the contents of the different containers.²⁸

²⁸ "Household Cleaning Management and Methods," by Carol Willis Moffett, 22 pp., Farmers Bulletin No. 1834. United States Department of Agriculture, U. S. Government Printing Office, Washington, D. C., January 1940, 5 cents.

CHAPTER VIII

VALUE OF STANDARDS, GRADES, AND INFORMATIVE LABELS TO CONSUMERS AND THEIR EFFECT ON MERCHANDISING

The commodities consumers buy and the general pattern of their expenditures is determined largely by their income level and skill in spending.

The standard of living in this country has been raised as the result of mass production of many commodities. Nevertheless, consumers have failed to profit as much as they might from industrial progress because of inefficient buying. The use of standards, grades, informative labels for commodities sold at retail is of value to consumers because they are an aid in identifying desirable commodities, in economical buying, in reducing the time and energy required in shopping, in bringing about more satisfactory performance in "style" commodities, and by providing a better basis for consumer education.

Various retailing and manufacturing activities and practices, many of which are of significance to consumers, are affected by the use of commodity standards and informative labeling in the retail market. These activities and practices relate to advertising, misrepresentation and adulteration of commodities, volume of returned goods, "marked-down" sales, demand for commodities, store purchasing, and size of inventories. The use of standards and labels also affects the relationship between prices and quality, various aspects of selling by brand, and competition between commodities and between different types of firms.

Hindrances to the development and wider use of standards and informative labels are the lack of available information concerning commodities, consumer failure to state concisely the type of information desired, lack of common agreement as to the character and form of information to be supplied, lack of recognized and adequate means of guaranteeing compliance with approved standards and grades, the inadequacy of many existing standards and labels, confusion in the terminology used in designating standards and grades, and the resistance of manufacturers and retailers to informative selling.

Factors contributing to the development of desirable standards, grades, labels, and their use merit thoughtful consideration and support.

Income Level and the Choice of Commodities.

Family incomes in this country have failed to keep pace with the actual and potential flow of commodities from fields and factories. It has been estimated that in 1935-36, there were approximately 29 million families and 10 million single individuals in the United States. In a study of consumer incomes for that year (see table 21) it was estimated that over 40 percent of the families and 60 percent

of the single individuals received incomes of less than \$1,000 a year and that almost 65 percent of families and 80 percent of single individuals received incomes of less than \$1,500.¹

With the uneven distribution of income as represented in this table, it is readily apparent that the proportion spent, by families and individuals on the different levels, for the various types of commodities and services, and the character of the commodities and services purchased will of necessity be very dissimilar. This is borne out by data obtained in the companion study of rural and urban expenditures in 1935-36. (See table 22.)

Family expenditures for food represented almost 43 percent of the total where the average annual expenditure is \$817, and only 23 percent for families with average expenditures of \$4,454, but the former only spend \$347 as compared with \$1,038 spent by the latter

TABLE 21.—*Distribution of families and single individuals, by income levels, 1935-36*¹

Income level	Families			Single individuals		
	Number	Percent at each level	Cumulative percent	Number	Percent at each level	Cumulative percent
Under \$500	4, 178, 284	14. 21	14. 21	2, 532, 627	25. 18	25. 18
\$500 to \$1,000	8, 076, 263	27. 47	41. 68	3, 571, 775	35. 53	60. 71
\$1,000 to \$1,500	6, 747, 916	22. 95	64. 63	1, 986, 507	19. 75	80. 46
\$1,500 to \$2,000	4, 240, 395	14. 42	79. 05	945, 531	9. 40	89. 86
\$2,000 to \$3,000	3, 779, 059	12. 85	91. 90	655, 026	6. 51	96. 37
\$3,000 to \$4,000	1, 181, 987	4. 02	95. 92	172, 091	1. 71	98. 08
\$4,000 to \$5,000	402, 595	1. 37	97. 29	61, 596	. 61	98. 69
\$5,000 to \$10,000	510, 010	1. 74	99. 03	85, 898	. 85	99. 54
\$10,000 or over	283, 791	. 97	100. 00	46, 949	. 46	100. 00
All levels	29, 400, 300	100. 00	-----	10, 058, 000	100. 00	-----

¹ Compiled from data in table 3 on p. 18 and table 15 on p. 30 of "Consumer Incomes in the United States," by the National Resources Committee, U. S. Government Printing Office, Washington, D. C., August 1938, 30 cents.

TABLE 22.—*Average expenditures for main categories of consumption for the year 1935-36*¹

Items of expenditure	By families				By single individuals			
	\$500 to \$1,000	\$1,500 to \$2,000	\$3,000 to \$4,000	\$5,000 to \$10,000	\$500 to \$1,000	\$1,500 to \$2,000	\$3,000 to \$4,000	\$5,000 to \$10,000
All items	\$817	\$1, 589	\$2, 729	\$4, 454	\$700	\$1, 409	\$2, 354	\$3, 863
Food	347	511	770	1, 038	262	452	636	846
Housing	144	283	485	784	172	304	514	947
Household operation	96	175	319	584	37	88	142	211
Clothing	67	155	316	557	86	176	302	518
Automobile	36	136	289	522	12	80	195	382
Medical care	34	74	132	248	18	52	121	253
Recreation	14	45	105	206	22	77	156	270
Furnishings	22	61	102	158	2	5	11	24
Personal care	16	33	54	89	18	29	42	60
Tobacco	17	31	48	62	15	39	58	66
Transportation (not auto)	7	17	31	48	35	59	92	153
Reading	7	15	27	41	14	24	35	44
Education	4	13	37	83	4	10	11	8
Other items	5	9	14	34	4	15	39	81

¹ "Consumer Expenditures in the United States," by the National Resources Committee, United States Government Printing Office, Washington, D. C., 1939, 50 cents.

Average expenditures for the two lower income groups for families were computed from data in tables 24A and 24B on page 86 and for individuals from data in tables 28A and 29A on page 88. Average expenditures for the two higher income groups for families were taken from table 2 on page 23, and for individuals from table 4 on page 34.

² "Consumer Incomes in the United States," by the National Resources Committee, pp. 18, 30, United States Government Printing Office, Washington, D. C., August 1938, 30 cents.

group. The corresponding expenditures for housing are \$144 in contrast to \$784 and for clothing are \$67 in contrast to \$557.²

A more detailed comparison of expenditures for food of families at different income levels shows that in 1935-36—

* * * the 14 percent of our families with the lowest incomes, that is, families receiving \$312 on the average, are spending only slightly more than \$1 per person per week for food. * * * With an increased income to an average of \$758, the weekly per capita expenditure for food rose to about \$1.62. With an average income of \$1,224, people spent about \$2.18 per person per week for food. * * * People with incomes of under \$500 a year have about 5 cents per person per meal to spend for food. Families getting an income of \$100 a month have around 10 cents per person per meal for food.³

These data furnish incontrovertible evidence that the incomes of a large number of families and individuals in this country are too low to meet the demands of a comfortable standard of living. Hence the purchases of these low income families can only partially satisfy desires of these consumers. Expenditures for unessential goods and for those which are worthless or deceptively poor in quality only serve to reduce, by that much, the sum left for essential needs if health and self-respect are to be maintained.

In many cases the buying of the higher income group influences the buying of those in the lower income groups. This comes about, in part, according to Robert S. Lynd,⁴ through the effect the choice of the wealthy has on the productive activities of industry, in all but the production of staple goods. Because of the "high visibility which movies, radio, periodicals, greater travel, and leisure, and similar developments have given to the consumption habits of the wealthy," individuals in low income groups try to obtain commodities resembling those used by the high income group. To meet this demand manufacturers of high quality luxury goods have produced commodities similar in appearance but sufficiently adulterated and cheapened in quality to sell at a price within the range of lower income groups.

The high-income groups appear to exert most influence in luxury goods such as automobiles, expensive clothing, and housing. In contrast, John H. Cover⁵ concluded from a study of packaged foods that the middle income group seems to respond more rapidly to the promotion of such commodities and that the use of these foods tends to extend upward and downward from the middle income group. This trend apparently applies to necessities and staple goods such as cereals, soap flakes, and crackers which are put out in new forms at prices to secure volume acceptance.

The disproportionate use of various kinds of high pressure promotion to influence consumers in buying new and nonessential commodities, compared with the scant advertising to stimulate the purchase of most staple commodities, has served to lessen the selection of goods on a rational, reflective basis.

Standardization and Cost of Commodities.

Consumers benefit from the use of standards by industry primarily because of the resulting mass production at lower cost of needed and

²"Consumer Expenditures in the United States," by the National Resources Committee, pp. 23, 24. United States Government Printing Office, Washington, D. C., 1939, 50 cents.

³"The Challenge of Under-Consumption," based on a statement by Milo R. Perkins, p. 6, Federal Surplus Commodity Corporation, U. S. Department of Agriculture, Washington, D. C.

⁴"Recent Social Trends in the United States," report of the President's Research Committee on Social Trends, vol. II, p. 860, McGraw-Hill, New York City, 1933.

⁵Ibid.

often greatly improved commodities and the production of many new commodities.

The equipment and furnishings in most American households of today are far more adequate than those found in a corresponding proportion of the households of a few generations ago, as the result of a more varied supply of commodities at different price ranges.

"More Goods for More People," a booklet published in 1938 by the National Machine Tool Builders' Association included illustrations to show how prices of commodities have been reduced by modern machine production.

Stoves, refrigerators, and washing machines would cost anywhere from 6 to 10 times what they do today if the plants manufacturing them were not tooled with modern equipment.

Precision looms of a type that were not available a few years ago reduce weaving costs from 15 to 30 percent. Without this improvement in looms, the selling prices of fabrics for men's and women's clothing would be higher than they now are.⁶

This list might be extended almost indefinitely to include examples from practically all types of household utensils, equipment, and furniture, as well as different kinds of garments and clothing accessories for children and adults. Furthermore, services of the various public utilities, such as railroads, telephone, telegraph, water, electricity, and gas, are made available to a larger proportion of the consuming public because standardization, and certain regulations by government, coupled with increased consumption, have made in some instances relatively low rates possible to the individual consumer.

The Value of Standards, Grades, and Informative Labels to Consumers.

Mass production, largely a development of the last half century, and the many changes it has brought about have made various adjustments in the merchandising of commodities both desirable and necessary. Nevertheless, industrial leaders have been preoccupied with problems related to increasing the production of goods and have given much less consideration to the modernization of certain merchandising methods to aid consumers in the intelligent selection of commodities.

Fifty or sixty years ago, most consumers and many manufacturers and retailers were better informed about the relative value of available commodities than they are today. At that time, only a few processes and methods were employed in producing consumer commodities, so that both sellers and buyers of these commodities could judge their relative values more accurately than is now possible. Furthermore, changes in commodities in pre-mass-production years took place more slowly, thus affording a better opportunity to evaluate their effect on the commodity. As a result, when replacing a wornout commodity the consumer could rely on his own and his neighbors' experiences as well as on the judgment of the retailer with whom he often had years of business acquaintance.

Nowadays, the complexity of most commodities and frequent changes in their manufacture, prevent consumers from making satisfactory selections. However, the intelligent use of standards, quality grades, and informative labels could be of inestimable value to purchasers for individual and household use.

⁶"How Mass Production, Standardization, Lower Costs, Raise Living Standards." Industrial Standardization and Commercial Standards Monthly, vol. 9 (5), p. 123, May 1938.

Aid in identifying desirable commodities.—A consumer, using a commodity of known composition, quality, and performance, and desiring to select a new one, will be helped when comparable information is made available concerning those commodities from which he is to choose. This is advantageous also to the retailer, for such information tends to expedite sales and to reduce the consumer's dissatisfaction with the commodity he selects.

If commodity information is sufficiently accurate and complete, the consumer is able to compare different commodities and determine wherein they are similar and in what respects they are different. Thus, he is aided in selecting the commodity which meets his requirements.

It would seem that previous experience with a given commodity should aid a consumer in future purchasing. If, however, the consumer does not know the kind of metal in a knife that does not hold an edge, nor the ingredient in a cosmetic that causes a rash on the skin, he is unprepared to select a more satisfactory commodity the next time he makes a purchase. The value of experience is also influenced in many cases by the nature of the commodity;

* * * frequency of purchases aids in selecting fresh fruits and vegetables, but is of much less assistance in selecting silk hose. In the latter commodity, important qualities are not readily recognized. Experience as a means of discovering what is best may be very expensive. This is especially true when the purchase price is large. If durable goods are purchased in the hope of learning from experience, extended periods of dissatisfaction may result.⁷

Help in economical purchasing.—With reliable information about the quality, performance, and other significant characteristics of commodities made available to the consumer, it is possible for him to form a judgment as to their relative economic value. For example, it is possible to determine which of two automobile tires represents the best value if information is provided, based on reliable tests, indicating the miles of service each may be expected to give. The consumer is then in a position to make a reasonable choice, in the light of his needs and his financial status, as to which tire represents the best one for him to choose. Furthermore, he is spared the unfortunate experience of unknowingly selecting one of poor quality when a better one is available at the same or a lower price.

* * * The ideal situation is one in which selection is made after all important facts are known and their significance verified. * * * It may be that there is one quality which is best for the purpose in mind. But price differences among the qualities available might make it desirable to substitute a different quality. To achieve maximum economy the relative merits of the various qualities for a given use should be considered. Care in thinking out clearly and precisely what is wanted brings satisfactory results only if the market provides means of recognizing quality and of weighing relative merit.⁸

Reduction of time and energy required in shopping.—Despite assertions to the contrary, many women find shopping an unnecessarily heavy tax on time and energy, especially in cases of low income when it is important to select inexpensive commodities. Commodity information concerning reliable standards of quality, size, performance, and other pertinent factors made available in advertising and at the

⁷ "Consumers and the Market," by Margaret G. Reid, p. 356. Crofts & Co., New York City, 1938.

⁸ *Ibid.*, pp. 354-355.

retail counter increases the ease of shopping and inspires confidence. With pertinent facts at hand which reduce guessing, a choice can usually be made in less time than is required if the consumer is inhibited by doubt of his own judgment, or by uncertainty as to the quality of the commodity.

More purchases could be made satisfactorily by telephone or by mail if it were possible for consumers to specify by recognized standards or grades the quality of the commodity desired. This would save time, energy, and expense for the consumer and take less of the clerk's time. Furthermore, such orders could be placed outside of rush hours in the store, thus spreading work more evenly through the day for the store employees.

Increase of performance in style commodities.—The adoption of the practice of furnishing at least some information about the quality and performance of commodities in which style is an important factor seems a reasonable concession to grant to consumers. This might tend to check rapid changes in style commodities if manufacturers of the fabrics and garments recognized the necessity of giving more consideration to the characteristics of the materials they use.

The manufacture of cheap, shoddy fabrics, usually a liability and source of annoyance and loss to consumers, garment manufacturers, and retailers, might be greatly reduced if sufficient emphasis were placed on supplying at least some information as to the fiber content, balance in weave, shrinkage, color permanence, and breaking strength of style fabrics.

There is common agreement that standardization which eliminates style changes in clothing is not desired. However, the consumer is usually interested in other qualities in addition to beauty and style.

* * * She wants style, it is true, in her winter coat but she is likely to be interested also in the genuineness and durability of the fur used for trimming and in the warmth and durability of the main fabric. Color and design offer her choice of draperies but the "sun-fastness" and launderability are also important. Most goods are bundles of utilities.⁹

A similar point of view was expressed by Daniel C. Roper, while Secretary of Commerce.

* * * I wish to say that I do not advocate the introduction of any procedure that would restrict the choice of our people, either men or women, in any items contributing to what is usually referred to as "style." What I do visualize, however, is a standardization movement so directed as to permit even those placing major emphasis on "style" to obtain appropriate, definitely identifiable quality at reasonable prices in commodities selected, proportioned, and decorated with the fullest possible freedom. * * *¹⁰

Information supplied to consumers about the delicate or fragile characteristics of a commodity need not prevent its sale, but may reduce markedly the number of consumer complaints. This was the case, some years ago, when retail stores displayed "transparent velvet" fabrics and dresses together with conspicuous signs stating that the fabric was fragile and not guaranteed by the store to give long or hard service. Because consumers were apprised of the delicate nature of the fabric they handled it with care and were generally satisfied with the service received.

⁹ "Economic Problems of the Family," by Hazel Kyrk, pp. 482-483. Harper & Bros., New York, 1933.

¹⁰ "Constructive Standardization—An Aid to Better Living," by Daniel C. Roper, p. 5, address before the General Federation of Women's Clubs, U. S. Department of Commerce Building, January 16, 1935, mimeographed.

Aid in education for buying.—One of the significant advantages to be gained from the use of commodity standards, grades, and informative labels is the opportunity afforded to consumers to improve their buying habits through experience with commodities of known quality. Another advantage of standards and labels is that the consumers can follow general buying guides more intelligently and use specific factual information in their purchasing.

Education for buying is clearly one of the major divisions of the education of the consumer. Such education would give him the information that is necessary if he is to recognize and compare values. It would include information as to what is available on the market and what makes an article good for its purpose. * * * To the extent that there is informative labeling and grade marking, it would include information concerning terminology and symbols used for these purposes. * * * Education for buying is designated primarily to reduce economic waste, to make buying less of a guess-work process. The objective of this education is to enable consumers to gratify their wants more economically, whatever these wants may be.¹¹

Commodity standards, grades, and informative labels would also aid in the education of salespersons in the store. According to a check made by the Retail Executive the leading directors in charge of training store personnel in representative stores throughout the country are practically unanimous in their desire for more informative labeling and supplementary factual data concerning commodities.¹² These directors agree that this type of information would prepare salespersons to answer correctly more of the questions consumers ask about merchandise and thereby aid consumers in more intelligent buying.

Manufacturers, advertisers, and retailers who employ approved standards and grades in selling their commodities contribute constructively to educating consumers in buying. Unless and until selling is placed on this new basis, consumer purchasing may be expected to continue, in large measure, to be irrational and unpredictable.

However, the development and use of standards, grades, and informative labels for commodities has many other aspects: "With every purchase they [consumers] are contributing not only to the support of the store in which they buy, but also to the kind of manufacturing represented by the integrity, or its lack, which characterizes the article chosen."¹³

Effect of Standards, Grades, and Labels on Merchandising.

As is generally recognized, standards and specifications for commodities are used extensively by manufacturers in selling to wholesalers and retailers, but they are used only to a slight extent in reselling commodities to individual and household buyers. However, there has been enough experience in using standards, grades, and informative labels in the retail market to demonstrate that their use brings about definite changes in certain retailing activities. Some of these changes are of significance to consumers as well as to various manufacturing and retailing groups and may affect their relations with one another.

Advertising and Commodity Information.—Many manufacturers and retailers have expressed deep concern over the insistence by con-

¹¹ "Who Shall Educate the Consumer?" by Hazel Kyrk. The Annals of the American Academy of Political and Social Science, vol. 182, p. 42. Philadelphia, Pa., November 1935.

¹² "More Factual Data Is Asked for by Training Directors." Retail Executive, vol. 12 (21), p. 21, sec. 2, May 22, 1940.

¹³ "Scientific Consumer Purchasing," edited by Alice L. Edwards, p. 5. American Association of University Women. Washington, D. C., 1939.

sumers that advertising furnish more specific information about commodities. However, the inclusion of information concerning standards is a means of making advertising more valuable to consumers, as well as to manufacturers and retailers, and tends to increase consumer confidence in both the commodity advertised and in the firm selling it.

Through the use of standards the informative matter in advertising may be increased since specific facts concerning characteristics of goods can be stated. As advertising becomes more informative, the amount of non-informative material will be decreased by the elimination of that which is irrelevant, spurious, and false.¹⁴

Before standards and grades can be used advantageously in advertising, it is essential that the commodity be tested by an approved method to obtain information concerning its properties and performance, and to determine whether or not the commodity conforms to established standards. If the commodity is found to be inferior in some important particular, it may be withdrawn from the market until the defect has been eliminated and thereby economic loss resulting from unfavorable consumer reaction may be avoided.

Advertisers have often expressed the fear that the amount of advertising copy would be decreased if standards and grades of commodities were included in informative labels and advertising. However, it has been stated that—

The space taken by canning advertisers in Canadian publications is no less under grade regulations than before. Advertising by brand name is the rule; and such brand advertising assures the canner a cash premium for his goods over those rivals who do not thus pay to stimulate consumer interest.¹⁵

The information available to consumers concerning commodities tends to be more accurate if labels and advertising indicate the standards or grades with which the respective commodities comply. Dependence can usually be placed on the truthfulness of information on such labels, as both manufacturers and retailers hesitate to assume the risk involved in handling commodities which fail to meet the standards or grades specified.

If labels specifying standards and grades appear in a considerable proportion of a line of commodities there may be less misrepresentation of the nongraded commodities in this line.

Actual misrepresentation of commodities, or the failure to reveal the true character of an adulterated commodity, or an imitation of another commodity, usually results in competition of the falsified commodities with the genuine commodities.¹⁶ In cases of such competition, the genuine commodity may be driven off the market; this was the result when genuine sole leather and sole leather impregnated with cheap salts or other inexpensive materials were both sold by weight. In some cases genuine and falsified commodities may remain side by side in the market; this is illustrated by genuine and imitation diamonds, and the copies of famous paintings. In other cases the falsified commodity, being of such poor quality as to serve no useful purpose, may disappear entirely from the market; sometimes, as the result of the competition of such an unsatisfactory commodity there ceases to be a demand for the genuine commodity as well as for the imitation.

¹⁴ "Standardization of Consumers' Goods," by Jessie V. Coles, p. 188, Ronald Press, New York City, 1932.

¹⁵ "Grade Labeling of Canned Foods in Canada," a report made by the Consumers Advisory Board to Division Administrator Armin W. Riley, p. 4, National Recovery Administration, Washington, D. C., December 21, 1934, mimeographed. (Out of print.)

¹⁶ "Economic Aspects of Adulteration and Imitation," by Carl L. Alsberg, *The Quarterly Journal of Economics*, vol. XLVI, pp. 1-33, November 1931.

Sometimes the demand for the substitute as well as the genuine commodity may increase; this was the case of chicory and coffee. Since neither has nutritive value, selection is determined largely by taste, local custom, and price. However, due to the lower price of chicory, the use of this commodity, has to a considerable extent, contributed to a "coffee-drinking" habit and resulted in an increased consumption of both chicory and coffee.

Volume of returned goods.—An analysis of the reasons for returned goods reveals that in many instances commodities have failed to comply with reasonable standards of quality, composition, performance, or size. One of the advantages the retailer should gain by using standards, grades, and informative labels in purchasing and selling is a reduction in the number of adjustments, because fewer commodities would prove defective or unsatisfactory. If, for example, the buyers of dresses in stores having a large volume of returns would place less emphasis on price, and be more critical of how dresses are made and of their adherence to recognized standards of quality, size, and performance, there is reason to believe that the number of justifiable returns would be measurably reduced.

Confusion in the present system and nomenclature of sizes for children's garments results in a high percentage of returned goods.

* * * the lack of uniformity in marking garments is illustrated by a suit marked as an eight-year-old size which is inches larger than a suit marked as a ten-year-old size. The inherent inadequacy of age as an index is illustrated by the fact that children ranging in age from four to thirteen years may fall into the same height group, the average age for the group being eight years.¹⁷

In discussing the problem of returned goods, a leading retailer has said:

Figures for the year 1939, just published, show that 9 percent or all the goods sold by department stores were recorded as returns. This figure must be increased to allow for unrecorded returns, of which we have many—15 to 16 percent returns would be a more accurate reflection of the facts. In other words, one-sixth of all goods we sell come back for credit or exchange. * * * And they are costly. It has been estimated that a medium sized department store will handle 80,000 returns per year at a cost of some \$80,000, or an even dollar apiece. To such a store this \$80,000 would often represent more than its total annual net profit.¹⁸

It is often contended by those opposed to informative labeling, that the cost of providing them is unwarranted.

A case history study of adjustments just made by the Metropolitan Retail Store Adjustors Association throws much light on this subject. It reported that only 13 percent of the adjustments made in 13 merchandise classifications involved goods which carried informative labels. Here, then, is evidence that informative labels have lessened the returned goods "evil"—at least in the cases studied. It would seem from this that they help business as well as consumers, and the cost of providing informative labels is justified.¹⁹

"Mark-down" sales.—Some significant changes in the practice of mark-down sales would doubtless occur if retailers were required to furnish reliable information about the quality of commodities of their regular stock and of those placed on sale. Retailers would often find it much more difficult to convince customers of the value of "bar-gains" being offered.

¹⁷ "Toward Better Sizes for Children's Garments," by W. H. Waters, *Industrial Standardization and Commercial Standards Monthly*, vol. 10 (6), pp. 159-160, June 1939.

¹⁸ "How Consumers and Retailers Are Cooperating to Spread the Family Dollar," address by Max Gertz, p. 5, at the annual meeting of the American Home Economics Association, Cleveland, Ohio, June 27, 1940, mimeographed.

¹⁹ "Do Labels Help Sellers?" *Sales Management*, vol. 46 (11), pp. 44-45, May 15, 1940.

Usually, at a genuine mark-down sale only a limited amount of merchandise, consisting of incomplete lines or broken sizes, is offered. But if the volume of goods on sale is large, it is usually the result of a wrong estimate on the part of the store buyer of the quantity which the store can sell, or of an unsatisfactory selection of quality or style. Since consumer selection is sometimes a result of overemphasis on style or novelty features, consumer preference may be directed to some unusual styles and leave the regular staple lines unsold. As a result of this, the staple goods are marked-down for sale. This may also happen in case of a large purchase of style goods when this particular style does not meet consumer demand. However, if consumer could buy on the basis of standards, grades, and other pertinent facts concerning commodities, as well as style, and manufacturers and retailers were accustomed to giving this information, it is probable that fewer mark-down sales would be required to dispose of commodities.

Demand for graded commodities.—Commodity grades and standards are used extensively in the marketing of agricultural products. Experience has demonstrated that these grades and standards provide a basis of negotiation in selling and thus reduce controversies over quality. If products are graded before shipment those of poor quality can be discarded at that time, thus reducing the cost of handling, shipping, and storage. In addition, grade standardization facilitates shipment to a particular market of the grades preferred in that area. Furthermore, standardization of grades of agricultural products has brought about the standardization of containers in sizes convenient for marketing and also in dimensions which permit maximum efficiency in loading trucks and freight cars.

Banks make annually extensive loans to producers on the basis of products graded by Federal graders and stored in warehouses. This facilitates the gradual shipment of products as they are required in retail trade.

Even though, in many cases, information concerning the grades of agricultural products is not made available to the consumer, he is benefited indirectly when he buys these commodities because they tend to be relatively uniform and of better quality than those which are ungraded. The upward trend in the volume of Government graded agricultural products, as shown in the following tables, is an indication of the consumer's preference for these commodities.

TABLE 23.—*Contract deliveries of meats graded by Federal graders*¹

[In pounds]

Calendar year—	Fresh and frozen				Cured		Manufactured sausage and ground meats
	Beef	Veal and calf	Lamb and mutton	Pork	Beef	Pork	
1930.....	68, 749, 576	1, 442, 573	2, 469, 591	1, 816, 067	790, 514	2, 871, 936	553, 481
1933.....	237, 593, 692	1, 864, 686	8, 012, 880	1, 628, 597	489, 907	3, 706, 378	918, 355
1936.....	450, 127, 284	3, 617, 265	19, 021, 457	2, 365, 257	1, 326, 979	14, 244, 522	34, 371, 188
1939.....	512, 016, 902	5, 684, 117	24, 213, 777	8, 054, 168	2, 279, 048	36, 965, 666	42, 737, 079

¹ Based on data furnished by the Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

TABLE 24.—*Dairy products graded by Federal and Federal-State graders*¹

Calendar year—	Butter in pounds	Eggs in 30 dozen cases	Dressed poultry in pounds	Dressed Turkeys in pounds ²	Cheese in pounds
1927.....	72, 744, 659	616, 060	68, 299	-----	298, 932
1930.....	163, 350, 365	397, 635	601, 121	7, 492, 968	395, 529
1933.....	269, 310, 674	556, 081	3, 916, 960	6, 288, 843	1, 568, 158
1936.....	250, 269, 731	1, 026, 640	7, 849, 683	12, 650, 672	3, 919, 945
1939.....	271, 339, 115	1, 333, 009	9, 998, 727	18, 792, 426	5, 514, 528

¹ Based on data furnished by the Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

² By fiscal year beginning on July 1 of the given calendar year.

One of the leading food chain-stores has been using Government grade labels on certain lines of its canned fruits and vegetables²⁰ for several years. On April 30, 1940, this company reported that since the fall of 1934, when the use of grade labels was initiated, a total of over 928,400,000 of these labels have been used on approximately 38¼ million cases of canned foods packed 24 to the case. Of these labels, approximately 347,250,000 were for grade A canned foods, 10,330,000 were for grade B, and 570,820,000 were for grade C.

It is interesting to note that over 60 percent of these labels were grade C products, which should dispell the belief advanced by many producers that consumers would not knowingly purchase a grade C product.

During this same period, the company reports that approximately 180,000,000 cans of fruits were sold using the words "Fancy" and "Choice" to designate the grades.²¹

Selection and purchasing of commodities.—Commodities for which there are satisfactory standards or grades can be selected more readily by manufacturers and retailers, as well as by the consumer, than commodities for which such information is lacking. If commodities are standardized, they may be selected by sample or ordered by grade with reasonable assurance of the characteristics of the commodity to be received by the purchaser. Therefore, the retailers' expense in selecting commodities for which reliable standards and grades are available may be measurably reduced. The retailers' savings, alone, may be sufficient to justify the expense incurred in grading commodities.

The use of standards and grades in describing commodities is a safeguard to both buyer and seller.

Commercial contracts transferring the ownership of commodities must be based on dimensional standards and quality specifications that are mutually satisfactory to the buyer and seller. National recognitions of such standards will remove misunderstandings and expedite commercial transactions. Especially is this important in interstate and international trade when the buyer is unable to inspect personally and select the commodities offered by the seller.²²

Number of different commodities in stock.—Every unnecessary item added to the stock of commodities carried by manufacturers and re-

²⁰ Letter by C. W. Parr, the Great Atlantic & Pacific Tea Co., New York City, April 30, 1940.

²¹ Letter by C. W. Parr, the Great Atlantic & Pacific Tea Co., New York City, May 7, 1940.

²² "Trade Associations in Law and Business," by Benjamin S. Kirch and Harold Roland, p. 154, Central Book Co., New York City, 1938.

tailors tends to reduce the profits of a company. Therefore, it is desirable for a company to adopt a well developed plan by which all unnecessary sizes, varieties, and types of the different line of commodities can be eliminated. Such simplification reduces the volume of goods on the merchants' shelves, increases the rate of turn-over of commodities, and reduces operating costs. The interests of the consumer may be served through reduced prices and the availability of standard commodities.

It has been found that reductions in inventories may be facilitated by a company's adoption of a policy to provide consumers with information concerning the standards and grades of the commodities it offers for sale.

For example, in trying to give informative copy which shows the difference between 15-cent, 19-cent, and 25-cent items within a given line it sometimes reveals that there is no real need for all three items in the assortment. Many lines are being reduced in this manner making for a better merchandising structure, greater concentration on less number, more specification buying with its consequent savings in cost.²³

Price and Quality.

Where the qualities of commodities are clearly recognized by both seller and buyer, prices of commodities are determined, largely, by their qualities and consumer preferences. An illustration of this is given in a report by the Consumer Advisory Board of the National Recovery Administration: "In general, the Canadian consumer may buy by price and still be assured that her purchases fall within the grade uniformly marketed within that price range." The fear, expressed by certain members of the canning industry in the United States, that all commodities placed in a given grade would have identical prices, was not borne out by the situation in Canada. "The prices of like products in the same grade are not frozen to one level. The spread is often small yet evidence appears that a product, either through advertising or superior merit, or both, can command a premium over rival brands of the same grade."²⁴

When a consumer is not provided with information as to the quality of a commodity, he tends to place considerable dependence on price as a quality guide. The consumer hesitates to select the less expensive of a group of commodities for fear it may be distinctly inferior in quality. While there is considerable basis for this attitude, retail prices are often less closely related to quality than are wholesale prices.

The wholesale price classification is not carried through automatically to the consumer with a uniform mark-up. The value to the store of the executive in charge of the "women's ready to wear" is in his ability to pick some dresses from the \$2.75 wholesale group and regrade them into the \$5.95 retail group rather than into the \$3.95 group where most of their sister dresses may go. That is, the retail price grades do not in any sense parallel the wholesale price grades, so that while wholesale prices paid by experienced professional buyers may be considered as bearing some relation to inherent quality, as represented by material and workmanship, retail prices of dresses tend away from such a relation. But the consumer's willingness to associate quality with price

²³ "How Should We Label What? From the Merchandising Point of View," by Fred C. Hecht, p. 3, address before the National Retail Dry Goods Association, Chicago, Ill., June 18, 1940, mimeographed.

²⁴ "Grade Labeling of Canned Foods in Canada," a report made by the Consumers Advisory Board to Division Administrator Armin W. Riley, pp. 2-3, National Recovery Administration, Washington, D. C., December 21, 1934, mimeographed.

frequently leads her into paying several hundred percent profit to the store that has reclassified cheap merchandise into a higher grade.²⁵

Furthermore, present day advertising has contributed to establishing prices of commodities more in line with the extent and cleverness of the advertising than in relation to the specific qualities of the commodity.

* * * we have persistent price differences between brands and grades not warranted by differences in quality. Not only may goods of the same grade sell at different prices but goods of superior quality may sell at a lower price than the inferior because the buyer has no test of quality except price, or has been so repeatedly told to buy a particular brand and accept no substitutes that she does it without knowing why.²⁶

It has been found by those who have studied farmers' experiences in marketing agricultural products "that where no standards are recognized the tendency of the trade is to pay a flat price based on average value." Such a practice does not encourage the producer to sacrifice the volume of product marketed in order to maintain a given standard, while "trading on a quality basis is the greatest stimulus to better methods of production."²⁷

Commodity Standards and Brands.

The brand name in many cases is the consumers' only available guide to quality although legally a brand name, as such, is not supposed to indicate the quality of a commodity. Section 5 of the Trade-Mark Act of February 21, 1905, as amended January 3, 1913, specifically forbids the registration of trade-marks consisting of words or devices which describe the commodity or its qualities.

Within the last 30 years there has been a marked reduction in the proportion of commodities sold in bulk and an increase in packaged commodities identified by brand names.

It is the purpose of the brand device to attract consumer purchases to the goods handled by a single firm. The brand name does not identify the goods themselves, since their composition may be altered from time to time without notice and without any corresponding alteration in the brand. Nor does the brand name identify the maker of the goods; for the brand may be owned by the fabricator, the wholesaler, or the retailer. * * *²⁸

There is a wide variety of different brands of many commodities. This is true especially of various canned and packaged foods. Although all of the available brands are not sold in any one store or in any one city, a survey of brand preferences conducted by the Milwaukee Journal in 1939 revealed that consumers in that city could choose between 225 brands of canned peas, 184 brands of canned corn, 127 brands of packaged coffee, 107 brands of peanut butter, 102 brands of tomato juice, and 40 brands of canned milk.²⁹ It has been found that—

* * * manufacturers sometimes sell the same goods under several brands; that "seconds" under a different name may compete with the first quality goods

²⁵ "A Survey of the Terms Used in Designating Qualities of Goods," by Consumers Advisory Board, p. 43, National Recovery Administration, Washington, D. C., September 1934, mimeographed.

²⁶ "Food Buying and Our Markets," by Day Monroe, Hazel Kyrk, and Ursula Batchelder Stone, p. 134, M. Barrows & Co., New York City, 1938.

²⁷ "National Standards for Farm Products," Bureau of Agricultural Economics, p. 7, circular No. 8, revised, U. S. Department of Agriculture, U. S. Government Printing Office, Washington, D. C., September 1935, 5 cents.

²⁸ "Brand Names, Quality, and Price," by Clair Wilcox, the Annals of the Academy of Political and Social Science, vol. 173, p. 80, May 1934.

²⁹ "Consumer Analysis: Greater Milwaukee Market," 95 pp., sixteenth annual edition, compiled by the Milwaukee Journal, Milwaukee, Wis., 1939.

of the same producer; and that the same product is sometimes sold under the manufacturer's brand, the converter's brand, and the retailer's private brand. Also the same quality under different names is sold as regular stock and for special "bargain" sales. The fact is generally known that identical products of a single canning plant may be labeled with several different brands.³⁰

It has been found that the excellent quality of a branded or trade-marked commodity may be maintained only until it has won consumer acceptance. Thereafter, the manufacturer sometimes lowers the quality especially if the demand for the commodity exceeds the readily available supply of high grade products required in its manufacture. An awareness of this practice no doubt accounts for the consumers' preference for branded commodities labeled with Government grades as indicated in a survey to determine the probable effect of Government grading of goods on public buying.³¹ The survey was based on replies from 1,000 consumers in 30 Eastern States, and revealed that 70 percent of these consumers would be inclined to be guided by Government grades stamped on commodities and that 52 percent selected advertised brands in preference to little known brands when both were grade-marked, even though the advertised brand was more expensive.

Brands and trade-marks are essential if advertising is to promote wide consumption of a specific commodity. The economic value to the manufacturer of a successfully promoted brand is indicated in the following statement by Robert S. Lynd:

The value of a brand name has mounted steadily; five times annual earnings was but a few years ago an established sale price for a business involving the good will from a brand name; this has recently jumped to ten and in exceptional cases sixteen times annual earnings. The Maxwell House Coffee habit of the American people was bought in 1928 for \$42,000,000 and the Jell-O habit in 1925 for \$35,000,000.³²

Many large retail stores have their own brands or place their names on certain lines of commodities which are purchased from manufacturers whose names remain unknown to individual consumers. Some of these commodities are manufactured in factories owned by the stores. The independent manufacturer sometimes meets competition of the large retail store by establishing his own brand of commodities for which he seeks to build widespread demand. By this means he more or less dominates the activities of the small retail stores. It is said that "the business of the small shop keeper has been turned topsy-turvy by the distribution of branded goods on a wide scale." Since these goods can be sold so easily the shopkeeper is often little more than a commission agent and the "consequences for the community at large almost entirely depend upon the standards of good faith and honest service which the makers of branded goods set for themselves."³³

The real objective of the manufacturer of a brand-marked commodity is to lift it out of competition with other similar commodities. He wishes to avoid an accurate comparison of the characteristics of the brand-marked commodity with the characteristics of nonbranded commodities.

³⁰ "Standardization of Consumers' Goods," by Jessie V. Coles, p. 41, Ronald Press, New York City, 1932.

³¹ "How One Thousand Consumers Would Use Government Grades," by Pauline Arnold. Advertising and Selling, vol. 22 (9), pp. 22, 23, 48, March 1, 1934.

³² "Recent Social Trends in the United States," report of the President's Research Committee on Social Trends, p. 876, McGraw-Hill, New York City, 1933.

³³ "Branded Goods," editorial, the Economist, pp. 156-157, London, England, Oct. 22, 1938.

While national brands unquestionably make for greater uniformity of quality, an important aspect of the consumer's use of branded goods is the increasing technical complexity of fabricated commodities such as foods, textiles, mechanical equipment and toilet goods. This tends to remove further the characteristics, blanketed by a brand name from the sorts of empirical comparisons that were more often possible a generation ago when there were fewer brands and more commodities were produced in the home. Again, there is a tendency in the ceaseless quest for what advertising men call "million dollar merchandising ideas" to disguise commodities still further by identifying them with cryptic characteristics. Along with this goes the tendency to drive goods under their real names off the retail market.³⁴

There may be considerable variation in the quality and other characteristics of commodities sold under a given brand. The development and use of standards, grades, and informative labels for such commodities would tend to bring about more uniformity in the product.

Commodity Standards and Competition.

The widespread use of standards and grades is of benefit to the manufacturers and distributors who try to avoid deception in the manufacture and sale of commodities. As long as standards are not developed and followed in manufacturing and selling and consumers cannot distinguish between different qualities, the manufacturer will be tempted to lower the quality of the commodities when competition is keen. On the other hand, if grade labels are placed on commodities "there is a decreased tendency for good quality to be driven off the market merely because consumers through ignorance were willing to accept an inferior product."³⁵ Consumers usually prefer commodities of high quality to those of low quality, and are willing to pay more for the high quality if they can afford the extra cost. Therefore, the use of standards and other pertinent commodity information usually bring about a reasonably direct relationship between price, quality, and consumer preference.

If commodity standards and informative labels are used in retailing there is a tendency to reduce the varieties in each line. This may, and often does, stimulate competition.

* * * Standardization and the competitive spirit cannot live amiably together; one always tends to destroy the other. Thus if standardization be attempted under competitive conditions and if a number of rival firms undertake to manufacture the same standardized article, competition is entirely on the basis of price and the concern which can produce at the lowest cost and consequently sell at the lowest price will undersell its rivals and drive them from the field.³⁶

In certain cases, the number of companies manufacturing a commodity may be so reduced through price competition that the control of the manufacturing and selling of the commodity is concentrated in only one or a few companies. In this way, standardization may contribute to the development of monopoly. One point of view is that—

* * * if standardization is retained, the progress towards monopoly proceeds at an accelerated rate of speed because every inroad which the largest concern makes upon the market of its rivals may increase its output and lower its overhead cost per unit of product, and correspondingly decrease the output

³⁴ "Recent Social Trends in the United States," report of the President's Research Committee on Social Trends, pp. 876-877, McGraw-Hill, New York City, 1933.

³⁵ "Consumers and the Market," by Margaret G. Reid, p. 373, Crofts & Co., New York City, 1938.

³⁶ "Standardization and Its Relation to Industrial Concentration," by Homer Hoyt, the *Annals of the American Academy of Political and Social Science*, vol. 82, p. 271, March 1919.

and raise the overhead cost per unit of product of the smaller firm. In those industries where unit costs decrease with volume, the largest concern can use the very trade gained by price cutting as a basis of covering prices still more, while the smaller concern with every loss of sales is either forced to raise prices or to increase its deficit at a progressive rate. Wherever standardization thus makes mass production under conditions of heavy fixed capital the most economical, competition will die of its own excesses and a combination of firms.³⁷

Rival manufacturers or retailers often seek to escape excessive price competition by promoting trade-marks or brands for their respective commodities. Since specific information as to the quality of branded commodities is not furnished to consumers, vigorous promotion may build up such a strong demand for these commodities that the manufacturer sometimes maintains what has been termed a quasi-monopoly. The manufacturer is then enabled to sell his commodity at a price far in excess of that which consumers would pay if the commodity were sold on the basis of known merit.

Thus it becomes evident that an intimate but intricate relationship exists between price, quality, competition, and monopoly. In many instances consumer and public interests can be safeguarded only by a certain degree of carefully adjusted regulation or control.

Hindrances to the Development and Use of Standards, Grades, and Informative Labeling.

There are many obstacles to the development and wide use of commodity standards, grades, and informative labels in retail selling. Some of the more significant of these obstacles are the lack of available commodity information; the consumers' failure to state clearly the type of commodity information desired; lack of agreement on the character and form of information to be supplied; lack of recognized and adequate means of guaranteeing compliance of commodities with approved standards and grades; inadequacy of many standards, grades, and labels; confusion in terminology used in designating standards and grades; and the resistance of many manufacturers and retailers to informative selling.

Lack of available commodity information.—The difficulty consumers have in obtaining the information required for intelligent selection of commodities places in the hands of the manufacturer and retailer much of the responsibility for providing reliable commodity information.

At first thought it would seem a simple matter for the manufacturer to supply all the information about his products which consumers might want or need. But in some instances this is not as easy as it seems. Changes in the materials employed and technical advances in production cause manufacturers to make frequent modifications of commodities. Where a new process is used in making a commodity it is often necessary to make more or less extensive tests to determine what changes may have taken place in the commodity, and how satisfactory from a variety of angles the new commodity will prove to be. Some modifications are not manifest until after a commodity has been in use for weeks or months. This is particularly important in case of such commodities as drugs, cosmetics, and other substances that may either favorably or adversely affect health. All of this emphasizes the need for careful performance testing of new commodities both before and after they are placed on the market.

³⁷ "Standardization and Its Relation to Industrial Concentration," by Homer Hoyt, the *Annals of the American Academy of Political and Social Science*, vol. 82, p. 271, March 1919.

In case the commodity is a processed or manufactured food, such questions as these arise: Of what ingredients is the new food composed? Has the character of the carbohydrate, fat, or protein been changed in any significant way; and if so, what effect does this have on nutritive value? Have the vitamins been either partially or wholly destroyed? If vitamin values have been impaired, to what extent? Have mineral values been reduced? If the commodity is to be used in preparing foods in the home, have its physical properties been so changed as to require modifications in recipes in which it is to be used? Has the flavor of the food been retained or changed in any way; and if so, how?

Similar questions tend to rise concerning almost every commodity. Therefore, many manufacturers and some industries as a whole have established research laboratories, not alone to develop new commodities, but to study the commodities already developed, to improve them as weaknesses are revealed, and to learn what their performance values are, as well as to discover desirable ways of using and taking care of them. When this research is sufficiently thorough in character, the manufacturer can supply the consumer with useful information, although it is often incomplete when the commodity is first placed on the market.

A new commodity is usually subjected to successive modifications. These changes may be a seasonal, a monthly, or a weekly occurrence before all improvements have been made. Therefore, it is to be expected that the manufacturers' information pertaining to the latest form of a commodity can be complete only after the method of production has been stabilized and tests have been made on the commodity in its final form.

Consumer failure to state types of information desired.—The failure of consumers to state clearly and concisely the type of information they need for each of the commodities they purchase, has been given repeatedly by various manufacturers and distributors as the reason for their failure to supply consumers with adequate information about commodities.

On the other hand, consumers are unfamiliar with many important technical facts concerning commodities and with most manufacturing processes. Therefore, they need the cooperation of the manufacturer and retailer in determining the information essential for the correct evaluation of the commodity and the form in which this information can best be provided.

The consumers' lack of information and technical training, coupled with the facts that there are so many commodities in which they are interested, usually results in consumers giving insufficient support to the formulation of standards and informative labels for specific commodities to convince manufacturers and retailers that these standards and labels should be formulated and used in selling the commodities.

Meanwhile, manufacturers and distributors express bewilderment as to the specific kind of information consumers want and thus seek to place on consumers the responsibility for the failure to supply adequate commodity information.

Lack of agreement on the character and form of information to be supplied.—The manufacturer or retailer who is inclined to provide information to consumers concerning new or changed commodities

is faced with many questions. What information and how much shall be given? What claims for the commodity are justified? What information can be provided without risk of complications with competitors, or unfavorable consumer reaction? If the commodity is labeled grade C, will consumers buy it?

If practical answers to these questions are to be found, it is necessary to consider the point of view of representatives of manufacturers, retailers, and consumers, as each has a contribution to make in answering the questions relative to the kind and form of commodity information to be provided.

Lack of recognized and adequate means of guaranteeing compliance of commodities with approved standards and grades.—Proposals for the development of standards, grades, and informative labeling of commodities are repeatedly questioned by representatives of business groups who believe that adequate plans are lacking for the enforcement of adopted standards and grades. Unless commodities do comply with advertised standards and grades, consumers lose confidence in this type of advertising and the advantage to the manufacturer of using standards and grades in sales promotion is seriously lessened or may actually be destroyed.

Some form of inspection or policing is often coupled with certification or guaranteeing of commodities, as indicated in chapter III to insure compliance with established standards. These plans may be carefully formulated and administered so that the commodities do comply with the specified standards. However, there have been numerous instances in which the public has been deceived and commodities or services have been grossly misrepresented.

Inadequacy of many standards, grades, and labels.—Frequently manufacturers and distributors have considered that consumers are not interested in commodity standards and grades because of apparent consumer indifference to certified or guaranteed commodities. However, this seeming indifference can be explained; too often the standards or grades of a commodity take into account only the characteristic or characteristics which, for a time, may have special promotional value. Therefore, as the standard fails to cover other equally important characteristics the commodity may give very poor service. For example, a house paint may adhere firmly to the wall but prove unsatisfactory because the pigment fades rapidly in the sunlight; or the guaranteed finish of the top of a dining room table may not be spotted by moisture but may be marred by warm or hot dishes.

Extending commodity standards or grades to cover all significant construction as well as performance characteristics, as in the case of the I. E. S. reading lamp, would increase consumers' confidences in standards.

Confusion in terminology used in designating standards and grades.—The lack of standardization of terms used in designating the grades of different commodities has prevented consumers, as well as manufacturers and retailers, from gaining a clear concept of how the use of generally recognized commodity grades would affect the distribution of commodities, and of the value of adequate grade labeling to consumers.

At present, the same term is sometimes used to designate quite dissimilar grades of different commodities. Also, the terms selected for

different grades are often deceptive and suggest a higher quality than the grades to which they apply, as illustrated in the appendix.

Resistance of manufacturers and retailers to informative selling.— Even though a manufacturer or retailer is in sympathy with the program of informative selling, he cannot ignore the practical question: "Which method of merchandising will sell the larger volume of goods, specific information concerning the commodities, or strong promotion of a brand name?" Such questions are not always easy to answer and because of uncertainty of the results in adopting informative labeling, and fear of financial loss, many manufacturers and retailers follow the familiar plan of building up a market by a widely publicized trade name, with the result that insufficient information is given to the consumer concerning the composition, construction, quality, or performance of a commodity.

The manufacturer can readily provide specific commodity information, through informative advertising and labeling of his products. However, it is the practice of some retailers to remove from commodities the informative labels provided by manufacturers. The retailers who pass on to consumers the information from manufacturers, may, through interpretation of customers' needs, encourage manufacturers to increase the amount and value of the information provided.

For years, scientists have purchased equipment on the basis of very specific information. Microscopes, surveying instruments, and scores of other types of scientific equipment have been purchased by professional workers from catalog descriptions with confidence in the reliability of the instruments to be furnished. Manufacturers of these instruments furnish definite and highly accurate information about the materials used in the instruments and the degree of refinement of performance to be expected. A similar situation exists in supplying information for most of the commodities purchased by industry. However, substantial resistance to providing concrete information for a considerable proportion of consumer commodities is encountered only in the field of retail merchandising.

CHAPTER IX

RECOMMENDATIONS AND POLICIES OF VARIOUS ORGANIZATIONS RELATING TO CONSUMER STANDARDS, GRADING, AND LABELING

Industry, a long time ago, recognized the value of standardization in engineering and manufacturing. Nearly every item of materials is bought by industry on the basis of purchase specifications formulated by its engineering and purchasing departments. The movement toward standardization of consumer goods represents an attempt to bring to the ultimate consumer the advantages of scientific purchasing long enjoyed by industry.

During the last few years we have witnessed a continuous parade of various organizations carrying banners in behalf of the consumer. Retailers joined the parade and at their meetings the problems of consumer standards, fiber identification, serviceability of products, and other matters affecting the consumer have been discussed at length. Manufacturers and advertisers are becoming more and more concerned with these problems. Standardizing bodies, primarily concerned with industrial standardization, have found it advisable to make provision for consumer standards in their program.

Nearly every day we come across articles dealing with labeling, quality standards, and certification plans, not only in the technical press but in newspapers, magazines, and periodicals.

As a result of the increasing interest in consumer standards, grades, and labels, consumer organizations, retailers, and manufacturers have from time to time expressed officially their opinion on the subject in the form of recommendations and written policies. It has seemed suitable to present a few statements to indicate the viewpoint of different groups on this subject.

It is interesting to note that as early as 1931 in a Report of the Subcommittee on Purchasing Procedures of the Committee on Household Management of the President's Conference on Home Building and Home Ownership, in analyzing the consumers' facilities for judging merchandise, Ruth O'Brien and Olive Hartley made the following recommendations:

The present lack of facilities by which the household purchaser can make an intelligent selection of commodities on the retail market constitutes a serious deterrent to that practice of wise spending and saving necessary in the average family if adequate housing is to be achieved. The situation is made more serious by the sales pressure which the rapidly-growing production in this country has brought upon the consumer in an effort to create larger markets.

On account of the fundamental importance of this problem to home ownership, this committee recommends the following:

1. That the Conference bring to the attention of the manufacturing and distributing groups the importance of improving the means for intelligent

retail purchasing as a direct aid to home ownership and better housing in this country.

2. That wherever practicable, quality specifications be set up for consumers' goods, based on a study of the situation as it now exists and the actual needs of the consumer; that these specifications be established and regulated by the industries concerned under some such procedure as that now used for Commercial Standards; and that the essential facts covered by the specifications be given on commodity labels.

3. That, when the nature of the article is such that quality specifications cannot be designated on it, a grading system be used and grade designations be given on the labels, the basis for which will be readily ascertainable by the purchaser.

4. That steps be taken to set up a simple standardized nomenclature for grading systems, the terms of which will be self explanatory and applicable to grades now in use and those developed in the future.

5. That advertising of consumers' goods be patterned more closely after present-day advertising of industrial goods with emphasis given to the dissemination of facts regarding the constituent materials, construction, and performance of the commodity advertised.

6. That the Conference urge retail stores to recognize their responsibilities as buyers for the community and base their purchases on specifications and the results of testing laboratories; that this information be made available for the use of their clerks and customers.

7. That consumer education be directed toward teaching the technical information necessary for an adequate understanding of the performance of materials and constructions and their utilitarian and economic value for various household uses; that consumers be encouraged to form organizations in order to initiate and finance impartial laboratory testing of commodities when no other means of obtaining comparative data is available.¹

Representatives of the American Association of University Women, American Home Economics Association, and General Federation of Women's Clubs, serving on the National Consumer-Retailer Council, drafted in 1939 a tentative platform for consumer relations with business. The organizations making up the council, in addition to the above consumer organizations, are: American Retail Federation, National Association of Food Chains, National Better Business Bureau, Inc., National Retail Dry Goods Association, and National Shoe Retailers Association.

In this platform an attempt was made to define the point of view of consumer organizations and the basis on which consumers can legitimately work with manufacturers, retailers, and other related groups in efforts to bring about improved marketing practices. This platform is as follows:

A. Point of view.—We believe that—

1. American democracy is based upon a recognition of the dignity and worth of the individual, and upon the willingness of the individual to accept a limitation of personal liberty in order to make possible a maximum of freedom and equality for all. We recognize that the self-interests of individuals as well as economic groups are frequently in conflict and that the maintenance of our democracy depends upon establishing and maintaining a balance in our economic life which insures an equal recognition to the interests of each group.

2. Consumers have two major interests: to secure enough income to buy goods and services which will satisfy their needs and provide them with the greatest possible satisfaction; to be able to identify those products and services which are best suited to their special needs at prices they can afford to pay.

3. In order to protect these interests consumers need: to understand the basic economic principles which affect our standards of living; to take an intelligent

¹ "Selection: An Analysis of Consumers' Facilities for Judging Merchandise." by Ruth O'Brien and Olive Hartley, Excerpts from the Report of the Subcommittee on Purchasing Procedures of the Committee on Household Management of the President's Conference on Home Building and Home Ownership, pp. 22-23. Mimeographed by the American Association of University Women, Washington, D. C., December 1931.

part in the formulation of policies and legislation that promote or hamper the general welfare; to promote the development and general use of simple methods of identifying quality and performance in consumer goods that make intelligent buying possible.

4. Consumers must have the opportunity to make those free and intelligent choices among the goods and services available which are possible only when consumers are given adequate and accurate statements of fact about the relative quality and performance of the goods and service offered to satisfy their needs.

5. Lack of opportunity to exercise real freedom of choice based upon their own judgment and experience often creates a sense of helplessness and frustration in consumers which may lead to an unfortunate attitude toward business.²

6. It is possible for consumers and business to work together in good faith to their mutual advantage and without jeopardizing the legitimate self-interest of either group.

7. Constructive work of this kind will contribute more to the welfare of consumers, distributors, and producers than restrictive legislation and punitive measures.

8. The goal of co-operative work between consumers and business should be: an intelligent and sympathetic understanding of the problems of business by consumers, and the problems of consumers by business; active work on the development of useful and accurate definitions, standards, and performance specifications for consumer goods and services which will make intelligent buying and selling possible; active promotion of the use of sound, factual information now available in the distribution, promotion, and sale of consumer goods.

B. Definitions of goods and services.—We believe that—

1. The most useful kind of definitions are those commonly called standards and specifications. These may be based on such measurement and descriptions of the content, construction, and performance of goods as will accurately indicate their relative value or performance in use. We believe that these may be developed either by agreement among makers, sellers, and buyers or by mandatory decree of governmental agencies.

2. Without such definitions selling price has no meaning as an indicator of the relative value of any product or service to the individual consumer.

3. An earnest effort on the part of manufacturers, retailers, and consumers to formulate such definitions as rapidly as possible, if entered into with zeal and good faith, will bring about a readjustment of manufacturing, retailing, and consuming practices which will greatly benefit all three groups.

4. The structure and policies of the American Standards Association provide a satisfactory machinery by means of which the points of view of the manufacturer, retailer, and consumer may be fairly presented, polled, and used as the basis for voluntary agreements on standard definitions and for their continuous revision which is necessary because of our rapidly changing technology.

5. Definitions should be stated in the simplest possible terms, such as the A, B, C designations now in use for canned fruits and vegetables. Where this is not possible in our present state of knowledge, specifications and terms should be agreed upon so that like merchandise will be described in the same way by all manufacturers, retailers, and consumers, thereby establishing a language of the market place which means the same thing to sellers and buyers.

6. The use of such definitions by buyers for retail stores of all kinds will promote the use of the same terms throughout the distribution system and reduce the possibilities for misrepresentation of merchandise to the consumer.

7. Certification, approval, and rating statements are of no value to consumers unless they are accompanied by information telling precisely what characteristics of the goods or services have been tested, by what methods they have been tested, and for what they are certified, approved, or rated.

C. Methods of informing consumers.—We believe that—

1. The most satisfactory method for communication of information from manufacturer, through retailer, to consumer is a label attached to the product. Labels are useful only insofar as they state sufficient facts about the construction, grade, performance, or serviceability of the product to enable the consumer to judge relative values, and instruct the consumer on methods of care which prolong the usefulness of the product.

2. Advertisements are a useful means of communication only insofar as they inform consumers of the variety of products offered for choice and include the

² This paragraph is presented as revised at the annual meeting of the American Home Economics Association in June 1940.

same kind of factual information as is needed on labels. We believe that the voluntary efforts to establish "truth in advertising" which has continued actively since 1911, and to promote fair trade practices which reached a climax in the NRA codes, have failed to achieve their aims largely because no definitions have been agreed upon between sellers and buyers, and they have different ideas about "truth." Frequently when voluntary agreements on definitions have been developed, the fact that they have not been widely used on labels and in advertising has discouraged consumers and may lead them to turn to legislation as the only effective remedy.³

3. The National Consumer-Retailer Council, which has proved itself of value as a forum through which business and consumers may meet to discuss their mutual problems and agree upon steps toward solution, is a valuable means for the dissemination of agreements on terms. Its committee on labeling affords a mechanism through which manufacturers, retailers, and consumers can agree on the desirable content of labels for specific goods, and pass this information along to all parties at interest. The committee on customer abuses deals with returns, consumer complaints, charge accounts, deliveries, etc., and seeks to eliminate losses resulting from these things. The committees on local groups and store program extend the cooperative relationship between national leaders to consumers and retailers in the local communities. We urge both retailers and consumers to continue their support of this co-operative effort.

D. Consumer education.—We believe that—

1. Up to this time most of our efforts toward consumer education have stressed buying information based on the construction and content of commodities. Since this was done before it was possible to obtain much information in relation to specific articles in many retail stores, it has tended to increase the consumer's sense of frustration and resentment against business. However, since consumers do want and must have this kind of information for each commodity to be able to select wisely for their individual needs, and since some manufacturers and retailers have shown that it can be given, we reiterate that such information must be made generally available.

2. The education of the consumer, like all other education, must be kept comprehensive, objective, and without bias. To this end special care must be taken to safeguard the consumer point of view: (a) in the use of speakers or materials from commercial sources; (b) in organizations formed to protect or further consumer interest, or when cooperating with other groups promoting a common interest.

3. Whenever consumers participate in cooperative activities they must name their own representatives.

4. No funds should be accepted for the promotion of consumer interests or activities without full publicity as to their source and full control over their use.

5. No other group should be delegated to speak for them.

6. No co-operative program should be undertaken in which business interests are in a position to dominate or outvote the consumer interest.⁴

Consumer organizations, such as the American Association of University Women, the American Home Economics Association, and the General Federation of Women's Clubs, have consistently supported the work of various governmental agencies and legislation dealing with consumer problems. These organizations have specifically gone on record for legislation designed to promote the establishment of quality and performance standards for consumer goods and increase use of informative and grade labels.

The National Retail Dry Goods Association's platform of June 8, 1937, outlining its relationship with government, consumers, employees, and vendors, was reviewed and unanimously endorsed by the Executive Committee of the Board of Directors of the National Retail Dry Goods Association and approved by the board of directors. The part of the platform dealing with consumer relations, covering specifically

³ This paragraph is presented as revised at the annual meeting of the American Home Economics Association in June 1940.

⁴ "Tentative Platform for Consumer-Business Relations," Bulletin of the American Home Economics Association, pp. 9-12, Series 22 (3), Washington, D. C., February 1940.

merchandise standards, standard definitions of terms, labeling, factual merchandise publicity, valid certification, and advertising standards, follows:

I. CONSUMER RELATIONS

A. Merchandise standards:

1. The further development of an extensive long term program for the creation of merchandise standards in staple and semistaple goods for the purpose of protecting and assisting the consumer and eliminating waste in industry—such standards to cover grades, construction, performance, size, durability, etc.; methods of testing to insure the foregoing; and machinery for revising these standards from time to time so that they may be kept up to date.

2. The solicitation of the cooperation of national associations of manufacturers to assist in the initiation and development of this program of merchandise standards. We recognize that in order to promote universal use of any standards so developed that it is important to have as collaborators in the work of establishing such standards various commercial and store laboratories, the National Bureau of Standards, the Bureau of Home Economics, the Bureau of Agricultural Economics, the Food and Drug Administration, various national consumer organizations, and the Consumer-Retailer Relations Council.

As such merchandise standards are established and revised, we recommend that the endorsement of the American Standards Association be secured through the Advisory Committee on Ultimate Consumer Goods as to designate such approved standards as American Standards; and that when advisable the Federal Trade Commission be requested to recognize such approved standards.

3. Standard definition of terms: The development, with the cooperation of the aforementioned groups, of a universal dictionary of terms to be used in retailing to describe various types of merchandise, their characteristics, performance, grades, finish, construction, etc., so that consumers will find like merchandise in all stores described basically in the same way and be able better to judge values, uses, and limitations.

This dictionary should serve as a guide to be followed in specifying merchandise to be bought and in describing merchandise to be sold. It should be used by copywriters as a basis for advertising copy; by store personnel groups for instruction of salespeople in merchandise information; by testing laboratories in reporting on merchandise examined, and by manufacturers in describing merchandise for sale. A special edition expressed in simple, non-technical language should be issued for the use of consumers.

4. Labeling: The further development, with the cooperation of the aforementioned groups, of an extensive practical program of informative labeling of merchandise to serve as buying guides to consumers, including grade labeling in the case of staple merchandise.

5. Factual merchandise publicity: The further development of a constructive program which will go far toward eliminating representations in regard to merchandise which are exaggerated, misleading, inaccurate, or inadequate, substituting therefor a constructive program of adequate factual presentation of merchandise through all types of advertising, labels, signs, and statements of sales clerks. This program should provide for clear and concise statements of content, construction, durability, and serviceability, where such information is of importance to consumers in enabling them to judge better intrinsic value and usability. It should include, but not be limited to—

(a) Fiber identification of piece goods, apparel, and other merchandise made of cotton, wool, silk, linen, or synthetic materials, or combinations of these fibers.

(b) Definite statements concerning the degree of washability, including color permanence, percent of shrinkage, tensile strength, sizing, weighing, etc., together with information for reconditioning and for proper handling to give longer wear and greater satisfaction.

(c) Identification of material used in other lines of merchandise, such as woods used in furniture, together with fair estimates of performance and durability of household appliances and furnishings, etc.

6. Valid certification: The establishment of a basis for sound technical investigation and a standard procedure to be followed by retailer, manufacturer, and advertiser when certifying commodities to the public, which shall include publicity of the methods of testing and rating used as a basis for such certification.

B. Advertising standards:

1. The establishment of the following guiding principles for the proper conduct of advertising:

- (a) Truthfulness in advertising, both in statement and implication.
- (b) The inclusion in advertising of all essential information.
- (c) The elimination of statements and practices unfair to competitors.

2. The achievement of this objective by cooperation between retailers and representatives of various forms of advertising so as to promote consumer confidence in advertising generally.

3. The appointment of a committee representing the National Retail Dry Goods Association to confer with representatives of the American Newspaper Publishers' Association and representatives of other forms of advertising to re-define good and bad practices in advertising; and to recommend ways and means of eliminating practices defined as bad.

4. The leadership by National Retail Dry Goods Association members in various localities, in organizing local groups to enforce such accepted standards in cooperation with other organizations desiring to accomplish the same end, and with representatives of various forms of advertising.⁵

The platform of the National Retail Dry Goods Association has been presented in its entirety because it is the most exhaustive statement on the subject approved by any retail organization concerned with general merchandise.

It is interesting to note that there is no agreement on policies relating to labeling of foods between such organizations as the National Association of Retail Grocers and the National Association of Food Chains.

The National Association of Retail Grocers at its forty-second annual convention in Kansas City, June 19 to 22, 1939, expressed the belief "that the consumer is entitled to know more about commodities she buys in food stores," but urges—

* * * all packers, canners, and manufacturers to give attention to "descriptive" labeling which shows the consumer a picture of the product, tells her how it is packed, the number of units in the package, number of portions it will serve, and similar facts with reference to the product in the can or package and * * *

* * * that the National Association of Retail Grocers expresses its opposition to "grade" labeling because of its misleading and unfair implications, and because of the impossibility of successfully and fairly issuing such grades.

On the other hand, the National Association of Food Chains, at its seventh annual meeting, October 15, 1940, unanimously adopted the report of its Consumer Committee including the following:

During recent months, your Consumer Committee and staff members have been working with the special Labeling Committee of the National Consumer-Retailer Council in the development of "informative and grade labels." Your committee recommends that this activity be continued with a view to discovering the type of food labels consumers really need and want and what type of labels they would support with their patronage. It is recommended that a standing Consumer Committee of your association and its staff members be directed to develop, if possible, a series of standards covering labeling of canned foods and such other products as it appears feasible and that such standards be submitted to the entire membership.

The National Paint, Varnish and Lacquer Association favors voluntary formula labeling but opposes any form of performance or grade labeling.

Recognizing the organized consumer demand for adequate information concerning products placed on the market, the executive committee of the National Paint, Varnish and Lacquer Association has recommended to its membership the adoption of formula labeling. The traditional stand of the group has been against State legislation requiring such labels, but at the recent con-

⁵ "Platform of the National Retail Dry Goods Association," Bulletin of the National Retail Dry Goods Association, vol. XIX, p. 9, June 1937.

vention of the association, held in the Ambassador Hotel, Atlantic City, the voluntary plan was presented as an alternative to enforced standardization and certification. To simplify the work of producing the new labels, the scientific section of the association has prepared a uniform simplified nomenclature appropriate for the purpose.⁶

The position of the Chamber of Commerce of the United States with reference to standards and grades for commodities is that—

In the case of certain classes of consumers' goods much benefit would result to consumers, distributors and manufacturers from the establishment of standards of quality. Complete standardization and grading of all classes of such products is impractical and impossible. * * *

Government should not attempt, however, to impose systems of standards on industry. Industry itself, with proper consideration for the interests of the public, should carry forward this work in cases where the establishment of standards is practicable and clearly for the benefit of the public.⁷

Analogous to the position of the Chamber of Commerce of the United States is that held by the National Association of Manufacturers. At its meeting on May 21, 1940, the Subcommittee on Standardization of the National Association of Manufacturers made the following recommendation:

After careful consideration of many of the factors involved, it was the opinion of your Subcommittee that this problem of standardization divides itself definitely into two fields, namely, the general standardization of products whereby it is sought to define and reduce to writing, standards for the products of industry, to avoid wasteful and costly multiplicity of items that serve no important purpose; and secondly, standardization as it relates to the consumer for the safeguard of the buying public, minimum specifications agreed on by industry as respects quality of goods to be sold, accompanied by adequate labeling wherever practicable.⁸

A motion was made, seconded and carried recommending that the National Association of Manufacturers in cooperation with the American Standards Association stimulate standardization work in order to forestall further governmental intervention in this field.

Although your committee recognizes that the Government has already intervened in this field, it is suggested that the standards set up by the Government should be strictly confined to the formulation of standards, to protect the public health and safety, traffic codes and building standards with respect to safety and health.⁹

⁶ "Paint Group Endorses Formula Labels," World Convention Dates, December 1938.

⁷ "Standardization of Consumers' Goods," pp. 13-14, Chamber of Commerce of the United States, Washington, D. C., 1934.

⁸ "Minutes of Meeting of the Subcommittee on Standardization," National Association of Manufacturers, Hotel Biltmore, New York City, May 21, 1940.

CHAPTER X

CONCLUSION

Most desirable standards, grades, and informative labels have been developed through a certain amount of cooperation by interested groups. Experience tends to demonstrate that there are a few significant factors which need to be observed in such activities if standards, grades, and informative labels are to be well adapted for the purposes they are designed to serve: There should be a fair representation of all substantially interested groups; full and objective consideration should be given to all pertinent data and situations; provisions should be made to safeguard the soundness of standards before they are approved; participants should be willing to first consider the simple or less controversial factors in developing a standard; an adequate educational program should be planned to promote the development of a suitable standard and its use when adopted; and finally, provision needs to be made for revision of a standard when experience and technological developments indicate the need for such a revision.

Due to the generally recognized importance of standards in the defense preparedness program, it seems appropriate to recall the experiences of the Conservation Division of the War Industries Board so well summarized by Bernard M. Baruch, Chairman of the War Industries Board:

The experience of the Conservation Division has clearly demonstrated that there are many practices in American industry which cost the ultimate consumers in the aggregate enormous sums without enriching the producers. These are often due to competitive demands, real or assumed. Many salesmen, in order to please the whims of particular customers, will insist upon the manufacture of new styles or new shapes of articles, requiring increased expense to the manufacturers and increased expense to both wholesalers and retailers in carrying more lines of stock; these in turn causing increased expense in maintaining salesmen and providing them with samples as well as in advertising. The consumer, the general public, is no better served by the satisfaction of these unreasonable demands, but the public ultimately pays the bill. We may well draw from this war experience a lesson to be applied to peace, by providing some simple machinery for eliminating wasteful trade practices which increase prices without in the remotest degree contributing to the well-being of the people. There is enough natural wealth in this country, and there is enough labor and technical skill for converting that wealth into objects of human satisfaction to provide abundantly for the elemental comforts of every person in the land. The problem before our Nation today is to bring about such adjustments of the industrial processes as lead toward that long-sought condition of life.¹

¹ "American Industry in the War, a Report of the War Industries Board," by Bernard M. Baruch, Chairman, p. 69, U. S. Government Printing Office, Washington, D. C., 1921.

APPENDIX

NOMENCLATURE OF STANDARDS

Although this study deals primarily with consumer standards, it was thought advisable, in addition to the definitions of basic terms given in Chapter I, to present in the following pages some of the most important terms used in discussing problems of standardization of commodities and services. While no attempt is made to present a standard classification system, the following categories may serve as an indication of the major groups in the field of commodity and service standards:

- I. Producer Goods Standards
- II. Distributor and Marketing Standards
- III. Consumer Goods Standards
- IV. Standard Codes, Rules, and Regulations

In the establishment of standards applicable to the above groups, the following factors¹ may be considered:

Scope:

- Local
- National
- International

Establishing Agency:

- Company
- Association:
 - Trade
 - Technical
 - Professional
- Government:
 - Municipal
 - State
 - Federal

Enforcement:

- Voluntary
- Mandatory

Adoption:

- Tentative
- Officially Adopted

Status:

- Prospective
- Active
- Obsolescent
- Obsolete

Range:

- Minimum
- Maximum

Coverage:

- Natural Products
- Raw Materials
- Intermediate Materials
- Semifinished Materials
- Finished Products
- Finished Equipment

Types:

- Building
- Composition
- Construction
- Processes
- Safety
- Services
- Utilities

Requirements:

- Durability
- Efficiency
- Measurement
- Performance
- Quality
- Standard Constants
- Testing
- Tolerances

Methods of Stating Requirements:

- Definition
- Description
- Identity
- Specification
- Terms

¹ Definitions are given in alphabetical order, since some of these terms may apply to different groups.

GLOSSARY

Active Standards: See Status of Standards.

Adoption of Standards: See Tentative Standards; Officially Adopted Standards.

Association Standards: "These may be standard practices that have grown in the trade; or they may be formally issued by organized groups, such as trade association. . . ." ² technical and professional societies.

"In a great number of cases a standard may be of . . ." importance . . . only to a particular consumer interest and to the producer of the product covered. In such cases the standard is likely to remain in the group or association stage. . . ." ³

Building Standards: See Construction Standards; Practice, Standards of.

Codes, Standard: See Practice, Standards of.

Company Standards: "These may be purchase specifications for the products the company buys, or company standards for the products it sells. These latter may take the form of trade brands. (The degree of uniformity of a product sold under a trade brand means there is a standard of some kind. This is true even though this standard be changed arbitrarily from time to time, thus changing the quality of goods sold under the brand name.) They are usually called private brands if they are established by retailers; national brands, if they are established by manufacturers." ⁴

Composition Standards: Standards designating the elements of which a material or a product is composed, and the proportions in which these elements are combined, such as, fiber content of textiles, chemical content of drugs, carbon content of steel, and so forth.

Construction Standards: Tell how the product is made and include requirements for shape, style, strength, finish, method of manufacture, workmanship; also "Size, weight, number of yarns per inch, weave, number of stitches per inch, finish, ply, cut, hand or machine made, pressed, molded, stamped, inlaid, etc." ⁵

Definitions, Standard: See also Identity, Standards of.

"A definition and standard of identity strictly defines the composition of a product, as well as its name." ⁶

"Standard Definitions—Standards for identification serve as the basis for describing particular characteristics in such a way that

² "Functional Steps in the Development, Promulgation and Use of Standards for Consumer Goods," by P. G. Agnew, p. 1, American Standards Association, New York City, December 28, 1939, mimeographed.

³ "National Standardization in America," by P. G. Agnew, *Industrial Standardization and Commercial Standards Monthly*, vol. 4 (7), p. 112, July 1933.

⁴ "Functional Steps in the Development, Promulgation and Use of Standards for Consumer Goods," by P. G. Agnew, p. 1, American Standards Association, New York City, December 28, 1939, mimeographed.

⁵ "Informative Labeling," by Committee on Informative Labeling, p. 4, Consumer-Retailer Relations Council, New York City, 1938.

⁶ "Labels for Canned Foods," p. 13, National Cannery Association, Washington, D. C., August 6, 1940.

others may be identified or proved to be the same as that described. Therefore, they usually are in the form of definitions. These definitions may be for the purpose of setting up exact meanings for old terms which have long been in use but which in practice have come to be interpreted in various ways. They may also be for the purpose of setting accurate meanings for new terms used for describing new products or describing characteristics which have attained new significance."⁷

Description, Standards of: See Definitions, Standard; Identity, Standards of; Terms.

Distributor Standards: (1) Standards on which purchase of merchandise for retail distribution is based.

(2) Standards for advertising and marketing ". . . may take the form either of indicating that the advertised or displayed goods are manufactured in accordance with certain definite, generally known and widely approved standards, such as those of the American Standards Association or the Federal Specifications Board [now Federal Specifications Executive Committee]; or of stating in the advertising copy or the sales talk the relevant constituent materials, method of construction, etc., pertaining to the product, and what or whose standards, if any, are met. In either case the manufacturer or seller is certifying to the buyer that the qualities or the properties meet some definite and recognizable specification."⁸

Durability Standards: "'Durability' . . . may be defined as the ability to resist wear arising from actual use . . ."⁹

Efficiency Standards: See Performance Standards.

Establishing Agency of Standards: Agency responsible for the formulation and establishment of standards.

Government Standards: Government standards are those used by a municipality, a county, a State, or the Federal Government in the procurement of goods, services, and so forth.

Identity, Standards of: See also Definitions, Standard.

"Standards for identification do not involve quantitative consideration of the characteristics but they are confined rather to the purpose of establishing their identity. For example, when the standard for 'silk' is set as 'the product of the cocoon of the silkworm,' all things which conform to this standard possess the same characteristics, the same chemical and physical properties. No other product has been found which possesses exactly these same characteristics; therefore, this standard serves to differentiate it from all other products and provides a means for identifying its peculiar characteristics. The product known as 'rayon,' although similar in appearance, does not conform to this standard since it is made artificially from cellulose. Therefore, we know that it does not possess the same characteristics as silk."¹⁰

⁷ "The Consumer-Buyer and the Market," by Jessie V. Coles, p. 446, John Wiley & Sons, Inc., New York City, 1938.

⁸ "Industrial Standardization," p. 207, National Industrial Conference Board, Inc., New York City, 1928.

⁹ "Standardization of Consumers' Goods: An Aid to Consumer-Buying," by Jessie V. Coles, pp. 98, 99, The Ronald Press Company, New York City, 1932.

¹⁰ *Ibid.*, p. 103.

International Standards: "‘International’ standards may be broadly defined as those which represent the cooperative effort of most of the principal producing or consuming nations, having a major interest in the standard."¹¹

"International standardization is, in a sense, more of a necessity in import and export trade than in our domestic trade. It primarily concerns those standards which, by cooperative effort have been adopted by authoritative groups representative of two or more nations.

"In the matter of weights and measures, such cooperative effort in the establishment of standards has been in evidence for many decades. Likewise, in the matter of illumination and in other fields more or less concerned with scientific or technical matters, we find that considerable progress has been made in international standardization."¹²

Local Standards: Standards established by a city, a municipality, a county, or other agency of local scope.

Mandatory Standards: ". . . official standard, the use of which is compulsory in the conditions specified by the law under which that standard is promulgated."¹³

Marketing Standards: Standards which are used in connection with the marketing of commodities, especially agricultural products. These standards provide a common language for trading and a basis for market quotations; eliminate the necessity of personal inspection before purchase; provide a basis for price adjustment; afford a quality basis for payment; afford a check on the quality of production; promote a fair and honest basis for loans on products in storage, and for regulating or controlling shipments under marketing agreements.

Maximum Standards: See Range of Standards.

Measurement Standards: "Reference and working standards for measurements of all kinds, including fundamental and derived standards of measurement for expressing the quantitative aspects of space, time, matter, energy, and motion, and of their interrelations.

"By definition, specification, or material standard, covering, for example, length, area, and volume; mass, weight, density, and pressure; heat, light, electricity, and radioactivity, including for each the quantity, flux, intensity, density, etc."¹⁴

In the standardization of component parts measurement standards provide "Uniformity in dimensions necessary to secure interchangeability of parts and supplies, and the interworking of apparatus."¹⁵

¹¹ "Industrial Standardization," p. 149, National Industrial Conference Board, Inc., New York City, 1928.

¹² "Product Standardization," by Robert B. Harper, p. 19, Lecture at the Seventeenth Annual Meeting of the National Institute of Commercial and Trade Organization Executives, Northwestern University, Evanston, Illinois, August 15, 1939, mimeographed.

¹³ "Check List of Standards for Farm Products Formulated by the Bureau of Agricultural Economics," Bureau of Agricultural Economics, U. S. Department of Agriculture, Washington, D. C., March 1930, mimeographed.

¹⁴ "Bureau of Standards of the U. S. Department of Commerce, Washington, D. C., Functions," Government Printing Office, Washington, D. C., 1931.

¹⁵ "Work of the American Engineering Standards Committee," by P. G. Agnew, The Annals of the American Academy of Political and Social Science, Vol. CXXXVII (226), p. 13, May 1928.

Minimum Standards: See Range of Standards.

National Standards: "A national standard implies a consensus of those substantially concerned with its scope and provisions. . . . The basic test to be applied in all cases is the fact of the assent, affirmatively expressed, of all groups having substantial interest in the standard."¹⁶

Nomenclature, Standard: See also Definition, Standard; Identity, Standards of; Terms.

"Definitions of technical terms used in specifications and in contracts, and in technical literature; abbreviations; letter symbols for quantities used in equations and formulas; graphical symbols (ideographs or pictographs) used on drawings, schematic diagrams, and the like."¹⁷

"The careful and accurate formulation of standards established by the authority or general agreement gives rise to precise and definite language or exact nomenclature.

Language as a vehicle for the communication of ideas is for the most part developed through custom or long usage. It is constantly growing and undergoing change. Therefore meanings are often variable and subject to individual interpretation. When standards are established scientifically, specific meanings are attached to each term, phrase, symbol, and the like."¹⁸

Obsolescent Standards: See Status of Standards.

Obsolete Standards: See Status of Standards.

Officially Adopted Standards: Those standards which have been formally approved and adopted as official by the establishing agency.

"... comprise those specifications and methods of test that have been formally adopted by the Society."¹⁹

Performance Standards: "The term 'performance' is used in connection with commodities to refer to the manner in which they act or behave in carrying out certain functions arising with their use. The term is most frequently used in connection with machines and mechanical devices. For instance, one writer describes performance as 'operating characteristics of machines and devices: output, rating, speed, efficiency, durability, etc.'; but no reason is apparent why the term might not be applied to nonmechanical goods."²⁰

"Specification of operative efficiency or action for machines and devices, known as standards of performance, specifying the factors involved in terms susceptible of measurement.

"Numerical statement of speed, uniformity, output, economy, durability, and other factors which together define the net efficiency of an appliance or machine."²¹

"The items of acceptable performance are most varied—speed, economy, accuracy, efficiency, durability, and many others. The

¹⁶ "National Standardization in America," by P. G. Agnew, *Industrial Standardization and Commercial Standards Monthly*, vol. 4 (7), p. 111, July 1933.

¹⁷ *Ibid.*, p. 107.

¹⁸ "Standardization of Consumers' Goods: An Aid to Consumer-Buying," by Jessie V. Coles, pp. 81, 82, The Ronald Press Company, New York City, 1932.

¹⁹ "A. S. T. M. Standards, 1939: Part I. Metals," p. iii, American Society for Testing Materials, Philadelphia, Pennsylvania, 1939.

²⁰ "Standardization of Consumers' Goods: An Aid to Consumer-Buying," by Jessie V. Coles, pp. 97, 98, The Ronald Press Company, New York City, 1932.

²¹ "Bureau of Standards of the U. S. Department of Commerce, Washington, D. C., Functions," Government Printing Office, Washington, D. C., 1931.

breakage and wear of hacksaw, for example, depend on the steel and on the design of teeth and frame. To specify its useful life and cutting rate is to set a standard of performance, or work value, or utility factor. A performance may involve speed; for example, the photography of a bullet in flight in one-millionth of a second, or an effective profile of a propeller or airplane wing. The performance standard may involve: (a) continuity, as in the non-stop run of a motor; (b) uniformity of rate, as in a time-piece; (c) efficiency, as in the gasoline motor; (d) economy, as the luminous efficiency of the electric lamp; (e) accuracy, as in a thermostat; and so on. If fixed in units or measurable terms, these are standards of performance. Their use and application require judgment based on experience and experiment, a knowledge of physical and chemical constants of materials and energy, and a correct use of the principles of science."²² Examples: "Degree of color permanence; shrinkage or stretchage; breaking strength; seam slippage; resistance to water, perspiration, wind, wear; light, heat, and power tests; power consumption; cost upkeep; etc."²³

Permissive Standards: See Voluntary Standards.

Practice, Standards of: "Codes and regulations impartially analyzed and formulated after study and experiment into standards of practice for technical regulation of construction, installation, and operation, and based upon standards of measurement, quality, and performance.

"Collection of standard data, numerical magnitudes, and ranges of the pertinent factors defining quality, safety, economy, convenience, and efficiency."²⁴

Processes, Standard: "The standardization of operations and processes of production rests, in the first instance, upon the standardization of equipment. . . . Standardized machines with interchangeable parts, and standard tools are of fundamental importance in the shop and factory likewise.

"If standard tools and equipment are combined with the proper plant layout, a continuous flow of production from stage to stage and process to process may be made possible. This is one of the most important aspects of the application of standardization technique to production. As maximum efficiency in the machine is dependent upon a given uniform speed and method of operation, with each part intermembered with every other part with the smallest possible coefficient of variation and the minimum of friction, so the efficient operation of an entire plant requires a continuous input of standard goods, a continuous flow from process to process, and continuous and relatively invariable output. . . ."²⁵

Producer Goods Standards: Standards for "commodities used in the manufacture of other commodities, as machinery or raw materials."²⁶

Product Standards: "Product standardization is the deliberate making of a product to, or regulation thereof by a definite type, model,

²² "Standards and Standardization," by Norman F. Harriman, pp. 62, 63, McGraw-Hill Book Company, New York City, 1928.

²³ "Informative Labeling," by Committee on Informative Labeling, p. 4, Consumer-Retailer Relations Council, New York City, 1938.

²⁴ "Bureau of Standards of the U. S. Department of Commerce, Washington, D. C., Functions," Government Printing Office, Washington, D. C., 1931.

²⁵ "Industrial Standardization," p. 40, National Industrial Conference Board, Inc., New York City, 1929.

²⁶ "The Winston Simplified Dictionary, College Edition," The John C. Winston Company, Philadelphia, Pennsylvania, 1939.

set of requirements or specifications or example, as to dimensions, size, bulk, degree, range, shape, mass, weight, volume, number, worth, utility, efficiency, price, composition, color, property, quality or characteristic, or two or more thereof."²⁷

Professional Association Standards: See also Association Standards.

Standards established by the various professional societies and associations for products and equipment, test methods, and so forth, of primary interest to, and use in each profession.

Prospective Standards: See Status of Standards.

Quality Standards: "Specifications for material (by description, sample, or both), known as standards of quality, fixing in measurable terms a property or group of properties which determine the quality.

"The numerical magnitude of each constituent property pertinent to the quality involved, and specific magnitude in units of measure of such significant factors as uniformity, composition, form, structure, and others."²⁸

"Standards of Quality: Specifications setting up standards of purity, strength, elasticity, durability, color, workmanship and other nondimensional characteristics which determine the industrial or engineering usefulness or appearance of raw or intermediate materials, semifinished products, or of structures, equipment or machines."²⁹

Quantity Standards: See Measurement Standards.

Range of Standards: Minimum and Maximum Standards—"When a single standard is established, goods are divided into two groups: (1) those designated as 'equal to and above the standard' and (2) those 'below the standard.' For the first there are no upper limits on qualities and for the second no lower limits. Sometimes such a standard is established for the purpose of separating the desirable or acceptable from undesirable or unacceptable goods, in which case the standard is called a 'minimum' standard. Such standards are used by the United States Food and Drug Administration. The goods falling below the minimum standards are considered so undesirable that they are kept off the market. Sometimes this minimum standard is stated as the minimum of the desirable quality which is acceptable and in some cases as the maximum of the undesirable quality which is acceptable."³⁰

"In some cases the standard is described in terms of the minimum of the desirable characteristics permitted. In other cases, it is set by fixing the maximum limits of the undesirable characteristics, or both a maximum and a minimum may be used."³¹

Rating, Standard: "Ratings of machinery and apparatus which establish test limits under specified conditions as a basis of purchase

²⁷ "Product Standardization," by Robert B. Harper, p. 2, Lecture at Seventeenth Annual Meeting of the National Institute of Commercial and Trade Organization Executives, Northwestern University, Evanston, Illinois, August 15, 1939, mimeographed.

²⁸ "Bureau of Standards of the U. S. Department of Commerce, Washington, D. C., Functions," Government Printing Office, Washington, D. C., 1931.

²⁹ "Classification of Engineering and Industrial Standards," by F. J. Schlink, Mechanical Engineering, p. 120, February 1925.

³⁰ "The Consumer-Buyer and the Market," by Jessie V. Coles, pp. 447, 448, John Wiley & Sons, Inc., New York City, 1938.

³¹ "Standardization of Consumers' Goods," by Jessie V. Coles, p. 108, The Ronald Press Company, New York City, 1932.

specification, or which establish requirements as to performance, durability, safety, etc., under operation."³²

Regulations, Standard: See Practice, Standards of.

Rules, Standard: See Practice, Standards of.

Safety Standards: "Instructions for safe use of equipment such as hoists and derricks, hand tools, boilers, scaffolding, and trucks, as well as recommendations for safe methods in demolition, handling and storage of material, loading and handling vehicles, and equipment upkeep."³³

Household safety standards are methods of care and caution to protect life and property from hazards occurring in or about the home, such as mechanical, fire, gas, electrical, lightning, and other hazards.—

Standard Constants: "Natural standards of the measured numerical data as to materials and energy, known as physical or standard constants—the fixed points or quantities which underlie scientific research and industrial processes when scientifically organized.

"Mechanical equivalent of heat, light, electricity, and gravitation; specific densities; viscosities; melting and boiling points; heat capacity; heats of combustion; velocity of propagation of light; conductivities of materials to heat and light; electrochemical and atomic weights; and many similar magnitudes determined experimentally with maximum precision and referred to fundamental standards of measure."³⁴

Status of Standards: Prospective, Active, Obsolescent, Obsolete—

"Standards may be classified on the basis of their degree of acceptance, those in regular customary use being known as tentative or provisional standards. In ordinary course, it is assumed that such standards will advance to the status of regular standards.

"A further classification of standards is possible with respect to the time and trend of their utilization, thus, obsolete, obsolescent, standard, prospective standard, and interim standard, the latter being intended to bridge an interval between an obsolescent and a current standard, or between a standard and a prospective standard.

"In an actively growing and developing industry, all of these classes of standards are often involved. Some may be designated as definitely obsolete, and others are to become obsolete after the lapse of a certain interval or upon exhaustion of existing stock. The third class, or active standards, is that for which no change of application is yet foreseen, while future or prospective standards may be established for utilization after a certain period of time or upon the completion of certain preparatory stages, or of related standardization work in other fields."³⁵

Technical Association Standards: See also Association Standards.

Standards established by associations ". . . composed essentially of persons engaged in scientific, engineering, and technical work (as employees of industrial or manufacturing concerns) independent

³² "Industrial Standardization," p. 23, National Industrial Conference Board, Inc., New York City, 1929.

³³ "ASA Approval Shows National Consensus on Manual for Safety in Construction," *Industrial Standardization and Commercial Standards Monthly*, Vol. 10 (10), pp. 246, 247, October 1939.

³⁴ "Bureau of Standards of the U. S. Department of Commerce, Washington, D. C., Functions," Government Printing Office, Washington, D. C., 1931.

³⁵ "Standards and Standardization," by Norman F. Harriman, p. 95, McGraw-Hill Book Company, Inc., New York City, 1928.

consulting engineers and professional men . . . concerned with raw materials, manufacture, processes, construction, equipment, and tools and products, naturally have engaged in product standardization."³⁶

Tentative Standards: "Standards in process of development . . . 'a standard that is still subject to investigation . . . that is offered for use under commercial conditions to test its practicability or as a basis for discussion.'"³⁷

"Tentative standards represent the latest thoughts and practices and are published as 'tentative' by the Society on the recommendation of the committee concerned, prior to adoption as 'standard.'"³⁸

Terms, Standard: See also Definitions, Standard; Identity, Standards of.

"In setting up practically every series of standards for grading products, meanings of terms are set up definitely for the purpose of describing accurately certain products or certain characteristics. For example, in the standards for grading apples, such terms as 'mature,' 'clean,' 'russeting,' 'well formed' are carefully defined in order that these particular characteristics may always be identified and may be interpreted uniformly."³⁹

Testing Standards: "Although tests of an experimental nature are necessary in the research incident to the development of standards, the term 'methods of test' as generally used refers only to the practical procedure for identifying and measuring qualities and performance of goods. They are primarily for the purpose of securing data by means of which goods may be described. Identification and measurement by means of tests are necessary to group goods according to grades, to determine their ratings, and to discover the magnitudes which are to be expressed in terms of standard units of measurement. Tests may be used to determine the quantitative or nonquantitative information used on labels, in advertising, or in otherwise describing goods.

"The methods of making tests and the conditions under which they are to be carried out must be uniform and agreed upon as 'standard.' The procedure for these tests must be worked out in such a way that the tests made in one laboratory may be compared with those made in another with some degree of accuracy."⁴⁰

Tolerances for Standards: "Whenever the chemical or physical properties of the materials desired are of significance, specifications list the minimum, and sometimes the maximum, qualities—tensile strength, degrees of hardness, chemical purity, coloration, etc.—that the commodity delivered must possess. These quality specifications are sometimes supplemented by what are called tolerances, but the term tolerances when used in this connection includes quality as well as dimensional variations."⁴¹

³⁶ "Product Standardization," by Robert B. Harper, p. 15, Lecture at the Seventeenth Annual Meeting of the National Institute of Commercial and Trade Organization Executives, Northwestern University, Evanston, Illinois, August 15, 1939, mimeographed.

³⁷ "Standardization of Consumers' Goods: An Aid to Consumer-Buying," by Jessie V. Coles, p. 84, The Ronald Press Company, New York City, 1932.

³⁸ "A. S. T. M. Standards, 1939: Part I. Metals," p. iii, American Society for Testing Materials, Philadelphia, Pennsylvania, 1939.

³⁹ "Standardization of Consumers' Goods: An Aid to Consumer-Buying," by Jessie V. Coles, pp. 103, 104, The Ronald Press Company, New York City, 1932.

⁴⁰ *Ibid.*, p. 132.

⁴¹ "Industrial Standardization," pp. 25, 26, National Industrial Conference Board, Inc., New York City, 1929.

Trade Association Standards: See also Association Standards.

"The types of standardization involved in the work of the trade associations are, taking them as a whole, quite broad. Simplification, standardization of terms, definitions and technical nomenclature, quality and dimensional standards, codes of good practice, etc., are worked out either within the separate associations themselves; cooperatively with other trade associations, the technical societies and the Federal Government; or through sponsorship for sectional committees working under the procedure of the American Society for Testing Materials and the American Standards Association."⁴²

Voluntary Standards: "Voluntary standards, supported by a consensus of the various groups concerned."⁴³

"Voluntary Use of Standards by Producers—In the absence of laws requiring the use and preventing the misuse of particular standards, their adoption depends upon the industry concerned. While trade associations may establish standards, they do not possess the power of demanding their use. The use of such standards then depends upon their voluntary adoption by individual members of the association. Although cooperation of the majority may be expected when standards are set up by agreement, some usually wish to avoid the terms of the agreement."⁴⁴

⁴² "Industrial Standardization," p. 79, National Industrial Conference Board, Inc., New York City, 1929.

⁴³ "Functional Steps in the Development, Promulgation and Use of Standards for Consumer Goods," by P. G. Agnew, p. 1, American Standards Association, New York City, December 28, 1939, mimeographed.

⁴⁴ "Standardization of Consumers' Goods: An Aid to Consumer-Buying," by Jessie V. Coles, p. 181, The Ronald Press Company, New York City, 1932.

GRADE TERMINOLOGY OF FOOD PRODUCTS

The United States standards now in effect for agricultural products fall into two distinct categories. There are those which are made mandatory by national legislation, as in the case of grain and cotton, and those which may or may not be employed according to the choice of the individuals concerned. In this latter category are all of the standards for fruits and vegetables, dairy and poultry products, livestock, meats, wool, hay, dry edible beans, and processed foods.

Grade designations referred to in the following charts fall in the second category, or permissive standards. These standards were originally developed for the purpose of establishing a common language which could be used by the producer and the trade to facilitate trading operations. In each group of commodities, therefore, the terminology used to describe the grade has been influenced very largely by the common usage in the trade. For example, butter grades follow a score system having the top grade "93 score" and ranging downward to "85 score." There are four grades of eggs, designated as U. S. Special, U. S. Extra, U. S. Standard, and U. S. Trade. Fresh fruit and vegetable grades generally follow the numerical rating starting with U. S. No. 1 as the highest and ranging downward. Processed foods follow a set pattern of alphabetical designations of A, B, and C, with the permissive use of trade terms such as Fancy, Choice, Standard, and so forth.

Departures from the general plan of grade designations will be noted in many instances. For example, a top "U. S. Fancy" grade is provided for some fruits and vegetables, and "combination" and "commercial" grades are permitted between the U. S. No. 1 and U. S. No. 2 grade designations. "U. S. Extra No. 1," "Extra Standard," or "Choice" and some other special designations will be noted.

Examination of the charts illustrates the confusion that exists in the grade designations. So long as the grades are used largely in wholesale transactions by the trade which is more or less specialized in its operation the variations and special designations do not create a serious problem. This is true because in all such cases the variation has been brought about by some special condition that has arisen and the trade itself is responsible for the special case. Coordination and simplification of the grade designations is, however, needed when the products reach the retail or consumer stage.

Progress in the direction of simplified terminology for consumers is being made, notably in the case of canned goods, butter, and eggs. A considerable quantity of canned goods is now being marked with the A, B, or C designation on each individual can. The marking of the cans with U. S. Grade A, B, or C is also being developed on an experimental basis by a few canning plants that are under con-

tinuous supervision of Federal inspectors. A large quantity of butter is being marketed in retail channels under a "certificate of quality" that informs the consumer of the quality of the butter contained in the package. Simplified grade designations are also being carried through to the consumer in the marketing of eggs that are graded and packed in retail cartons under the supervision of a Federal inspector.

Objections to the use of uniform grade terminology in terms readily understood by the consumer has usually been based, first, upon the assumption that consumers would discriminate unduly against any commodity carrying a designation that indicated it was of second or third grade and, secondly, upon the fear of distributors that much of the value of brand advertising would be lost. There is, for example, a feeling among the trade that the consumer would be more likely to buy "Choice" beef than "Grade B" beef even though both terms refer to the same quality. There is also a feeling among distributors that if all products were uniformly labeled under standard quality grades the advantages to be gained through advertising and other means to build up preferences for private brands would be impaired.

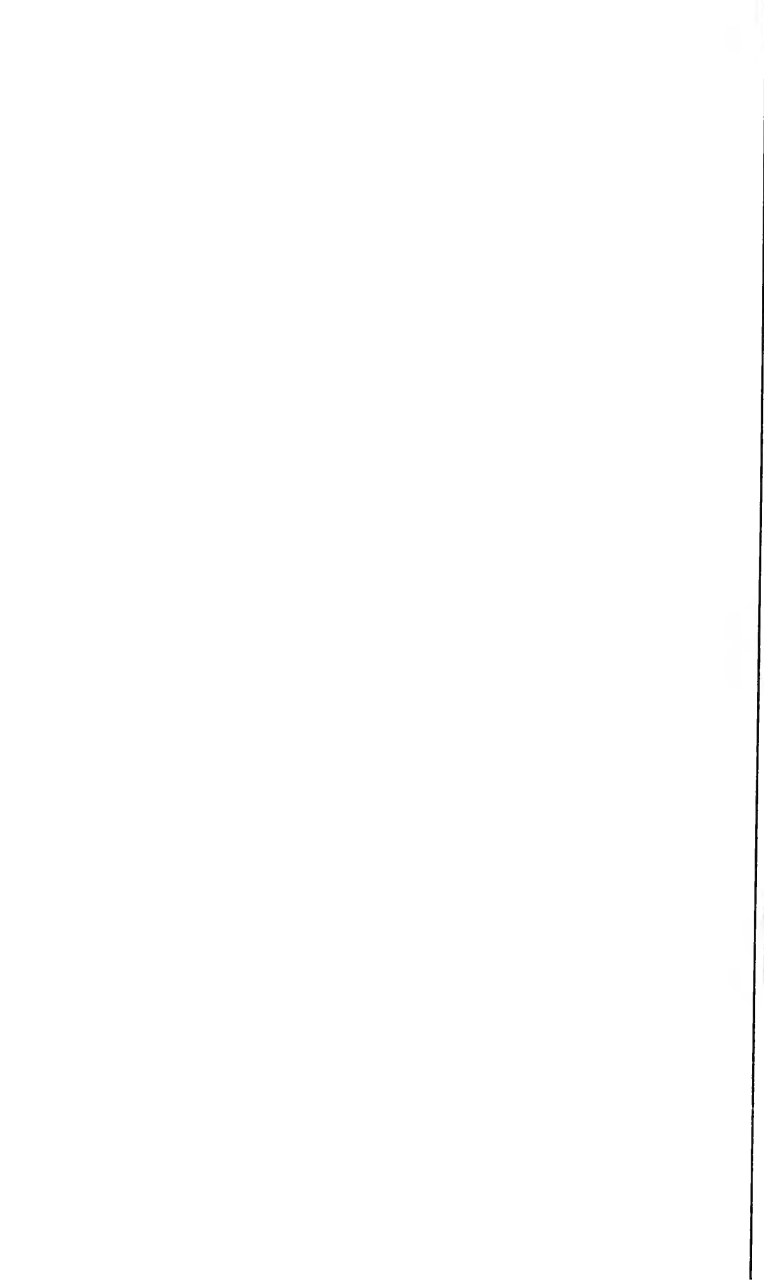
In the absence of legislation similar to that in effect for grain and cotton under which only official standards may be used, there is likely to be considerable lack of uniformity in grade specifications and the designations by which they are described. So long as grades and grade terminology are on a permissive basis, simplification and standardization of terms may be expected to progress only as rapidly as the demand for this type of information is made by consumers.

Food products—Grade designations as promulgated by Federal agencies

[These charts were prepared by Katherine R. Chesbro and Winifred E. Davis, members of the staff, Consumer Standards Project, Consumers' Counsel Division, Agricultural Adjustment Administration, U. S. Department of Agriculture, and Work Projects Administration]

Product	Grades													Source	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Dairy products:															
Butter.....	85 score.....	92 score.....	91 score.....	90 score.....	89 score.....	88 score.....	87 score.....	86 score.....	85 score.....						Official United States Standards for Quality of Creamery Butter, Nov. 1933, B. A. E. ¹
Buttermilk:															
Raw.....	A.....	B.....	C.....												Milk Ordinance and Code recommended by the U. S. Public Health Service, 1929 (Bull. 229, 1929 Edition), U. S. Public Health Service, Washington, D. C.
Pasteurized.....	A.....	B.....	C.....												
Cheese, American whole-milk.....	U. S. Extra Fancy.....	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....	Culls.....									Handbook for Use in the Inspection of Whole-Milk American Cheese Under the Food Products Inspection Law, (Cir. 157), Jan. 1923, Office Sec'y, U. S. Dept. Agric., Washington, D. C.
Cream, Sweet:															
Raw.....	Certified.....	A.....	B.....	C.....											Same as buttermilk.
Pasteurized.....	Certified.....	A.....	B.....	C.....											
Milk:															
Raw.....	Certified.....	A.....	B.....	C.....											Same as buttermilk.
Pasteurized.....	Certified.....	A.....	B.....	C.....											
Eggs.....	U. S. Special.....	U. S. Extra.....	U. S. Standard.....	U. S. Trade.....											Handbook of Official United States Standards for Eggs, June 1935, B. A. E. ¹
Fish:															
Tuna.....	Fancy.....	Standard.....	Flakes.....	White meat flakes.....											Trade Practice Rules for the Tuna Industry as Promulgated March 22, 1940, Proceedings to Amend Trade Practice Rules for Tuna Industry as Promulgated March 22, 1940, Apr. 8, 1940, Federal Trade Commission, Washington, D. C.
White-meat tuna.....	Fancy white meat.....	Standard white meat.....	Flakes.....	White meat flakes.....											
Fruits:															
Berries:															
Cherries.....															
Unpitted sulphured.....	U. S. No. 1.....	U. S. No. 2.....													United States Standards for Grades of Unpitted Sulphured Cherries, May 17, 1934, B. A. E. ¹
Pitted sulphured.....	U. S. No. 1.....	U. S. No. 2.....													United States Standards for Grades of Pitted Sulphured Cherries, May 17, 1934, B. A. E. ¹
Machine pitted.....	U. S. No. 1.....	U. S. No. 2.....													
Canned:															
Apples.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Sub-standard).....												United States Standards for Grades of Canned Apples, February 1938, B. A. E. ¹
Applesauce.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Sub-standard).....												United States Standards for Grades of Canned Apple Sauce, Jan. 25, 1934, B. A. E. ¹
Apricots ²	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water pack).....	U. S. F (Pie).....									Tentative United States Standards for Grades of Canned Apricots, October 1936, B. A. E. ¹
Blackberries ²	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water or Pie pack).....	U. S. F (Pie).....	not high grade off-grade (Sub-standard).....								Tentative United States Standards for Grades of Canned Blackberries, May 3, 1940, A. M. S. ¹
Cherries.....															
Red sour pitted.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade ⁴												United States Standards for Grades of Canned Red Sour Pitted Cherries, May 3, 1940, A. M. S. ¹
Sweet.....	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water or Pie).....	Off-grade ⁴									United States Standards for Grades of Canned Sweet Cherries, May 3, 1940, A. M. S. ¹
Grapefruit.....	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. Broken.....	Off-grade.....											United States Standards for Grades of Canned Grapefruit, (S. R. A. 149), August 1934, B. A. E. ¹
Grapefruit juice ²	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Sub-standard).....												Tentative United States Standards for Grades of Canned Grapefruit Juice, Feb. 25, 1939, B. A. E. ¹
Peaches, yellow clingstone ¹	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water pack).....	U. S. F (Pie).....	not high grade off-grade (Sub-standard).....								Tentative United States Standards for Grades of Canned Peaches (Yellow Clingstone), June 1935, B. A. E. ¹
Pears ²	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water pack).....	U. S. F (Pie).....	not high grade off-grade (Sub-standard).....								Tentative United States Standards for Grades of Canned Pears, June 1936, B. A. E. ¹
Plums ¹	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water pack).....	U. S. F (Pie).....	not high grade off-grade (Sub-standard).....								Tentative United States Standards for Grades of Canned Plums (Italian Plums—Canned Fresh), Not Dated, B. A. E. ¹
Raspberries, red ¹	U. S. A (Fancy).....	U. S. B (Choice).....	U. S. C (Standard).....	U. S. D (Seconds).....	U. S. E (Water or pie pack).....	Off-Grade (Sub-standard).....									Tentative United States Standards for Grades of Canned Red Raspberries, May 3, 1940, A. M. S. ¹

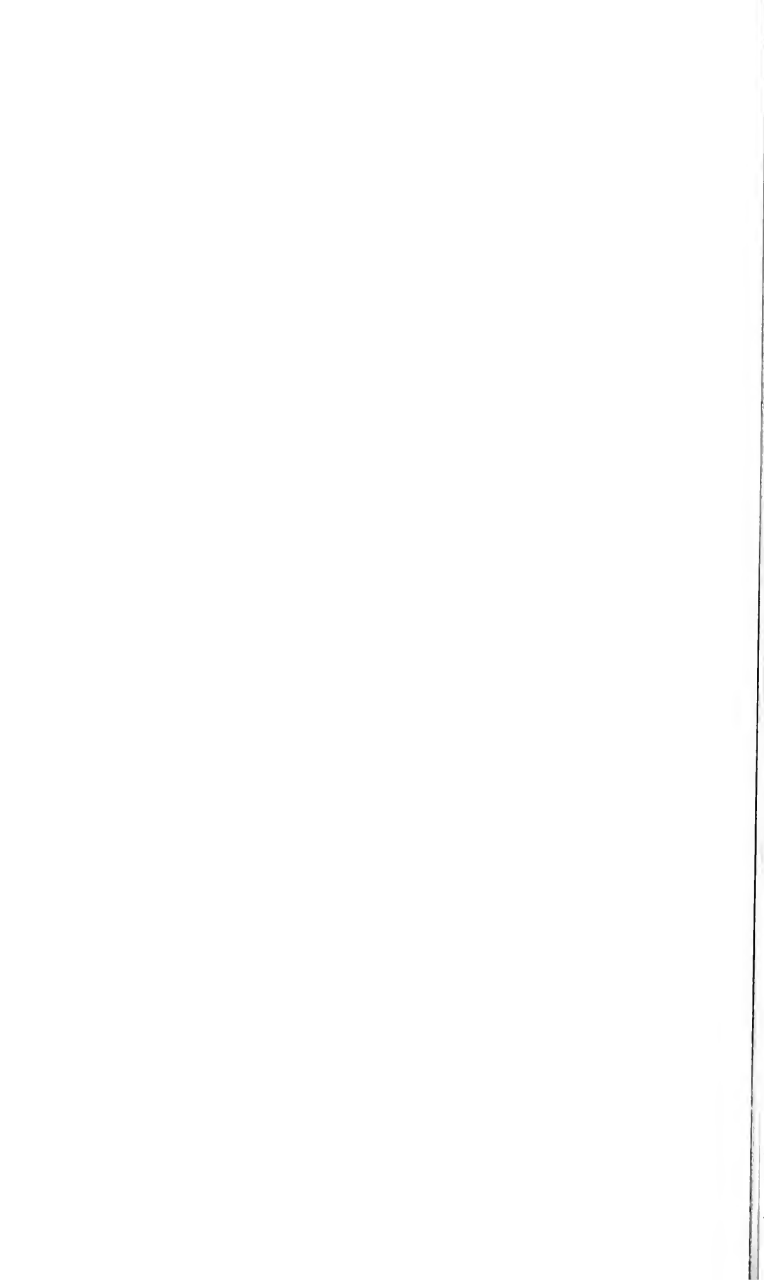
See footnotes at end of table



Food products—Grade designations as promulgated by Federal agencies—Continued

Product	Grades													Source
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Fruits—Continued.														
Dried: Prunes	U. S. A (Fancy)	U. S. B (Extra Choice)	U. S. C (Standard)	Substandard										Tentative United States Standards Dried Prunes, Sept. 1930, A. M. S. ⁴
Fresh:														
Apples	U. S. Fancy ¹	U. S. No. 1	U. S. Commercial ¹	U. S. No. 1 Early	U. S. Utility ¹	U. S. Utility Early	U. S. Hill							United States Standards for Apples (S. R. A. 154), Oct. 1937, B. A. E. ³ U. S. Standards for Apples (1929), May 28, 1929, B. A. E. ³ U. S. Standards for Apples (1929), May 10, 1927, B. A. E. ³
Apricots	U. S. No. 1	U. S. No. 2												U. S. Standards for Apricots (1929), May 28, 1929, B. A. E. ³ U. S. Standards for Apricots (1929), May 10, 1927, B. A. E. ³
Cantaloupes	U. S. No. 1	U. S. Commercial												U. S. Standards for Cantaloupes, May 10, 1927, B. A. E. ³
Cherries, sweet	U. S. No. 1	U. S. No. 2												U. S. Standards for Sweet Cherries (rev. June 2, 1927, B. A. E. ³) U. S. Standards for Cherry Fruits, Sept. 1930, A. M. S. ⁴
Citrus fruits (except California and Arizona)	U. S. Fancy	U. S. No. 1	U. S. No. 1 Bright	U. S. No. 1 Golden	U. S. No. 1 Bronze	U. S. No. 1 Russet	U. S. Combination	U. S. Combination Russet	U. S. No. 2	U. S. No. 2 Bright	U. S. No. 2 Russet	U. S. No. 3	Culls	U. S. Standards for Dried Cherries (1923), Feb. 13, 1928, B. A. E. ³ U. S. Standards for California and Arizona Grapefruit, May 1, 1937, B. A. E. ³
Dewberries and blackberries	U. S. No. 1	U. S. No. 2												U. S. Standards for Dewberries and Blackberries (1923), Feb. 13, 1928, B. A. E. ³
Grapefruit, Arizona and California	U. S. Fancy	U. S. No. 1	U. S. No. 2	U. S. No. 3										U. S. Standards for California and Arizona Grapefruit, May 1, 1937, B. A. E. ³
Grapes:														
Eastern type, American bunch ²	U. S. Fancy Table	U. S. No. 1 Table	U. S. No. 1 Juice											U. S. Standards for American (Eastern Type) Bunch Grapes (1930), July 14, 1930, B. A. E. ³
European or violina type:														
Juice	U. S. No. 1 Juice	U. S. No. 1 Mixed Juice	U. S. No. 2 Juice	U. S. No. 2 Mixed Juice										U. S. Standards for Juice Grapes, July 14, 1930, A. M. S. ⁴
Sawdust pack	U. S. Fancy Sawdust Pack	U. S. No. 1 Sawdust Pack												U. S. Standards for Sawdust Pack Grapes, July 11, 1930, A. M. S. ⁴
Table	U. S. Fancy Table	U. S. No. 1 Table												U. S. Standards for Table Grapes July 14, 1930, A. M. S. ⁴
Lemons ¹	U. S. No. 1	U. S. Combination	U. S. No. 2	U. S. No. 3										U. S. Standards for Lemons, Dec. 27, 1927, B. A. E. ³
Limes, Persian (Tabiti)	U. S. No. 1	U. S. Combination	U. S. No. 2											U. S. Standards for Persian (Tabiti) Limes, Apr. 25, 1930, B. A. E. ³
Melons, honey dew and honey ball type	U. S. No. 1	U. S. Commercial	U. S. No. 2											U. S. Standards for Honey Dew and Honey Ball Type Melons, May 10, 1927, B. A. E. ³
Nectarines	U. S. Fancy	U. S. Extra No. 1	U. S. No. 1	U. S. Combination	U. S. No. 2									U. S. Standards for Nectarines, July 21, 1930, B. A. E. ³
Oranges, Arizona and California	U. S. Fancy	U. S. No. 1	U. S. No. 2	U. S. No. 3										U. S. Standards for California and Arizona Oranges, May 1, 1937, B. A. E. ³
Peaches	U. S. Fancy	U. S. Extra No. 1	U. S. No. 1	U. S. No. 2										U. S. Standards for Peaches (1933), B. A. E. ³
Pears:														
Summer and fall	U. S. No. 1	U. S. Combination	U. S. No. 2											U. S. Standards for Summer and Fall Pears, June 28, 1930, A. M. S. ⁴
Winter	U. S. Extra No. 1	U. S. No. 1	U. S. Combination	U. S. No. 2										U. S. Standards for Winter Pears, June 28, 1930, A. M. S. ⁴
Pineapples:														
Except Puerto Rican ¹	U. S. No. 1	U. S. No. 2												Suggested Tentative U. S. Grades for Pineapples (1931), Dec. 4, 1931, B. A. E. ³
Puerto Rican	U. S. Fancy	U. S. No. 1	U. S. No. 2											U. S. Standards for Puerto Rican Pineapples (1931), Oct. 27, 1931, B. A. E. ³
Plums and prunes	U. S. Fancy	U. S. No. 1	U. S. No. 2											U. S. Standards for Plums and Prunes (Fresh), May 28, 1937, B. A. E. ³
Raspberries	U. S. No. 1	U. S. No. 2												U. S. Standards for Raspberries (1931), May 29, 1931, B. A. E. ³
Strawberries	U. S. No. 1	U. S. No. 2												U. S. Standards for Strawberries, Nov. 12, 1931, B. A. E. ³
Watermelons	U. S. No. 1	U. S. No. 2	U. S. No. 3											U. S. Standards for Watermelons, June 22, 1930, B. A. E. ³
For canning:														
Apples	U. S. No. 1	U. S. No. 2	Culls											U. S. Standards for Cannery Apples (1930), July 23, 1930, B. A. E. ³
Pears	U. S. No. 1	U. S. No. 2	Culls											U. S. Standards for Pears for Canning, June 6, 1930, B. A. E. ³
For freezing: Strawberries, washed and sorted.	U. S. No. 1													U. S. Standards for Washed and Sorted Strawberries for Freezing, May 25, 1935, B. A. E. ³
For manufacture:														
Cherries, red sour	U. S. No. 1	U. S. No. 2	U. S. No. 3	U. S. No. 4										U. S. Standards for Red Sour Cherries for Manufacture (1931), revised Aug. 2, 1935, A. M. S. ⁴
Strawberries, growers' stock	U. S. No. 1	U. S. No. 2	U. S. No. 3	U. S. No. 4										U. S. Standards for Growers' Stock Strawberries for Manufacture, May 25, 1935, B. A. E. ³

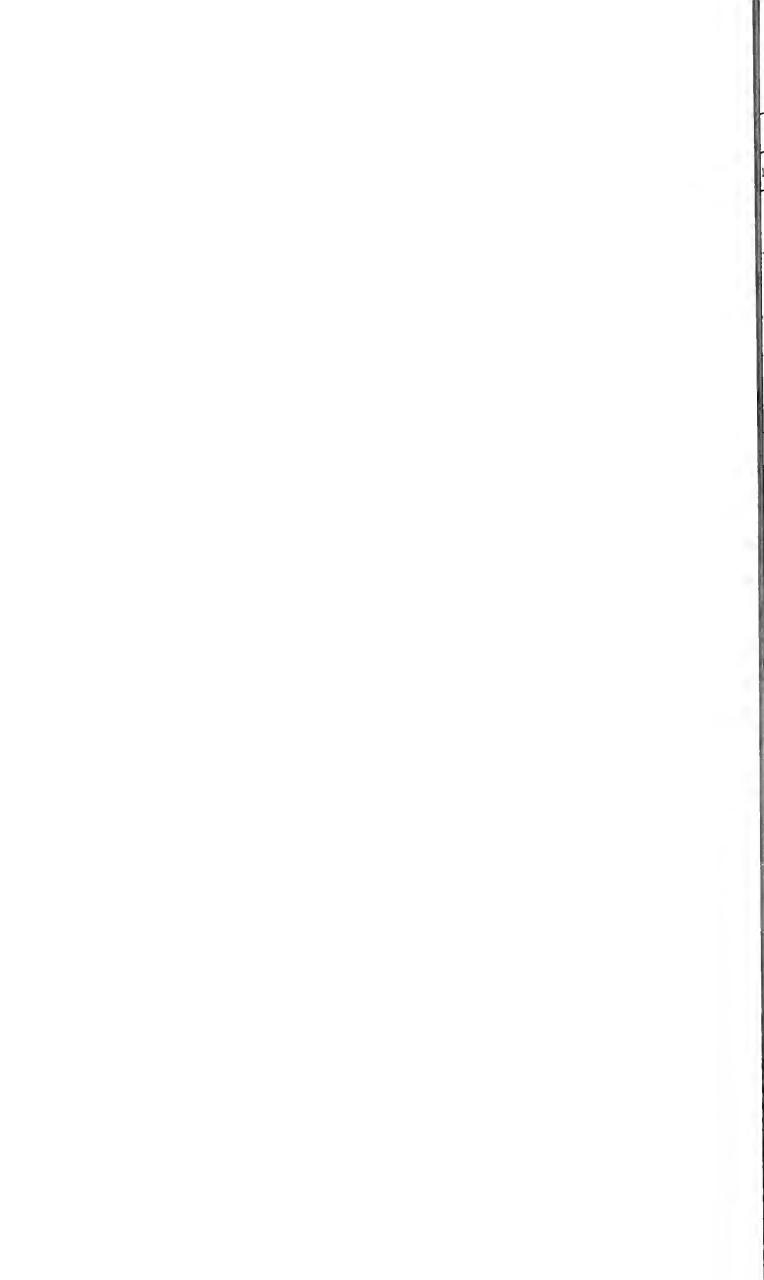
See footnotes at end of table.



Food products—Grade designations as promulgated by Federal agencies—Continued

Product	Grades													Source				
	1	2	3	4	5	6	7	8	9	10	11	12	13					
Honey:																		
Extracted.....	U. S. Fancy	U. S. No. 1	U. S. No. 2														United States Grades, Color Standards, and Packing Requirements for Honey (Circular 24), rev. Aug. 1933, Bureau of Entomology, U. S. Dept. of Agric., Washington, D. C., and B. A. E. ¹	
Comb-section.....	U. S. Fancy	U. S. No. 1																
Shallow-frame comb.....	U. S. Fancy	U. S. No. 1																
Wrapped cut-comb.....	U. S. Fancy	U. S. No. 1																
Chunk or bulk comb honey:																		
Packed in tin.....	U. S. Fancy	U. S. No. 1																
Packed in glass.....	U. S. Fancy	U. S. No. 1																
Maple Syrup:																		U. S. Standards for Table Maple Syrup, Feb. 7, 1940, A. M. S. ²
For table use.....	U. S. AA (Fancy)	U. S. A	U. S. B															
For reprocessing.....	U. S. AA (Fancy)	U. S. A	U. S. B	U. S. C														U. S. Standards for Maple Syrup for Reprocessing, Feb. 7, 1940, A. M. S. ²
Meat:																		
Cattle:																		
Feeder and stocker steers, heifers, cows.....	U. S. Fancy (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Inferior (No. 5)											Market Classes and Grades of Feeder and Stocker Cattle, (Circular 505) Oct. 1933, U. S. Dept. Agric., Washington, D. C.	
Slaughter:																		
Steers, heifers.....	U. S. Prime (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cutter (No. 5)	U. S. Low Cutter (No. 6)										Official United States Standards for Grades of Slaughter Cattle (S. R. A. 112), Sept. 1928, B. A. E. ¹	
Cows, stags.....	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cutter (No. 5)	U. S. Low Cutter (No. 6)												
Bulls.....	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cutter (No. 5)													
Beef:																		
Carcases:																		
Mature:																		
Steer and heifer.....	U. S. Prime	U. S. Choice	U. S. Good	U. S. Commercial	U. S. Utility	U. S. Cutter	U. S. Canner										Amendment No. 1 to Service and Regulatory Announcements No. 96, Official United States Standards for Grades of Carcase Beef, July 1939, A. M. S. ²	
Cow.....	U. S. Good	U. S. Commercial	U. S. Utility	U. S. Cutter	U. S. Canner													
Bull and stag.....	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cutter (No. 5)	U. S. Low Cutter (No. 6)											Official United States Standards for Grades of Carcase Beef (S. R. A. 90), June 1928, U. S. Dept. Agric., Washington, D. C.	
Yearling.....	U. S. Prime (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cutter (No. 5)											Market Classes and Grades of Yearling Beef (Circular 208), rev. Dec. 1936, U. S. Dept. Agric., Washington, D. C.	
Veal and calf:																		
Carcases:	U. S. Prime (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cull (No. 5)											Official United States Standards for Grades of Veal and Calf Carcases (S. R. A. 114), Sept. 1928, U. S. Dept. Agric., Washington, D. C.	
Calves and vealers.....	U. S. Prime (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cull (No. 5)											Official United States Standards for Grades of Vealer and Slaughter Calves (S. R. A. 113), Sept. 1928, U. S. Dept. Agric., Washington, D. C.	
Lamb and mutton:																		
Carcases:	U. S. Prime (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cull (No. 5)											Official United States Standards for Grades of Lamb Carcases, Yearling Mutton, and Mutton Carcases (S. R. A. 121), Mar. 1931, U. S. Dept. Agric., Washington, D. C.	
Feeders:	U. S. Fancy (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Inferior (No. 5)												
Slaughter:	U. S. Prime (No. 1)	U. S. Choice (No. 1)	U. S. Good (No. 2)	U. S. Medium (No. 3)	U. S. Common (No. 4)	U. S. Cull (No. 5)											Market Classes and Grades of Lambs and Sheep (Circular 282), Mar. 1939, U. S. Dept. Agric., Washington, D. C.	
Pork:																		
Fresh Cuts:																		
Fat-Type, Meat-Type, Saw, Slinger, Roasting, Stog.....	U. S. No. 1	U. S. No. 2	U. S. No. 3	Cull													Market Classes and Grades of Pork Carcases and Fresh Pork Cuts (Circular 280 Oct. 1935, U. S. Dept. Agric., Washington, D. C.)	
Slaughter: Barrows and Gilts.....	U. S. Choice	U. S. Good	U. S. Medium	Cull													Temporary U. S. Standards for Classes and Grades of Slaughter Barrows and Gilts, July 31, 1931, B. A. E. ¹	
Poultry:																		
Dressed:																		
Chickens:	U. S. Special (AA)	U. S. Prime (A)	U. S. Choice (B)	U. S. Commercial (C)														
Ducks:	U. S. Prime (Old) or U. S. A (Choice)	U. S. Prime (Old) or U. S. A (Choice)	U. S. Choice (Young)	U. S. Choice (Old) or U. S. B (Old)	U. S. Commercial or U. S. C												Classification and Tentative Specifications for U. S. Standards and Grades for Dressed Chickens; Tentative Specifications for U. S. Standards and Grades for Dressed Turkeys, Geese, Guinea, and Squabs, rev. Mar. 1938, B. A. E. ¹	
Geese:	U. S. Prime (A)	U. S. Choice (B)	U. S. Commercial (C)															
Guinea:	U. S. Prime (Young) or U. S. A (Young)	U. S. Prime (Old) or U. S. A (Old)	U. S. Choice (Young) or U. S. B (Young)	U. S. Choice (Old) or U. S. B (Old)	U. S. Commercial or U. S. C													
Squabs:	U. S. Prime (A)	U. S. Choice (B)	U. S. Commercial (C)															

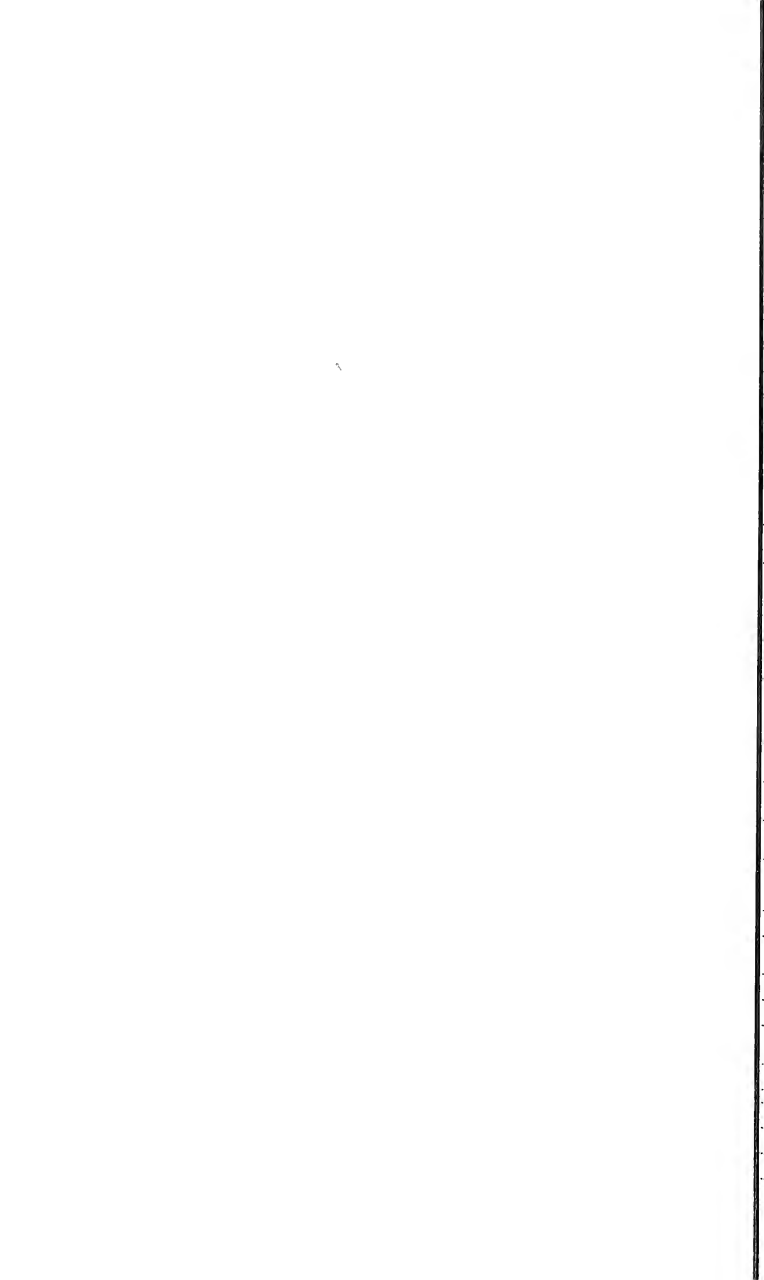
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Food products—Grade designations as promulgated by Federal agencies—Continued

Product	Grades													Source
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Meats—Continued.														
Poultry—Continued.														
Livestock—Continued.														
Turkeys.....	U. S. Special (A.A.)	U. S. Prime (A.)	U. S. Choice (B.)	U. S. Commercial (C.)										
Live ¹	U. S. A.	U. S. B.	U. S. C.											
Rabbits, dressed domestic ²	U. S. Prime	U. S. Choice	U. S. Commercial											
Not:														
Peas:														
Runners:														
Farmers' stock (unshelled).....	U. S. No. 1	U. S. No. 2	U. S. No. 3											
Shelled.....	U. S. No. 1	U. S. No. 2												
Virginia type:														
Cleaned (unshelled).....	U. S. Jumbo Hand Picked.	U. S. Fancy Hand Picked.	U. S. Extra Hand Picked.											
Farmers' stock (unshelled).....	U. S. No. 1	U. S. No. 2	U. S. No. 3											
Shelled.....	U. S. Extra Large Virginia Shelled.	U. S. Medium Virginia Shelled.	U. S. No. 1 Virginia Shelled.	U. S. No. 2 Virginia Shelled.	U. S. Virginia Splits.									
White Spanish:														
Farmers' stock (unshelled).....	U. S. No. 1	U. S. No. 2	U. S. No. 3											
Shelled.....	U. S. No. 1	U. S. No. 2												
Pecans:														
Shelled.....	U. S. No. 1 Halves	U. S. No. 1 Pieces												
Unshelled.....	U. S. No. 1	U. S. No. 2												
Walnuts:														
English:														
Shelled.....	U. S. No. 1 Halves	U. S. No. 1 Extra Light Halves.	U. S. No. 1 Halves and Pieces.	U. S. No. 1 Pieces.	U. S. No. 2	U. S. No. 3								
Unshelled.....	U. S. No. 1	U. S. No. 2	U. S. No. 3											
Rice:														
Milled.....	U. S. No. 1 (Extra Fancy)	U. S. No. 2 (Fancy)	U. S. No. 3 (Extra Choice)	U. S. No. 4 (Choice)	U. S. No. 5 (Mediam)									
Brown, (except following).....	U. S. Extra Fancy	U. S. Fancy	U. S. Choice											
California-Javan, Calsaly.....	U. S. Fancy	U. S. No. 1	U. S. No. 2											
Rough (except following).....	U. S. No. 1	U. S. No. 2	U. S. No. 3	U. S. No. 4	U. S. No. 5	U. S. No. 6								
Shilling quality ³	U. S. Prime	U. S. Good	U. S. Medium	U. S. Fair	U. S. Ordinary	U. S. Low								
Vegetables:														
Barreled: Sauerkraut.....	U. S. A (First)	U. S. C (Second)	Off-Grade (Sub-standard)											
Canned:														
Asparagus ⁴	U. S. A (Fancy)	U. S. C (Standard)	Off-Grade (Sub-standard)											
Beans:														
Dry ⁵	U. S. A (Fancy)	U. S. C (Standard)	Off-Grade (Sub-standard)											
Lima ⁶	U. S. A (Fancy)	U. S. B (Extra Standard)	U. S. C (Standard)	Off-Grade (Sub-standard)										
Snap (or stringless).....	U. S. A (Fancy)	U. S. B (Extra Standard)	U. S. C (Standard)	Off-Grade (Sub-standard)										

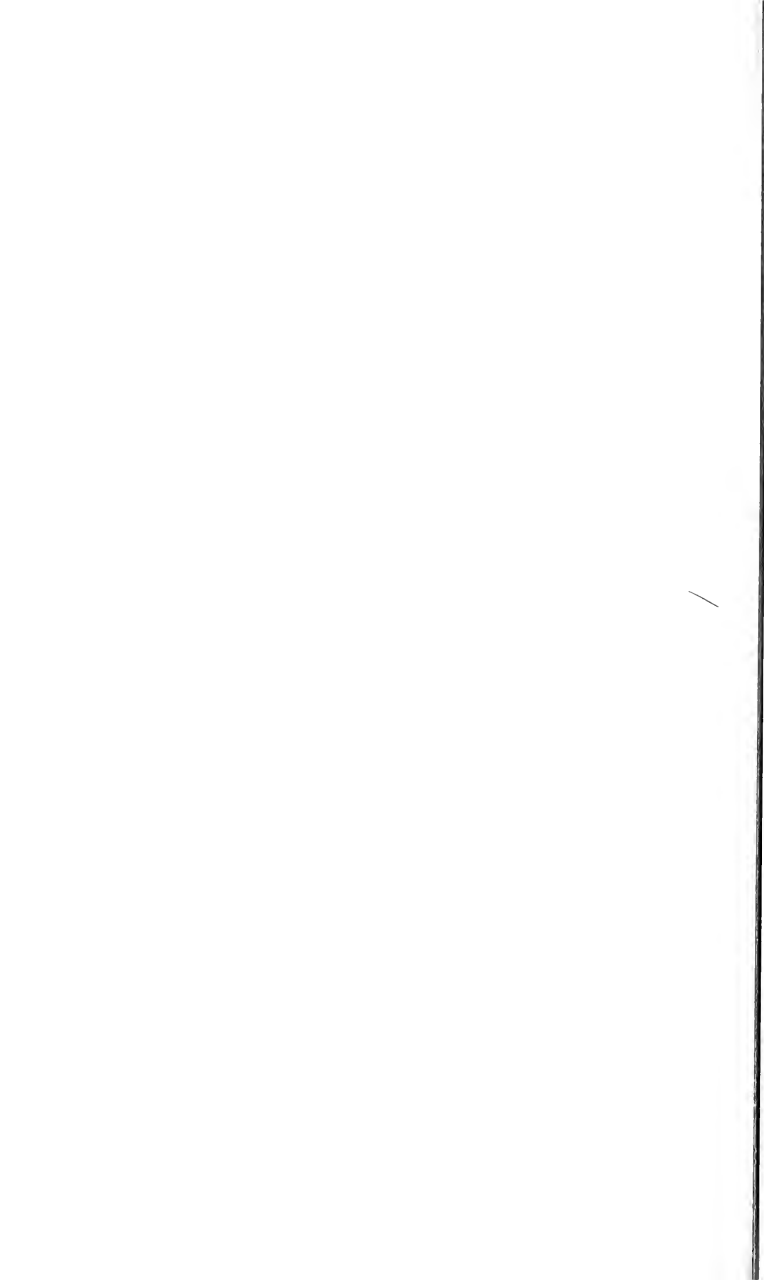
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Food products—Grade designations as promulgated by Federal agencies—Continued

Product	Grades													Source	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
Vegetables—Continued.															
Canned—Continued.															
Beets.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											United States Standards for Grades of Canned Beets, May 1935, B. A. E. ¹	
Carrots.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Carrots, June 1935, B. A. E. ¹	
Corn:															
Cream style.....	U. S. A (Fancy).....	U. S. B (Extra Standard or Choice).....	U. S. C (Standard).....	Off-grade (Substandard).....										United States Standards for Grades of Canned Corn, Cream Style (S. R. A. 130), Feb. 1933, B. A. E. ¹	
Whole-grain style.....	U. S. A (Fancy).....	U. S. B (Extra Standard or Choice).....	U. S. C (Standard).....	Off-grade (Substandard).....										United States Standards for Grades of Canned Corn, Whole-Grain Style (S. R. A. 131), Feb. 1933, B. A. E. ¹	
Mushrooms:*															
Whole or button.....	U. S. A (Fancy).....	U. S. C (Standard).....												Tentative United States Standards for Grades of Canned Mushrooms, June 1935, B. A. E. ¹	
Sliced.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Okra, Oct. 19, 1933, B. A. E. ¹	
Okra.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Okra, Oct. 19, 1933, B. A. E. ¹	
Peas.....	U. S. A (Fancy).....	U. S. B (Extra Standard or Choice).....	U. S. C (Standard).....	Off-grade Quality (Substandard).....										United States Standards for Grades of Canned Peas (S. R. A. 140), Apr. 1933, B. A. E. ¹	
Pimientos.....	U. S. A (Fancy).....	U. S. A Pieces (Fancy).....	U. S. C (Standard).....	U. S. C Pieces (Standard).....	Off-grade (Substandard).....									Tentative United States Standards for Grades of Canned Pimientos Oct. 6, 1933, B. A. E. ¹	
Potatoes, sweet:.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Sweet Potatoes, Aug. 1, 1934, B. A. E. ¹	
Pumpkin and squash.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Pumpkin (and Squash), Feb. 8, 1933, B. A. E. ¹	
Sauerkraut.....	U. S. A (First).....	U. S. C (Second).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Sauerkraut, Feb. 8, 1933, B. A. E. ¹	
Spinach and other greens.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											Tentative United States Standards for Grades of Canned Spinach (and Other Greens including Turnip and Mustard Greens), Feb. 10, 1933, B. A. E. ¹	
Tomatoes.....	U. S. A ¹ (Fancy).....	U. S. B (Extra Standard).....	U. S. C (Standard).....	Substandard.....										United States Standards for Grades of Canned Tomatoes, Aug. 17, 1940, A. M. S. ²	
Tomato catchup.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											United States Standards for Grades of Tomato Catchup (Canned or Bottled), Jan. 25, 1934, B. A. E. ¹	
Tomato Juice.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											United States Standards for Grades of Tomato Juice (Canned or Bottled), Aug. 28, 1938, A. M. S. ²	
Tomato pulp.....	U. S. A (Fancy).....	U. S. C (Standard).....	Off-grade (Substandard).....											United States Standards for Grades of Canned Tomato Pulp, Jan. 25, 1934, B. A. E. ¹	
Dried:															
Peas.....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....											Official U. S. Standards for Dry Peas, revised July 1937, B. A. E. ¹	
Split peas.....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....											Official U. S. Standards for Split Peas, Aug. 6, 1937, B. A. E. ¹	
Fresh:															
Anise, sweet.....	U. S. No. 1.....													U. S. Standards for Sweet Anise (1930), Dec. 3, 1930, B. A. E. ¹	
Artichokes, globe.....	U. S. No. 1.....	U. S. No. 2.....												U. S. Standards for Globe Artichokes (1930), B. A. E. ¹	
Asparagus.....	U. S. No. 1.....	U. S. No. 2.....												U. S. Standard for Asparagus (Fresh), Mar. 1933, B. A. E. ¹	
Beans:															
Dry edibles (except Lima).....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....											Handbook of Official United States Standards for Beans, revised Aug. 1935, B. A. E. ¹	
Lima.....	U. S. Extra No. 1.....	U. S. No. 1.....	U. S. No. 2.....											U. S. Standards for Fresh Lima (Fava) Beans (1931), Apr. 16, 1931, B. A. E. ¹	
Fava (Fava).....	U. S. No. 1.....													U. S. Standards for Lima Beans, Dec. 23, 1937, B. A. E. ¹	
Lima.....	U. S. No. 1.....	U. S. Combination.....	U. S. No. 2.....											U. S. Standards for Snap Beans, July 24, 1936, B. A. E. ¹	
Snap.....	U. S. Fancy.....	U. S. No. 1.....	U. S. Combination.....	U. S. No. 2.....										Handbook of Official United States Standards for Soybeans, 1935, B. A. E. ¹	
Soybeans.....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....	U. S. No. 4.....											

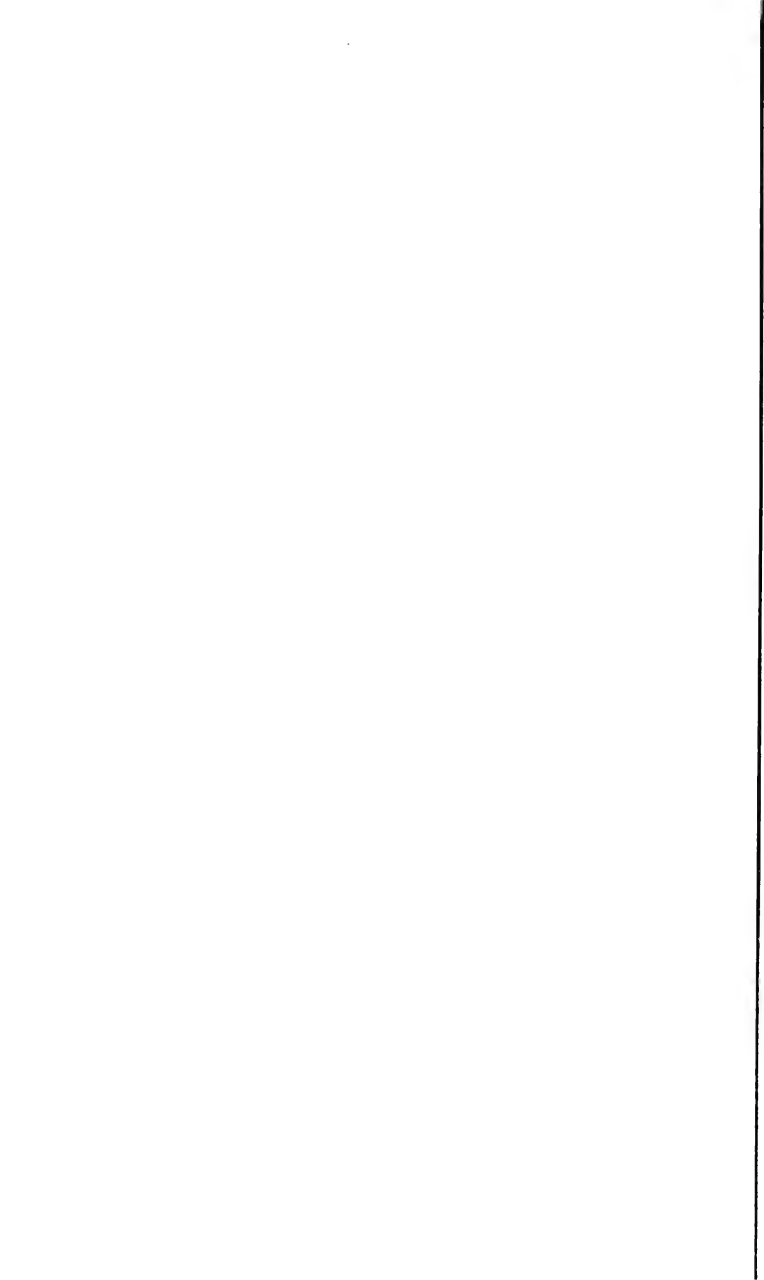
See footnotes at end of table.



Food products—Grade designations as promulgated by Federal agencies—Continued

Product	Grades													Source		
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Vegetables—Continued.																
Fresh—Continued.																
Beets:																
Bunched.....	U. S. No. 1.....															U. S. Standards for Bunched Beets (1927, Aug. 9, 1927, B. A. E. 1)
Topped.....	U. S. No. 1.....															U. S. Standards for Topped Beets Apr. 22, 1934, B. A. E. 1
Broccoli, bunched Italian sprouting.....	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....													U. S. Standards for Bunched Italian Sprouting Broccoli, Sept. 18, 1940, A. M. S. 1
Cabbages.....	U. S. No. 1.....	U. S. Commercial.....														U. S. Standards for Cabbages, Dec. 18, 1939, A. M. S. 1
Carrots:																
Bunched.....	U. S. No. 1.....															U. S. Standards for Bunched Carrots, Dec. 3, 1937, B. A. E. 1
Topped.....	U. S. No. 1.....															U. S. Standards for Topped Carrots, (1928), Oct. 24, 1928, B. A. E. 1
Cauliflower.....	U. S. No. 1.....															U. S. Standards for Cauliflower, July 31, 1939, A. M. S. 1
Celery, rough.....	U. S. Fancy.....	U. S. No. 1.....	U. S. Combination.....	U. S. No. 2.....												U. S. Standards for Rough Celery, Dec. 20, 1937, B. A. E. 1
Corn, green.....	U. S. Fancy.....	U. S. No. 1.....														U. S. Standards for Green Corn (1927), Jan. 20, 1927, B. A. E. 1
Cucumbers, greenhouse.....	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....													U. S. Standards for Greenhouse Cucumbers, Sept. 14, 1934, B. A. E. 1
Eggplant.....	U. S. No. 1.....	U. S. No. 2.....														U. S. Standards for Eggplant, Nov. 18, 1935, B. A. E. 1
Endive or escarole or chicory.....	U. S. No. 1.....															U. S. Standards for Endive or Escarole or Chicory, June 15, 1931, B. A. E. 1
Garlic.....	U. S. No. 1.....															U. S. Standards for Garlic, Aug. 26, 1934, B. A. E. 1
Horseradish roots.....	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....													U. S. Standards for Horseradish Roots, July 20, 1939, B. A. E. 1
Kale.....	U. S. No. 1.....	U. S. Commercial.....														U. S. Standards for Kale, Apr. 20, 1934, B. A. E. 1
Lettuce (except greenhouse leaf):																
Greenhouse leaf.....	U. S. Fancy.....	U. S. No. 1.....	U. S. Commercial.....	U. S. No. 2.....												U. S. Standards for Lettuce, Mar. 1, 1934, B. A. E. 1
Mushrooms.....	U. S. No. 1.....															U. S. Standards for Greenhouse Leaf Lettuce, Sept. 14, 1934, B. A. E. 1
Mustard greens.....	U. S. No. 1.....															U. S. Standards for Mushrooms (1928), Oct. 1, 1928, B. A. E. 1
Okra.....	U. S. No. 1.....															U. S. Standards for Mustard Greens (1928), Dec. 18, 1928, B. A. E. 1
Onions:																U. S. Standards for Okra (1928), Dec. 18, 1928, B. A. E. 1
Bermuda.....	U. S. No. 1.....	U. S. Commercial.....	U. S. No. 2.....													U. S. Standards for Bermuda Onions Mar. 16, 1927, B. A. E. 1
Creole.....	U. S. No. 1.....															U. S. Standards for Creole Onion (1950), May 6, 1950, B. A. E. 1
Northern grown ¹¹	U. S. No. 1.....	U. S. Commercial.....														U. S. Standards for Northern Grown Onions, July 10, 1939, A. M. S. 1
Onion sets.....	U. S. No. 1.....	U. S. No. 2.....														U. S. Standards for Onion Sets, Jan. 25, 1949, A. M. S. 1
Parsley.....	U. S. No. 1.....															U. S. Standards for Parsley (1930), July 30, 1930, B. A. E. 1
Pea.....	U. S. Fancy.....	U. S. No. 1.....														U. S. Standards for Fresh Peas, Jan. 5, 1934, B. A. E. 1
Peppers, sweet ¹⁴	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....													U. S. Standards for Sweet Peppers (1929), Sept. 30, 1929, B. A. E. 1
Potatoes:																
White.....	U. S. Fancy.....	U. S. Extra No. 1.....	U. S. No. 1.....	U. S. Commercial.....	U. S. No. 2.....											U. S. Standards for Potatoes (1918, R. A. 151), Harvested May 1946, A. M. S. 1
Sweet.....	U. S. Fancy.....	U. S. Extra No. 1.....	U. S. No. 1.....	U. S. No. 2.....												U. S. Standards for Sweet Potatoes, June 1, 1937, B. A. E. 1
Radishes, bunched.....	U. S. No. 1.....															U. S. Standards for Bunched Radishes (1929), Feb. 25, 1929, B. A. E. 1
Rhubarb, field grown.....	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....													U. S. Standards for Rhubarb (Field Grown), Mar. 1931, B. A. E. 1
Romaine.....	U. S. No. 1.....															U. S. Standards for Romaine (1928), Dec. 18, 1928, B. A. E. 1
Shallots, bunched.....	U. S. No. 1.....	U. S. No. 2.....														U. S. Standards for Bunched Shallots, Oct. 1, 1934, B. A. E. 1
Spinach (except New Zealand).....	U. S. No. 1.....	U. S. Commercial.....														U. S. Standards for Spinach (1931), Sept. 4, 1931, B. A. E. 1
Tomatoes (except greenhouse).....	U. S. No. 1.....	U. S. No. 2.....														U. S. Standards for Fresh Tomatoes, Aug. 22, 1934, B. A. E. 1
Greenhouse.....	U. S. Fancy.....	U. S. No. 1.....	U. S. No. 2.....													U. S. Standards for Greenhouse Tomatoes, Sept. 14, 1934, B. A. E. 1

See footnotes at end of table.



Food products—Grade designations as promulgated by Federal agencies—Continued

Product	Grades													Source		
	1	2	3	4	5	6	7	8	9	10	11	12	13			
Vegetables—Continued.																
Fresh—Continued.																
Turnips:																
Bunched.....	U. S. No. 1.....															U. S. Standards for Bunched Turnips (1927), Aug. 9, 1927, B. A. E. ¹
Topped or rutabagas.....	U. S. No. 1.....															U. S. Standards for Topped Turnips or Rutabagas, Mar. 21, 1935, B. A. E. ¹
Greens (except seven top turnip)	U. S. No. 1.....															U. S. Standards for Turnip Greens (1928), Dec. 18, 1928, B. A. E. ¹
Frozen: Peas ²	U. S. A (Fancy).....	U. S. B (Extra Standard).....	Off-grade Quality.....													Tentative United States Standards for Grades of Frozen Peas, May 1939 B. A. E. ¹
For canning:																
Asparagus, green.....	U. S. No. 1.....	U. S. No. 2.....	Culls.....													U. S. Standards for Green Asparagus for Canning or Freezing, Dec. 20, 1937, B. A. E. ¹
Beans, snap.....	U. S. No. 1.....	U. S. No. 2.....	Culls.....													U. S. Standards for Snap Beans for Canning or Freezing, Feb. 26, 1940, A. M. S. ³
Corn, sweet—classes A, B, C.....	U. S. No. 1.....	U. S. No. 2.....														Development of a Grading and Inspection System for the Purchase of Sweet Corn for Canning, Feb. 21, 1935, B. A. E. ¹
Spinach.....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....													U. S. Standards for Fresh Spinach for Canning (1931), Apr. 19, 1931, B. A. E. ¹
Tomatoes.....	U. S. No. 1.....	U. E. No. 2.....	Culls.....													U. S. Standards for Canning Tomatoes (1938), reissued July 16, 1939, A. M. S. ³
For freezing:																
Asparagus, green.....	U. S. No. 1.....	U. S. No. 2.....	Culls.....													U. S. Standards for Green Asparagus for Canning or Freezing, Dec. 20, 1937, B. A. E. ¹
Beans, snap.....	U. S. No. 1.....	U. S. No. 2.....	Culls.....													U. S. Standards for Snap Beans for Canning or Freezing, Feb. 26, 1940, A. M. S. ³
For manufacture:																
Cabbage for sauerkraut.....	U. S. No. 1.....	U. S. No. 2.....	Culls.....													U. S. Standard for Cabbage for Sauerkraut Manufacture (1933), Feb. 1933, B. A. E. ¹
Tomatoes for strained tomato products.....	U. S. No. 1.....	U. S. No. 2.....	Culls.....													U. S. Standards for Tomatoes for Manufacture of Strained Tomato Products, Mar. 1, 1933, B. A. E. ¹
For pickling: Cucumbers.....	U. S. No. 1.....	U. S. No. 2.....	U. S. No. 3.....	Culls.....												U. S. Standards for Cucumbers for Pickling, Dec. 10, 1936, B. A. E. ¹

¹ B. A. E. indicates Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C. The Bureau of Agricultural Economics was reorganized in the fiscal year 1939 and all regulatory duties were transferred to the Agricultural Marketing Service, United States Department of Agriculture.

² Tentative United States grades only.

³ A. M. S. indicates Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C.

⁴ Cherries that fall below the standard of quality promulgated under the Federal Food, Drug, and Cosmetic Act will be certified with the additional statement "Below Standard in Quality," together with the reason for so certifying.

⁵ May be combined with preceding or following grade and labeled "U. S. Combination" provided that at least 50 percent of the contents meet the requirements of the higher grades.

⁶ Any lot of grapes consisting of more than one variety which meets all other requirements "of U. S. Fancy Table," "U. S. No. 1 Table," or "U. S. No. 1 Juice," may be designated as "U. S. Fancy Table Mixed," "U. S. No. 1 Table Mixed," "U. S. No. 1 Juice Mixed," respectively.

⁷ If the lemons in each container are of a full green color "Green" shall be added to the grade designation; if they fail to meet the color requirements of the grade with the word "Green" added "Mixed Color" shall follow the grade number.

⁸ There are two additional grades for comb-section honey: United States Exhibition, a special grade which is only packed on order, and United States Export.

⁹ When sections of "U. S. No. 1" comb-section honey of different colors are packed in the same container, they shall be designated as "U. S. No. 1 Mixed Color" comb-section honey.

¹⁰ These are quality designations for head rice yield, for total yield of head rice and broken rice the designations shall be A, B, C, D, E, or F. The milling quality so determined shall be stated in hy-

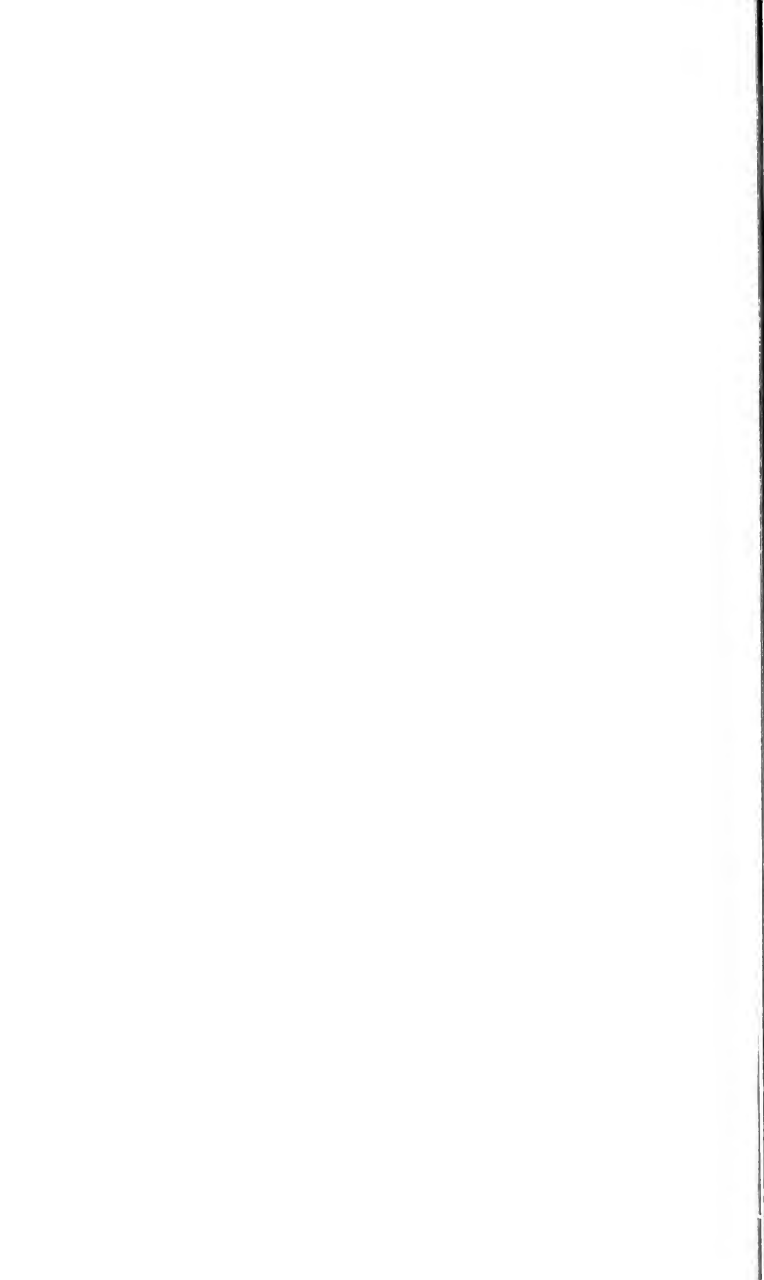
phenated form (as, for example, "Prime-A" milling quality) and shall be added to, and made a part of, the grade designation of all rough rice, to which it applies.

¹¹ Tomatoes meeting the requirements of this grade, if 96 percent of the drained tomatoes are whole or almost whole, will be certified as U. S. Grade A—Whole.

¹² When certificates of grade are issued, the quality designation shall, in addition to the grade, show the specific gravity, i. e., "U. S. Grade A—Specific Gravity 1.014."

¹³ "U. S. No. 1 Bulvers" and "U. S. No. 1 Picklers" shall consist of onions which meet all requirements of "U. S. No. 1" grade except for size.

¹⁴ Peppers which conform to the requirements of "U. S. Fancy," "U. S. No. 1," or "U. S. No. 2," except as to color, if uniformly red or turning red shall be designated "U. S. Fancy Red," etc., or if turned red and green peppers shall be designated "U. S. Fancy Mixed," "U. S. No. 1 Mixed," or "U. S. No. 2 Mixed."



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[This index was prepared by Katherine R. Chesbro, member of the staff, Consumer Standards Project, Consumers' Counsel Division, U. S. Department of Agriculture and Work Projects Administration]

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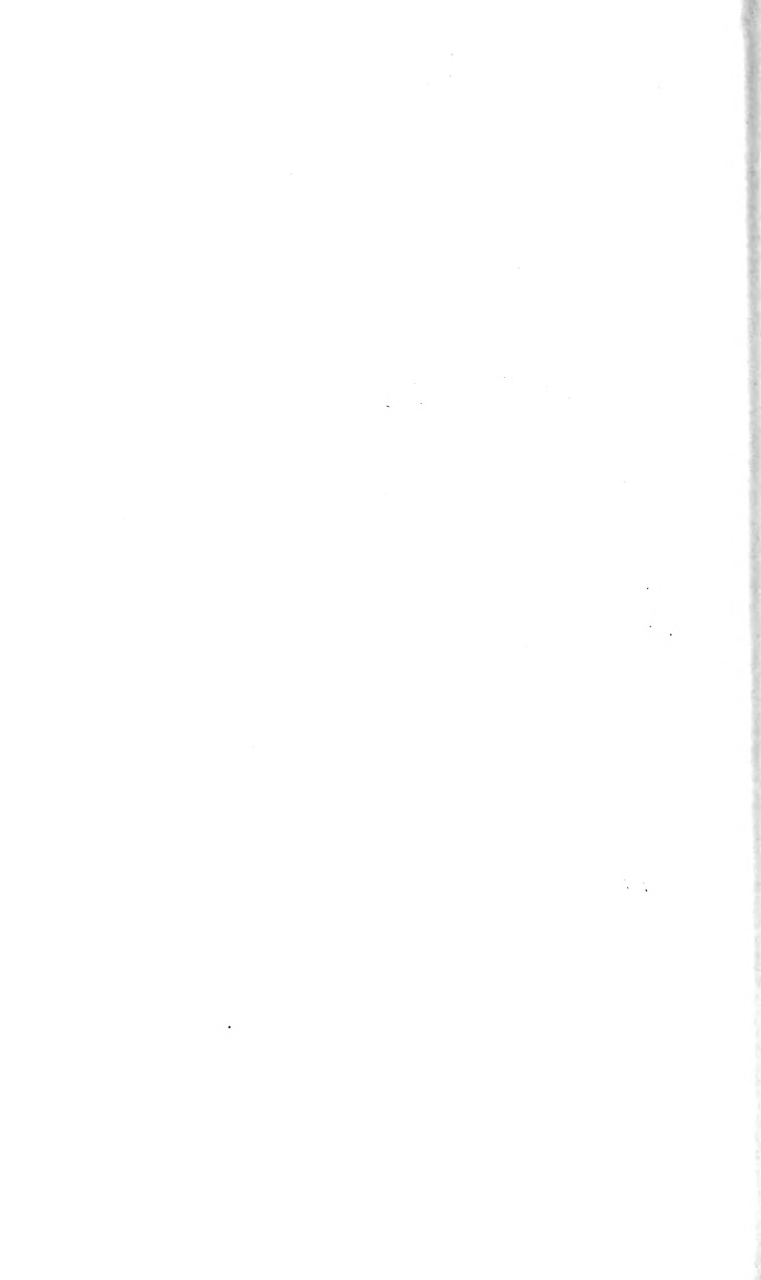
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