

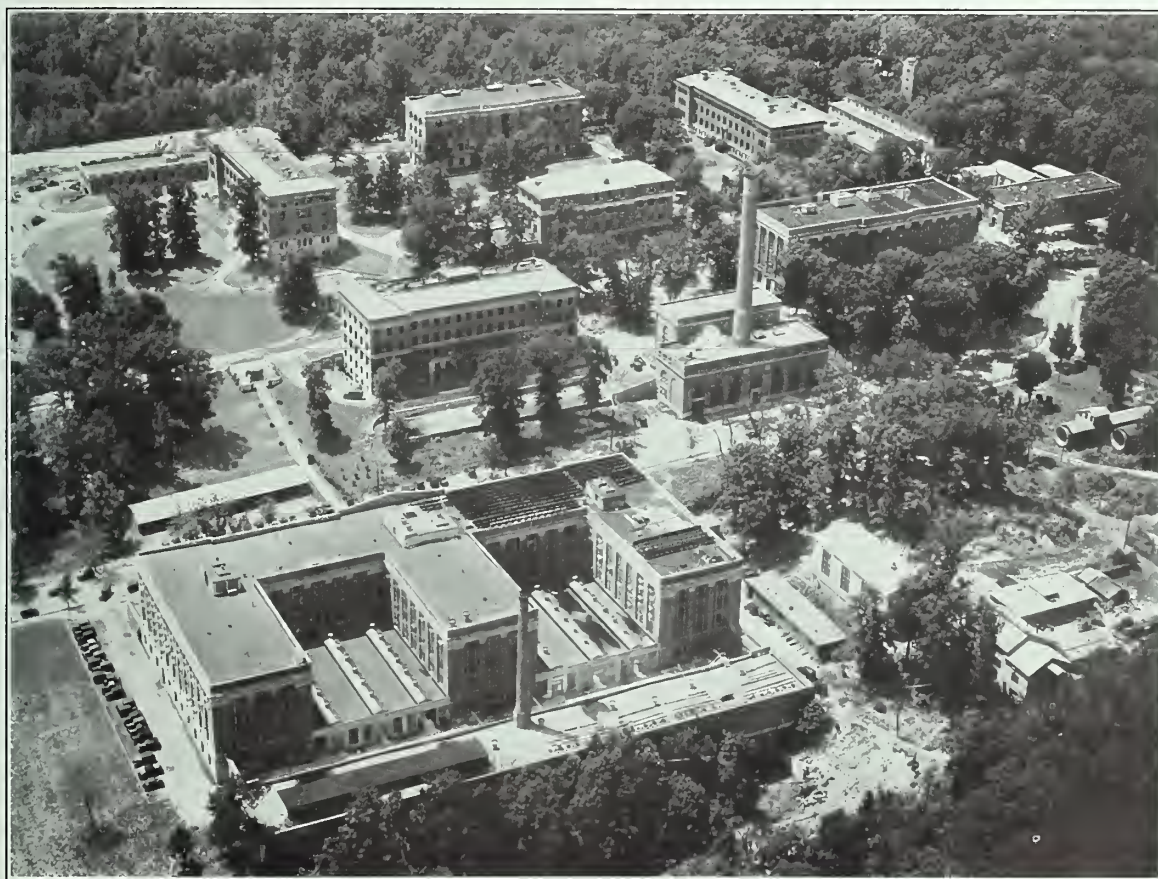
COMMERCIAL STANDARDS MONTHLY

Bureau of Standards

MAR 1 1933



*A Review of Progress in
Commercial Standardization and Simplification*



Photographed by Army Air Corps

AIRPLANE VIEW OF BUREAU OF STANDARDS (LOOKING SOUTH)

ISSUED BY THE BUREAU OF STANDARDS OF THE UNITED
STATES DEPARTMENT OF COMMERCE, WASHINGTON, D. C., U. S. A.

Vol. 9, No. 8



February, 1933

The Commercial Standardization Group

A. S. McALLISTER, Assistant Director

DIVISION OF SIMPLIFIED PRACTICE

Edwin W. Ely

The division of simplified practice cooperates with industrial and commercial groups to reduce waste, usually through eliminating unnecessary variety of product, method, or practice. Its function is to bring together all parties interested in a project of this character, and to coordinate their work in developing a simplified practice recommendation. Such work includes surveys of current practice, formulation of a simplified practice program, and presentation of that program for action by a general conference representing all interests. The division then transmits to all concerned a full report of the general conference, with a request for written acceptance of the action taken. When the volume of acceptances is sufficient to indicate initial success, the Department of Commerce indorses the program and publishes the recommendation. The division thereafter cooperates with a standing committee appointed by the industry concerned, in conducting periodic surveys to determine the degree of adherence, to maintain and extend support of the recommendation, and to secure data for reaffirmation or revision. Simplified practice may be applied to any commodity or activity in which it will reduce waste. The division stands ready to render service in developing and making effective any application of simplified practice which will reduce waste, stabilize business, or extend commerce.

BUILDING AND HOUSING DIVISION

J. S. Taylor

The division of building and housing, formed in 1921, cooperates with business, technical, and professional groups in furthering construction activities. It works to modernize building codes and to encourage improved standards for the quality of building construction, and the practical application of the latest development in design and use of building materials.

It encourages home ownership through the development of an enlarged, steadier, more intelligent, and more discriminating demand for dwellings—the largest single class of buildings which the construction industries provide.

The division also cooperates with other governmental agencies and with many private business and professional groups in efforts to distribute building activity more evenly throughout the year and to secure less fluctuation from year to year.

The work on city planning and zoning has the broad objective of making buildings more useful through proper location with respect to other structures, stabilizing of land values and property uses, well coordinated thoroughfare systems, and well laid out public works.

DIVISION OF SPECIFICATIONS

A. S. McAllister

The duties of the division of specifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technical societies; trade associations; Federal, State, and municipal Government specifications making and using agencies; producers, distributors, and consumers; and testing and research laboratories. It ascertains the standardization and specifications promoting activities of the associations and societies, and brings to their attention the work being done by the commercial standardization group. It brings the Federal specifications and commercial standards to the attention of the maximum number of producers and users of commodities complying with these standards and specifications. It compiles and distributes lists of sources of supply of materials guaranteed to comply with the standards and specifications. It shows both buyers and sellers the benefits from handling nationally specified, certified, and labeled commodities. The division prepares directories of governmental and nongovernmental testing laboratories and the Directory of Specifications, and is working on an encyclopedia of specifications, the first two volumes of which have been issued, namely, "Standards and Specifications in the Wood-Using Industries" and "Standards and Specifications for Non-metallic Minerals and their Products." It also aids in preparing the Standards Yearbook.

STANDARDIZATION
.. IS..
A CONTINUING PROCESS
~*~
ITS AIM IS NOT FIXITY
OR STAGNATION
.. BUT..
TO ADD SERVICEABILITY
AS OFTEN AS THE
POTENTIAL GAIN
MAKES IT WORTH WHILE

DIVISION OF TRADE STANDARDS

I. J. Fairchild

The division of trade standards, on request, assists industrial and commercial groups in the voluntary establishment of standards covering grades, quality, dimensional interchangeability, or other acceptance criteria as a national basis for marketing manufactured commodities.

The detail criteria are selected or determined voluntarily by interested buyers or sellers, without any Government dictation or domination, and adjusted at a general conference of producers, distributors, and users so as to represent the composite views of all branches. The division functions chiefly as a neutral agency to see that all interested elements are given full opportunity to be heard and satisfied; to solicit and record acceptances; and to publish and promulgate the standard when a satisfactory majority of acceptances is obtained and provided there is no active opposition.

Industries are encouraged to apply self-certifying labels to products meeting the commercial standard requirements, as a means of protecting the consumer and the scrupulous seller from misrepresentation or unfair methods of marketing.

Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodically any necessity for revision of the standard, in order that it may be kept constantly compatible with progress in the industry.

Address BUREAU OF STANDARDS, Washington, D. C., for further information

COMMERCIAL STANDARDS MONTHLY

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AN INVITATION TO VISIT THE BUREAU OF STANDARDS

A cordial invitation is extended to all interested in scientific progress to visit the laboratories of the Bureau of Standards when in Washington. A personally conducted trip is organized at 2.15 p. m. daily except on holidays. Special trips for groups may be arranged at other times by writing to the bureau in advance. The bureau's illustrated Visitor's Manual may be had for the asking. This lists the work in progress and gives an airplane view of the ensemble and a brief statement of typical discoveries and inventions which have been notable, basic contributions to radio, aviation, and other modern arts and industries.

Labels to Protect Manufacturers of Radio Sets



"Gyp" radio sets made in tiny shops whose equipment is a set of soldering irons and whose research consists of tearing a standard set to pieces so as to copy it, are the curse of established radio manufacturers. The "gyms," of course, pay no royalties to anyone. They hire no engineers, buy no advertising, contribute to no broadcasting, issue no guaranties, give no service. But they sell sets.

The Radio Manufacturers Association plans to correct this evil through the use of a label attached to each set which will assure the purchaser that his set is duly licensed and made up to certain specifications. Initial use of the certified seal of the association, which became effective January 1, 1933, will be confined to receiving sets. Later it is contemplated to extend its use to other radio and sound-equipment apparatus. Only members of the association may use the seal.

To insure reliability of manufacture and performance of receiving sets bearing the seal, manufacturers using the seal must meet the requirements of the newly created RMA Engineering Institute, which provides the engineering standards and requirements for receiving sets. Among these are requirements that such receiving sets bearing the RMA seal shall have been submitted to and approved by the National Underwriters Laboratories; shall cover the entire United States and Canadian broadcast band from 540 to 1,500 kilocycles; shall be noninterfering in accordance with RMA standards; shall not exceed 10 feet radiation from the chassis and 5 feet radiation from the antenna; and shall meet the quality and performance standards of the Radio Manufacturers Association.

USE OF SPECIFICATIONS BY STATE AGENCIES

Centralized Purchasing Based on Specifications Utilized by Majority of State Governments

By SPENCER H. REED, *Bureau of Standards*

In an endeavor to augment and bring up to date its earlier published material on State purchasing, the Bureau of Standards recently communicated with the procurement agencies (State and State highway) of the 48 States, and the District of Columbia. An abstract of the data gained from the returns—43 out of 49 States (includes the District of Columbia) and 47 out of 48 State highway agencies reports—together with pertinent information from other sources is presented in the following pages.

Perhaps the most definite fact brought out by the bureau's survey is the wide prevalence of centralized State purchasing. This system, given its initial trial in State government in 1897, when Iowa centralized its purchasing for penal and charitable institutions, languished until 1910, the year Oklahoma became the first State to centralize the buying for all branches of its government. Since then, the centralized purchasing movement has increased apace, and to-day returns show that at least 31 States and the District of Columbia are using such a system with varying degrees of inclusiveness.

Centralized State purchasing bodies have a variety of names, but they may be grouped for the most part under three general types of administration. The first type contains those States which buy through a separate purchasing department or bureau, such as Arkansas, Idaho, Illinois, Maine, Massachusetts, Montana, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Virginia, Wisconsin, and the District of Columbia. The second type purchases through an appointive board, and includes Alabama, Arizona, Florida, Kentucky, Michigan, North Dakota, Oregon, Texas, Utah, and Wyoming. The third type includes at least eight other States—California, Maryland, Minnesota, Ohio, South Dakota, Tennessee, Vermont, and Washington—which procure supplies through a subdivision of the State finance department.

In contrast to those States that employ a centralized purchasing system, there are as many as six States in which the several departments of the government make their own purchases—Connecticut, Delaware, Louisiana, Mississippi, Nevada, and New Mexico. Although centralized purchasing is employed for penal, correctional, charitable, or other individual governmental divisions of Indiana, Iowa, Georgia, Kansas, Missouri, Nebraska, Rhode Island, and West Virginia no centralized purchasing agency is reported for all divisions of any of these States.

Needless to say, no State purchasing agency buys everything required by the entire State government, for emergencies arise which permit no delay in securing supplies, materials, or equipment. In some States perishable foodstuffs and fuel are purchased directly by the superintendents, business managers, or stewards of the several State institutions; in others, books for the State educational institutions are purchased independently. Technical apparatus and equipment are exempted from central purchase in several States.

Aside from independent emergency procurement by department officials of State governments, however, there are 16 States—Arkansas, Florida, Illinois, Massachusetts, Minnesota, Montana, New York, North Carolina, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Vermont, Washington, and Wisconsin—which report that their central purchasing body buys for all divisions of the government, including State highway and State educational institutions. Four States—Arizona, Maine, Michigan, and Wyoming—report that their respective central purchasing agencies buy for all divisions of the State government, except State highways and State educational institutions.

Obviously, the principal function of these purchasing bodies is to carry through to completion all entrusted procurement negotiations. To do this efficiently and economically requires systematization and the elimination of all obsolete purchasing machinery. Many States have gone a long way in this direction through centralized procurement, the use of specifications, laboratories, skilled inspectors, and performance tests.

Examination of the data on hand shows that at least 42 of the 48 States, together with the District of Columbia, use specifications. In addition to those States which name the purchasing agent or the heads of various departments as chiefly instrumental in drafting specifications, several report that their specifications are formulated by the State purchasing bureau, the State standards committee, or the State specifications division. Not a few States utilize the combined services of their State engineer and other technical authorities in drafting specifications.

In the formulation, adoption, and modification of specifications the purchasing agencies of 31 States report that they seek the advice and cooperation of the State department or agencies concerned, in order to ascertain their precise requirements. Only Kentucky, New Hampshire, and North Dakota report that their using departments are not consulted.

Twenty-eight States report that they purchase on specifications prepared by their own government; 26 use Federal Government specifications; 19 use trade brands; and 14 use standard specifications of national technical societies and trade associations; 10 States do not purchase on trade brands; 6 do not purchase on standard specifications of national technical societies and trade associations; 3 do not purchase on own specifications; and 4 do not purchase on Federal Government specifications. A large number of the States indicate the use of two, three, or even all of the methods referred to, depending upon the commodity procured.

Eighteen States report the maintenance by their own government of laboratories for testing purchases; 30 States use college laboratories; 12 State highway laboratories; and 11, commercial laboratories; 15 States report they do not have their own laboratories; 9 do not use college laboratories; and 6 do not use com-

mercial laboratories. Many States report the use of two, three, or even all of the types of laboratories above mentioned.

Although deliveries to certain State purchasing agencies receive very casual inspection and frequently no test at all, 35 governments claim to inspect purchases before acceptance. Several States employ trained inspectors and make performance tests as well. In some cases, the different using departments alone examine and pass upon incoming supplies. One State disclaims using inspectors or tests.

It is interesting to note that 18 States report savings effected by centralized purchasing, ranging anywhere from 6 to 50 per cent. Seven other States, unable to quote exact savings, declare they are considerable. The average saving is about 21 per cent. With the exception of three States, the savings in every instance amounted to 10 per cent or better. Eleven States reported a saving of 20 per cent or better; and two, a 40 per cent saving.

Turning now to State highway purchasing, it is observed that during the past 30 years the business of building roads and furnishing highway service has changed from a matter of community effort to one of county, State, and Federal activity. It has grown to such gigantic stature that the total disbursements by and for State highway departments for 1931 were reported as in excess of \$1,000,000,000. Expenditures for maintenance alone amounted to nearly \$161,000,000, to say nothing of more than \$21,000,000 spent for equipment and machinery.

The problem of constructing and maintaining the nation-wide system of highways has been entrusted by the several State to their highway departments and commissions. In at least 25 States, supplies, materials, and equipment for State highways are procured through the State highway departments and commissions; and in 12 States, through State purchasing agents.

Every one of the 48 State highway departments claim the use of specifications, almost without exception drawn by the State engineer and/or assistants, or by each division with the approval of the chief engineer. In Connecticut, for example, highway specifications are formulated by the deputy highway com-

missioners, designing engineers, and testing engineers. Specifications for Maryland highways are made by the engineering departments; for Massachusetts, by the Department of Public Works under the direction of the chief engineer; and for Texas, by the engineers, chemists, or purchasing officer.

Of the 48 State highway departments, 45 report that they purchase on specifications prepared by their own government, 43 on standard specifications of national technical societies and trade associations, 30 on Federal Government specifications, and 22 on trade brands. Fifteen States say they do not purchase on trade brands, 11 do not purchase on Federal Government specifications, and 3 do not purchase on standard specifications of national technical societies and trade associations.

Without exception, the State highway departments make use of laboratories in connection with their purchase routine. Forty-five departments say they have their own laboratories, 36 use commercial laboratories, and 26 use college laboratories. Many highway departments employ two or even all three classes of laboratories.

The amount of inspection and testing necessary for road materials has naturally increased steadily with the growing emphasis placed upon highway construction. The increase in Maine alone is well illustrated by a comparison of the number of tests made of Portland cement. It is reported that whereas in 1914 only 7 samples were tested, in 1931 more than 300 samples were tested. And Maine is by no means the only State in which the highway department inspects and tests its purchases. Forty-six other States do likewise.

Finally, with respect to highways, it seems pertinent to give renewed attention to the fact that modern conditions are apparently demanding a reallocation of governmental functions so as to provide larger administrative units. To this end, certain States have been taking over, reconstructing, and maintaining all roads within their confines. And in several States, notably Iowa, Kansas, and Michigan, the State governments have been authorized to assist in constructing and maintaining the roads in cities, counties, and townships which are designated as connecting links in the State road systems.

ELECTRICAL WHOLESALERS APPROVE LABELING PLAN

The electrical wholesalers' industry has adopted certain trade practice conference rules to minimize unfair methods of competition, and these rules have in turn been approved by the Federal Trade Commission. A prohibition against distributing electrical supplies not properly identified is included.

By this it is provided that the industry disapproves of the shipment of unlabeled products of the industry, which makes possible the easy substitution of merchandise of lower quality for that of higher quality, particularly such material as is removed from the original factory containers. The electrical wholesale industry records its approval of the labeling or identifying, in accordance with accepted standards of the industry, of all products of the industry in such manner as to establish the grade, quality, and quantity of the products.

INDUSTRY APPROVES STANDARD FOR DOUGLAS-FIR PLYWOOD

The manufacturers of Douglas fir plywood, together with the principal distributors and users have long felt the need for recognized grade classifications and this need has been met in the Commercial Standard for Douglas Fir Plywood, the approval of which has been announced by the division of trade standards, Bureau of Standards, in a circular letter under date of December 15, 1932.

Stock panels are divided into five grades on the basis of certain defects, while specifications are also included for concrete form material and door panels. Standard sizes are listed for stock panels and a glossary of terms is added for the use of those unfamiliar with the nomenclature of the industry.

Mimeographed copies of this standard may be obtained from the division of trade standards, Bureau of Standards.

WHAT ARE COMMERCIAL STANDARDS

Examples Are Cited and the Distinction Between These and Other Standards Is Shown

By I. J. FAIRCHILD, *Bureau of Standards*

Although in recent months the popular magazines and trade papers have carried numerous articles on various phases of standardization, the fog obscuring the terms which describe the several kinds of standards, for example, industrial standards, performance standards, quality standards and so on, is still about as thick as the fog which envelops "technocracy."

The reason for the fog lies not in the difficulty of understanding such terms but rather in their seeming simplicity. One jumps to the conclusion that he understands, when as a matter of fact his thoughts skip rather lightly over such common words with but little real discrimination among the standards which form the very backbone of our civilization.

It may be helpful therefore, to "burn off" some of the fog which obscures and confuses our comprehension of one class of standards, namely, commercial standards. How do they differ from other standards? What makes them different?

In a very broad sense, commercial standards might, quite naturally, be assumed to include all standards which form a basis for, or a necessary adjunct to trade or commerce. This would include standards of measurement; that is, length, area, volume, mass, weight, density, pressure, heat, etc.; standard constants such as the mechanical equivalent of heat, light, electricity, and so on; standards of quality or specifications for material by description or sample, or both; standards of performance; that is, a specification covering the operative efficiency, the output, durability, and other factors; and standards of practice for the technical regulation of construction, installation, and operation.

However, on a use basis, standards fall into a natural and practical classification of but few groups as follows: (1) Standard constants which comprise the natural standards or the measured numerical data on materials and energy, such as wave lengths, melting and boiling points, gravitation, etc., on which other standards are based; (2) weights and measures, namely, those standards which express the quantitative aspects of space, matter, time, energy, and motion, such as length, area, volume, mass, weight, and so on; (3) specifications; that is, purchase specifications covering materials by description or sample and project or job specifications which include both materials and construction; (4) codes, regulations, and practices set up by regulatory authority or common consent as a basis for control of sanitation, fire risks, safety zoning, or other limitations on construction, operation, and practice; and (5) laws which set forth standard principles and rules of conduct.

As used here the term "commercial standards" signifies that a small but effective group of specifications

which are voluntarily initiated and accepted by industry for marketing manufactured commodities and which are published by the United States Department of Commerce as a part of the commercial standard series. Commercial standards consist of nomenclature, definitions, grading rules, dimensional standards, tolerances, performances, methods of test, and other consumer criteria which may be incorporated into a specification established voluntarily by the industry as the accepted basis for daily marketing of the commodity; that is, the basis for guaranties of grade or quality by the seller or for acceptance by the buyer.

True, instances of other standards may be cited which are serving the same purpose, but by far the greater number of specifications are prepared by or for a large purchaser or a group of purchasers who normally buy on specifications. The usual specification covers purchase requirements for definite uses with little or no concern for what may

happen to rejected items or grades outside the limits of the specification.

Commercial standards, on the contrary, are established not only to serve as a basis for purchase, but more especially as a basis for marketing for the entire industry and, consequently, must cover all the grades necessary in that industry or form a part of a broader plan for marketing the essential grades, both standard and substandard. Hence, commercial standards, unlike most specifications, are established for the benefit of all divisions of a given industry rather than for just the large quantity buyers.

At first this may seem like a minor distinction, but a little examination discloses a marked difference between the two. Take, for example, the item of linoleum. The Federal Government and other large users buy the ordinary types, such as plain, jaspe, granite, inlaid, and printed, on a definite specification which covers thickness, minimum weight per square yard, pliability and indentation (hardness). Tests are made on the delivered goods to determine whether or not they meet the specifications.

However, you and I as individuals buy linoleum for use in our homes and we employ no specifications and no tests to guide in these purchases. We are offered no guarantees as to performance. According to my observation, very few individuals have sufficient information or pay enough attention to the trade brand to say with any degree of confidence that a certain make is superior to another.

What happens then to the run-of-the-mill linoleum which may or may not meet the manufacturer's own specifications or other adequate specifications? You and I buy this substandard quality for use in our

This is the second of a series of articles by Mr. Fairchild on the whys and wherefores of commercial standards. "Why have them?", "Who requests them?", "How are they used?", "How enforced?", and how they have accomplished the desired results without a corresponding extension of governmental function.

homes on the same basis as standard quality without suspecting the difference. We take our chances.

Since, but a small percentage of linoleum is sold on the basis of specifications, the great mass of the product is not required to meet any purchase specification requirements and there is no assurance of quality beyond that conveyed by the trade brand.

As a result of competition, manufacturers have brought out thinner and thinner gages of this product at lower and lower prices. Practically all of these gages and types bear trade-marks or brand names and there is nothing except the thickness (not indicated) and the price to distinguish them for the average buyer from higher or lower qualities. In other words, the producers do not tell the users how they may distinguish between the various grades. The fact that there is no readily discernible comparability of grades tends further to confuse the user, to make price comparisons impracticable, and to render unreliable any conclusions resulting from practical experience.

And so the multiplication of grades and qualities goes merrily on to the confusion and consternation of the consumer who is expected to accept at face value the adulant advertising sponsored by the producers, even though he is given no definite warranty of quality which might be used as a basis for justifiable complaint.

A little study of almost any item normally purchased on specifications by contract buyers reveals similar general conditions, and thus it appears clear that specifications recognized by the Federal Government or by various technical societies can not be accepted as representing the general quality of that particular item as it appears on the regular market; that it is not safe to assume that industry is prepared to produce items meeting such specifications on a large scale, since the rejects resulting from the general application of such a specification may be so large as to constitute an unbearable burden; and that the seller may quite reasonably hesitate or refuse to certify to the buyer that the quality of the goods delivered meets all requirements of such a specification.

Red cedar shingles.—Suppose we examine one or two commercial standards from this point of view. Take for example Red Cedar Shingles, Commercial Standard CS31-31. In the past, red cedar shingles have been sold in five different grades, and since the industry had no means of really convincing the purchaser that the higher grades were more valuable in service, the natural tendency was to market the lower grades on a price basis. The low-grade shingles were thin, they were cross grained, they curled on the roof, they split, they caught fire brands and ignited readily, and as a result many progressive cities barred their use entirely within the fire district. There was no profit in the poorer grades, and the industry slowly but surely lost its reputation and its business to other types of roofing materials.

The shingle manufacturers knew that the top grade of red cedar shingles was much thicker, it was edge grained, it lay flat on the roof, it did not hold fire brands, it did not ignite so readily, and finally they came to believe that if some means could be devised of convincing the purchaser that he was actually receiving top-grade shingles they (the shingles) would have an opportunity to prove their superior quality.

The manufacturers scrutinized the grading rules for the top grade and revised the wording so as to be more specific; they requested the cooperation of the Bureau of Standards in establishing this top grade as the commercial standard of the industry. The proposed grading rules were sent out by the Bureau of Standards to architects, to lumber dealers, to general contractors, to roofing contractors, and to others who are directly concerned in the grading of shingles, and as a result grading rules for the top-grade shingles were further improved and the old 1,000 pack was discarded for the square pack. In other words, the shingles were to be sold by the square (100 square feet), similar to other roofing materials, in order that a direct price comparison might be made by the purchaser.

The standard as recommended by the general conference of producers, distributors, and users was circulated widely for written acceptance, and a majority signed on the dotted line that they would use this standard as a basis for production or consumption. Then the grading rules and the inspection requirements were published by the Department of Commerce as Commercial Standard CS31-31.

The Red Cedar Shingle Bureau of Seattle, set up by the industry, was to inspect the shingles, to police the standard, and to issue the certification labels to manufacturers who actually complied with the requirements of the commercial standard. This label reads as follows:

Certified Shingles. This label can only be used on No. 1 Grade. These Shingles are Guaranteed by the Manufacturer. Inspected for, Certified by, RED CEDAR SHINGLE BUREAU, to meet all the quality requirements of Commercial Standard CS31-31 for Red Cedar shingles as issued by U. S. Department of Commerce, Washington, D. C. 100 per cent Edge Grain Series M000 Heartwood 100 per cent.

This label forms a part of the sales contract between the manufacturer and the lumber dealer and is enforceable by law as such. In the event the manufacturer fails to give satisfaction to the lumber dealer, the Red Cedar Shingle Bureau is then held responsible for replacement of the shingles or other satisfactory adjustment.

The standard became effective July 1, 1931, and in the short time since that date the industry has improved its position to an almost unbelievable extent. On September 15, 1932, after clearing all warehouse stocks, the producers as a group were oversold to the amount of 226 car loads of red cedar shingles. In the three months preceding October 1, 1932, employment had doubled and in the two months preceding that date the Red Cedar Shingle Bureau itself had found it necessary to take on six additional employees.

The industry gives full credit for this improvement to the establishment of the commercial standard and to the strict grading and adherence to the plan as carried out by the Red Cedar Shingle Bureau. Incidentally, only two lower grades of red cedar shingles are now recognized and they are rapidly losing their importance as significant items in this industry.

Suppose we examine another commercial standard; for example, Domestic and Industrial Fuel Oils, CS12-29.

Fuel oils.—The great variation in the properties of fuel oils renders it impracticable to design a domestic burner that will burn all grades satisfactorily. Users of oil-burning equipment in the past often found it difficult to obtain the proper grade of oil, as no definite

requirements for any particular grade existed. Most purchases were based on the specific gravity of the oil, a property now considered of no practical value in indicating the essential characteristics, which are distillation range, viscosity, and flash point.

The American Oil Burner Association requested the Bureau of Standards to assist in setting up standard grades of fuel oil and establishing them on such a basis as to permit certification of quality to the consumer. A tentative specification for six grades of oil was drawn up by the association, with the cooperation of the American Society for Testing Materials, the American Petroleum Institute, and individual oil refiners. This specification was made consistent with regular refining practices, and was recommended to the industry for acceptance as a commercial standard. Ample acceptance was accorded and the effective date was made July 1, 1929.

If one buys a domestic oil burner to-day he will most likely discover that it bears a metal tag which reads something like this:

This burner is designed to use No. 2 grade of fuel oil

He will naturally ask for No. 2 fuel oil. In the event of unsatisfactory service from the burner, the manufacturer's representative will have the oil tested to

determine whether or not it meets the specification for the No. 2 grade, thus immediately fixing responsibility for the difficulty. If the oil complies with the specification, the burner manufacturer will have to look further for his trouble; if not, the oil distributor is held responsible for not supplying oil to meet the specification requirements.

In both of the above instances, the producers are entirely familiar with the requirements of the commercial standard and are in a position to supply material complying with these commercial standards without limit, except, of course, to the extent of their production capacity.

At this writing, 45 commercial standards have been accepted and there are 78 active projects voluntarily proposed by the industries concerned, looking toward the establishment of commercial standards.

The answer then to the question raised by the title may be summarized as follows: Commercial standards are definitions, grading rules, dimensional tolerances, methods of test, and other consumer criteria embodied into specifications established voluntarily by the industries concerned under Bureau of Standards procedure as the accepted basis for daily marketing of the commodities, and published and identified as such by the United States Department of Commerce.

AMERICAN PUBLIC HEALTH ASSOCIATION

Scope and Function of the Research and Standards Committee of the Association Reviewed

By ABEL WOLMAN¹

Early in 1928 the council of standards of the American Public Health Association was designated to review any resolution, report, or publication which undertook to establish in the name of the association, or any of its sections, professional or technical standards and to notify the membership and the governing council of its approval or disapproval of such proposed standards.

In 1929, with the revision of the set-up of the association, the committee on research and standards was appointed. The committee took over the duties of the council on standards and was made responsible for carrying out research and the development of standards in the technical branches of public health service and training and the coordination of such research and standardization. It was charged also with the duty of reviewing from time to time standards already published.

The association has 50 committees, the majority of which have been allocated to the Committee on Research and Standards. It is through these subcommittees that the research work of the association is done. The committee has confined its activities to being of service to these numerous smaller subcommittees. Since the committee has come into existence it has reviewed many, but approved only three sets of new standards, "Minimum Qualifications for those Appointed to Positions in Public Health Nursing," "Essential Features in the Design of Sanitary Drink-

ing Fountains," and "Standard Classified Nomenclature of Disease."

The first-named standard was approved in the belief that they can be met quite generally by the year 1935. They include the minimum training and experience necessary for a nurse on a staff provided with well qualified supervision, for the nurse working alone, and for supervisors and directors. These qualifications were published in detail in the May, 1931, American Journal of Public Health.

The standard for "Essential Features in the Design of Sanitary Drinking Fountains" was developed by a joint committee of the association and of the Conference of State Sanitary Engineers after numerous conferences with users and manufacturers of fountains. These standards will be revised from time to time so as to include any improvement in design, etc.

The committee was asked to review the report "Standard Classified Nomenclature of Disease." They have, after careful consideration and conferences with the representative of the association to this committee, approved and endorsed this standard.

Standard Methods of Water and Sewage Analyses is, of course, our best known set of standards. They were originally prepared as early as 1905 and have been reviewed and revised at intervals. During 1932 the committee has worked closely with the committee making this revision and has put its final endorsement on the seventh edition which is now being published.

Immediate work for the future is concerned with the standardization of laboratory reagents, of methods of preparation of certain vaccines, and of ventilation requirements for indoor living quarters.

¹ Chairman, Committee on Research and Standards, American Public Health Association; chief engineer, State of Maryland Department of Health.

AMERICAN STANDARDS ASSOCIATION

Current developments of the following standardization projects under the auspices and procedures of the American Standards Association have been reported by that association:

Safety code for mechanical refrigeration.—A revision of the Safety Code for Mechanical Refrigeration has been approved by the association. The revision, made in order to bring the refrigerant methyl formate within the provisions of the code, is a very simple one. Methyl formate is added to the list of refrigerants contained in the definition of "flammable refrigerants" and the minimum test pressures on the high and low side are given for methyl formate in tabular form, along with the test pressures for other refrigerants. The American Society of Refrigerating Engineers is sponsor for this project.

Shaft couplings for hydroelectric units.—A new American standard entitled, "Shaft Couplings, Integrally Forged Flange Type for Hydroelectric Units," has been approved by the association. It gives tables relating to the coupling dimensions, and to the drilling layout and bolt dimensions, respectively. The standard was developed by the ASME committee on standardization of shaft couplings, and was approved by the American Standards Association as an existing standard.

Steel spiral rods.—The revised American standard on steel spiral rods for concrete reinforcement (Simplified Practice Recommendation R53-32) has been approved by the association. The revision consists largely of a rearrangement of the tabular form in which certain data are presented, and the removal to tables in an appendix of other data now given for informational purposes. The revision has been accepted by industry under the procedure of the division of simplified practice of the Bureau of Standards.

Annular ball bearings.—A revision of the American tentative standard for annular ball bearings, single-row type, has been approved by the association. This revision consists of a change from 0.4 and 1.0 mm to 0.6 and 1.5 mm, respectively, in the dimensions r and H of the light-type bearing No. 39 (r designates the maximum radius of the fillet of a shaft or housing, and H the minimum height of the shoulder on a shaft). The revision also includes the addition of the separable (open) type ball bearings, and of the angular contact type ball bearings in the light, medium, and heavy series.

Paper insulation.—Specifications for impregnated paper insulation for lead-covered power cable has been approved as an American standard by the association. These specifications were prepared by the sectional committee on insulated wires and cables, which is now under the sponsorship of the electrical standards committee. The requirements of the specifications are identical with those for insulation in the "Specifications for Impregnated Paper-Insulated Lead-Covered Cable" of the Association of Edison Illuminating Companies. These specifications are widely used for this type of material.

The specifications cover materials; workmanship; properties, such as recommended thickness of insulation for the various types of cables; dielectric strength of insulation; change of power factor with voltage; long and short time electric strength before and after

installation; mechanical properties; maximum operating temperature; measurements and tests, including selection of samples; and methods of measurement for the various properties of the cable.

Safety code for work in compressed air.—The ASA standards council has voted to initiate the development of a safety code for work in compressed air following a request received from the International Association of Industrial Accident Boards and Commissions (IAIABC), to whom sponsorship was assigned. The scope of the new project is as follows:

Construction and operating rules for work in caissons tunnels, or wherever workers are subjected to air under pressure higher than atmospheric, including protection from mechanical hazards, the use of necessary instruments and apparatus, provision of locks, methods of lighting, communication and decompression, the keeping of records, medical attendance, periodic inspection and air analysis, rest rooms, hours of labor, sanitation, ventilation, fire prevention, fire protection, temperature control, and other conditions of work.

Several State regulatory bodies have adopted standards on this subject and a fair degree of uniformity exists. The IAIABC felt that the development of a national code would help in maintaining this uniformity and minimize the danger of other bodies developing standards differing markedly from those now existing. Contractors engaged in this kind of work operate on a national basis and, as the equipment used is expensive, they should be relieved of all expense possible due to lack of uniformity in State requirements. The development of such a group of specifications as is contemplated in this project should do much toward accident prevention in what is undoubtedly a very hazardous operation.

Illuminating engineering standards.—A revision of the American standards on illuminating engineering nomenclature and photometric standards, made under the proprietary sponsorship of the Illuminating Engineering Society by its committee on nomenclature and standards, has been approved by the American Standards Association. With few exceptions, the principal changes in the standards are rewording in the interest of clarity and directness of statement, and not changes of substance.

The symbols and definitions approved in these standards have been widely adopted in other standards being prepared under the procedure of the American Standards Association. The committee of the Illuminating Engineering Society which prepared the standards has served as a subcommittee of the sectional committee on definitions of electrical terms, which is under the sponsorship of the Institute of Electrical Engineers. Group 55 "illumination" of the report on the proposed American standard definitions of electrical terms, prepared by this committee, also contains the definitions in the standards on illuminating engineering nomenclature and photometric standards. The symbols and abbreviations included in the standards have also been accepted by the sectional committee on scientific and engineering symbols and abbreviations. The symbols have been approved separately as the American standard symbols for photometry and illumination, and the abbreviations are included in the draft of the standard on abbreviations for scientific and engineering terms, which it is expected will be approved as an American tentative standard.

TIME ZONES OF THE WORLD¹

Correlated International Systems and Plan Adopted in United States Are Explained by Time Section
Chief of Bureau of Standards

By RALPH E. GOULD, *Bureau of Standards*

In recent years there has been a great increase in the demand for information regarding time in the various cities and countries of the world. This is largely due to the development of international news services, world-wide telephony, transoceanic aviation, exploration, and the more precise timing of events.

From the earliest civilization man has reckoned time by the apparent motion of the heavenly bodies. The rotation of the earth on its axis from west to east causes these bodies to "rise" in the east and "set" in the west. Consequently, points to the east of us have sunrise before we do, or, as we say, their time is faster than ours; while points to the west have time that is slower than ours. This rotation of the earth about its axis once in 24 hours gives a time change of one hour for every 15° of longitude. That is, if observations were made on the transit of the sun across the meridian at points separated by 15° of longitude, it would be found that the time of transit at two such points would differ by one hour. If the separation of the points of observation were decreased, the difference in time would be decreased in the same proportion. These times would all be true local times, using the transit of the sun across the meridian as a standard.

Since the distance around the earth is less at points not on the Equator than at the Equator the distance on the earth's surface corresponding to a time difference is also less in the same proportion. For example, at the Equator 15° corresponds to about 1,040 miles, while at the latitude of New York 15° corresponds to only about 784 miles. Or, at the Equator a difference of about 17 miles makes a time difference of one minute, while in the latitude of New York a difference of only 13 miles makes a difference of one minute in true local time.

The need of a uniform time began to be felt in the United States about 1870, and the railroads gradually adopted a system for use on their roads specifying definite important centers or junction points at which changes of one hour should be made. As means of communication still further developed, it became apparent that some system of international time must be established.

In 1884 an international congress was called in Washington to consider the subject of a world standard of time. The world was divided into zones, each covering 15° of longitude, the time for each zone being that of the meridian passing through its approximate center and the time in adjacent zones differing by one hour. The meridian passing through the observatory at Greenwich, England, was chosen as the zero meridian from which all time should be reckoned. Al-

though there was no definite agreement as to the adoption of this time by the different nations, the plan was gradually accepted.

In 1886 Japan made the time of the one hundred and thirty-fifth meridian east (nine hours faster than Greenwich) its standard time. Belgium and the Netherlands adopted Greenwich time in 1893, although the Netherlands later reverted to Amsterdam time, which it now uses. Germany, Italy, Denmark, and Switzerland in 1893-94 each adopted central European time, which is one hour faster than Greenwich, and Bulgaria, Rumania, and Turkey established the time for those countries as two hours faster than Greenwich. The Australian States followed in 1895. Rumania is now using one hour faster than Greenwich as its standard.

The adoption of time differing from Greenwich by an odd number of half hours soon made its appearance. This slight departure from the original plan is of advantage in some places, since it more nearly agrees with true local time. In New Zealand the time is 11½ hours faster than Greenwich time, in Burma 6½ hours faster, while in India, excepting Calcutta, it is 5½ hours faster. Cape Colony formerly was 1½ hours faster than Greenwich, but in 1903 the legal time was made 2 hours faster than Greenwich.

In 1914 Brazil was divided into time zones on the international basis, and in 1930 Mexico abandoned local time for the zone system. An important change was made in 1924 in the complete zoning of the Soviet Union, which comprises old Russia and Siberia, into 11 time areas. A few countries still retain the time of some important city as the legal time of the country.

The United States, although using the system since 1884, did not legalize it until March 19, 1918, when Congress directed the Interstate Commerce Commission to establish limits for the various time zones in this country. Changes in these boundaries have been made from time to time, in order that the time changes may occur at such points as to result in a minimum of inconvenience. The division lines are not straight, but largely follow the railroads and pass through important cities and junction points. The United States is divided into four standard time zones, each approximately 15 degrees of longitude in width. All places in each zone use, instead of their own local time, the time counted from the transit of the "mean sun" across the meridian which passes through the approximate center of that zone. The interval between successive passages of the sun across the meridian is somewhat variable, and for this reason apparent solar days are unequal. Therefore, mean time has been adopted, which is kept by a fictitious or "mean sun" moving uniformly in the Equator at the same average speed as that of the real sun, thus making days of equal length. It is "mean noon" when this "mean sun" crosses the meridian. These time zones are designated as eastern, central, mountain, and Pacific, and the time in these zones is reckoned from the seventy-

¹ Readers desirous of more information on this subject will find "Standard Time Throughout the World" (price 5 cents), Circular of the Bureau of Standards No. 399; "Standard Time Conversion Chart" (price 10 cents), Bureau of Standards Miscellaneous Publication No. 84; and "Time Zone Map of the United States" (price 10 cents), Bureau of Standards Miscellaneous Publication No. 111, of interest. These may be procured direct from the Superintendent of Documents, Washington, D. C.

fifth, ninetieth, one hundred and fifth, and one hundred and twentieth meridians west of Greenwich, respectively. The time in the various zones is slower than Greenwich time by 5, 6, 7, and 8 hours, respectively.

The question of changing from the time of one time zone to that of an adjacent zone arises in practice largely in the operation of railroads. Because of the inconvenience of changing the time by the necessary amount of one hour at every point where a railroad crosses one of these boundary lines, the more convenient practice has usually been followed of making the change at some terminal or division point on the road, at some junction point, or at the boundary line between the United States and Canada. The result is that practically the boundaries of the time zones are defined by the lines connecting these points of railroad time change. Because of the location of these railroad junctions or terminals the resulting lines are somewhat irregular.

The best generally available source of accurate time is the time signal as transmitted by telegraph from the United States Naval Observatory and broadcast by radio from Arlington, Va., and certain other naval stations. All naval time signals are made in a standard manner. The signals begin five minutes before the hour and consist of a dash on each second, except that no dashes are sent on the seconds listed below:

55 minutes; 29, 51, and 56 to 59 seconds.
56 minutes; 29, 52, and 56 to 59 seconds.
57 minutes; 29, 53, and 56 to 59 seconds.
58 minutes; 29, 54, and 56 to 59 seconds.
59 minutes; 29, and 51 to 59 seconds.

Beginning exactly on the hour a much longer dash is sent. In all cases the exact second is denoted by the beginning of the dash, the end being without significance.

It will be noted that the number of seconds sounded immediately following the single second omission and preceding the long omission at the end of each minute indicates the number of minutes of the signal yet to be sent. For instance, the signal for 56 minutes and 52 seconds is omitted and then 3 seconds are sounded, indicating that 3 minutes of the signal remain to be transmitted. These time signals, if received directly and automatically, are seldom in error by as much as 0.20 second. The average error is generally less than 0.03 second.

Two stations automatically transmit the signal as received from the Naval Observatory at Washington, with errors averaging only 0.02 to 0.006 second. Most of the other stations automatically reradiate, and error is somewhat larger. The signal, however, is sufficiently exact for commercial use. Nearly every country of the world has established a legal time upon which to operate, and also a legal time for islands and dependencies under its control.

CANADIAN ELECTRICAL CODE

The Canadian Engineering Standards Association has announced the issuance of part 2 of the Canadian Electrical Code, which includes definitions of terms and general requirements applicable to most of the individual specifications and are placed in this section so as to minimize repetition in the detailed specifications. Unlike part 1 of the code, which deals with regulations covering the installation of electrical equipment, part 2 consists of the general requirements of those specifications which govern the design, construction, manufacture, and marking of the electrical equipment itself. An appendix to part 2 gives the thickness limits and methods of measurement for uncoated and for galvanized plate and sheet steel.

Following the adoption of part 2 of the code, the majority of Canadian electrical manufacturers, whose products have heretofore been listed or labeled by Underwriters' Laboratories, have expressed a preference to employ the services of the Hydro Electric Power Commission of Ontario for these products rather than those of Underwriters' Laboratories. On January 1, 1933, therefore, Underwriters' Laboratories' listing, label, and reexamination services on electrical devices and materials manufactured in the Dominion of Canada was discontinued. All, or nearly all, of these Canadian electrical products are now listed by the Hydro Electric Power Commission of Ontario, which will extend to them its listing and label service as already applied to other Canadian electrical products.

However, lightning rods and motors, controllers, and fittings for use in hazardous locations will continue to be tested and listed by Underwriters' Laboratories, and the laboratories will continue its present

listings and label and reexamination services on products other than electrical as made in Canada by Canadian manufacturers. These include fire doors and windows, extinguishers, tanks, roof covering materials, refrigerators, hose, oil burners, and other non-electrical items.

The Hydro Electric Power Commission will continue as heretofore and under the same arrangements with United States manufacturers to list a large number of electrical products manufactured in the United States on the basis of their being listed and labeled by the laboratories. Furthermore, it is expected that the Underwriters' Laboratories will cooperate with the Hydro Electric Power Commission and with the Canadian Engineering Standards Committee at Ottawa, for the maintenance, so far as possible, of equivalent electrical standards.

SINGLETREES, DOUBLETREES, AND NECK YOKES

Simplified practice recommendation R134-32, covering singletrees, doubletrees, and neck yokes, is now available in printed form, and copies can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

This simplification program, which was proposed and formulated by the industry, is concerned with the sizes and types of stock varieties of these commodities. Representatives of the industry have estimated that adherence to the simplified practice recommendation by all interests will result in the elimination of approximately 90 per cent of the items formerly listed in the manufacturers' catalogues.

BETTER STANDARDS IN STYLE MERCHANDISE

The Critical Need for Better Standards of Quality in Merchandise Reviewed by Chairman of the National Quality Maintenance League

By JULIUS FORSTMANN¹

The argument, which has often been advanced, that the present economic situation is responsible for the deterioration in the standards of quality in merchandise of every character, is basically wrong. The proof of this lies in the fact that the promotion and sale of inferior merchandise gained increasing impetus during the period from 1925 to 1929, admittedly the most prosperous years this country has ever seen.

There is no doubt in my mind that this persistent exploitation of cheap merchandise—cheap in the sense that it is of inferior quality and gives poor wear or service—is responsible to a marked degree for the present deplorable economic situation in this country. Until it is remedied there can be little prospect for increased employment of skilled workers at high levels of wages by legitimate manufacturers or retail merchants, who are obliged to compete against copyists whose sole reason for existence is the copying, in inferior materials, of the legitimate products of responsible producers.

It is an acknowledged fact that the production of good quality merchandise of every character requires more labor at better wages than does the manufacture of cheap imitations. The legitimate manufacturer operates on a more stable schedule with fewer shut downs and reductions of personnel. He requires larger and more permanent investment of capital and more frequent renewal of equipment. He conducts research departments in order to create new commodities, or to improve existing products. His methods of operation tend to stabilize prices and to limit competition within legitimate bounds, because competitive manufacturers operating on identical or similar standards of qualities are working with fixed entities, and price advantages to customers are the result of superior skill and dexterity.

The manufacturer of inferior products who imitates superficially the exterior appearance of a legitimate product has no such responsibilities or limitations. He profits from the market established by another manufacturer who has produced a commodity which the public buys because of its style and service appeal. In order to bring down costs the imitator purchases inferior raw materials, and wherever possible eliminates operations of manufacture. He pays low rates of wages because his product does not require the skilled workmanship of the original which he is imitating. His schedule of operations is dictated entirely by the condition of a market which he has no hand in creating or maintaining so that his employee's working time is sporadic as well as poorly paid.

If the situation outlined above were confined to a few industries its effects would not be so generally disastrous to business. But in recent years it has become an almost universal condition. Legitimate manufacturers who have over one or many generations

built up great enterprises by their adherence to fixed principles of integrity in quality of products have these products stolen from them by imitators almost before they can place them on the market. As a result, they are finding in many instances that their initiative and continued expenditure in plant equipment, personnel, and sales activities are largely for the benefit of the irresponsible imitator.

The manufacturer is not the only one who is suffering. Since the condition that exists affects vitally questions of investment and employment, it is felt in the entire economic fabric of our existence. The retail merchant, after all, must be the outlet for all commodities which come directly into the hands of the general mass of consumers. The surfeit of cheap merchandise on the market has brought down his dollar sales to a point where profits are more unusual than usual. Merchants would rather sell the better grades of merchandise because each unit sale brings in more dollars, and good merchandise means more satisfied customers. But competition is so intense that against their will many of them have substituted the superficial appeal of low prices for the substance of reality at legitimate prices. The result of this kind of senseless price merchandising is that large numbers of retail merchants to-day base their operations primarily against competitors instead of what their own judgment tells them is the type of merchandise their particular clientele prefers.

There is another important phase of economic life which has been seriously affected by the prevalence of low-grade merchandise, and that is the newspaper and magazine field. Advertising has diminished tremendously in the past four years. Part of this, of course, may be justly ascribed to the general shrinkage of activities which have accompanied the depression. But beyond this is the undisputed fact that legitimate manufacturers who have a pride in their product have been forced to cease advertising through loss of revenue suffered by the encroachment of imitators. Where price instead of integrity of quality is the major appeal, advertising of wares to the public on the basis of their superiority in style, wear, service, etc., is useless, even if the manufacturer is prosperous enough to continue to advertise. This same situation obtains in retail advertising. The price battle has been waged with such unreasoning claims, and with such careless regard for the facts that the public is rapidly losing confidence in the claims of resources in which at one time they had the most implicit confidence.

The National Quality Maintenance League, which has been organized by a group of manufacturers originating and producing style merchandise with fixed standards of quality, has been carrying forward a general educational campaign to emphasize the economic and style value of merchandise of this character; to coordinate the activities of these organizations, and to encourage and foster the organization

¹ President, Forstmann Woolen Co. and chairman of the National Quality Maintenance League.

of such groups in related industries as can assist in this movement. The league could not have obtained the widespread support which it has gotten without the whole-hearted cooperation of publications of every character. This cooperation has run the gamut from such important fashion publications as *Vogue* and *Harper's Bazaar* to the *Atlantic Monthly* and *The Forum*. There is no doubt that this cooperation has been most effective in awakening the public to the fact that merchandise bought on price only is a gross extravagance.

A campaign of this character is necessarily one of education. It appears logical and feasible to me that

a most important curative measure would be a concerted campaign to educate the people of the country regarding the necessity of insisting on good standards of quality in every commodity which they buy, and to recommend to Congress legislation which would control the activities of unscrupulous copyists and imitators both in their physical operations and in the claims which they make in advertising and selling their products.

This whole question of better standards of quality in merchandise is one in which the Government, through the Department of Commerce and its other agencies, should interest itself actively.

WIRE DIAMETERS FOR PRODUCTION SCREENS

Manufacturers of wire screens used in the production of mineral aggregates have for some years desired to reduce the variety of wire diameters used for these screens. To this end they have been cooperating with officers of the three large associations representing producers of mineral aggregates, including sand and gravel, crushed stone, and slag. During 1932, conferences of manufacturers and users of screens were held to consider the possibility of materially reducing the number of different wire diameters catalogued.

A representative of the division of simplified practice of the Bureau of Standards was requested to attend a preliminary conference held on October 7, at which manufacturers of screens and producers of mineral aggregates were fully represented. A tentative list of wire diameters had been prepared by a committee of screen manufacturers and was approved at this meeting. The committee then requested the Bureau of Standards to arrange a general conference at which the tentative list could be acted upon.

This general conference was held on December 15 in Washington, under the auspices of the Bureau of Standards, and was attended by representatives of screen manufacturers, manufacturers of machinery in which these screens are used, producers of each group of mineral aggregates, and representatives of various departments of the Government, including the Departments of War, Interior, Agriculture, and Commerce. All phases of the matter were fully discussed, and certain modifications in the tentative list of wire diameters were made to bring the final simplified list in conformity with current practice and trends in the industry.

The simplified list as unanimously adopted by the conference, represents a reduction in variety of approximately 75 per cent in the number of different wire diameters used for square mesh screens having clear openings ranging from one-eighth inch to three inches, inclusive. Four wire diameters, designated as light, standard light, standard heavy, and heavy, were adopted for each clear opening listed. The total number of listed openings is 21 in the range of size above mentioned, and is stated by the manufacturers to cover 95 per cent of normal demand.

This project is regarded by screen manufacturers and users as a starting point for further simplification, which it is hoped will include reduction in the number of standard clear openings, also simplification of

all dimensions of round hole perforated screens and of bar and wire screens with rectangular openings. The industry hopes eventually to develop projects covering actual simplification of sizes of normal aggregates on a national scale, after completing the projects above described. It is authoritatively stated by both screen manufacturers and users, that such simplification is not only desirable from their own standpoint, but will be of direct public benefit through the establishment of definite standards of dimension for the materials used in all concrete construction.

RADIO TUBES IN NEED OF SIMPLIFICATION

Radio receiving sets to-day are using many new tubes. Thereby hangs a tale of a new confusion in the industry which is giving manufacturers, dealers, and service men trouble.

Six months ago there were 33 recognized designs of tubes. Tubes of the same type were widely interchangeable. To-day there are 65 types of tubes, and very little interchange is possible. An extreme instance is a tube about to be put on the market which has seven prongs. A definite trend toward simplification has been reversed.

Dealers and service men are complaining of the burden of stocking 65 varieties of tubes. Some manufacturers feel they have worked into a situation wherein they make no money from tubes but must depend upon a side line, as incandescent lamps, to get by. Set owners have not felt the full impact of the change as yet, but when they do find there is only one store, perhaps at the opposite end of town, where they can get the one tube that fits the socket in their radio set, they are expected to protest. In the end, the pressure of these forces probably will accomplish simplification.

ASBESTOS PAPER AND ASBESTOS MILLBOARD

Simplified Practice Recommendation R19-28, Asbestos Paper and Asbestos Millboard, has been reaffirmed without change by the standing committee of the industry.

This recommendation, which was proposed and developed by the industry, has been instrumental in reducing the varieties, sizes, widths, and thicknesses of asbestos paper from 72 to 20 and sizes and thicknesses of asbestos millboard from 21 to 4.

AIDS TO THE CONSTRUCTION INDUSTRY

Manufacturing and Construction Economy Effectuated by Simplified Practice, Commercial Standards, and Certification and Labeling Plan Developed by the Bureau of Standards

By HENRY D. HUBBARD, *Bureau of Standards*

The Bureau of Standards has facilities for a great variety of researches affecting construction. These are of the utmost value to the people: Fire resistance as related to construction, protection from lightning by suitable conducting systems, adequacy of plumbing, and other systems required in structures; the properties of structural materials and built-up building components; the economy strength of structural elements and structures; protection from weathering—the “ravages of time”; and others in great variety promoting the arts and industries which insure comfort, health, and wellbeing to all people.

The Department of Commerce, through its Bureau of Standards, aids the construction industry and the public served by it in many ways. The planning aspect was described in the preceding article; research and testing will be touched upon later. The present article deals with bureau standardizing activities.

Precise measurement during this century has extended to building materials and processes of construction with successful results. Strain gages measure to a few millionths of an inch the strains in structures under load. Testing devices are multiplying to measure the quality of structural materials and efficiency of processes. Scientific research discloses the optimum measured factors in the quality and performance of products. Measuring instruments and methods become steadily more precise and more automatic. Measurement is emerging as a master control of industry in serving the Nation.

Standards are vehicles for applied measurement. They prescribe in measured terms the quality of materials, performance of devices, and efficiency of processes, and are called standards of quality, standards of performance, and standards of practice.

The Bureau of Standards promotes actively the simplification of varieties, the standardization of staples, and the certification of quality of materials of construction. To reduce the number of sizes and varieties of any product to an acceptable minimum in the light of current production and demand, the bureau through its division of simplified practice, cooperates with industry in formulating simplified-practice recommendations. Seven representatives of business, industry, and the Government serve as an advisory committee in planning the simplification activities of this division.

If an industry requests the bureau to sponsor a project for simplifying a given line of products the work follows a carefully standardized procedure controlled by industry at each step. A special standing committee of the industry is appointed to secure the active

support of all interests concerned. The success of such projects is such that engineering handbooks, management handbooks, codes, and other reference works more and more refer to specific simplified-practice recommendations. If a simplification project is accepted, in writing, by a substantial majority of the producers, with a satisfactory concurrence of distributors and consumers, a simplified schedule of accepted sizes and varieties is officially promulgated by the Bureau of Standards with the approval of the Secretary of Commerce.

Simplified practice eliminates superfluous variety, sizes, patterns, and types of commodities; reduces production costs; and enhances values in distribution and consumption. An industry stands to gain by simplified practice which favors the stock items which reflect normal maximum demand (the user's choice), rather than odd sizes or “specials.” Given a

choice, it is economy to select a stock item instead of a “special.” Ease of replacement, prompt delivery, and economy result.

Active simplified practice recommendations illustrate how successfully industries have eliminated superfluous variety. A ratio of reduction of 5 to 1 is not uncommon. In some cases a reduction of more than 90 per cent is effected, apparently without inconvenience. The advantages and savings are reported as equally surprising.

Construction materials are especially amenable to simplified practice. Among successful projects we find glass for floor, roof, and sidewalk; millboard and paper board for insulating purposes, lumber, reinforcing bars and spirals, joists, roofing and roofing ternes, concrete building units, curbstone, slate, tile, pipe elbow fittings, plumbing fixtures for hospitals, lavatory fittings, brick, builders' hardware, and others of interest and importance to architects, structural designers, engineers and the ultimate consumer. The sizes and varieties of rough and smooth face brick were reduced from 75 to 2, concrete building units from 115 to 44, structural slate from 827 to 138, solid section steel windows from 42,877 to 2,274. Sidewalk lights were simplified by reducing 120 sizes to 6, 80 styles to 5, 10 shapes to 2.

One group finds “that manufacturers are able to make shipments more promptly and accurately. An architectural concern states that “the cost of materials is lessened by application of such standard simplified practice.”

The gains from reduced stocks, briefer catalogue, lists, quicker turnovers, reduced warehouse space requirements, efficient ordering, and more prompt re-

This is the second of a series of articles by Mr. Hubbard, assistant to the acting director of the Bureau of Standards, outlining the work of the bureau as it concerns the construction industry. These articles will cover research, testing, simplified practice recommendations, commercial standards, and the certification and labeling plan.

placement or repairs are estimated in high figures by experts in the several fields. One hardware merchant reports that "this (simplified practice recommendation) has increased our net profits on fencing at least 25 per cent." It is noteworthy that acceptors form more than 80 per cent of the national output of woven-wire fencing.

A large eastern manufacturer writes that simplified practice "is one of the greatest works done in recent years for the economy of construction." A concrete block distributor reports: "My block business shows a satisfactory profit whereas formerly excessive stock ate up all the profit." The head of a supply house writes: "We have been able to reduce our invested capital and inventory approximately 50 per cent."

Cooperation in the bureau's simplified practice service is given by the American Institute of Architects, a fundamental professional group concerned with construction. A survey of its members showed 4,112 requests for published simplified practice recommendations on 121 subjects, and 1,056 acceptances of 63 simplified practice recommendations from 46 firms and individuals. During a time of relative inactivity in building this is most significant.

Another division of the Bureau of Standards, "Trade Standards," serves consumer and producer alike by cooperation at the request of the industry in establishing standards of quality and dimension for products. If the industry as a whole, accepts the standard, the bureau, on approval by the Secretary of Commerce, promulgates it as a "Commercial Standard." Many gains result—a definite indication of grade, greater availability, lower costs by mass production, smaller stocks, competitive pricing, easy replacement, and more prompt shipment. A new confidence is felt by purchaser and user if a certificate of quality, based on a specification, which accompanies the product becomes part of the sales contract.

Typical "commercial standards" in the construction fields comprise: Staple porcelain (all-clay) plumbing fixtures (CS4-29); staple vitreous china plumbing fixtures (CS29-30); colors for sanitary ware (CS30-31), covering six standard colors, and providing for color reference samples to insure uniformity. The standard for builders' template hardware (CS9-29), and non-template hardware (CS22-30), combine simplified schedules of variety and interchangeability for replacement with standard finishes.

A structural material specification recently approved by industry as a commercial standard, fiber insulating board (CS42-32), gives specific requirements for thermal conductivity, tensile strength, plaster bond, water absorption, deflection, thickness, etc., for two classes of this material used as structural and roof insulation. This is most timely since a new created industry is now producing insulating materials—some resisting heat transmission, others resisting sound transmission, important for the new technologies of indoor air conditioning and quiet.

In establishing such a commercial standard, national groups participate, such as the American Institute of Architects, Associated General Contractors of America, Plywood Manufacturers Association, the National Retail Furniture Dealers Association, and similar large makers and users of construction materials. The bureau serves as impartial coordinator to measure the degree of acceptability of a proposed

specification, and a commercial standard is promulgated only if approved by 65 per cent by volume of production, and then only if no active opposition develops. Evidence of the value of this service is a report from the Red Cedar Shingle Bureau, stating that as a result of commercial standard (CS31-31), on September 15, the red cedar shingle industry was oversold by 226 carloads after all stocks on hand had been cleared. The mills are now operating at more than 50 per cent full capacity, employment has doubled in the past three months, and they are now able to operate at a profit. The industry is in a better position than it has been for about 10 years owing largely to the good effect of the commercial standard and the certification label system recommended by the bureau.

Another division of the bureau, "specifications," promotes and facilitates the use of nationally recognized specifications. In this enterprise the certification and labeling plans of purchase were devised with special reference to purchasing agencies of city, State, and Federal Governments, purchasing with tax money for public purposes.

There have been compiled "willing-to-certify" lists of 8,000 sources of supply of commodities certified to comply with the requirements of 381 Federal specifications and commercial standards, about 60 per cent of which relate to materials of construction. Officers of the National Association of Purchasing Agents and the Educational Buyers Association attest the value of the distribution of these lists to purchasers of educational institutions. The lists are continuously subject to revision and enlargement by increasing the number of lists and the number of "willing-to-certify" firms on those lists.

The certification plan is supplemented by a self-identifying quality guaranteeing labeling plan developed by trade associations for products meeting the terms of nationally recognized specifications. These bear a quality label guaranteed by the trade association. Gains from the plan include encouragement to makers to comply with nationally recognized standards of quality, aiding producers to expand their markets for staples complying with such standards by promoting confidence in their quality, determining the commercial acceptability of certain nationally recognized standards of quality, and, finally, broadening the source of supply of products conforming to such standards.

The Chief Coordinator of the Federal Government states in a published bulletin that inspecting officers are better assured of quality when a material is delivered under the certification and labeling plans. These facilitate the use of the nationally recognized specifications by purchasers not equipped to test the products delivered and thus remove the disadvantage under which the small purchaser labors.

Of particular interest to the construction industry are the compilations of nationally recognized specifications. The bureau's specifications division has done signal service to all purchasing agencies by the compilation and publication of the National Directory of Commodity Specifications, in which all nationally recognized specifications are listed and briefly described. It is also compiling an Encyclopedia of Commodity Specifications series giving in full, without duplication, the substance of all these specifications, with

indication of the differences in recognized specifications for the same commodities. Together the directory and encyclopedia not only form a monumental contribution to efficient purchasing, designed primarily for public purchasing agencies spending tax money, but equally valuable to private purchasing groups as well.

Naturally many structural materials are covered in this reference library, materials the quality of which determines the life and utility of construction work. Private purchasers may now buy quality-specified materials conforming to national standards without actual testing to secure the advantages of certified quality. Two volumes of the encyclopedia series have already been issued. Standards and Specifications in the Wood-Using Industries, and Standards and Specifications for Nonmetallic Minerals and Their Products; a third volume, Standards and Specifications for Metals and Metal Products, is in press; seven others are planned. A revised edition of the National Directory, first issued in 1925, recently appeared, bringing the subject references up to date.

The program is being carried out under the guidance of an advisory board, the members of which are official representatives of 14 national organizations interested in the preparation and unification of specifications, and with the cooperation of the Bureau of Foreign and Domestic Commerce of the Department of Commerce.

Typical materials of construction are now purchasable under the certification plan and guaranteed to conform to the Federal specifications, such as Portland cement (SS-C-191), hollow clay tile (SS-S-301), common clay brick (SS-B-661), fire-clay brick (HH-B-671), prepared asphalt roofing (SS-R-501), asbestos millboard (HH-M-351), abrasive paper (P-P-101), wire rope (RR-R-571), flat glass for glazing purposes (DD-G-451), builders nontemplate hardware (FF-H-101), interior varnish (TT-V-71), lead-zinc base paints (TT-P-36), battleship linoleum (LLL-L-351), concrete pipe (WW-P-371), threaded cast-iron pipe fittings (WW-P-451).

The certification plan has also been applied to certain structural materials for which commercial standards have been promulgated by the bureau, such as plywood (CS35-31), red cedar shingles (CS31-31), staple porcelain (all-clay) plumbing fixtures (CS4-29), builders' template hardware (CS9-29), colors for sanitary ware (CS30-31), wall paper (CS16-29), aromatic red cedar closet lining (CS26-30).

Related work is that of the Federal Specifications Board, of which the director of the bureau is ex officio chairman. The board is interdepartmental. Quarters and a clerical staff are, however, furnished by the bureau. Bureau experts actively cooperate in drafting technical specifications for the staple supplies required by the United States Government. Bureau experts hold 27 chairmanships of the technical committees of the board, which number more than 64, on which 56 bureau experts serve as committee members.

The bureau's research results thus enter specification practice as standards of quality and dimension. More than 700 Federal specifications have been adopted. They govern the great bulk of Government purchases, many of which relate to materials of construction. They are formulated in the light of the present "state of the art" and their use has effectively raised the standard of Government supplies. These Federal specifications may be adopted by States and municipalities and large private buyers to govern their purchases, thus giving all governmental purchasing agencies in the country the benefit of the knowledge and expert judgment of the Federal Government.

In times of economic stress rigid economy in public purchasing is called for to conserve tax money, and it is important to plan expenditures wisely to insure economy and efficiency. In these efforts the Bureau of Standards cooperates effectively with commerce and industry in three ways, namely, the active promotion of simplification of varieties, the standardization of commercial products, and finally, in facilitating the use of standards of quality in the manufacture and sale of materials on the Bureau of Standards' certification-labeling plan.

STANDARD NOMENCLATURE OF DISEASE

For the past three years, 27 national societies and governmental bureaus in the medical, clinical, and statistical fields have been collaborating through the National Conference on Nomenclature of Disease, which they created for the purpose, in the preparation of a uniform system of naming and classifying diseases. The results of this work which was described in the June, 1931, issue of *COMMERCIAL STANDARDS MONTHLY*, was released from the press of The Commonwealth Fund (41 East Fifty-seventh Street, New York) on January 1, 1933, under the title of *A Standard Classified Nomenclature of Disease*.

As compared with previous nomenclatures, this book, which presents a numerical index of diseases, is much more inclusive and takes into systematic account, as most other nomenclatures do not, both the etiology of the disease and the part of the body affected. It is the first classified nomenclature to be developed by national rather than local interests. The sponsors of the work hope that this standard nomenclature will promote uniformity in the expression of

medical thought and, because of its analytical nature, will encourage greater precision in the analysis of the causes of illness and death. It should thus provide a more accurate basis than any heretofore available for mortality and morbidity statistics, and for the recording and interpretation of clinical experience.

FLAX AND HEMP TWINE

The printed copies of Simplified Practice Recommendation R136-32, covering flax and hemp twine, are now available, and can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

This simplification program, which was suggested and developed by members of the industry, provides for the number, yardage, breaking strength, and put-ups of different grades of fine finished hemp twine; and for the ply, yardage, breaking strength, and put-ups of the various grades of fine unfinished flax and hemp twine.

COMMERCIAL TESTING LABORATORY SERVICE

Laboratory Aid in Investigating Sales Claims of Sellers

By B. H. WITHERSPOON¹

The buying public has at last awakened to a realization that its needs, desires, and demands during the past three years for progressively lower prices, and yet lower prices, have brought upon itself a barrage of difficulties and disappointments.

This price demand has been anticipated and encouraged by certain manufacturers in all fields of industry. Broadly speaking, these manufacturers were those whose ability to prove and sell the idea of quality to their buyers was limited or negligible. Price was their major sales weapon, and quality, performance, and efficiency were presumed, rather than actual.

Quality manufacturers, faced on every sales front by both public demand and competitive activities, were forced to either yield their previous product standards and attain a level of production costs to meet such price demands, or to sacrifice profits and accept losses, in an attempt to maintain their portion of such business as was available.

This merchandising era has been bolstered and promoted by advertising and sales claims running the gamut from truth to fiction.

It is to be wondered that the buying public, wanting to believe that they were getting the best for the least money, encouraged in this belief by advertisements and sales arguments, all too frequently unwarranted and unproven, and finally finding their beliefs unfounded and their money poorly spent or wasted, should have become progressively skeptical of all advertising and sales claims?

Even manufacturers whose word about their products formerly received unhesitating acceptance, now find an astounding lack of acceptance and belief upon the part of the buying public.

Such a situation, gaining ground with great momentum over recent months, obviously requires the most serious attention on the part of all manufacturers and distributors. Many of the more forward looking of these have recognized the situation well in

advance and have taken steps to make available to their own marketing organization and to their customers facts, evidence, and proof regarding the merit quality, efficiency, performance, and other factors of their products.

So far has been the public swing of incredulity, lethargy, and indifference to the claims of the manufacturer and distributor that the seller now finds it necessary to use every possible means to prove his case. No longer will the unsupported claims of the seller fully suffice, whether it be the spoken word of the individual salesman or the printed word of the advertiser.

In response to an insistent and growing demand by seller and buyers alike, for certification and proof from recognized disinterested sources, regarding the sales claims of the former, and which can be relied upon and accepted by the latter, the Pittsburgh Testing Laboratory has established an industrial research division to coordinate and expand its research and fact-finding investigations, for the mutual benefit of buyers and sellers. For this purpose use is made of the entire facilities of the laboratory and its branch offices. As well as its personnel located at all industrial centers. A considerable number of assignments for clients' use in sales and advertising have already been handled by the industrial research division.

In the interest of both the seller and the buyer, the findings of a technical institution serving the seller as a client, and yet definitely obligated to the buyer, who considers and accepts such findings, must be surrounded by every possible safeguard. Accordingly, the Pittsburgh Testing Laboratory, in accepting the clients' assignments, does so under an agreement that the use of its findings in sales promotion and advertising is not permitted unless and until such use is first submitted to the laboratory for review and approval, not only that the accuracy of quoted statements of the laboratory may be fully checked, but that the references to conclusions drawn, or inferences made, regarding its findings may be established as well.

¹ President, Pittsburgh Testing Laboratory, Pittsburgh, Pa.

UNIFORM STATUTE IS PREPARED FOR MECHANICS' LIENS

Completing an 8-year study, the standard State mechanics' lien act committee of the Bureau of Standards has made a report to the Secretary of Commerce embracing a uniform mechanics' lien act recommended for enactment by the legislatures of the several States.

The proposed uniform State statute provides a more equitable basis for liens against real property by laborers, persons who furnish material, subcontractors, and others engaged in building construction and related work.

The committee's report states that it had the assistance, in drafting the uniform act, of the National Conference of Commissioners on Uniform State Laws. This organization (see November, 1932, *COMMERCIAL*

STANDARDS MONTHLY) and the American Bar Association, approved the final draft of the act at their recent annual meetings. The task of the committee is said in its report to have been that of reconciling the diverse interests represented in the construction industry. The report states that an agreement on an act, "which, it is believed, accomplishes the purpose, is a new and forward step in the matter of legislation affecting so large a number of commercial groups."

The committees have endeavored to safeguard the interest of the owner at every step, and at the same time to accord to the contractor, the subcontractor, the material man, and the laborer a facility for collecting their accounts and, when necessary, for filing and proving their liens so as to insure security to them upon the real property for which their work or materials were furnished or upon a bond substituted for it.

SPECIFICATIONS FOR CONSUMER GOODS

Standard Specifications for Household Buying Are Being Developed

By FAITH M. WILLIAMS¹

At the present time many farm products are graded for sale according to standards set-up by the Bureau of Agricultural Economics, United States Department of Agriculture. Manufacturers have for a long time been writing accurate descriptions for the raw materials and partly finished goods they buy. The Bureau of Standards, United States Department of Commerce, has worked with industrial and commercial agencies in setting up specifications that have limited the production of various articles to a given number of stock sizes and thereby cut down manufacturing costs. The Federal and State Governments have worked out specifications for purchases for various Government institutions. The housewife is beginning to ask why she can not buy specification-made goods guaranteed by the manufacturers.

The Bureau of Home Economics, United States Department of Agriculture, and the American Home Economics Association received so many requests for information on the subject of standard specifications for household goods that they cooperated in the compilation and publication of the booklet entitled "Household Purchasing; Suggestions for Club Programs." This booklet outlines the material available for club programs on difficulties the consumer meets in the present market, food standards and grades, food containers, weights and measures, quality standards and grades for foods, buying textiles and clothing, household equipment, and what the Government can do to help the consumer. The programs are now in use by a number of extension clubs.

In this attempt to bring together information as to the standard specifications which are now in definite usable form for the housewife, several interesting points came to light.

Some of the grades used in sorting agricultural products for the market can profitably be used by the housewife in her purchasing, provided definite information is furnished her as to what these grades mean. In some cities beef officially stamped with the official grade name can be bought in the retail shops. In some parts of the country poultry, eggs, and butter are now being sold to consumers labeled according to the Government grades. Large numbers of turkeys have been graded for the consumer, each bird being labeled with its Government grade mark. The standards for canned foods developed in the Bureau of Agricultural Economics under the warehouse act have been used in certain States as a basis for selling canned goods.

Under the food and drugs act, definitions and standards for a large number of food products have been promulgated by the Department of Agriculture. These are designed (1) to fix the identity of the articles, and (2) to insure that they be of sound and marketable quality. The specifications are of such a nature that any departure of an article above the

maximum or below the minimum limits prescribed is evidence that the article is either impure or abnormal. Recently the food and drugs act was amended so as to authorize the Secretary of Agriculture to promulgate standards of quality, condition, and fill of container for canned foods. The same amendment authorizes the Secretary to prescribe a statement which will appear in a plain and conspicuous manner on the labels of all canned foods which do not meet the standard and which will clearly indicate that they fall below such standard. This amendment in no sense authorizes the distribution of adulterated or misbranded canned foods. As heretofore, these are banned under the terms of the food and drugs act. It does, however, divide legal canned foods into two classes: (1) A class of a quality which entitles it to be known as "standard," and (2) a class which is in some respects inferior and, therefore, must be labeled "substandard."

The imposition of the substandard labeling requirement is important from the housewife's standpoint because it is a precaution to save the pocketbook. The housewife with a limited budget who feels that she can not afford to purchase canned foods of standard quality but does desire to obtain canned articles of satisfactory nutritive value, can satisfy her desires by selecting those canned products which bear the substandard label, with full assurance that they are legal and wholesome, even if not so palatable or of such satisfactory appearance as the standard article. On the other hand, if it is her desire to avoid the lower grades of canned foods, she may assure herself of the character of the product she buys by refusing to accept an article bearing a substandard label.

Some of the specifications used by Government and State agencies for institutional purchases may also be used by the housewife. Most of these, however, need to be revised in terms which will help to indicate their use to her. This would involve considerable study.

When she buys household equipment, the housewife frequently spends a considerable sum of money for a single article. In making such a purchase she wants the best possible information, and she frequently asks the Bureau of Home Economics for assistance in learning what she needs to know. A beginning has been made in the setting up of standard specifications for household refrigerators. The refrigerator, like many other pieces of household equipment, does not carry its value on its face. It has taken some three years of work by manufacturers, ice distributors, and refrigerator users to determine how ice-cooled refrigerators should be labeled so that the housewife will know what she is getting. There may be in one row refrigerators varying in price from \$25 to \$200 with little difference in outside appearance. It is important that in deciding what to purchase the housewife should have some other basis of judgment. The salesman may tell her much about insulation and probable length of life. She would be much more secure in her purchase if each manufacturer were to place on his ice box such a

¹ Senior economist, Bureau of Home Economics, U. S. Department of Agriculture.

statement as the following with pounds and cubic feet definitely stated.

Ice capacity ---- pounds; ---- cubic feet of usable space. Guaranteed temperatures. Milk compartment not over 45° F. Food compartment average temperature not over 50° (under standard test conditions, outside temperature not exceeding 80°, with daily ice consumption under standard test conditions of ---- pounds).

Such information would enable the housewife to select the ice box best adapted to her needs. In con-

ferences among manufacturers, distributors, and users of refrigerators agreement has been reached as to part, although not all, of this label. It is an indication of the type of specification which the housewife wants and which the best manufacturers are coming to see they must furnish in some form and stand behind if they are to protect their goods on the market.

As time goes on it will be possible to develop similar labels suitable for other pieces of household equipment which will be of material help in solving the purchasing problems of the housewife.

MINIMUM REQUIREMENTS FOR SMALL DWELLINGS

Emphasizing the great advantages of sound construction as related to public safety and health, the Bureau of Standards announces a revision of the publication, "Recommended Minimum Requirements for Small Dwelling Construction." The primary purpose of this series of recommendations prepared by the Department of Commerce Building Code Committee, is to suggest minimum requirements that may be utilized by local building officials and committees in connection with redrafting their building codes. The present revision takes into consideration the results of research and experience since the publication of an earlier report of the same name issued in 1923. Copies of the revised publication may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 10 cents a copy.

There is a common tendency, a foreword to the report states, to forget the positive protection to safety and health that properly framed, well-administered building codes can effect through prohibiting faulty structures. This tendency has contributed in large measure to the hampering effects of antiquated codes which restrict unnecessarily the development and use of many of the best improvements in materials and methods that have been made in recent years.

Adequate strength and fire resistance are the chief considerations of the report. In the one case attention is centered on minimum thickness of walls, construction of floors, bracing where necessary to prevent distortion, and anchorage to resist the force of high winds. In the other, various methods of fire stopping, proper clearances between heating devices and combustible construction, and safe construction of chimneys is featured. The aim has been to require what is necessary in the light of tests and experience but at the same time not to burden the home builder by requiring excessive amounts of materials.

In addition to the suggested requirements, there is an appendix in which much supplementary information about sound building is given. This calls attention to the new developments that code committees may wish to consider. In some cases there is not as yet sufficient evidence upon which to base definite recommendations, but rapid increases in knowledge are to be expected, and will perhaps justify local authorities in giving recognition. The appendix also describes many features of good building practice that should be observed but which it is not feasible to require in a code.

The material presented in the report should be of marked value to designers, commercial builders, home

owners, and other groups. The timely value of the report proceeds from the fact that when a resumption of home building takes place, as it eventually must, a source of information on sound construction will be at hand.

NEW FEDERAL SPECIFICATIONS

Seventeen specifications were acted on by the Federal Specifications Board during the month of January. Of this number, nine proposed specifications and eight revisions have been sent out for official comment and criticism. Copies of these specifications are available in mimeographed form, and further information can be obtained from the Federal Specifications Board, Bureau of Standards, Washington, D. C.

New designation	Specifications proposed	Old F. S. B. No.
	Aluminum alloy No. 3 (aluminum-manganese) sheet and plate.....	
	Mattresses, inner spring.....	
	Sponges.....	
	Hose, pneumatic, braided.....	
	Brick, silica.....	
	Cement, silica.....	
	Charcoal.....	
	Mittens, asbestos.....	
	Conduit, steel, rigid, zinc-coated.....	
	Specifications to be revised	
M-C-301	Chinaaware, vitrified.....	243a
O-A-51a	Acetone.....	
W-L-101a	Lamps, electric, incandescent, large, Tungsten-filament.....	
FF-P-101a	Padlocks.....	
SS-T-301	Tile, structural, clay, fireproofing, partition, furring.....	508
SS-T-321	Tile, structural, clay, floor.....	506
SS-T-341	Tile, structural, clay, load-bearing, wall.....	507
ZZ-T-401	Tires, bicycle.....	581

EFFECTIVE DATE EXTENDED FOR WOOL-BLANKET STANDARD

The date for the clearance of existing stocks of wool and part wool blankets was extended to April 1, 1933, according to a circular letter to the industry from the division of trade standards, Bureau of Standards, under date of December 30, 1932. This action followed the request of representatives of the retail trade and was approved by a majority of the standing committee. It was felt that unusual business conditions and the attendant inability of the retail trade to clear their stocks of blankets before December 31, 1932, warranted this action.

The fine spirit of cooperation exhibited by the majority of the industry in agreeing to this postponement, when their stocks have already been cleared, will doubtless be reflected in the spirit of fair play that is anticipated after April 1.

DEVELOPMENT OF VARIOUS TYPES OF SPECIFICATIONS

Specifications for Materials and for Equipment Discussed by Waterworks Engineer

By F. M. RANDETT¹

Standardization is one of the essential bedrocks of civilization. The origin of standardization goes back to the crude beginning of human culture. The earliest records of which we now have any knowledge were the standards of weights and measures of ancient Babylonia and Egypt. The Ten Commandments are basic standards of modern ethics. Barter and trade developed a standard medium of exchange or money. The development of these early standards to the present methods of effecting commercial transactions is a history of interest and value that can not be covered in this brief article.

Standardization has been essential to the development of our civilization, and it is particularly necessary now if we are to advance in the next decade at the pace we have in the past. No one can doubt that the standardization of materials, of machine, of processes, and of products of manufacture, has been one of the prime aids to American progress.

Engineers preparing specifications and contracts should give emphasis to the use of standard terms, abbreviations, symbols, constants, and other nomenclature, for we must use a standard language if we are to be properly understood. Specifications, contracts, and other technical procedure must not overlook dimensional standards that have been set for various commodities. A standard form should be followed in the preparation of contracts and specifications, so that nothing is overlooked and that important general matters, such as responsibility, payments, etc., are legally covered.

We probably will never reach the point where standardization of specifications can extend to the complete specifications for a project. Specifications can not conceivably replace the service furnished by the engineer in drawing up a standard in contract form for a waterworks installation. This is manifest, as geographically, geologically, biologically, and logically, conditions are different. However, standardization of specifications for materials and equipment is of prime importance to the engineer in enabling him to fit into his project standard materials and equipment that make it possible for him to turn out a finished installation with a maximum of efficiency, hydraulically, mechanically, electrically, and financially. The recognition and use of specifications enables him to concentrate his attention to the planning of the installation and to the development of specification requirements for such materials and equipment as may not yet be covered.

The use of the word "standard" naturally raises the question—What is a standard specification? Primarily, a standard specification is a specification adopted as standard by some party. First, a specification may be a standard of one consumer or it may be that of the manufacturer where a specialty is involved. When such a specification is found effective its use

naturally extends to other consumers as a result of the brotherhood of engineers. When it has spread this far an association of consuming interests, such as the American Water Works Association, may advance the specification to a standard of that association.

Even with the greatest possible use of existing standards, there will be many materials and equipment items for which the individual must sooner or later set up his own standards, putting them in line for group use, and eventually national standard use. In the preparation of any such specifications, there are certain major matters that are worthy of mention.

1. A specification for a product should contain the fewest possible restrictions, consistent with obtaining the material desired. The service which the product is to perform, in connection with reasonably feasible possibilities in its manufacture, should determine the limitations of a specification. A complete workable specification for a product represents a very high order of work. It should combine within itself the harmonized interests of both the producer and consumer, and should be so comprehensive as to leave no chance for ambiguity or doubt, and above all, should provide for inspection and tests that will protect the consumer in his purchases.

2. Excessively severe limitations in a specification are suicidal. They lead to constant demands for concessions, which must be made if the work is to be kept going, or to more or less successful efforts at evasion. Better a few moderate requirements rigidly enforced, than a mass of excessive limitations, which are difficult of enforcement, and which lead to constant friction and sometimes to deception.

3. There is no real reason why a specification should not contain limitations derived from any source of knowledge. If the limitations shown by physical test are sufficient to define the necessary qualities of the material, and this test is simplest and most easily made, the specifications may reasonably be confined to this. If a chemical analysis or a microscopic examination, or a statement of the method of manufacture, or information from all four, or even other sources, are found useful or valuable in defining limitations, or in deciding upon the quality of products furnished, such information should appear in the specifications. Neither the producer nor the consumer has a right to arrogate to himself the exclusive right to use information from any source. Where methods of testing, analysis, or inspection are well known and understood, it is sufficient if the specification simply refers to them. Where new or unusual tests are required, or where different well-known methods give different results, it is essential to embody, in the specification, sufficient description to prevent doubt or ambiguity.

4. Proprietary articles and commercial products made by processes under the control of the manufacturer can not, from the nature of the case, be made the subject of standard specifications. The very idea of a specification involves the existence of a mass of com-

¹ Pacific coast manager, Robert W. Hunt, Co., engineers, San Francisco, Calif.; abstract of paper delivered before meeting of the California section, American Water Works Association, Stockton, Calif.

mon knowledge in regard to any product, which knowledge is more or less available to both producer and consumer. If the manufacturer or producer has opportunities, which are not available to the consumer, of knowing how the variation of certain constituents in his products will affect the product during manufacture, so also does the consumer, if he is philosophic and a student, have opportunities not available to the producer of knowing how the same variation of constituents in the product will affect that product in service under special conditions with which he is familiar, and it is only by the two working together and combining the special knowledge of each, that a really valuable specification can be drafted.

5. All specifications in daily actual use need revision from time to time, as new information is obtained, due to progress in knowledge, changes in methods of manufacture, and changes in the use of products. A new specification; that is, one for a product which has hitherto been bought on the reputation of the makers and without any examination as to quality, will be fortunate if it does not require revision in from 6 to 10 months after it is first issued.

There is at present a distinction existing between specifications for materials and specifications for equipment. Specifications for materials are essentially standards of quality involving test requirements that indicate a proper measure of usefulness. In addition to quality requirements, they should include provisions that will result in a high standard of usefulness in their application. Such items are tolerances, workmanship, and inspection provisions. Not only should materials comply with certain stated quality requirements, but they should comply with standards of first-class workmanship in all particulars. When materials are bought in considerable quantities or where they are vital construction materials, or where they are materials essential to the continuous operation of a plant or machine, or when their failure may result in appreciable monetary loss, such materials must be most thoroughly inspected, otherwise the preparation of any specification is superfluous.

The general term of "equipment" covers a large field—from small devices to the largest mechanical and electrical equipment. Generally speaking, the equipment represents the development of individual manufacturers. A specification of this kind can not be extended to the same detail as can one for materials.

There are, however, important points in connection with the specifications for equipment that should be carefully considered. Specifications for operative efficiency for machines and devices, known as standards of performance, specify 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. The requirements for the large field of equipment makes it practically impossible to give a more comprehensive picture of the method of arriving at sound or comprehensive specifications. Mention, however, might be made of the fact that municipal, State, and Federal codes and regulations should be studied for the technical regulation of the construction and installation. Such codes provoke efficiency and convenience in the maintenance and operation of the equipment with fire protection and safety provisions.

To much the same extent as on materials, specifications for equipment should include provisions for inspection and tests so that the inspector representing the consumer on vital equipment can see that proper materials are used and that they are fabricated in a first-class workmanlike manner. Tests of completed equipment when not of large size can be accomplished at point of manufacture, but on large power or pumping installations due provisions should be made for duty or performance tests after installation. These duty tests should be conducted under the direct control of the consumer or representative and be the basis of final acceptance and payment for the equipment.

Many of the specifications cover requirements of a device or piece of equipment in general as to dimensions and capacity only. To such specifications must be added such definite and concise statements as will make it evident what requirements must be met as to strength, durability, and efficiency of operation. Avoid general clauses that are not definite as they are usually matters of opinion often impossible of enforcement.

The development and use of specifications is a matter of vital importance to progress. By developing and using standard specifications the net result will be materials, equipment, and installations that will give the maximum of usefulness, serviceability, and efficiency—a maximum utility at a minimum cost.

NEW SPECIFICATIONS ADOPTED FOR OILS

Minimum specifications for oils used in the manufacture of motor oils carrying the Pennsylvania Grade Crude Oil Association emblem were fixed at a recent meeting held in Oil City, Pa., of the directors of the association. The new specifications are mandatory on March 1, 1933, but will be put into practice by most companies before that date.

Neutral oil used in blending motor oils after March 1 must have a minimum flash point of 420° F. This compares with a former minimum of 400° F. The neutral oil must have a minimum viscosity of 180 Saybolt universal seconds at 100° F. This compares with a former minimum of 150 Saybolt "A" seconds at 70° F. Neutral oil of 25 pour test used in blends must

have a minimum A. P. I. gravity of 29.5°. Bright stock to be used in motor oils carrying the emblem must be of at least No. 8 color and have a minimum flash of 540° F. In the case of oils made by the long residuum method, the finished motor oils must be at least equal to those produced by blending neutral oils and bright stock.

The improved minimum quality of motor oils carrying the emblem will have the effect of increasing the cost of manufacture of some of the oils which have been sold at "cut prices" under the emblem. Estimates are that the added cost may be on the order of about 2 cents per gallon. Some manufacturers, of course, selling branded goods at regular prices have maintained a standard of quality equal to the new minimum in the past.

STANDARDIZATION OF DIAGNOSTIC REAGENTS

Public-Health Specialist Outlines Need for Standard Reagents

By JOHN F. NORTON¹

The laboratory section of the American Public Health Association has, for more than 25 years, been actively interested through its committees in the standardization of certain laboratory procedures. Of these, the three best known relate to the examinations of water, milk, and shellfish. Standards for air examination and for disinfectants have been prepared, but these are not longer in existence as recognized procedures.

While it is unfortunately true that many laboratories depart in varying degrees from the so-called standard procedures, it can hardly be disputed that the standardization of technic as sponsored by the laboratory section of the association has had a wholesome effect on public health laboratory work. In certain States, supervision is exercised by the State department of health laboratory in connection with the diagnostic work of laboratories within the State. However, this affects public health laboratories in relatively limited areas. The writer is very doubtful as to the possibility or even the propriety of standardizing clinical laboratory technic. Certainly this could not be done without the expenditure of an enormous amount of time and energy.

There is one phase of laboratory technic however, which might properly become the interest of the laboratory section, and that is the standardization of reagents used. The larger laboratories may be equipped to prepare and standardize their own materials, although this is not practical in all instances. On the other hand, the small laboratory must depend entirely upon diagnostic reagents which are furnished by biological supply houses, except those which are occasionally supplied by a State laboratory.

At the present time there is no control by any independent and unprejudiced group, over these reagents. It would appear that an opportunity exists to devise some means for the approval of these diagnostic reagents in order that the laboratory worker may have concrete evidence that his fundamental materials are the proper ones to use for any specified test or reaction. The situation as it exists to-day is not a reflection on the ethics or the abilities of the commercial firms which supply diagnostic reagents. There may be real differences of opinion concerning the standardization of these products. Divergent views are sometimes capable of amalgamation and it is believed that in a majority of instances standards could be promulgated which would be satisfactory to the public health laboratory worker. Indirectly such an undertaking as the standardization and approval of diagnostic reagents would be of service to the medical profession which depends upon these laboratories for diagnostic data.

It is hardly necessary to present arguments concerning the necessity for standardization of diagnostic reagents. Most of us have had experiences which indicate its desirability. Antipneumococcic serums obtained from independent sources have given divergent results in the typing of pneumococci; antimeningococcic serums vary considerably when tested on the

basis of the agglutination reaction. It is freely admitted that standardization would not eliminate certain discrepancies connected with fundamental biological differences in the behavior of bacteria and their products. It would, however, tend to increase the reliability of much laboratory work.

A survey has been made of the various diagnostic reagents which may be purchased in this country. The variety is considerable, and includes most of the materials which are necessary to cover a wide range of clinical laboratory work.

Certain fundamental materials are now on a reliable basis. Buffer solutions should belong to this class if made from chemicals of the highest purity, but our experience has been that these should be checked by potentiometric measurements before use. Biological stains are being approved by a commission especially organized for this purpose. Carbohydrates of the highest purity are obtainable as well as other chemicals. The problem of standardization of peptones and meat extracts is an important one, but one on which little progress has been made. However, we are primarily concerned in this article with reagents that are used in biological reactions in connection with clinical laboratory diagnostic procedures. Two of the most important classes of reagents and the problems involved are mentioned.

Amboceptors.—Both antisheep and antihuman amboceptors are available. The problem of standardization probably is not so acute here as with some other reagents.

Serums.—The variety of serums available for diagnostic laboratory purposes is considerable. The list includes human-blood typing serums and antisera against a variety of bacterial species, such as diphtheria bacilli, gonococci, typhoid, and paratyphoid bacilli, meningococci, dysentery organisms of the various recognized groups, the Brucella group, and pneumococci. The antigenic specificity of strains of any group or species of bacteria is known to vary. These serums have therefore certain recognized limitations, but it seems to the writer that some uniformity should exist perhaps even to the extent of requiring that these serums be prepared from certain standard strains or that they react with such strains. At the same time it is admitted that the situation is a difficult one, but at the present time there are, with a few exceptions, no standards of any kind available.

No mention has been made of such laboratory materials as culture media, a great variety of which are available. The standardization of these would be at the present time, an extremely difficult task and perhaps not be worth the required effort.

It is obvious that this is a plea for the recognition of a situation in which the public health laboratory is vitally concerned. While the situation can not, of course, be remedied immediately, it is not inconceivable that a start could be made toward the approval of certain of the more important diagnostic reagents and thereby help to establish a greater uniformity in the results of clinical laboratory work.

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PAPER CONES AND TUBES FOR TEXTILE WINDING

A simplified-practice recommendation of interest to the textile industry is the one recently completed for paper cones and tubes, as reported in the January, 1933, *COMMERCIAL STANDARDS MONTHLY*. These cones and tubes are used for winding knitting yarns, silk, rayon, hosiery yarns, tire cords, wire insulating yarn, thread, etc. The cones covered by the recommendation range from $5\frac{7}{8}$ inches in length to $10\frac{1}{2}$ inches, while the tubes range from $2\frac{5}{8}$ inches in length to $6\frac{1}{2}$ inches. In addition to the length, the schedule for both cones and tubes provides for other basic dimensions to identify items which are retained for regular stock purposes.

This program is the first to be completed in a series proposed at a meeting of manufacturers of various kinds of textile machinery held in New York in 1929. This meeting was called at the suggestion of an important manufacturer of winding machinery, who had summarized the need for simplification in the industry as follows:

To date we have manufactured 163 distinct types of spindles with 1,900 varying sizes, and in so doing, naturally our manufacturing costs and inventory are inflated. Unless some standards are established, the list will ever be increasing. New industries now have no tabulations of standards to order equipment from and the older textile industries most frequently order their new machines equipped with spindles "same as last" or "with spindles to fit bobbin or tube as per sample herewith." The "same as last" customers might easily pick some standard spindle if such was tabulated, that could be used equally well, and the "same herewith" is usually picked at random and usually only varies from one which might have easily been standard had no error been made in its manufacture or had it been made to conform to some standard bobbin, quill, or tube.

From our records of some 36 years, we have prepared our own lists and drawings of what we consider standard, particularly with reference to the hole size. These standards are called for on approximately 80 per cent of our orders, and on the remaining 20 per cent, they are special. On one machine alone, namely our No. 90, we have 30 standard style spindles with 200 different sizes and, in the special spindles, we have 74 styles with 1,016 varied sizes. We naturally would not expect the industry to standardize according to our records alone, but believe it will meet nearly the list which other manufacturers would desire to standardize upon also.

As a result of this meeting, simplified practice committees were appointed to represent the following groups of textile machinery manufacturers: Winding machines, carding and spinning machines, loom manufacturers, bobbin, spool and shuttle manufacturers, paper-tube manufacturers, and worsted spinning mule manufacturers.

The committee on paper cones and tubes completed its program first, and this was given final approval at a general conference held in New York in June, 1932. The chairman of the committee in charge of the preparation of this recommendation was J. L. Coker, of the Sonoco Products Co., Hartsville, S. C. In presenting the program to the conference for consideration he explained that it had been the purpose of this committee to select the sizes of parallel tubes and cones which were in sufficient demand to be listed for regular stock purposes. He explained that it was not the intention to discontinue the manufacture of other sizes to meet special demand, as the committee survey had disclosed that there were many other sizes made. The items presented in the schedule were found to be in greatest demand, and it was his belief that many

other slightly different sizes could be replaced by those recommended. It would be the policy of his company, he explained to the conference, to use every effort to direct attention to the recommended sizes, so all concerned would derive the benefits from wide adoption of the program. In the opinion of Mr. Coker, general adoption of the recommended sizes in place of the many now used for the same or similar purposes will not only help to prevent increase in unnecessary variety, but will work toward the gradual elimination of the many sizes now in use. As the demand increases for the recommended sizes, the economies inherent in simplification will be realized.

Other simplified practice committees have not completed their studies covering other components, but considerable work has already been done and it is expected that the following items will be brought up soon for consideration or possible adoption as simplified practice recommendations: Spindle sizes for paper filling yarn tubes, spindle sizes for wooden filling bobbins, and sizes of wooden cones for warp and knitting yarns.

METRIC STANDARDS ADOPTED FOR SPORTS

On November 22, 1932, the Amateur Athletic Union "went metric." It may, perhaps, be interesting to inquire what affect this action by the A. A. U. will be likely to have upon athletic events, and records in those countries in which, up to this time, distances for such events have very generally been expressed in yards, feet, and inches.

First of all, it should be pointed out that from the standpoint of measurement athletic events fall into two general classes: First, field events in which measurements of distance only are involved; and second, track events in which measurements of distance and time are involved. The high jump, broad jump, pole vault, shot put, discus throw, hammer throw, etc., fall within the first class, while the dashes, hurdles, and other running events, of course, fall within the second class.

It is evident that field events will not be greatly affected by the adoption of the metric system of measurement. In all such events the height or distance attained by the contestant, whether measured in feet, inches, and fractions of an inch, or in meters and fractions of a meter, can readily be converted from one system of measurement to the other. Records of past performances can also be readily converted. All that is needed is a convenient and accurate table of equivalents.

When we consider track events, however, we find a quite different situation. In these events standard distances are set up, in terms of a unit of length, either the yard or the meter, and the contest in each event consists in running this standard distance in a minimum time. The standard distance chosen for each event is some integral number of yards or of meters, depending upon the system of measurement employed. For example, 100 yards, 220 yards, 440 yards, etc., or 100 meters, 110 meters, 200 meters, 400 meters, etc.

Obviously, the distances set up for a series of events under one system of measurement will not be appropriate for a series of similar events under the other system of measurement. Two entirely different series

of distances will therefore be necessary, and it will not be possible to set up a table of equivalents for track events held under the two systems of measurements, and records made under the two systems will not be comparable. They represent, in fact, an entirely different series of events.

It may reasonably be assumed that other athletic organizations will follow the lead of the A. A. U. in adopting metric distances; and with the above situation in mind a question naturally arises as to what is likely to happen with reference to track records, for distances measured in yards, that are now on the books if and when these events are no longer run. Obviously, if the events are no longer run the present records can not be broken, and will stand indefinitely. Such a record will, no doubt, when no longer subject to assault, lose some of its significance and relative value. To that extent the change can hardly fail to involve some disappointment to present record holders for distance events measured in yards. There is, however, a compensating advantage in that these records can not be broken, and are therefore safe for all time, no matter how future athletics may "burn up the cinders."

REAFFIRMATION OF STANDARD COLORS FOR SANITARY WARE

The standing committee on the commercial standard for Colors for Sanitary Ware, CS30-31, after careful consideration of the results disclosed in a recent survey to determine the degree of adherence, and the benefits resulting from the voluntary establishment of this standard has recommended its reaffirmation without change for another year and announcement to this effect has been issued by the division of trade standards, Bureau of Standards.

This standard designates six colors to be used as a guide in the production of colored sanitary ware, in-

cluding plumbing fixtures and allied products made of vitreous china, porcelain, enameled iron, metals, wood or glass.

Production of colored sanitary ware conforming to the requirements of the standard represented an unweighted average of 47 per cent of production based on replies from 40 manufacturers.

Six producers reported that all their colored ware was made according to the commercial standard, while 10 manufacturers indicated that they did not use the standard colors for any of their production. Deviations from the commercial standard were attributed to varying demands from purchasers and the use of color lines that were in vogue before July 1, 1931, when the standard became effective. Actual direct benefits from the establishment of the standard were reported by 23 producers.

KEY TO MINIMUM REQUIREMENTS IN BUILDING CODES

The Bureau of Standards announces a new letter circular, "Key to Minimum Requirements Recommended by the Department of Commerce Building Code Committee," which is a guide by which the committee's recommendations, issued at various times and amended through various supplements, may be utilized to the best advantage by local officials and code committees pending the time when the recommendations are completely revised and reissued under one cover.

The committee has not yet covered all phases of building regulation. It has, however, issued seven reports. Of these, that entitled "Recommended Practice for Arrangement of Building Codes" contains an approved arrangement for a code. Using this as an index, the announced letter circular has been drawn up showing what recommended requirements are to be found in the committee's other reports.

NEWS IN BRIEF

National standards for hydraulic agglomerations, knurlings, rounded and beveled elbows, and rivets, have been made mandatory for the use of Italian Government departments.

Amendment to section 3203, article 32, of the National Electrical Code, permits panel boards to be installed in class 1, hazardous locations, if of the type approved for use in explosive atmospheres.

More than 90 per cent of the oil-field equipment in the mid-continent conforms to standard specifications of the American Petroleum Institute, according to a survey made by the Tulsa, Okla., Purchasing Agents Association.

The automotive technical commission of the Italian national standardizing body (Ente Nazionale per l'Unificazione nell'Industria) is working on a revision of the standard for automobile storage batteries, as well as studying questions relating to brakes and to injection pumps for heavy-oil motors.

A new index of Federal specifications, dated November 1, 1932, has been issued by the Federal Specifications Board. Copies desired by those outside of the Federal Government may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents a copy.

The British Chemical Standards has issued a new British chemical standard for cupro-nickel containing 68.85 per cent of copper, 30.1 per cent of nickel, and small amounts of silicon, manganese, iron, magnesium, carbon, sulphur, lead, and cobalt. The standard is expected to prove useful in connection with the analysis of cupro-nickel sheets and strips, and also for checking the analyses of copper-nickel condenser tubes, electrical rheostats, bullet envelopes, thermocouples, etc.

New specifications applying to motor busses and their operation and maintenance were announced to-day by the State Board of Public Utility Commissioners. Greater accessibility to emergency doors; a minimum limit for seat spacing, allowing more knee room; a guard rail to prevent passengers from standing forward of the rear of the driver's seat; wider aisles in the city type busses and the prohibition of the use of trailers are among the new provisions.

Standardization in the construction of concrete roads has been the result of efforts to increase efficiency, reduce costs, and attain a more durable concrete. To secure uniformity it is undoubtedly necessary to secure a method of measurement that will minimize these conditions. Aggregates can be readily weighed to a high degree of accuracy, and the resulting proportions will insure greater uniformity, better workability, and more uniform strength when combined by mixing to make concrete. Many States, cities, and subdivisions of States, require the proportioning of aggregates by weight, and the United States Bureau of Public Roads require that all aggregates for concrete pavements used in Federal-aid projects must be proportioned by weight.

Recent Italian royal decrees have put into effect the international conventions on the maximum load line of merchant vessels, which were signed at London, England, in July, 1930; and on the unification of various air transport regulations, which were signed in October, 1929.

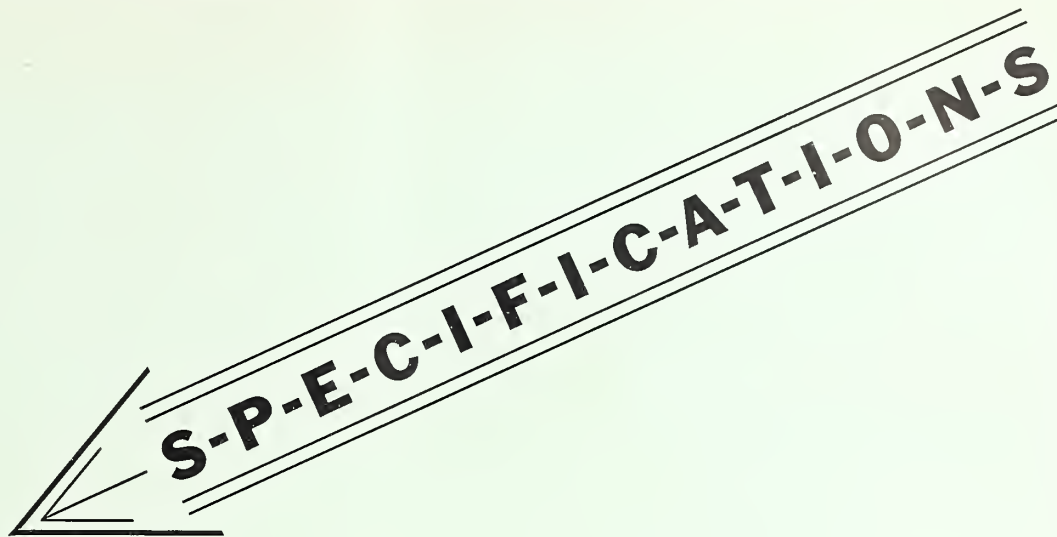
The standard for "Measurement of Test Voltages in Dielectric Tests," No. 4, in the American Institute of Electrical Engineers series, has been revised by rewriting the first paragraph of section 4-102. The revision concerns impedance of testing transformers. For accurate tests, the impedance of the testing transformer should be not greater than 20 per cent based on voltage and current at which the transformer is operated for any test.

The Standards Association of Australia has announced the promulgation of a simplified practice recommendation for fibrous plaster sheets. Contained in the recommendation is a proviso that sheets manufactured in accordance with this recommendation may be indelibly and clearly marked with the association's symbol adjacent to the maker's trade-mark or name. The use of the symbol is intended to indicate strict compliance with the simplified practice recommendation.

An Italian standard for magnetos and distributors has been approved by the directive council of the Italian national standardizing body (Ente Nazionale per l'Unificazione nell'Industria). The standard deals with magneto bases, height of axis from base, radius of the cylindrical cradle upon which the magneto rests, bolt holes in base, couplings, and shaft-end dimensions. For distributors of the Remy type, there are given requirements for the size of the distributor, location of grease cup, advancing adjustment, attachment to motor, and direction of rotation. Requirements for magnetos and distributors of the Society of Automotive Engineers of America were considered in the preparation of the Italian standard.

A specification for manhole openings for chemical plant has been published by the British Standards Institution. To meet the varying conditions of service, vessels are classified as process, mobile, and storage tanks. There has been no attempt to lay down a standard design, and the specification is couched in general terms, the size and position only of the manhole coverings being specified. The specification is applicable only for pressures up to 185 pounds per square inch.

Suggestions have recently been made by the National Hardware Association of London, England, that considerable benefit could be derived from formulating standard specifications applicable to domestic and other hardware, according to information received from American Trade Commissioner James Somerville, at London. Informal discussions have been taking place between the association and the British Standards Institute with respect to the association's joining the institute and considering the possibilities of standardization as applied to the hardware trade.



To determine whether an applicable specification exists for any commodity—consult—

National Directory of Commodity Specifications, 1932

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