Bureau of Standards
MAY 5 1933

COMMERCIAL STANDARDS MONTHLY

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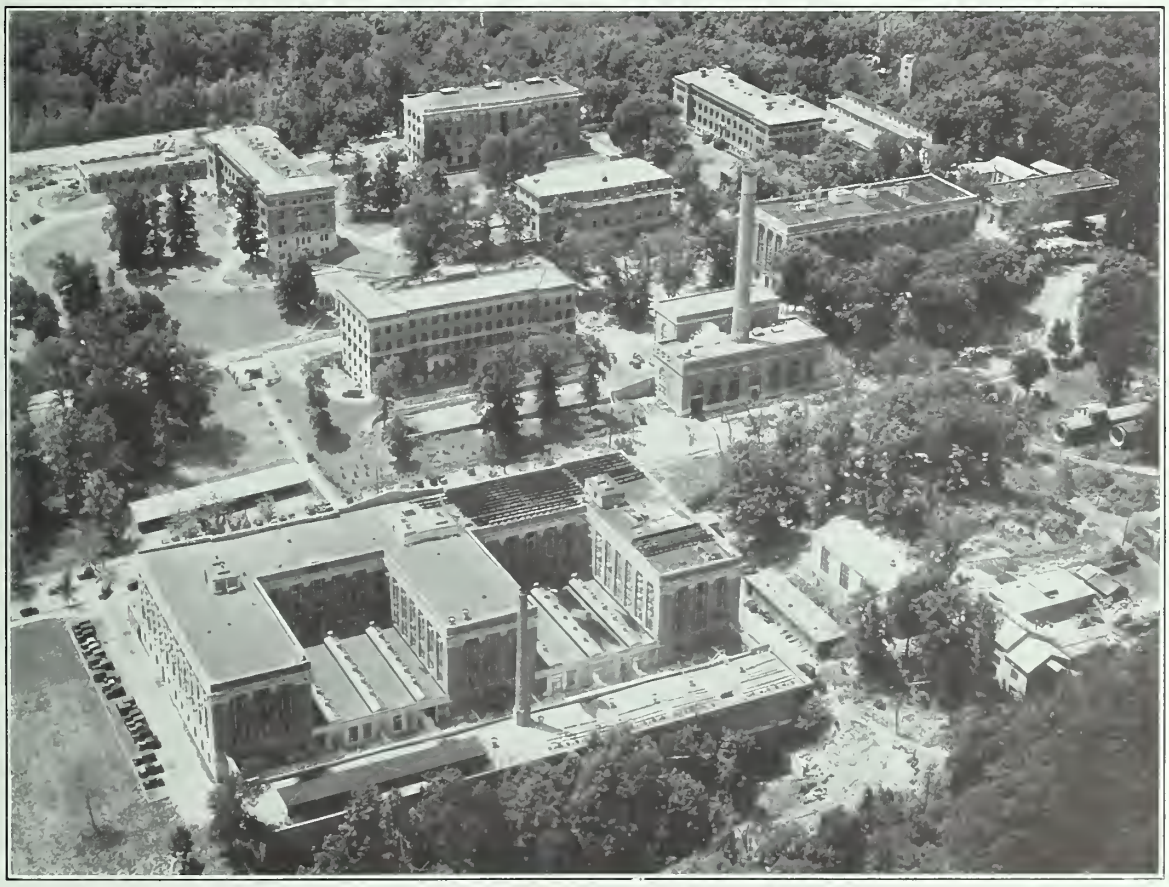
A Review of Progress in Commercial Standardization and Simplification



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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. 10 April, 1933

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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.

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 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 Nonmetallic Minerals and their Products." It also aids in preparing the Standards Yearbook.

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.

COMMERCIAL STANDARDS MONTHLY

A Review of Progress in Commercial Standardization and Simplification

VOLUME 9 WASHINGTON, D.C., APRIL 1933 NUMBER 10

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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.

European Conference on Standardization

Forty-five delegates representing the national standardizing associations of 11 countries, attended the conference of the International Federation of National Standardizing Associations, held January 9 to 14 at Dusseldorf. The countries represented were: Austria, Belgium, Czechoslovakia, Denmark, France, Germany, Holland, Italy, Poland, Sweden, and Switzerland.

The Swiss Standardizing Association, which forms the secretariat of the technical committee of the international federation which deals with iron and steel, brought forward a number of proposals relating to standardization, which were based on resolutions passed at a conference held in Prague in October, 1928. These covered: classification and marking of iron and steel; symbols and definitions of the marks used in the proving of sections, rod and sheet; testing and acceptance, including the method of carrying out tests, the shape of the test pieces, samples, tensile tests, yield point, elongation, limits of compressibility, Brinell hardness, bending and notched-bar tests, and specifications for machines and apparatus used in carrying out acceptance tests; structural steel, sections, rods and flat billets; material for screws and rivets; unalloyed steels for use in machine construction, both with and without restrictions as to purity, and including case-hardened materials; and alloyed steels.

The next conference is to be held within the next 12 months, when draft regulations relating to delivery and acceptance, which have already been tentatively prepared, will be discussed.

HOW ARE COMMERCIAL STANDARDS ENFORCED?

Review of Methods Used to Enforce Voluntary Standards

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

This is the fourth of a series of articles by Mr. Fairchild, Chief, Division of Trade Standards, Bureau of Standards, on the fundamental whys and wherefores of commercial standards. It responds to the questions, How are they used? and How enforced?

One of the most frequent questions regarding commercial standards is, How are commercial standards enforced? Since commercial standards do not fall into the category of compulsory standards, but are purely voluntary standards, it is necessary to understand how they are used before the manner of enforcement can be properly clarified for the reader.

It will be recalled that commercial standards are specifications voluntarily proposed and adjusted through the joint cooperation of producers, distributors, and users; are accepted in writing by a majority of production by volume, and are published by the Bureau of Standards of the Department of Commerce in the absence of active opposition. They cover the essential criteria of staple manufactured commodities as a basis for guaranties, tests, sale, or acceptance of these commodities in daily trade.

Commercial standards are identified by exclusive numbers which are not used for other Federal publications. For example, Surgeons' Rubber Gloves, Commercial Standard CS40–32 is fully identified by the number CS40–32. The letters CS signify "Commercial Standards", the numeral 40 stands for the serial number of the standard, and the last two digits 32, indicate the year in which it was made effective by the industry.

The manufacturers who are producing gloves in conformity with the standard and who are cooperating in this method of marketing, apply the following label to each package of gloves conforming to the standard:

> These gloves are certified to conform to all requirements of the Commercial Standard for Surgeons' Rubber Gloves, CS40–32, (Signed) _____ _____ Company.

The requirements of the commercial standard cover tensile strength, elongation, resistance to sterilization, composition, measurements, and minimum weight of the various sizes. It seems reasonable to suppose that some of the larger hospitals will purchase surgeons' rubber gloves in sufficient quantities to justify their purchasing agents in becoming familiar with the detail requirements and in making the prescribed tests prior to acceptance and payment for the shipment.

It is expected, therefore, that where quantities purchased are very large, some tests may be made on the basis of the commercial standard prior to acceptance, even though the goods be guaranteed by the manufacturer to comply therewith.

However, it is reasonable to suppose that the average individual surgeon and the small hospital institution will not be sufficiently interested to become familiar either with the minimum requirements or methods of test, probably not even to the extent of reading the commercial standard. For these surgeons and the smaller hospitals, the guaranty label will be relied upon in making the purchase.

The same holds true of the majority of commercial standards since it is not expected that the individual consumer or smaller distributor will become familiar with the requirements or tests. It will be clear, of course, that the sales contract may be either verbal or written and that the guaranty statement may be of such character as to form a binding part of either form of sales contract. Therefore, it will behoove such consumers and distributors to examine the guaranty statement carefully to see whether it is worded in a way so as to constitute a binding part of the sales contract.

For example, Does it identify the guarantor? Does it identify the product? Does it identify the specification or standard on which the guaranty is based? Unless it does identify each of these essential elements in a perfectly definite way there may well be some question as to the validity of the guaranty.

It is obvious that if the statement does not identify the organization making the guaranty, the question of responsibility therefor, is subject to doubt. If the product is not identified (as accomplished by the words "these gloves" in the guaranty of above reference) the seller may claim that the guaranty was not intended to apply to the article in question, but was placed thereby error and was really intended to apply to some other item regularly manufactured.

Again if the specification or standard on which the guaranty is based is not specifically mentioned the buyer has little or no redress since no specific quality or grade is certified and there is no recognized test which the buyer may use to demonstrate whether or not the goods comply with the guaranty.

The associations which are sponsoring commercial standards as a means of restoring confidence, particularly the consumer groups, are convinced that consumers can readily be taught to distinguish between bona fide guaranty labels which are binding on the seller and the bogus ones which merely appear to do so.

Honest, straight-from-the-shoulder guaranty labels which embody the three essentials mentioned above reflect the character of the producer, or the seller, or the association standing back of the merchandise as the case may be. Whereas, dishonest labels attempt to create an illusion of a binding guaranty but omit one or more of the prime essentials, and a careful examination leaves the reader in a hazy state of mind as regards the responsibility of the seller.

At first though it may seem that manufacturers may regard such guaranties lightly and may issue them freely without regard to consequences. My own observation, however, is that manufacturers who have been

inclined toward sharp practices tend to continue such tactics by omitting essential elements of the guaranty so as to leave themselves with no legal responsibility or with at least a good-sized loophole through which to dodge the issues if apprehended. Even the shyster groups are loath to apply a guaranty label which will hold them completely responsible both morally and legally to the distributor and the consumer for supplying a specific grade or quality, since their chances of getting by on this basis are exceedingly slim and must of necessity be confined to short periods of time.

Of course the above statements apply only to commodities for which a commercial standard has been established or where a Federal specification or other nationally recognized specification is used as a basis for the guaranty. There are still great numbers of commodities for which no nationally recognized standards or specifications exist and where a guaranty of the above kind is not practicable at the present time.

The chief use for commercial standards then is as a nationally recognized basis for binding guaranties from the seller to the buyer either as a part of the label attached directly to the goods, to the container or carton, or printed on the invoice, or made a part of the significance of an association grade mark or brand by means of national advertising.

At this point it may be well to examine a few of the various types of guaranty labels. The most common perhaps is the one sponsored by the manufacturer, for example—

> ——— Oil Corporation certifies this stoddard solvent to comply with the requirements of Commercial Standard CS3-28 as issued by the United States Department of Commerce.

Some such labels constitute a guaranty by the trade association as well as by the manufacturer, for example, the following:

> We guarantee this mirror AA quality as specified in Commercial Standard CS27-30 issued by the United States Department of Commerce. John Doe & Co. and the Mirror Manufacturers Association.

Likewise, the guaranty label or certificate may represent an inspection bureau operating as a part of the trade association for the specific purpose of inspection, for example—

> 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 United States Department of Commerce.

Or it may represent an independent inspection and labeling agency which assumes full responsibility for the integrity of the label and for the detection of bogus labels on similar goods as—

> National Standards Council, Inc., certifies that this broom is correctly graded and marked to comply with The Broom Institute Standard.

Of course labels may also be the certificate of a testing laboratory employed for the specific purpose of testing and certifying the quality as conforming to the requirements of a certain definite specification.

It will be evident from the above that, in general, there are at least three organizations or individuals directly interested in the integrity of the guaranty label. These are the manufacturer, the distributor, and the user, and in addition in many instances there will also be the trade association or the testing laboratory or the labeling agency. Each of these are concerned in seeing that the integrity of the label is maintained. Our experience indicates that the manufacturers and their trade associations are among the first to learn of any shady practices on the part of their competitors. Retailers are increasingly on the lookout for false claims and when suspicions are aroused, the most natural step is to have the shipment inspected and return the goods or refuse payment in the event they are below standard. The consumer too plays his part in enforcing such standards since having noted the specific guaranty, he will be inclined to complain to the seller in the event the quality of the goods does not come up to his expectations and in the event his complaint is justified by the facts and by the specification he will demand some adjustment or replacement on the part of the seller.

In most States there is no compulsory labeling but it seems reasonable to suppose that for commodities covered by commercial standards where labeling has become the accepted rule of the industry, the product of the noncooperating manufacturer will be conspicuous by the absence of guaranty labels and that the absence of such guaranty will be reflected in the price which he may expect to obtain. In fact, comparatively little difficulty is anticipated from the lack of direct enforcement on labeling, since guaranty labeling is coming to be regarded as an essential part of the marketing of staple commodities, in order to really convince an increasingly skeptical public as to the actual grade or quality of the goods offered.

It may be said then in conclusion that the guaranty label is the hub around which the wheel of use and enforcement of commercial standards revolves; that if a guaranty label or certificate is so worded as to constitute a bona fide guaranty forming a part of the sales contract, it will, in the event of misrepresentation (1) form the basis for rejection or nonpayment for the goods on the part of the retailer; (2) form a basis for complaint on the part of competitors through their trade association; (3) form a basis for action through the Federal Trade Commission or through the courts; (4) form a basis for complaint and return of goods by the consumer; and (5) form a basis for complaint by better business bureaus. Also (6) sellers will be inhibited from direct misrepresentation by fear of unfavorable publicity and loss of reputation.

The hubs of the wheels which support the enforcement of commercial standards and on which the car of commerce may move forward in the restoration of consumer confidence are the guaranty labels or certificates, and the axles on which these wheels turn are the ability of the buyer to distinguish between bogus and bona fide guarantees, and the persistence with which sellers and trade associations maintain the integrity of guaranty labels and certificates.

POLISHED COTTON TWINE

Simplified practice recommendation R124-31, covering polished cotton twine, has been reaffirmed without change by the standing committee of the industry.

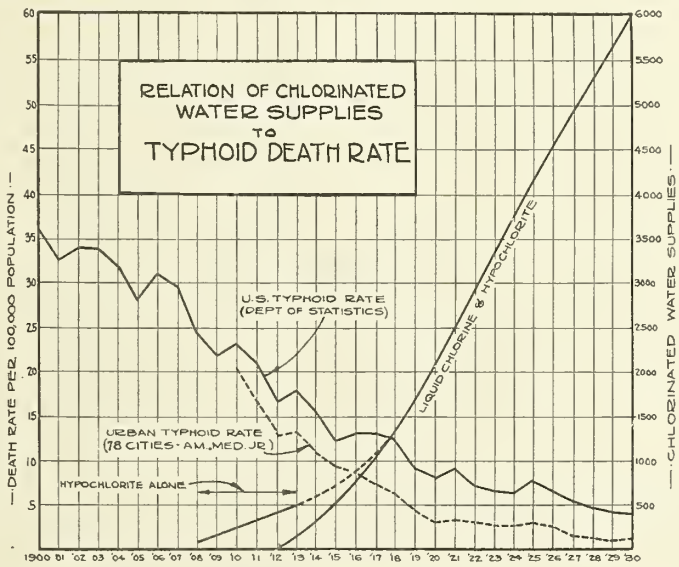
This recommendation, which was proposed and developed by the industry, provides for twine sizes, yarn sizes, number of feet per pound, put-ups, and packaging of plain and surface colored polished cotton twine. It has been in effect since November 1, 1931.

WHAT IS PURE WATER?

Standards as to Source and Protection Adopted by the United States Public Health Service

By Charles H. Eastwood, *Newark, N.J.*

What is pure water? Actually of course, outside of the laboratory, there is no such thing as pure water. What we mean when we say pure water, is a safe water—a water safe for human consumption. Since it has been amply demonstrated that drinking water has been responsible for innumerable typhoid fever and other intestinal disease outbreaks, the sanitarian and public health authority is concerned largely with the epidemiologically demonstrable safety of a public water supply, leaving the acceptability of the water from the viewpoint of chemical and physical characteristics largely in the hands of the consulting engineer responsible for the original selection of the source.



In submitting recommendations for drinking water standards as subsequently adopted by the United States Treasury Department, for the control of Drinking and Culinary Water Supplied by Common Carriers in Interstate Commerce, the advisory committee appointed by the Surgeon General of the United States Public Health Service, says in part:

> The first step toward the establishment of standards which will insure the safety of water supplies conforming to them is to agree upon some criterion of safety. This is necessary because safety does not necessarily signify that absolutely no risk is ever incurred in drinking it. What is usually meant, and all that can be asserted from any evidence at hand, is that the danger, if any, is so small that it cannot be discovered by available means of observation. Nevertheless, while it is impossible to demonstrate the absolute safety of the water supply, it is well established that the water supplies of many of our largest cities are safe in the sense stated above, since the large population using them continuously have, in recent years, suffered only a minimal incidence of typhoid fever and other potential water-borne infections.

The standards recommended were intended only to apply to the particular purpose outlined in the title of the report, but in lieu of any others and because they constitute a fair interpretation of the essential requirements for the safety of drinking water, have been generally adopted by State and local health authorities exercising control over public drinking water supplies.

These standards say: "As to source and protection"—"The water shall be (*a*) obtained from a source free from pollution, or (*b*) obtained from a source adequately protected by natural agencies from the effects of pollution, or (*c*) adequately protected by artificial treatment." The report then goes on to lay down certain standards as to the physical characteristics of the plant and as to the physical and chemical characteristics of the water. In section II, "As to Bacterial Quality", these bacteriological standards are laid down: (1) Of all standard (10ml) portions examined in accordance with the procedure specified below,[1] not more than 10 percent shall show the presence of organisms of the B. Coli group; (2) occasionally three or more of the five equal (10ml) portions constituting a single standard sample may show the presence of B. Coli. This shall not be allowable, however, if it occurs in more than (*a*) 5 percent of the standard samples when 20 or more samples have been examined, (*b*) 1 standard sample when less than 20 samples have been examined.

Having determined from a preliminary examination of the source of supply that the water is chemically and physically suitable or with proper treatment can be made so, periodic checks to determine that, as supplied to the consumer, it meets standards of "safety" must consist, in the main, of these bacterio-logical examinations. The presence of B. Coli, as determined in the manner indicated, is generally accepted as evidence of sewage contamination and the water is classified as potentially unsafe for drinking purposes. The inability to find B. Coli is generally accepted as evidence that the water is safe for human consumption.

As population grows, as demands increase, it becomes more and more difficult to locate a water supply source free from contamination and one that will continue to remain so, and the difficulty in meeting requirements (*a*) and (*b*) become increasingly greater. How then is the term "adequately protected by artificial treatment"—requirement (*c*) to be interpreted? To most sanitarians and public health authorities this implies sterilization, irrespective of what other treatment may be considered advisable to correct other undesirable characteristics. And sterilization means chlorination.

Since its inception in the United States, when chlorine in the form of hypochlorite of lime was first used by Col. George A. Johnson at the Bubbly Creek Filtration Plant in 1908, through the development, by Darnall in 1912 and Ornstein in 1915, of practical means to meter and apply the compressed gas, chlorination has progressed to a point where today some

[1] Standard Methods of Water Analysis, American Public Health Association, New York, 1923.

6,000 American municipalities are sterilizing 80 percent of the country's domestic supplies (6,000,000,000 gallons daily) with chlorine.

How important a part this has played in the reduction of the Nation's typhoid death rate is shown by the accompanying chart and adequately expressed by the Journal of the American Medical Association, which, speaking editorially, says in part:

> Chlorination of water supplies is probably the most important contribution made by this country to the art of water purification. In fact, this process stands out as the most useful procedure yet devised for insuring the safety of a municipal water supply * * * chlorination is almost indispensable for many supplies. The expense is low and amounts to only about 40 cents per million gallons of water treated.
>
> Even, however, if it is impossible to ascribe all credit for typhoid diminution to water chlorination, it is enough to say that this procedure has had a large share in the improvement effected. If it were still more widely used, especially in the smaller towns and cities using surface water without filtration, there is no question that further impetus would be given to the work of typhoid prevention in the United States.

RECOMPARISON OF PRIMARY STANDARDS OF THERMAL RADIATION

Numerous investigations are being conducted on the effect of radiation of various wave lengths (ultraviolet, visible and infra-red rays) upon matter. Prominent among such investigations are (1) the response of the eye, and of photoelectric cells to light of different wave lengths or "colors"; (2) the effect of different wave lengths of ultraviolet radiation in producing an eythema (reddening) of the skin; and (3) the wave lengths and the amount of radiation required to cure rickets, etc.

The intensities of these radiation stimuli are measured with some form of radiometer, such as, for example, a thermopile, which, for uniformity of comparison, is calibrated in absolute value (microwatts per square centimeter). This is most conveniently accomplished by the calibration of the thermopile against a standard of thermal radiation (an incandescent lamp of known radiation), similar to a standard of luminous intensity (an incandescent lamp of known candlepower).

An examination has recently been made into the status of the primary standards of radiation maintained by the Bureau of Standards, reproductions of which standards during the past 2 decades have been issued to biologists, botanists, photochemists, physicists, physiologists, etc., who desire to measure their radiation stimuli in absolute value. These standards of radiation consist of 50-watt, 115-volt, anchored carbon-filament incandescent lamps which have been seasoned and calibrated as radiation standards at definite voltages and currents, in accordance with the accepted procedure in preparing similar standards of luminous intensity (candlepower standards). The first standards of radiation were obtained in 1913 by direct comparison of a group of lamps against a black body, and subsequent standards were obtained by comparison with this first group of lamps.

The present inquiry was prompted by a published report that three such standards supplied to users deteriorated in radiant flux at the rate of 0.5 percent per hour of use. This is contrary to all previous experience in the use of such lamps as standards of luminous intensity or as standards of radiation.

In 1918 an intercomparison of six of these radiation standards showed a deviation of from 0 to 3 parts in 1,000 from the values of the radiant flux assigned to each lamp in 1913, which deviation is entirely within experimental errors. In 1930 an intercomparison of nine primary standards of radiation, including three of the originals (1913) which had not been used for 12 years, showed a maximum deviation of 3 parts in 1,000; again entirely within experimental errors, and none differing systematically from the intercomparison of 1918.

On recalling the three lamps that were reported to be deteriorating in radiant flux, one was reported destroyed by arcing in the socket. The second lamp, which was reported to have deteriorated in radiant flux to the extent of 3.1 percent in 9 hours, was found unchanged to less than 3 parts in 1,000. Similarly, tests with a potentiometer showed no changes in the volt-ampere calibration. The third lamp of this group was found to have increased (instead of having decreased) in radiant flux by almost 1 percent, caused by a hot spot in the filament, which appeared much brighter (hotter) than the rest of the filament, on continuous operation. On closing the circuit momentarily this spot became red hot before the rest of the filament began to glow. Whether this injury in the filament occurred in shipment is unknown. The lamp is obviously defective, and unfit for use as a standard of radiation.

The conclusion from this inquiry is that there is no appreciable deterioration in the standards of thermal radiation issued by the Bureau of Standards, though unavoidably some may become defective. In a life test of a standard of radiation, after operating the lamps for 176 hours, it was found that the radiant flux had changed by less than 3 parts in 1,000 from the value observed at the beginning.

INNOVATIONS IN PACKING

Innovations in packaging fruits and vegetables have been developed during the past winter. Strawberries are packed in cellophane; celery is appearing in colorful cartons having a front window; many fruits and vegetables customarily sold in bulk are being retailed in mesh bags.

Container manufacturers report to the Bureau of Agricultural Economics of the United States Department of Agriculture that they have developed consumer cartons for practically all kinds of fruits and vegetables. Most of these cartons feature a front window. A new tomato package is a 2-pound carton with the window feature. Paper baskets and paper hampers are replacing some of the customary wood containers used in shipping. Apples are being shipped from the Pacific Northwest in paper bushel baskets that are said to permit of a "tight pack" and to prevent bruises and rim cuts. Grape baskets and berry boxes are being made of paper.

Officials of the Department of Agriculture express the belief that consumers have been pleased with the new consumer packages principally on account of sanitary features.

WRITING MATERIALS—ANCIENT AND MODERN

Describing the Development from India Ink Invented by Chinese More Than 3,000 Years Ago to Present Gallotannate Types

By C. E. Waters, *Bureau of Standards*

Nobody can say how early in his long history man began to use signs and symbols to serve as reminders to himself, and convey information to his fellows. No doubt the earliest of such signs were piles of stone, and the broken twigs we still use to mark an unfamiliar trail.

The spirited though crude drawings left on the walls of European caves by the men of earlier cultures than ours show that primitive man was akin to us. Worse art is to be seen today on walls in public waiting rooms.

The walls of caves, flat rocks on the faces of cliffs, clay tablets, sheets of wax, and pieces of ivory, bone, and skin have all been used for writing upon. Even today a college diploma is a sheepskin in name if not in fact, and tattooing has not died out.

For centuries parchment was the material on which many books were written, but the papyrus roll was common enough to have given us the word "paper". These materials were expensive and could not be obtained in large quantities, and there could have been no great development of printing, or much letter writing, if paper had not been invented.

We may never know what was first used for writing ink. It may have been the juices of berries, or perhaps the colored earths that were stirred up with water and used as war paint. About 1,200 years before the Christian era the Chinese are said to have begun to make what is usually called india ink, by mixing soot with a solution of glue or of a plant gum. This pasty mixture was made into cakes which were dried. When some ink was needed for writing, the end of the cake was rubbed with water in a shallow dish. The nature of this ink made it necessary to write with a brush. Leather tanned with bark was known before the Christian era, and the staining of wet leather by contact with iron must have been noticed often. Yet the world waited for more than 2,000 years after the discovery of india ink, or until about 1126 A.D., before tannin and iron were combined to make writing ink. This kind of ink is still used in larger quantities than any other. The ink was made by dissolving ferrous sulphate—copperas or green vitriol—and glue in an infusion of nutgalls, which contains a kind of tannin that is especially suitable for making ink.

The infusion of nutgalls was allowed to ferment, the other materials were added, and the mixture allowed to stand for a time. When it was quite black, it was used as ink. The change in color was caused by the action of oxygen from the air upon the iron salt. Ferrous iron forms with tannin an easily soluble compound that is not intensely colored, but the ferric compound formed by the oxidation is black and nearly insoluble in water. Ink made by this process was a muddy fluid in which floated innumerable microscopic particles of the black ferric compounds. The glue, or the plant gum if it were used instead, helped to keep the particles from settling to the bottom of the fluid, and later served to fasten them to the paper or parchment.

In those days there was no thought of chemical control of the manufacturing process, nor any chemist who could have supervised it. Not until 1748, when William Lewis began to experiment, was any attempt made to produce a balanced ink, with nearly correct proportions of iron and nutgalls; and even in his time there were no analytical methods to help him. Though he had to work by the cut-and-dry method, he tried.

As each ink maker used the formula he considered the best, but had no idea of the amount of tannin in the galls, or of the purity of his ferrous sulphate, many a batch of ink must have been far from balanced in composition. This state of affairs is reflected by the condition of various old documents preserved in European libraries and elsewhere. The writing of some is still legible, and the parchment or paper in good condition. In others the paper is more or less eaten through by the ink, which, it is generally believed, contained too much sulphuric acid, which does not evaporate, and which has a sort of charring effect upon paper. Another explanation is that iron oxide formed from the ink destroyed the paper in the same way as a rusty nail attacks a piece of wood. Whatever the real cause, it is said that in extreme cases only the unwritten margins of the pages are left, for the rest of the paper has crumbled away. Early in the nineteenth century a change was made in the manufacture of writing ink. Instead of deliberately allowing it to oxidize and be turned into a muddy fluid, it was guarded from the action of the air and kept clear as long as possible. When a batch is made nowadays it is allowed to remain undisturbed for a time so that solid impurities will settle to the bottom, but only a small part of the iron salts in a vat containing some hundreds of gallons of ink will become oxidized.

The coloring matter in the older inks consisted of black particles that remained to a great extent upon the surface of the paper. The clear inks soak into the fibers of the paper, or between them, and then become oxidized. For this reason it can be argued that the clear inks should be the more permanent, because so little of the writing is on the surface where it can be rubbed off. To keep the ink clear as long as possible it must be kept from oxidation, and must also contain a small quantity of free hydrochloric or sulphuric acid. The more free acid the ink contains, the longer will it remain clear, but the greater will be its destructive effect upon paper, and its corrosive action on steel pens. There must be some sort of compromise if the use of iron gallotannate (or iron-gall) ink is not to be abandoned.

Our ancestors a few generations back were not concerned with the acidity of their ink. It was muddy anyhow, and they had no steel pens to be corroded. The fountain pen with its noncorrodible point puts a

temptation in the path of the ink maker, who knows what an extra amount of acid will do for him in keeping the ink clear. Ink which has undergone but little oxidation does not look intensely black in the bottle, and makes such pale marks on paper that it is necessary to give it a stronger color by the addition of a dye. The dye would not be needed if the writer could keep his letters for a day or two for them to become easy to read. When clear gallotannate inks began to be made, synthetic or so-called "aniline dyes" were something yet to be discovered. Of the comparatively few available dyes in those days, it is probable that only indigo could be used without causing the precipitation of solid matter in the ink. Indigo itself is not soluble, but by suitable treatment with strong sulphuric acid it is converted into the disulphonic acid, which dissolves readily and forms no precipitate by combining with the other ingredients of the ink.

In 1890 Schluttig and Neumann, ink chemists of Dresden, Germany, wrote what is in many respects the most important book on iron gallotannate inks, because of its far-reaching and lasting influence. Their definition of ink, their explicit recommendations for making record ink, and the whole tone and spirit of the book set a new mark for the ink manufacturer to aim at. Taking it for granted that the ink should contain iron, they first studied the effect of using different amounts of that metal and of gallic and tannic acids in the solution. Having done their best with these materials, they extended their investigation to include inks made with iron and substances that are closely related to gallic acid in their chemical structure.

The tannins are a group of more or less closely related substances that are found in many different kinds of plants. Their name comes from their use for tanning the hides of animals to make leather. The chemistry of this group of substances is quite complicated, and only a start has been made in determining the molecular structures of the different tannins. It has been shown that at least some of them are glucosides, or compounds of the familiar sugar, glucose (dextrose), with varying amounts of gallic acid, digallic or tannic acid, and possibly some trigallic acid. Chemically, glucose is an alcohol, and its compounds with these acids are esters, or salts, as truly as ethyl acetate as the ester or salt of ethyl alcohol and acetic acid. The sugar and the acids can be separated by the same type of reaction that splits apart ethyl alcohol and acetic acid from ethyl acetate.

Their final conclusion was that in order to be suitable for making ink of good color and permanence, the tannin must contain three adjacent, free hydroxyl groups. This condition is satisfied by tannic and gallic acids, and these of all the substances studied were found to be the best for making ink. Thus a formula, probably discovered by accident, and improved empirically during the centuries, is shown to be scientifically correct.

There are two Federal specifications for blue-black iron gallotannate ink. The first is TT–I–521, Ink, Copying and Record. This is primarily a record ink based on the Schluttig and Neumann formula. Almost identical ink must be used in Massachusetts and Connecticut for all official records.

The second specification, TT–I–563, was originally written for the Post Office Department, for buying ink to be used in the lobbies. It was hoped to gain some relief from the conditions that produced the much maligned post office pen. The ink of this specification is about half as concentrated as the copying and record ink.

There are Federal specifications for black waterproof drawing, indelible marking, red, and stamp-pad inks, and a specification for colored waterproof drawing ink is in course of preparation. These inks are entirely different in composition from the blue-black inks.

STANDARDIZATION SAVES MILLIONS FOR STATE OF WASHINGTON

In the last biennial report of the Department of Business Control of the State of Washington, which points out that more than $4,000,000 have been have the State's taxpayers during the last 8 years through centralized purchasing, the significant facts is emphasized that "no small part of the present splendid financial condition of the State treasury is due to the enormous saving made possible through standardization and truly competitive buying of the State's requirements."

Briefly, specifications for the material requirements of the using agencies of the State are formulated by the purchasing officer, or by the departmental engineers subject to the approval of the purchasing officer. Although the principal requirements of the State are purchased on its own government specifications, nationally recognized trade-association specifications and some Federal Government specifications have been adopted. Certain bids are called for on the basis of trade brands or equivalents.

Coal, grader blade steel, and soap, for example, are purchased on specifications indicating maximum and minimum limits of certain elements or ingredients. Bulk grains, such as corn, wheat, oats, etc., are purchased on specifications calling for standard grades; and the contractor is required to furnish either a United States Government or State department of agriculture certificate as to grade and weight of contents of each car. Lumber is purchased on bids calling for specified grades, and the contractor may be required to furnish a Pacific Lumber Inspection Bureau certificate as to grade. Inspection in many instances is made by a qualified departmental inspector at the time of shipment.

It is interesting to note that the total purchases made by the Washington procurement division from 1925 to 1932, inclusive, amounted to $25,373,371.51, at a monthly cost of $1,517.62; as compared with a monthly cost of $1,601.79, from 1923 to 1924, inclusive, and despite the greater volume handled as a result of bringing all departments and institutions under centralized control. Whereas purchases made during the biennium prior to 1925 amounted to $4,578,116.26, the average per biennium for the past 8 years was $6,343,342.87. Reduced to percentages, the cost of the 1923–24 biennium was 0.0084 percent, while the average cost of operation for the past 8 years was 0.0057 percent. According to the figures given in the biennial report, as recorded above, the savings to the taxpayer amounted to approximately 14 percent.

ACTIVITIES OF THE 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 glass.—The request of the National Bureau of Casualty and Surety Underwriters that the American Standards Association initiate a project looking to the development of specifications and methods of test for safety glass, used chiefly for the prevention of accidents in connection with the operation of motor vehicles, and also of the type used in the manufacture of industrial goggles for the protection of the eyes of workmen, has been formally acted upon by the standards council of the A.S.A., and the initiation of the project has been approved. The sponsorship has been assigned to the National Bureau of Casualty and Surety Underwriters and the Bureau of Standards. These two organizations are now engaged in the development of a sectional committee and the collection of materials and information for the use of the committee.

Industrial inch-millimeter ratio.—The value 25.4 has been approved by the American Standards Association as the American standard inch-millimeter conversion ratio for industrial use. This ratio, with three conversion tables based on it, and recommendations for the rounding of converted values, are included in the American standard B48.1–1933. This standard, the first one to be established by the general acceptance method, has passed through all the phases of its development by unanimous decision. The general conference of industry held on October 21, 1932, under the auspices of the A.S.A., made the recommendation that the proposed standard be submitted to American industry for acceptance. Accordingly, more than 100 organizations were canvassed by the A.S.A. office and a large number of acceptances were received, no objection to the proposed standard being made.

Bolts and nuts.—A revision of the American tentative standard for wrench-head bolts and nuts and wrench openings has been approved by the American Standards Association as an American standard. This revision differs from the 1927 edition mainly in that tables for "heavy" bolt heads and nuts have been added to the original smaller "regular" series. The addition of the heavy series was requested by the manufacturers of valves and fittings and the users of pipe lines in connection with the relatively large clearance that must be left between the bolt shank and the hole, in making flanged pipe connections. The new standard contains eight tables covering the following subjects:

Square and hexagon bolt heads (unfinished, semifinished, and finished), in the regular series (sizes one fourth to 3 inches), and the heavy series (sizes one half to 3 inches); square and hexagon nuts and jam nuts (unfinished, semifinished, and finished), in the regular series (sizes one fourth to 3 inches), and the heavy series (sizes one half to 4 inches); light nuts (hexagon, semifinished), in sizes one fourth to 1½ inches; cap screw heads (hexagon), sizes one fourth to 1¼ inches; light castle nuts (hexagon), sizes one fourth to 1½ inches; machine screw and stove-bolt nuts (square and hexagon) in numbered sizes (0 to 12), and one fourth, five sixteenths, and three eighths inch; set screw heads (square), sizes one fourth to 1½ inches; and open-end wrench openings for regular, heavy, and light series of bolt heads and nuts.

The American Society of Mechanical Engineers and the Society of Automotive Engineers are sponsors for the project. The standard is being published by the American Society of Mechanical Engineers.

Ball-bearing standards.—It will be of interest to the users of ball-bearing standards that the types so far approved by the American Standards Association are expected to appear in three separate pamphlets, as follows:

American Standard for Radial Ball Bearings, Single Row Type and Separable (Open) Type.

American Recommended Practice for Annular Ball Bearings, Wide Type.

American Standard for Annular Ball Bearings, Angular Contact Type.

An extension of the series of angular contact bearings is expected to be submitted to the A.S.A. for approval shortly and, if approved, will be printed, together with the series which has been already approved in the American standard B3.3—1933 (American Standard for Annular Ball Bearings, Angular Contact Type).

Coal-mine tracks.—A revised standard, "Frogs, Switches, and Turnouts for Coal-Mine Tracks", has been approved as American recommended practice. The revised document covers part of the scope for the project on coal-mine tracks, signals, and switches and presents a more comprehensive treatment than the former standard, which was approved in 1927. Under the sponsorship of the American Mining Congress the sectional committee through an active subcommittee canvassed the industry on several occasions and considered a number of drafts in order to develop satisfactory designs of these important parts of coal-mine tracks.

Classification of coal.—The annual meeting of the sectional committee on classification of coal was held in New York on February 22. The meeting consisted of successive sessions of the three technical committees, on "use classification", on "scientific classification of coal", and on "marketing practice", in which the entire sectional committee participated.

Consideration of a recently proposed tentative classification of coal indicated that the fixing of definite boundary lines between different classes of coal required intensive study. From discussion it became evident that no further progress could be made in the classification of coal unless governmental agencies, both State and national, could be induced to make it their official duty to assign a part of their staff to the actual work of making the necessary study whereby exact boundary lines for classification of coal could be set up. Accordingly, a new subcommittee consisting of representatives of governmental agencies in the United States and Canada, was set up to give attention to this problem. It was also decided by the sectional committee to organize a technical committee on nomenclature, in view of the use of various names in classifying coal for commercial purposes.

To facilitate early action in the formulation of tentative classification of coal (by type and rank) for

presentation at the fall meeting of the committee, W. A. Selvig, of the Pittsburgh Experiment Station of the United States Bureau of Mines, was appointed secretary of the technical committee on scientific classification of coal.

A key symbol for coal, which is being developed by the technical committee on scientific classification, and which will place a coal in its proper position both as to scientific classification and as to its most practical factor in use—its B.t.u. value as purchased—was suggested by Dr. H. J. Rose, of the Mellon Institute.

It was decided to appoint a subcommittee of the technical committee on scientific classification to correlate the requirements of coal for various uses with the classes of coal outlined by the technical committee; in other words, to fit the uses of coal into the scientific classification system.

STANDARDIZATION OF CONSUMERS' GOODS

"Let the buyer beware" has long been an accepted principle of trading. It places at a distinct disadvantage small-scale, unspecialized consumer-buyers. They are unfamiliar with the processes through which goods passed in their manufacture and distribution. Their only contact with the present complex marketing system is with the retailer, the final link in the chain of distribution. Little attention has been given to their difficulties and they have not been trained to recognize and meet their problems as buyers. The unsatisfactory position of the consumer-buyer is disadvantageous to the seller as well as to the buyer and becomes a barrier to the effective distribution of goods. Standardization is coming to be regarded as an important and effective means of aiding both consumer and producer and hence in promoting manufacture and distribution of goods.

In her book Standardization of Consumers' Goods (The Ronald Press Co., New York, N.Y.) Dr. Jessie V. Coles, associate professor of home economics, University of Missouri, makes the observation that in the field of consumers' goods, standardization may be described as the process of making available in commonly understood terms such information concerning characteristics of goods as will permit their identification and comparison in the market. Such identification and comparison make it possible for the consumer-buyer to secure the goods best suited to a particular use with a minimum expenditure of time, effort, and money. The common use of standards which aid the consumer-buyer has an important bearing on the production and purchase of consumers' goods. It is of benefit to consumers and producers, to sellers as well as to buyers.

The application of standards to consumers' goods is only one type of standardization and their use in this field is of comparatively recent origin. As a result, much confusion has arisen in regard to this phase of standardization. The purpose of this book, Standardization of Consumers' Goods, is to contribute to a more definite understanding of standardization as a device for describing consumers' goods. This type of standardization is differentiated from other uses of standards, and the process necessary to bring it about as a functioning device is designated. The problems involved, the difficulties encountered, and benefits to be gained are indicated.

The discussion is presented in four parts. Part I points out the need for standardization as indicated by the present unsatisfactory position of the consumer-buyer. Part II explains the nature of standards and standardization, while part III traces the steps in the development, establishment, and effective use of standards and discusses the agencies for carrying out standardization. Part IV considers the present status of standardization in its application to specific consumers' goods.

Concrete examples of the various types of standards in different stages of progress are provided and attention has been called to specific agencies interested in promulgating standards.

NOISE MEASUREMENT STANDARDS

As one of the steps in the program of the American Institute of Electrical Engineers to develop standards for noise measurements, Dr. Harvey Fletcher, of the Bell Telephone Laboratories, Inc., recently spoke before the institute's session on sound measurement.

Dr. Fletcher described in detail the researches that have been carried on during the last few years in this field, explaining the many difficulties that have been overcome, and the methods followed in arriving at an understanding of the way the human ear registers sound. The most important problems have been the determination of reference levels and audibility ratios for measuring pure notes of different frequencies and means of expressing the total loudness of complex sounds.

Research has shown that the threshold of hearing of a 1,000-cycle tone for the average person occurs at a sound energy level of approximately 10^{-16} watts per square centimeter and that this level is of the same order of magnitude as the limit of audibility established by the irregularities of sound due to thermal motion of the air. Thermal agitation of the air acts in much the same way on sound as thermal effects in resistors do on radio transmission, so that in each case there is a definite lower limit to transmission. Careful measurements have been made, determining this threshold of hearing for all audible frequencies, and curves expressing loudness in terms of an equivalent, 1,000-cycle frequency have been established. It has also been found that the nerves of the human ear which transmit sound to the brain are arranged in a manner similar to that of the keyboard of a piano, giving rise to a masking effect when notes of different frequencies exist simultaneously. Two notes of equal loudness and with frequencies close together give the impression of a much lower intensity than two similar notes with frequencies widely separated. This effect cannot as yet be imitated by any noise meter.

Dr. Fletcher, therefore, has developed a system of analyzing a complex sound into its component frequencies, expressing these in terms of a reference note of 1,000 cycles, and combining them by means of frequency masking factors into a single value representing the total loudness.

SELECTING THE REFRIGERATOR

Report of Standardization Committee of American Home Economics Association Intended to Aid Housewife in Her Selection of an Adequate Refrigerator[1]

Before selecting a refrigerator one of the first questions to be decided is whether an ice refrigerator or a mechanical type, operated by electricity, gas, or kerosene will be most satisfactory. This must be determined in the light of:

1. The amount to be spent for the refrigerator.
2. The extent to which it will be used.
3. The temperature conditions under which it will be used.
4. The availability of ice, electricity, gas, kerosene, and water. Gas and some kerosene refrigerators call for a supply of flowing water when in operation, hence information should be obtained as to the maximum amount and the temperature of water required and as to whether adequate drainage facilities are available.

In choosing any refrigerator, most careful consideration should be given to:

1. The temperature it will maintain.
2. The cost of operation.
3. The durability or probable length of satisfactory service.
4. A suitable size.
5. Adequate insulation. This is of first importance in the case of an ice refrigerator and affects economy of operation in a mechanical one.
6. In a mechanical refrigerator, further significant facts are: (*a*) The economy and quietness of operation; (*b*) the assurance of prompt, adequate, and inexpensive servicing. This will depend upon the standing and reliability of both the manufacturer and local distributor.

Whichever type is chosen, before selecting the refrigerator to be purchased, answers should be obtained, if possible, to each of the following questions:

Will it maintain a satisfactory temperature? The function of a refrigerator is to keep perishable foods at a temperature low enough to prevent or retard the growth of the bacteria which cause spoilage. To do this adequately, the refrigerator must maintain over the 24-hour period an average temperature of not more than 45° F. in the milk compartment, and an average of not more than 50° F. in the food compartment. Both ice and mechanical refrigerators may be purchased which will maintain these desired temperatures.

Careful consideration should always be given to the insulation. This is of added importance when the refrigerator is to be kept in a warm room or is to be used in a locality where the humidity is high and combined with summer temperatures which average more than 80° F. with occasional periods of continuous 90° F. or higher. Under these conditions an ice refrigerator requires at least 2 inches of a good insulator well-installed in a cabinet designed so that the air circulates readily to maintain the desired inside temperature. Similar construction is essential for inexpensive operation in a mechanical refrigerator.

American standard tests are being developed for household refrigerators. Within a short time, if consumers ask for it, retailers should be able to obtain information from manufacturers as to the temperatures a refrigerator will maintain under standard test conditions. This information should be given on the name plate of the refrigerator.

Will it be durable and economical to operate? This depends upon a number of factors, the most important being—

1. Adequate insulation. If moisture accumulates on the outside of the cabinet, this is evidence of inadequate insulation.
2. Closely fitting doors with catches which hold them tightly closed.
3. In an ice refrigerator, an ice compartment adapted to the size of ice cake required to cool the cabinet. (An ice compartment which holds 75 pounds of ice will be adequate in a well-constructed and well-insulated refrigerator which provides 5 cubic feet of food storage space. A compartment to hold 100 pounds of ice will be required by a less efficient one.) In an electric, gas, or kerosene refrigerator, a cooling unit of the proper size for the cabinet. (Usually this needs consideration only when a unit is being installed in a refrigerator originally built to use ice.)
4. Durable construction which is chiefly dependent on—

(*a*) A strong, rigid frame.

(*b*) Insulating material which cannot warp, slip, or settle.

(*c*) Adequate protection of insulating material from moisture.

(*d*) An inside lining which will prevent the penetration of odors and moisture.

(*e*) Strong hardware, which does not rust or tarnish easily.

In warm, humid climates, refrigerators with enameled or lacquered metal exterior surfaces should be accompanied by a durability guaranty against rusting of the metal sheet. A fused enamel lining should be selected if it can be afforded. Many refrigerators are now lined with such floors and baked enameled walls and ceiling, which is relatively satisfactory, as most of the wear comes on the floor. If refrigerator space must be obtained at the least possible cost, the ice chest holding 25 pounds of ice should be chosen. This chest should have a lid which is lifted up when food or ice is placed in it. When more storage space is needed at low cost, a larger chest of the same type which holds 50 pounds of ice is practicable. The consumer should learn, if possible, the amount of ice, electricity, gas and water, or kerosene and water required to maintain the desired temperature in a refrigerator for a 24-hour period. The operating expense, exclusive of servicing and repair, may then be readily estimated.

Although the first cost of a well-made refrigerator may be much higher than that of a poor one, it will in time more than make up the difference in the original price through its longer serviceability and its sav-

[1] Consumer purchasing leaflet no. 3, entitled "When You Buy a Refrigerator", prepared by the committee on standardization of consumers' goods, American Home Economics Association, 620 Mills Building, Washington, D.C. Copies are obtainable direct at prices approximately equivalent to postage.

ing of ice, electricity, gas, or kerosene. A refrigerator which does not maintain reasonably low temperatures is both expensive and dangerous to health because of the spoilage of food.

Is it the right size? The size of a cabinet required varies with the number in the family, the kinds and quantities of foods used, and the methods of purchasing. A family of 5 with convenient markets ordinarily needs about 5 cubic feet of refrigerated space for food storage; more is desirable, and less will serve if there is supplementary cool storage for less perishable products. Where funds are limited, preference should be given to a smaller refrigerator or chest which will maintain the low temperature necessary to preserve milk and meat, rather than to a larger and less efficient cabinet. If space for the refrigerator is limited, the purchaser should be sure there is room for the one selected before the purchase is finally made.

Is it conveniently constructed? Ordinarily the cabinet should rest on a sanitary base, and this should be not less than 8 inches high so that the lowest shelf will be easy to reach. The shelves should be spaced so that the desired containers can be stored in them without undue waste of room. The space for milk should be in the coldest part of the cabinet and not less than 9¾ inches high.

Will it be easy to care for? The exterior and interior finish should not absorb moisture, should be smooth and easy to clean and keep clean; the lining should have rounded corners; all shelves should be easy to remove and replace; and the space underneath the refrigerator should be easily accessible for cleaning.

Name plates recommended for refrigerators.—A name plate attached to the refrigerator provides the best method of conveying accurate information from manufacturer to purchaser. A movement is under way to give consumers such information. It is recommended that purchasers ask for a name plate which gives these data:

1. Name of the manufacturer.
2. Usable storage space (stated in cubic feet).
3. Ice capacity stated in pounds (if ice refrigerator).
4. Average temperature maintained under American Standard test conditions in the milk compartment and in the food compartment.
5. Amount of ice, electricity, gas, or kerosene required to maintain the temperature under American Standard test conditions over a 24-hour period.
6. Statement that the refrigerator meets American Standard tests for durability.

COLOR FOR SCHOOL FURNITURE

The majority of producers of school furniture who have accepted simplified practice recommendation R111–30 have expressed their intention to extend their present methods of identifying the simplified lines by including statements in catalogs and other trade literature.

This recommendation, which was formulated and approved by the industry, applies to school seating (pupils' desks), teachers' desks, movable desks, recitation seats, chairs, tablet armchairs, tables, typewriter tables, library furniture, filing cabinets, bookcases, kindergarten tables and chairs, and laboratory furniture. The color for stock varieties of school furniture is known as school furniture brown. The industry has fixed light and dark limits of shades within this color. While any shade within these limits will be considered as conforming with the requirements, for school furniture brown, it is understood that every effort will be made to conform as nearly as possible to the selected median shade.

The National School Supply Association has issued a pamphlet entitled "Harmony in Color Finish of School Equipment", which describes this recommendation. Some manufacturers are supplying color panels to their customers. Others are using labels to identify the conformance of their products to the recommended color.

A number of national associations representing users of simplified commodities have for some time strongly urged the identification of products by manufacturers who have accepted the various simplified practice recommendations. The general adoption of the identification plan should assist the school furniture industry in maintaining closer adherence to the waste-elimination program. Cooperation by distributors, buyers, and others will greatly increase the benefits and economies possible through simplified practice. When the simplified lines are so identified in trade literature their selection can be made without difficulty and much waste now incurred in checking files and auxiliary records for these data is eliminated.

Manufacturers of other of the 140 commodities for which simplified practice recommendations have been developed have recently commenced identifying in their catalogs those products which conform to the simplified line.

The identification plan, as applying to simplified practice recommendations, is described and illustrated in a mimeographed report, copies of which may be had on request to the Division of Simplified Practice, Bureau of Standards.

SIEVE SIZES OF CANNED PEAS

A summary report of the general conference on the simplification of sieve (screen) sizes of canned peas has been mailed by the division of simplified practice of the Bureau of Standards, to all interests in the industry for their consideration and written approval.

This recommendation, which was proposed and formulated by the industry, lists the screen opening sizes to be used in separating peas into three size groups, designated, respectively, as small, medium, and large. The new "small" size combines the old size nos. 1 and 2 in both the Alaska type and sweet varieties of peas. The "medium" size replaces the old size no. 3 of the Alaska type, and the combined size nos. 3 and 4 of the sweet varieties. The combined old size nos. 4 and 5 of the Alaska type, and 5 and 6 of the sweet varieties are designated as "large" in the new schedule.

The recommendation, subject to the written approval by the industry, is to be effective as of May 1, 1933.

STANDARDIZATION ACTIVITIES OF S.A.E.

Standards Committee of S.A.E. Formulate Plans for 1933

Scores of new standardization projects, practical and vital to progress in every phase of motor-vehicle design and operation, are being undertaken by various divisions of the standards committee of the Society of Automotive Engineers. New objectives have been outlined also for development of other standards activities which already have been in process for many months, while final action on a number of important items is scheduled for 1933.

Most of the 19 divisions of the standards committee are concerned more or less with parts standardization. In the aircraft division a study has been started of the relation between the tolerances of the bolt diameter and the hole diameter. Dimensional standardization for aircraft bushings, cables, electrical equipment, brakes, tires, rims, and wheels is also scheduled, largely in conjunction with the Army-Navy Standards Conferences. The aircraft engine projects include spark plugs, fuel pump mountings, and the standardization of both splined and taper types of propeller hubs and shaft ends, the latter being contemplated revisions of present standards.

The work of other divisions includes such dimensional projects as square keys, a narrow, light series of ball bearings and inclosed thrust ball bearings; flanged fittings, fuel nozzle connections, poppet valves and fuel line tubing for Diesel engines; a revision of the standard ignition distributor mountings and a new standard for 14 mm spark plugs for gasoline engines.

Fan-belt manufacturers have a committee studying standardization of fan belts and pulleys whose report is to be submitted to the gasoline engine division. The industry has been surveyed as the basis for standardization of replaceable valve seat rings and the mountings and connections of transmission gear boxes to the clutch housing.

In the motor boat field, the most recent development is a critical review of the shaft and propeller wheel mounting standards by the manufacturers, to bring these standards into line with present practice for both gasoline and Diesel power plants.

Another important project is the modernizing of the S.A.E spline fitting standard, the probable inclusion of the side bearing type and the possible coordination of the entire standard in a national program for all mechanical industries. Possibly three of the most important projects now being completed which affect the automotive industry are the refinement of the standards for screw threads and the adoption on a national basis of a definite standard for wrench head bolts and nuts.

In international standardization, the principal projects in progress relate to antifriction bearings and tires and rims. Other projects in progress for dimensional standardization include machine pins and plain and lock washers. These are handled by sectional committees for which the society is a sponsor under American Standards Association procedure.

In the nonferrous metals field, the society has just adopted the revised specifications for aluminum alloys and for brass and bronze alloys, together with new specifications for aluminum and zinc base die casting metals. Work is in progress on specifications for magnesium alloys and nickel bronzes and on general introductory notes and information bearing on the several nonferrous metal specifications. In the field of ferrous metals, the iron and steel division is surveying the use of chrome-nickel molybdenum and 3½ percent nickel-molybdenum steels and will consider specifications for cast irons and possibly special steels for aircraft use. The results of some work on the so-called " probablity method " of indicating physical properties of steels have been published in the society's handbook. This method is likely to be further developed by the division, as conditions permit, to replace the present physical property charts for these steels in the handbook.

Committees are being organized for, or are now engaged in, the study of improved standards for brake linings and felts. The principal activity in the petroleum field is toward establishing definite classifications for greases and lubricants for motor-vehicle chassis.

The standard engine-testing forms are being studied with a view to including more accurate barometric and temperature correction formulas for use in testing airplane engines. Important developments are being made in improved laboratory testing specifications for automobile head lamps to spersede those in use for several years. In this connection, plans are in progress for developing suitable means on a national scale to bring about greater safety in night driving as affected by headlighting and to encourage better maintenance of automobile headlighting equipment in the hands of vehicle operators. Another important project in the vehicle operating field is development of cost record forms for motor-vehicle fleet operation, the intention being to incorporate these in the present, widely used S.A.E. Recommended Practice for uniform motor-vehicle operating cost classification.

In the motor-boat field, consideration probably will be given to endorsement of a code for fuel installation and safety systems that has been drafted by the motor-boat industry.

A telegraphic code for iron and steel specifications and a code for color marking of standard steel bars are scheduled for early consideration. Some study has already been given to a code for the design and testing of shock absorbers. The society is also cooperating in the preparation of standard codes for automobile brakes and brake testing, drafting-room practice, foundry equipment and supplies, and acoustical measurements and terms by means of sectional committees functioning under American Standards Association procedure.

Special committees of the society are preparing to issue recommendations, one with regard to dimensional and weight limitations for motor trucks in connection with their regulation by States, and the others on rating motor trucks by a standard method to be tried out by the truck manufacturers.

The society's activities in the field of manufacturing practices are at present mostly directed to projects for

the standardization of tools, machine-tool elements, fixtures, and similar types of manufacturing equipment. This work is being carried forward by a sectional committee under the procedure of the American Standards Association on a national basis. A new project on a similar basis is that for definition and classification of surface finishes on different materials obtained by different methods of work, such as surface removal, plastic operations, coating, and plating.

An important project, plans for which are now being formulated, looks toward standardization of gasoline tanks and tank trucks in cooperation with the American Petroleum Institute, with regard to both the present type of motor trucks and new types that may be developed as the result of new motor-vehicle regulations enacted by the several States.

Definite progress in standardization is hoped for this year as regards interchangeability between different makes of tractor semitrailer couplings. A survey is to be made of the use of the society's present chassis record form, which is a service record for fleet operators, and a definition of what constitutes a standard-truck chassis will probably be adopted soon.

Last fall the society entered into a new field of standardization activity by a cooperative program with the Radio Manufacturers Association for the standardization of radio equipment for automotive installation. This work is progressing rapidly, and definite recommendations will probably be approved before long.

The only work in progress in nomenclature is for Diesel engines, for which it was felt there is a distinct need for the establishment of definite descriptive terms. The present automobile nomenclature is revised from time to time where it relates to groups of terms, such as electrical equipment, and it is possible that a general review of the entire standard may be made this year to bring it up to date and to include terms for new developments, such as 4-wheel brakes, free-wheeling devices, superchargers, and so on.

A recommended practice which is nearing completion in the lighting division covers the location of the various types of lamps used in automobile construction, the voltage and candlepower of incandescent lamps used in each location, and general notes relative to the installations. In sectional committees on which the society is represented work is also in progress on definitions of technical terms, electric welding, machine tool safety code, geometric series of preferred numbers, such as those for use in determining the progression of sizes, scientific and engineering symbols and abbreviations, and the use, care, and protection of abrasive wheels.

For a number of years S.A.E. specifications have been designated as S.A.E. standard or S.A.E. recommended practice. The standardization policy committee is considering the simplification of the method of designating specifications in view of the real intent of some of the standards as distinguished from that indicated by the status designation.

COLOR OF MANILA ROPE

A good rope must be not only good when new, but must also be reasonably durable in service. There is no known test method for estimating this durability, although the Navy is now attempting to develop one. To protect itself, therefore, the United States Government requires that the rope which it buys shall be made of certain specified grades of manila fiber, on the basis of the trade's experience that the higher grades of fiber produce ropes of greater durability.

Manila fiber is graded in the Philippines by visual inspection and passes through many hands before the finished rope reaches the ultimate consumer. It would obviously be worth while to develop a test method which could be used to grade the fiber in a sample of rope, and which would be sufficiently mechanical to be used by persons other than the expert Philippine graders.

Since the interests of the Government and of the industry run parallel in this matter, the Bureau of Standards accepted a research associate from the Cordage Institute, to develop such a test method. As a result of this work, which has been in progress for about a year, a quantitative method for the evaluation of the color of rope fiber has been established. Equipment for use in applying this method has become available commercially and several rope manufacturers are using it. During the month of January 1933, the Federal specification for manila rope was revised by the cordage committee of the Federal Specifications Board, to provide for the use of the new method, and the revised specification has been submitted to the Federal Specifications Board for promulgation.

NEW LIST OF STANDARD SAMPLES

A new list of standard samples for use in chemical analyses has just been published by the Bureau of Standards as a supplement to Circular No. 398. This replaces the former list known as " Supplement to Circular No. 25."

The samples are listed by groups, such as irons and steels, ferro-alloys, sheet brass, bronzes, bearing metals, die-casting alloys, limestone, clays, glass sand, various kinds of glasses and ores; sugar, naphthalene and benzoic acid for determining heats of combustion; cement for testing the fineness of sieves; and pure chemicals, such as sodium oxalate, arsenic trioxide, and acid potassium phthalate.

Directions are given for ordering, and the methods of shipment to addresses in the United States and foreign countries are described. Copies of this pamphlet are obtainable without charge from the Bureau of Standards.

CORRUGATED AND SOLID FIBER BOXES

Simplified practice recommendation R146–33, covering corrugated and solid fiber boxes for canned fruits and vegetables, having been accorded the required degree of acceptance by the industry, is to be considered effective as of January 1, 1933.

This recommendation, which was formulated and developed by the industry, provides a simplified list of 41 different sizes of corrugated and solid fiber boxes. The sizes of these shipping boxes are based on standard units of pack for the 27 simplified sizes of fruit and vegetable cans as approved by a general conference of the industry on January 20, 1931.

AIDS TO THE CONSTRUCTION INDUSTRY

Research in Natural and Manufactured Structural Materials Conducted by Bureau of Standards

By Henry D. Hubbard, *Bureau of Standards*

This is the fourth 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.

Cement enters into the making of practically every modern structure. The astonishing amount now being used stirs the imagination—approximately 5,000,000 barrels, for example, will be required in constructing the Hoover Dam alone. In close cooperation with the technicians of the cement industry the Bureau of Standards has been conducting an extensive program of research on fundamental problems concerning cements and concrete. The constitution of cements, their properties, and uses; the processing and especially the measured control of the conditions of manufacture are being studied. An experimental mill for the production of cement under precise laboratory control, a 10,000,000-pound capacity compression machine capable of testing concrete specimens weighing more than 3 tons form important parts of the equipment used in these studies.

Studies of steam curing to enhance the useful properties of Portland cement concrete showed generally an increase in strength with increase in steam pressure as well as decrease in subsequent shrinkage. In the studies of the causes of crazing of concretes, specimens exposed on the roof were found to be nearly all crazed but specimens could be made that would not craze in the laboratory. Studies of the effect of sea water on cement and concrete showed that a properly made Portland cement concrete when totally immersed in sea water will apparently not decompose. The published report of this study gives conclusions of value to structural engineers.

In the study of the resistance of concrete aggregates to disintegration, materials were ranged in their order of resistance to disintegration when subjected to cycles of boiling and drying, freezing and thawing, and to sodium-sulphate and sodium-chloride treatments. A study of some 40 commercial brands of masonry cements is now being made. Some of these cements showed no signs of failure after 50 cycles of freezing and thawing, whereas others failed after a few cycles.

A series of concrete beams was studied as to behavior under load, according to arrangement and percentage of reinforcement. Shear tests of reinforced-concrete beams developed data of value in fixing standards of design in general practice for reinforcing concrete. Stresses in the shearing reinforcement were found to be independent of the strength of the concrete and to depend upon the amount and arrangement of the reinforcement. An investigative test of 42 beams made up of hollow tile and concrete slabs showed that hollow tile increases resistance to bending and shearing stresses.

The increasing use of cast stone led to the demand for direct knowledge of its properties. The bureau's investigation of the cast stone brought out interesting properties of the material. One specimen showed a compressive strength of 21,000 pounds per square inch. The freezing tests show results from complete destruction in 25 cycles to first signs of failure in 1,450 cycles.

A special committee, of which two were bureau specialists, selected 14 proposed standard cast-stone samples for matching color and texture. Present plans call for the supplying of a standard sample to the contractor and the second to the building inspector, for comparison with delivered materials. The group believe that standards of color and texture will facilitate procurement of the desired material and clarify misunderstandings that have often occurred between the architect and the manufacturer of the cast stone.

In a bureau research on damp proofing and waterproofing compounds and void-filling materials recommended or advertised as damp proofing, 50 integral and 50 surface waterproofings were tested. The test results, with conclusions invaluable to the engineer have been published.

The foregoing is but a brief outline of some of the more important investigations undertaken by the bureau in the field of cement and concrete. The bureau furnishes a pragmatic service in the inspection and testing of Portland cement for use by the Government. Some 3,000,000 barrels were tested during the past fiscal year in the Washington Laboratory and in the bureau's branch laboratories in Pennsylvania, Colorado, and California.

Important as lime is as a structural material, when the Bureau of Standards first began its researches on lime, scientific methods were not in practice in the lime industry. In a survey of the industry, 19 plants were visited and inspected. At 6 plants, kiln tests and heat balances were worked out. The introduction of heat-measuring devices and scientific methods in standardizing the process of lime making was credited to the cooperation of the bureau specialists by formal vote of the industry. The survey is described in detail in "Manufacture of Lime" (C337), which contains an account of modern methods of lime making and a technical description of the plants. This publication played its part in the scientific reorganization and modernization of the industry from its rule-of-thumb methods then current. Another Bureau's publication (C30) describes briefly the manufacture and properties of lime and a score of its practical uses.

Recent work on lime includes a study of particle size distribution in hydrated lime, correlation of autoclave test results with results of tests of lime in plas-

tered panels, a study of the properties of commercial sand-lime brick, investigation of hydraulic lime, and collaboration on the revision of specifications for quicklime and hydrated lime for structural purposes.

A plasticimeter was devised for measuring the relative working properties of plaster finishes when applied to an absorbent base. This apparatus is now widely used in making specification tests and by the industry in judging the plasticity of finishing limes.

Commercial limestones available for building construction in the United States were investigated in the Bureau of Standards laboratories, and the results were published (T349) under the title "Physical Properties of the Principal Commercial Limestones Used for Building Construction in the United States". The survey covered 130 samples from 7 States and 42 quarries. Measurements were made of strength in compression, tension, flexure, and shear; the elasticity, absorption, specific gravity, porosity, permeability, thermal expansion, discoloration, weathering, and efflorescence. Thirteen practical conclusions were drawn from the laboratory results in addition to a large amount of tabulated technical data on the limestones.

The September 1932 issue of the Bureau of Standards Journal of Research gave the results of its slate investigations under the title "Study of the Physical Properties and Weathering Characteristics of Slate." This paper will be printed separately for sale to the general public and industry. Tests were made on 343 samples of slate. It gives the physical properties and weathering characteristics of slate from the various regional sources along the Atlantic seaboard where quarries are now in active operation. Slate is used primarily as a roofing material. However, it has a number of other applications in the industries, as, for example, laboratory sinks, laundry tubs, electrical switchboards, etc. If care is used in selecting this material it provides a very durable roof. By combing slates of various colors pleasing decorative effects may be obtained. Twelve definite conclusions are of interest to the producer and the user, and photomicrographs, charts, and tables give many useful details of interest to the construction technologist.

Structural materials are exposed to unfavorable conditions—weather, wear, stress, vibration, rain, and the like. The "save the surface and save all" philosophy holds with special force for materials of construction. The Bureau of Standards has conducted many lines of research on protective coatings, such as the investigation of accelerated corrosion, absorbing and insulating value of paints, and electroplated metal coatings. The effective life of these coatings is measured in artificial weather cycles produced in the laboratory to simulate natural weathering.

Ultraviolet of sunlight is duplicated by arc light; water spray serves as rainfall, and freezing plays its part in the experimental weather exposure of protective coatings. The disintegrating effects of these treatments are measured, by experts, for example in the case of paint films by the permeability to water vapor, and air, the electrical conductivity, and the presence of pinholes. The results agree remarkably well with natural weathering. Weathering tests on asphalts similar to those on paints show that the accelerated cycle produces effects similar to actual weather. Service is the ultimate test of structural materials, but accelerated tests enable one to duplicate the weathering effects of a lifetime in a period suitable for test.

Studies in soil corrosivity and the performance of protective coatings have been made by the Bureau. Underground metal structures are subject to corrosion or electrolysis. The metallurgical division of the Bureau suggested an aluminum coating for duralumin and this has proven effective in commercial practice where it is now established.

Advice to the Government on construction enterprises has spelled economies. An ultraviolet absorbing varnish was suggested for hangars as a substitute for expensive colored glass installations. Experiments showed that painting Army tents white on the outside and with aluminum paint on the inside was effective in reducing by 80 percent the heat entering them. The Bureau's radiation specialist also found that metallic paints for radiators required more radiating surface while earth paints gave better radiation. This also suggested the use of aluminum paint for steam piping where radiation would be wasteful of heat energy. The use of aluminum paint on the inner surface of attic roofs reduced the reradiation of the heat energy coming through the roof and thus tended to make more habitable attics which before had been too hot. The saving of heat losses by the same means in industrial plants was also possible wherever heat radiation carried with it wasted energy.

In an important service to science and industry the Bureau helps to standardize methods of chemical analysis and to check the accuracy of the results by means of selected and typical analyzed and certified materials. They also serve to study the accuracy of the analysts and of the analyses they make. These "standard samples" form an important item in the technical control of the manufacture of construction and other materials. The work began in 1905 when the American Foundrymen's Association turned over to the Bureau of Standards its standardized pig-iron samples and their distribution, urging that the Bureau conduct it for the industry as a standardization enterprise. Nearly 100 standard samples are now handled by the Bureau. Through their use an analyst can accurately check his methods by means of these samples of known and certified composition. These include steels, irons, ferro-alloys, brasses, bronzes, bearing metals, light aluminum alloys, ceramic materials, such as limestones, clays, feldspars, refractories, and glasses.

The utility of this service is illustrated by citing a few of their uses; for example, checking the accuracy of methods of analysis; settling and avoiding disputes arising from faulty analytical methods in standardizing calorimeters to measure fuel value, and polarimeters for sugar tests; standardizing pyrometers for use in annealing steels, alloy steels, and other metal products; checking the sieving values of sieves used in the cement industry, the study of improved and more rapid methods of analysis, and in research work in educational institutions. The number of certified standard samples distributed during the year was 5,215.

EFFECTS OF STANDARDIZATION ON PRODUCTION AND MARKETING

Outlines of Certain Phases of Industrial Economy as Affected by the Standardization Movement

By Paul L. Dildine[1]

The term "standardized goods" suggests to the layman's mind commodities which are manufactured in fair-sized quantities according to rather rigidly fixed procedures. The term precludes that there should be few variations from these fixed procedures. There is the idea of "sameness" about the product. The manufacturing procedures lend themselves to a high degree of mechanization. The employment of labor is largely confined to "machine tending." The work performed by human hands is very simple and requires very little training or skill.

This description fits most aptly the ultimate in standardized production. There are comparatively few commodities which will fall completely within this classification, because there are varying degrees to which commodities are standardized. Many manufacturers of automobiles regard their line of products as being standardized, although the factory in which they are produced may turn out as high as a dozen or more models. Many manufacturers have only within recent years started to reduce their line of products to fixed types, sizes, and characteristics. They have considerable simplification yet to accomplish before their products can be considered completely standardized. Indeed, their purposes may be accomplished without further efforts in this connection. In the final analysis, standardization is not an end in itself but only a means to an end. Its purpose primarily is to supply human wants at a lower cost.

It is not unusual in any movement, such as the standardization movement, that various other phases of industrial economy are affected. It is for the purpose of considering some aspects of the standardization movement that this article has been prepared. The following are considered: (1) The market demand for the product, (2) the seasonality of production, (3) the development of machines, (4) the adoption of changes in production, and (5) the competition in the field.

The market demand for the product.—Market demand is governed by many factors. A very important factor is that of price. Insofar as the demand for a commodity is elastic, price exerts a very material influence on the volume of market demand. Insofar as the demand for a commodity is inelastic, the matter of price is of lesser importance. The prices of manufactured commodities fluctuate closely over a period of time with the cost trends of these same commodities.

Standardization reduces the costs of production. It should, therefore, follow that the market demand for standardized products should increase within the limits of the elementary economic principles noted above. Standardization undoubtedly does contribute to increased market demand. The contribution is handicapped by reason of the fact that many of the everyday commodities of commerce are intricately connected, so as to offset the selling power of low prices. The elastic demand for commodities is limited. The demand for automobile tires is so definitely interlinked with the manufacture of automobiles that it is doubtful whether or not the standardization of tire sizes and types contributes materially to the market demand for the product. Indeed, the market demand is increased only insofar as the low cost of tires contributes to the low cost of purchasing and operating an automobile. Market demand is definitely interwoven with the entire economic fabric. Standardization is only one of many factors.

The contribution of standardization to increased market demand is measured by the extent to which low prices effected through standardization enable ultimate consumers to increase their purchases of luxuries and improve their standards of living.

Seasonality of production.—The greatest benefits of standardization are enjoyed when production of commodities is carried on at a uniform rate throughout the seasons of the year. The conditions surrounding production remain fixed. Changes in rates of production are costly. Hiring and training new employees are costly. The standardization of products does permit of more uniform production. The manufacturer comes nearer knowing what future demands will be and can plan inventory production during dull periods. The experienced manufacturer is not, however, unaware of the hidden dangers accruing from the pursuit too far of such policies. The lesson of building up unduly large inventories of slow moving stocks has been well learned. Pretty definite knowledge of future demands must be available in order that the peaks and valleys of production may be smoothed out. This knowledge is usually more accessible in the case of standardized products than unstandardized products, although the limitations expedient in long time planning must be respected.

The development of machines.—The highly mechanized equipment now in industry is justified largely by the reduced costs of production effected through its uses. The mass production which accompanies standardization of product shortens the time period in which the reduced costs will justify the capital investment. This is assuming, of course, that mass production will accompany the standardization process. Standardization renders it very worth while to develop cost-saving equipment.

Foresight is here again necessary lest the capital investment in machinery become obsolete and worthless before the monetary benefits equal the cost of the machine. The constantly changing consumer demands, competitors' activities in developing new products, and other factors cast a speculative flavor around any new machine development. Standardization of product lessens this risk but does not entirely eliminate it.

The adoption of changes in production.—The outstanding features of economic life during the past decade have been changes—rapidly accelerating changes.

[1] Manager, factory standards, The B. F. Goodrich Co., Akron, Ohio.

There is no counteracting economic force sufficiently strong to resist change. The standardization of goods, once accomplished, is opposed to change. When viewed from a close-up period of time, many changes are uneconomical. Thus viewed, changes in the production of standardized goods are particularly wasteful. (The change in the Ford Model " T " to Model "A" is a notable example.) Workers are thrown out of work. All business is disrupted. Seasonal rather than long-range planning of production is encouraged. This is emphasized more strongly in the production of standardized goods than nonstandardized goods. In the latter case the transition from one line or type of production to another is made so gradually that no serious upheaval occurs. In the case of standardized products a lapse of time occurs until production of the new line of products gets under way.

Nevertheless, consumer demand must constantly be stimulated and satisfied. Industrial progress required evolution of this sort. During the period of transition the industrial community suffers maladjustment. Over a period of time the industrial community and consuming public benefits through the use of a superior product. This results in continued or increased demand. The transitional hardships represent the pains of progress which are soon forgotten long after the benefits continue to be enjoyed. This describes briefly the effect of standardized goods upon the adoption of changes.

The competition in the field.—The mass production of standardized goods has completely changed many of the aspects of competition and market distribution. It is possible in this brief space only to sketch briefly the results. Competition becomes very keen. It becomes a comparatively easy matter for prospective customers to compare values on a dollar basis of competing brands of standardized goods. It becomes difficult for the seller to establish the superiority of his merchandise as compared with that of his competitor. The selling problem is complicated. Selling prices are established so as to furnish the seller a very close margin of profit. Both factory and distribution costs become doubly important. This may reflect back on the wages paid to workers in some instances, depending upon the importance of the labor cost factor. Wages paid in different communities tend to be equalized for the manufacture of the same products.

In order to render the selling job easier, national advertising is utilized. Attempts are made through the media of widely read magazines, billboards, radio broadcasting, and other means to educate the public regarding the particularly fitting qualifications of one brand of products compared with all others.

The outstanding results in this connection, as in many other connections, has been to furnish the consuming public better products at lower prices. The standards of living have been raised without a materially increased dollar cost. There are times that the development and production of standardized goods engender hardship upon certain portions of the working population for limited periods of time. Noteworthy attempts are being made and will no doubt continue to be made to overcome these hardships. It is the hope of all public-minded industrial statesmen that a happy solution may be found. But the experience of the past indicates that whatever solution is found must be in harmony with industrial progress. The solution must contribute to the lasting happiness of the population in order to be enduring.

SHINGLE MANUFACTURERS REPORT ON ADHERENCE

A report of adherence to the Commercial Standard for Red Cedar Shingles, CS31–31, indicates that the commercial standard specifications have been followed very closely by manufacturers of that commodity.

Of the 69 manufacturers responding to the questionnaire, 60 reported that they were manufacturing and labeling all of their first-grade shingles according to the standard and the general unweighted average for the industry was 97.5 percent of individual production for the first 9 months of the year 1932. Most of the companies resorted to advertising commercial standard quality shingles through pamphlets and other sales literature and have instructed their salesmen to advocate the use of the commercial standard grade when possible. Thirteen companies used magazine and newspaper advertising to indicate conformance to the standard.

Numerous complimentary remarks were made regarding the program on shingle standardization, common among which were the following:

We think this the most progressive and important step ever taken by the shingle industry.

The standard has created an additional interest in high-class shingles.

The movement has been a general benefit to the industry by bringing up the standard and by distinctly marking shingles so that the users of our product can know what they are getting.

NEW FEDERAL SPECIFICATIONS

Eighteen specifications were acted on by the Federal Specifications Board during March. Of this number, 10 proposed specifications and 8 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	Old F.S.B. No.
	PROPOSED	
	Colors of the American flag	
	Mallets and mauls, wood	
	Naphthalene; balls, flakes	
	Punches; bag, center, coopers', coppering, cutting, and drive pin	
	Turpentine (for) paint, type 2	
	Compound, sweeping	
	Borax (sodium borate)	
	Polish, stove	
	Bronze, copper-silicon, castings	
	Bronze, copper-silicon, bars, plates, rods, shapes, sheets, and strips	
	TO BE REVISED	
C-F-201a	Felt, hair	
V-T-291a	Thread, linen	
HH-T-111	Tape, rubber, insulating	292
RR-R-571	Rope, wire	297
WW-C-571	Conduit, steel, rigid, enameled	311
CCC-D-771a	Duck, cotton (canvas), plied yarns (Army, numbered, and tent duck)	
DDD-B-421a	Blankets, cotton, and cotton-warp and wool-filling	
LLL-T-791b	Turpentine (for) paint, type no. 1	

GRADING SULPHONATED OILS

Recommended Modifications of Distillation Method for Determining Moisture Outlined

By Ralph Hart[1]

This paper comprises a brief summary of the first report to the American Association of Textile Chemists and Colorists by the subcommittee on sulphonated oils, and includes recommended modifications of the usual distillation method for the determination of moisture.

The establishment of a commercial standard for the grading of sulphonated oils has done much to crystallize current opinion concerning methods of testing and grading sulphonated oil.

Confusion surrounding particularly the method of grading has been recognized for several years. The writer has in the past proposed methods for the determination of the various components of sulphonated oils, some of which have been adopted by the American Leather Chemists Association. In foreign countries methods of testing have been proposed by the Wissenschaftliche Zentralstelle fur Öl und Fettforschung and by the International Society of Leather Trade Chemists.

At the 1931 annual convention of the American Association of Textile Chemists and Colorists at Boston, Prof. A. H. Crimshaw called attention to the existing confusion and there resulted the appointment of a subcommittee of the research committee, which was instructed to conduct investigations and recommended improved testing methods. This subcommittee is composed of 11 members representing the technical, manufacturing, and consuming branches of the industry under the chairmanship of the writer. Investigations so far have been confined to the method for moisture determination.

Of the various existing methods for moisture determination, the distillation method was selected as being the most widely used, least subject to theoretical error, and at the same time comparatively rapid and precise. It was recognized, however, that as conducted at present there are several modifications needed to adapt the method to the conditions peculiar to sulphonated oil.

Samples of three lots of oil were analyzed by each member of the committee, and on the basis of data obtained and the experiences of the analysts, a method is proposed which includes the following features not usually specified in other procedures: (1) Ground glass connections for the apparatus, (2) thorough cleaning of the apparatus with soap and water before treating with chromic acid, (3) specifications for calibrating the apparatus. (4) a more accurate method of weighing the sample to be taken for analysis, (5) the addition of oleic acid and the amount, (6) a different and more convenient criterion for controlling the rate of distillation, (7) definite end-point when the distillation may be considered complete, and (8) more precise method for measuring the condensed water and calculating the final result.

Details of the proposed method are included in the proceedings of the American Association of Textile Chemists and Colorists as published in the American Dyestuff Reporter for November 21, 1932. Reprints are available to interested individuals on application to the writer, 1440 Broadway, New York, N.Y. This report also includes results of the experiments by the membership of the subcommittee, together with their comments.

Methods for the determination of other components of sulphonated oil are to be investigated in a similar way. The results of these investigations will be available to the standing committee for the commercial standard in considering proposals for revision.

[1] Chairman of the standing committee for Commercial Standard on Sulphonated (Sulphated) Oils—Saponifiable Types; chairman of subcommittee on sulphonated oils of the research committee of the American Association of Textile Chemists and Colorists.

NEW LETTER CIRCULARS ANNOUNCED

Announcement of the availabity of three new letter circulars, in mimeographed form, has just been made by the Bureau of Standards. The Bureau prepares these circulars in mimeographed form in order to expedite answers to numerous inquiries on a given subject, and issues them on specific request, to those persons having a special interest in the respective subject matter. Requests for the circulars listed herein below should be addressed to the Bureau of Standards, Washington, D.C.

LC358. Color Charts. (List and description of color charts issued or used by branches of the United States Government; also list and description of color charts used for general purposes.)

LC359. Sound Absorption Coefficients of the More Common Materials (supersedes LC344).

LC360. Rerefining Used Crank-case Oil.

FUEL OILS

The recommended revision of the commercial standard for fuel oils having been accepted by a large majority of the refiners of fuel oil, practically all of the oil burner manufacturers and numerous distributors and organized consumers, an announcement of the success of the revision was made to the industry on March 1, 1933. The revision will become effective May 1, 1933.

Minor changes were incorporated in the revision of this standard including a footnote and table of maximum sulphur content for those oils used for special purposes such as heat treating of metals and in ceramic furnaces.

Mimeographed copies of the standard designated as "Commercial Standard, CS12–33, Fuel Oils" are obtainable from the division of trade standards, Bureau of Standards, until the printed copies are available.

COVERINGS FOR LINE WIRES

Throughout the past 2 years investigations have been carried on by the electrical and chemical divisions of the engineering experiment station at Purdue University, in cooperation with the Utilities Research Commission of Chicago, leading to the development of improved weather-resistant coverings for overhead electric light and power wires, and the establishment of accelerated weathering and other tests for determining the comparative merits of such coverings.

These investigations are described and summarized in a bulletin entitled "Improved Weather-Resistant Coverings for Overhead Line Wires", which may be secured from the Purdue University, free to residents of Indiana, and at a cost of 50 cents to nonresidents of Indiana.

In this bulletin a brief comment is made upon the changes in methods of producing weatherproof wire, the forces that have been at work to lower the quality of the coverings on such wires, and the economic justification for improved coverings, even at a slightly higher first cost. The equipment developed and constructed and the test methods utilized in this work are described. The reasons for the variable life, often very short life of weather-resistant coverings, together with illustrations showing test results, are summarized. The development work leading to the final selection of a class of asphaltic saturating materials providing consistently long-lived coverings is traced. Chemical analyses of asphalts are described and the lack of correlations with weather resistance shown.

Finishing materials and possible future improvements in weather-resistant coverings are discussed. The specifications, proved by this work to provide improved weather-resistant coverings, are given in detail, as are also the details of the accelerated weathering test which has been developed to a point of extreme usefulness in testing weather-resistant wire coverings.

The conclusions, specifications, and tests resulting from the work described in this bulletin should prove of aid to both the manufacturer and the purchaser of weatherproof wire, in increasing the length of life of overhead electric light and power wires, and in reducing the expenditure for replacement of wires still capable of rendering adequate electric service except for the shedding of the coverings.

REVISED RECOMMENDATIONS FOR SHIP REGULATION

Six recommendations by the Board of Supervising Inspectors of the Department of Commerce Bureau of Navigation and Steamboat Inspection, for the protection of life at sea and shipping generally have now been approved. These recommendations have the force of law.

Among the approvals is a new spring loaded safety valve. Other valves operating on this principle have been approved in the past. Detailed specifications were approved for the construction of wooden life floats for river steamers. The specifications cover the method of construction and materials used. The Board also amended the specifications for fire-detecting systems by making them more rigid. The Board amended the rules in regard to lights for barges, canal boats, and nondescript vessels in tow on the Hudson River and adjacent waters, and on Lake Champlain. This action not only simplified the rules, but makes the lights more effective. The Board also approved a new water-tube boiler and a child's kapok life preserver. Other life preservers of similar materials have been approved in the past.

One of the most important of the new regulations is that regarding the use of detectors (thermostats) in fire-detecting systems on vessels. This regulation provides that "detectors shall not be approved for use in cargo compartments or other inaccessible places after June 30, 1933, unless satisfactory provision is made to replace them without ingress to the compartment in which they are located." The enforcement of this provision will eliminate one source of fire hazard. Regulations of the Bureau of Navigation and Steamboat Inspection have already served to reduce fire loss to shipping.

The regulation concerning wooden life floats, which are sometimes used on river steamers in place of life preservers, provides that floats made of balsa shall not be less than 3 feet in length, 11½ inches in width, and 2 inches in thickness. The use of balsa in floats is increasing. An additional factor of safety in the new ruling is the provision that the balsa floats shall be made of not more than two pieces and in addition to being securely glued shall be made with four dowels, driven through and entirely across the float.

The method of publishing the rules regarding the changes in regulations for the use of lights on vessels in tow on the Hudson River and adjacent waters and Lake Champlain is expected to simplify their interpretation. Diagrams are printed along with the text of the rules which are mainly provisions for more advantageous placing of the lights than is now common.

PROTECTION AGAINST LIGHTNING

A revised edition of the Code for Protection Against Lightning has been issued by the Bureau of Standards as Handbook No. 17. An earlier edition of this code was issued as Miscellaneous Publication No. 92.

In the new publication, parts I and II of the code have been revised. The first deals with the protection of persons; the second deals with the protection of buildings and miscellaneous property including flagpoles, water towers, smokestacks, aircraft, ships, trees, and livestock. The changes in these two parts are rather minor in nature, but have been made further to perfect the code by the national committee which reviewed the subject last year.

Handbook No. 17 includes also part III of the code dealing with the protection of structures containing inflammable liquids and gases. This part of the code has not been revised at this time, but is expected to undergo revision at some future date. It was approved by the American Standards Association as American tentative standard when first published. Parts I and II were approved as American standards in the first edition, and approval of the revised text is now pending before the standards council of the association.

Copies of this publication may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., at 15 cents each.

FOURDRINIER WIRE CLOTH

A revision of the commercial standard for Fourdrinier wire cloth, approved by the standing committee, has been accepted by the industry. The changes resulted from a survey conducted at the request of the general conference to determine the degree of adherence and the benefits arising from the use of the standard.

This survey indicated that production of Fourdrinier wire cloth for six months ended June 30, 1932, conforming to the requirements of the standard, averaged 85 percent of individual production. (Average of 17 replies not weighted according to individual production.) Deviations from the requirements of the standard were attributed to demands from purchasers, and to the fact that some of the tolerances were too close for practical use.

The revision as accepted by the industry includes an increase of 0.0003 inch in the maximum diameter of the shoot wire before weaving for the 65, 75, and 80 mesh wire cloth and decreases by 2 the number of beats of the shoot wires per inch for the 70, 75, and 80 mesh wire cloth.

Special grades and meshes of Fourdrinier wire cloth are not covered by the revised standard and will continue to be furnished by the manufacturers as heretofore. The commercial standard continues to require high-grade workmanship and material in order that maximum service and satisfaction in use may be provided.

The revised commercial standard will be designated hereafter as CS36–33, and the changes are to be effective immediately.

Mimeographed copies of this revision are available from the Division of Trade Standards, Bureau of Standards, Washington, D.C.

STANDARDS YEARBOOK FOR 1933

The Standards Yearbook for 1933, outlining the activities and accomplishments in standardization of not only the Federal Government but also those of States, municipalities, and trade associations, is just off the press, the seventh volume of the series. The book is compiled by the Bureau of Standards of the United States Department of Commerce, and is procurable from the Superintendent of Documents, Government Printing Office, Washington, D.C., at $1 per copy.

One chapter is devoted to the work of the Bureau of Standards. However, the book is in no sense confined to the activities of the Bureau. It contains reports from the principal standardizing bodies all over the world, both governmental and private, lists all American organizations in this field, and ends with a bibliography of standardization literature. This was prepared under the direction of the Library of Congress, and contains references to literature not previously cited.

It is interesting to note the important progress reported in the Standards Yearbook for 1933 concerning world standardization in spite of adverse business conditions. In many nations, including our own, emphasis is being placed more and more on improvement in the accuracy of the basic standards and in the promotion of international uniformity. Notable examples are the redetermination of the values of the electrical units and the tentative adoption by the International Bureau of Weights and Measures, of the new radiation standard of candlepower first suggested by the Bureau of Standards.

The methods of establishing and maintaining the standards of measurement in the United States are explained in the first section of the book, which serves as a very satisfactory introduction to the succeeding sections.

Well may it be said that the 1933 Standards Yearbook is the standardization reference book, summarizing and bringing up to date, under one cover, the reports of current standardization activity and accomplishments of hundreds of technical organizations in the United States and around the world. It is designed to keep all interested in standardization well informed and in touch with all the important developments in America and the Nation-wide developments in standardization in other countries. Thus, the seventh volume will be found of real value to purchasing officials, engineers, scientific men, economists, teachers, and to all those who wish to keep abreast of developments in standardization.

SURGICAL GAUZE

Simplified practice recommendation R86–28, covering surgical gauze has been reaffirmed without change by the standing committee of the industry. A recent survey of production of the various items covered by the recommendation for the year 1931 showed that the average degree of adherence for those reporting to be 98.8 percent.

The recommendation, which has been in effect since June 1, 1928, was proposed and formulated by the industry. It is concerned with constructions and widths, in 100-yard bolts, of surgical gauze and crinoline; constructions, widths and lengths of bandages and bandage rolls; and constructions and lengths of package goods.

KANSAS PROPOSES OIL SPECIFICATION MARKING ON CONTAINERS

A complete laboratory inspection report on the contents must be shown on all filled lubricating oil containers used for handling or sale of lubricants in Kansas, if house bill no. 429, recently introduced in the Kansas State Legislature, becomes a law.

According to this bill, no "automotive lubricating oil" may be offered for sale in that State unless and until the container, or tags attached to the container, is marked with the inspection results, obtained by A.S.T.M. standard test methods, the S.A.E. viscosity number, flash point, A.P.I. gravity, pour point, carbon residue, and volume percentage of nonpetroleum material incorporated in the oil. Flash point tolerance permitted is 10° F.; gravity, 0.5° A.P.I.; pour point, 5° F.; and carbon residue, 10 percent.

A fine of not more than $100 and costs is proposed for violation of this statue; the term "automotive lubricating oil" is indicated as including oils sold or offered for sale for "crank-case lubrication" of automobiles, trucks, and tractors.

N.P.A. DEPARTMENT OF STANDARDS PLAN BUSY YEAR

The Department of Standards and Tests of the National Petroleum Association has outlined an active program of work for the year 1933. Trustees of the association have approved the program, which includes:

1. Interchange of samples between various company laboratories for camparative tests to check the accuracy of laboratory procedure.
2. Visit of chemists and other technologists of the department to laboratories of the Bureau of Standards, or a visit to some refinery laboratory.
3. Group meetings of technical men at convenient locations throughout the year.
4. Maintaining liaisons with committee D–2 of the American Society for Testing Materials, the American Petroleum Institute technical committee, and the Federal Specifications Board.

During the 15 years that the department has been functioning actively it has done a great deal of constructive work. Early sample exchanges, for example, showed a wide variation in test results. Since then succeeding exchanges have shown closer and closer agreement.

COTTON STANDARDS APPROVED

European and American delegates to the Universal Cotton Standards Conference, which convened at the Department of Agriculture on March 13, have completed examination and approval of 65 sets of copies of the standards for use during the next 2 years by the United States Department of Agriculture and by the arbitration appeal committees of the principal cotton associations of the world. Conforming to the provisions of the agreements under which the biennial conferences are held, no changes were made in the standards.

Several weeks ago, some of the European cotton associations asked the Department of Agriculture to call a special meeting under the cotton standards agreement to consider certain revisions of the grades with respect to color. This meeting was held by the Department on March 16. The views of the delegates differed as to the need of changes in the standards. The European associations withdrew their request and no revisions were agreed upon.

The Department of Agriculture announced, however, that it would make a comprehensive study of the standards situation with a view of determining whether and to what extent revisions of the standards may be desirable. Users of the standards promised to cooperate in this study, the results of which, it is contemplated, will be presented to interested groups before further action is taken.

Since the Department of Agriculture and the representatives of the American industry considered the proposal undesirable at this time, no action was taken on the request by the European associations that the cotton standards conference be held, and copies of the standards, drawn once every 3 years instead of biennially as now provided by the agreements.

Attention was directed to the Department's technological work at the experimental cotton gin at Stoneville, Miss., which seeks to develop better ginning methods that will improve cotton quality with respect to eliminating dust and other foreign substances. European delegates voiced objection to the use of sisal bagging on baled cotton, asserting that the wrapper has no reuse value, and that the sisal fibers impair the quality of the cotton yarn and are the cause of difficulties in manufacture.

Representatives of 9 associations in 7 European countries and of 2 Japanese associations were in attendance.

FIRE-CLAY BRICK

Several changes have been made in Federal specification HH–B–671 for fire-clay brick. The provisions in the revised specification (HH–B–671a) will become mandatory, not later than April 15, 1933, for all departments of the Federal Government in the purchase of fire brick. The following changes have been made in revising the specification.

The number of classes of bricks have been reduced from 6 to 4 (designated as M73, H57, H75, and SH75), and siliceous brick (more than 65 percent silica) is now included in class H75. However, the requirements for the siliceous type of brick apply only when specified in the invitations for bids.

The softening point or pyrometric cone equivalent requirement of bricks in class SH75 has been increased from 31 to 32.

The requirements of the quenching test for bricks of class SH75 now specify 18 cycles without failure instead of 15.

PACKAGING OF ELECTRIC RAILWAY MOTOR PARTS

Simplified Practice Recommendation, R146–33, covering the packaging of electric railway motor and controller parts, has been accorded the required degree of written approval by the industry, and may be considered effective as of March 15, 1933.

This recommendation, which was proposed and formulated by the industry, is the direct result of studies made during the past several years by committee no. 2 of the American Transit Association. The simplified schedule is concerned solely with the number of units of the various parts of electric railway motors and controllers which are contained in each package.

KRAFT PAPER SEALING TAPE

The standing committee of the industry in charge of simplified-practice recommendation R114–30, covering no. 1 kraft paper sealing tape has reaffirmed the existing schedule for another year, without change.

This recommendation, which was suggested and formulated by the industry, provides a simplified schedule of widths and lengths of rolls of plain and printed tape made from 35-, 60-, and 90-pound basic paper, together with tensile and tear requirements for 60-pound tape which is commonly used for sealing fiber and corrugated shipping containers. It also provides for testing methods, packaging, and marking of this commodity.

The recommendation has been in effect since February 1, 1930.

SULPHONATED OILS

The Commercial Standard, CS43–32, Standard Grading of Sulphonated (Sulphated) Oils, Saponifiable Types, is now available in printed form and is obtainable from the Superintendent of Documents, Government Printing Office, at 5 cents per copy.

This standard defines the term "sulphonated oil" and covers the method of grading the types that split off their organically combined SO_3 upon boiling with mineral acids. It also includes nomenclature and method of expressing strength or concentration, together with methods of analyses for determining the percentage of weight of the various ingredients.

DOUGLAS-FIR PLYWOOD

Copies of Commercial Standard, CS45–33, Douglas Fir Plywood, which became effective on February 15, 1933, may now be secured from the Superintendent of Documents, Government Printing Office, Washington, D.C., at 5 cents each.

Because of the extended application of Douglas-fir plywood to a wide number of new uses, a general conference of all interests approved certain standard grading rules as a universal basis of understanding in the industry. It is the belief of the industry that the general adoption and use of this standard will facilitate procurement of the proper grade of material for the varied uses and provide a better understanding between buyer and seller. Architects, engineers, contractors, industrial users, and home owners will thus be able to specify their needs from nationally recognized grades. In addition, the standard contains grade specifications for door panels and concrete-form material, together with export designations and a glossary of terms.

Douglas-fir plywood is a laminated board for paneling, sheathing, concrete forms, cabinetwork, and industrial uses.

VIRGINIA ESTABLISHES GRADES FOR FISH

The Bureau of Fisheries of the Department of Commerce is cooperating with State officials of Virginia in establishing State grades for fresh and cured fish, which is the first attempt by this State to establish uniform grades for the benefit of the fishing industry.

The grading of agricultural products has been carried out in virtually all States with considerable success. Virginia officials decided to try to give similar assistance to those engaged in buying and selling fish and fishery products. Hotel and restaurant owners were among the first to advocate such a development.

WOVEN WIRE FENCING

Simplified practice recommendation R9–28, covering woven wire fencing, has been reaffirmed without change by the standing committee of the industry.

This recommendation, which was suggested and approved by the industry, has been instrumental in effecting a reduction in the number of stock varieties of woven wire fencing from 552 to 69, or approximately 88.7 percent; and in the number of woven wire fence packages from 2,072 to 138, or approximately 93.4 percent.

WOOL AND PART WOOL BLANKETS

The Federal Trade Commission on February 17, 1933, dismissed six complaints that were awaiting disposition in regard to the wool content of part wool blankets. This action was taken in view of an attempt of the industry to put its own house in order through the establishment of Commercial Standard CS39–32 for Wool and Part Wool Blankets and the adoption of labels guaranteeing conformity to the standard.

The chief requirements of the commercial standard are as follows:

Standard percentages of wool content.—No finished blanket containing less than 5 percent wool shall carry the word "wool" in any form.

Blankets labeled with the word "wool" in any form and containing—

(*a*) Between 5 and 25 percent wool shall be labeled "Part wool not less than 5 percent wool."

(*b*) More than 25 percent wool shall be labeled with the guaranteed (minimum) wool content in percentage.

(*c*) Above 98 percent wool shall be labeled "All wool."

A.S.T.M. ADOPTS KNOCK TEST FOR MOTOR FUELS

The Cooperative Fuel Research Committee's "motor method" for antiknock testing has been adopted as a tentative standard of the American Society for Testing Materials. This method was adopted after a very comprehensive series of cooperative road and laboratory tests had shown satisfactory agreement between the test results and average performance in cars on the road.

The new motor method provides for operating the test engine at 900 r.p.m., a jacket-water temperature of 212° F., and one inlet charge heated to 300° F. The former method now to be known as the research method, provided for motor operation at 600 r.p.m. and a jacket-water temperature of 212° F. with the charge unheated.

STANDARDIZATION BRIEFS

The American Hospital Association has begun work on the standardization of material for mattresses and pillows.

The subject of certification and specifications will be considered at the June meeting of the Pacific division, National Association of Wooden Box Manufacturers, which will be held in Klamath Falls, Oreg., on June 23–24, 1933.

The American Association of Textile Chemists and Colorists is continuing the development of standard methods for determining fastness of dyed textile materials to all important color-destroying agencies, such as light, domestic washing, laundering, fulling, perspiration, acids, alkalies, sea water, and crocking. It is also developing standard methods for measuring shrinkage, and is studying the effects of carbonizing on the properties of wool.

The metric system will be in use in the Dutch East Indies after January 1934, under present plans, according to a report received from Assistant Trade Commissioner C. H. Boehringer at Batavia. The question has been raised in the Volksraad, or Peoples' Council, in Batavia, whether the Government may not postpone the period of grace in view of the fact that the native traders and dealers will find it difficult to purchase new sets of weights and measures before the end of 1933 because of the present unsettled period in Java.

A revision of the specification dealing with tungsten-filament electric lamps, has been issued by the British Standards Institution. The most important respect in which the present specification differs from previous editions is in connection with the table referring to dimensions of lamps for general service. The valuable work done prior to the issue of the 1930 specification, which included exact dimensions, namely, over-all length, diameter of the bulb, neck dimensions and filament center, for lamps up to and including the 100-watt size, has now been completed by specifying similar dimensions for the larger lamps from 150 to 1,500 watts.

A specification dealing with electric overhead traveling cranes has been issued by the British Standards Institution. The specification provides for cranes, power-driven in all motions, of spans up to 80 feet, and load capacities up to 70 tons, for general use in factories and workshops. In general, a factor of safety of 5 has been adopted, but higher factors of safety are recommended with proportionately lower working stresses for cranes intended for duty of great severity. No attempt has been made to deal with cranes from the dimensional or size standpoint, although, in other respects, the specification is drawn on very comprehensive lines.

The raw-silk-classification committee of the Silk Association of America is revising standard photographs for evenness, neatness, and cleanness, and is cooperating with Japan toward international standards. It has also approved standards for examination and grading of finished broad silks.

The National Association of Hosiery and Underwear Manufacturers has conducted tests toward a standard method for evaluating colors of raw silk. It has also made more than 29,000 measurements for width and length of welt, leg, high heel, heel, sole, instep, and toe of men's and women's full-fashioned and circular hosiery, tabulating them and plotting graphs for further study.

A feature of the British refuse collection is the standardization of dust bins. Unsightly ash pits, boxes, barrels, and other crude containers are almost a thing of the past. In their place, uniform galvanized iron dust bins are employed. These are frequently purchased in large quantities by the city and sold or rented to the householder. In other cases the standard specifications are established and the householder may purchase his own.

Since May 1 the sale of substandard electric light bulbs have been prohibited in Ontario, Canada, according to a report received from Trade Commissioner L. A. France at Toronto. The Ontario Hydro-Electric Power Commission has advised retailers throughout the Province that the substandard bulbs must be discontinued as soon as present stocks have been exhausted. Merchants will not be permitted to purchase new supplies of lamp bulbs unless the bulbs conform to the Commission's standards, and have obtained approval certificates. Stringent penalties are provided for violation of the new regulations.

Culminating more than 2 years of negotiations between the standards commissions of Sweden, Norway, and Finland there has been adopted a standard of uniform patterns and sizes for dressed lumber produced in the three Scandinavian countries. Items included in the standards are tongued and grooved V-jointed flooring; tongued, grooved, and beaded flooring; shiplap; V-shaped tongued and grooved flooring; V-shaped double tongued and grooved flooring; tongued and grooved V-jointed ceiling two sides; tongued, grooved, and beaded ceiling two sides; beveled siding, round edge siding, and rustic. The patterns are very similar to those which have been used by Swedish lumber manufacturers, but differ considerably from former Norwegian and Finnish planing mill practice. The Swedish mills, therefore, are expected to put themselves in position quickly to produce the patterns, while the change will be somewhat slower in coming about in Norway and Finland.

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The Standards Yearbook should be in the personal library of all engaged in work on standards, or concerned with its application.

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THE UNITED STATES DEPARTMENT OF COMMERCE

DANIEL C. ROPER, Secretary of Commerce

"* * * this department * * * is devoted solely to aiding and fostering the development of higher standards of living and comfort of our people * * * its ideals are clear: That by cooperation and not by compulsion it should seek to assist in maintaining and giving the impulse of progress to commerce and industry in a nation whose successful economic life underlies advancement in every other field."

—President Hoover, at the laying of the corner stone of the new building of the U. S. Department of Commerce, June 10, 1929.

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