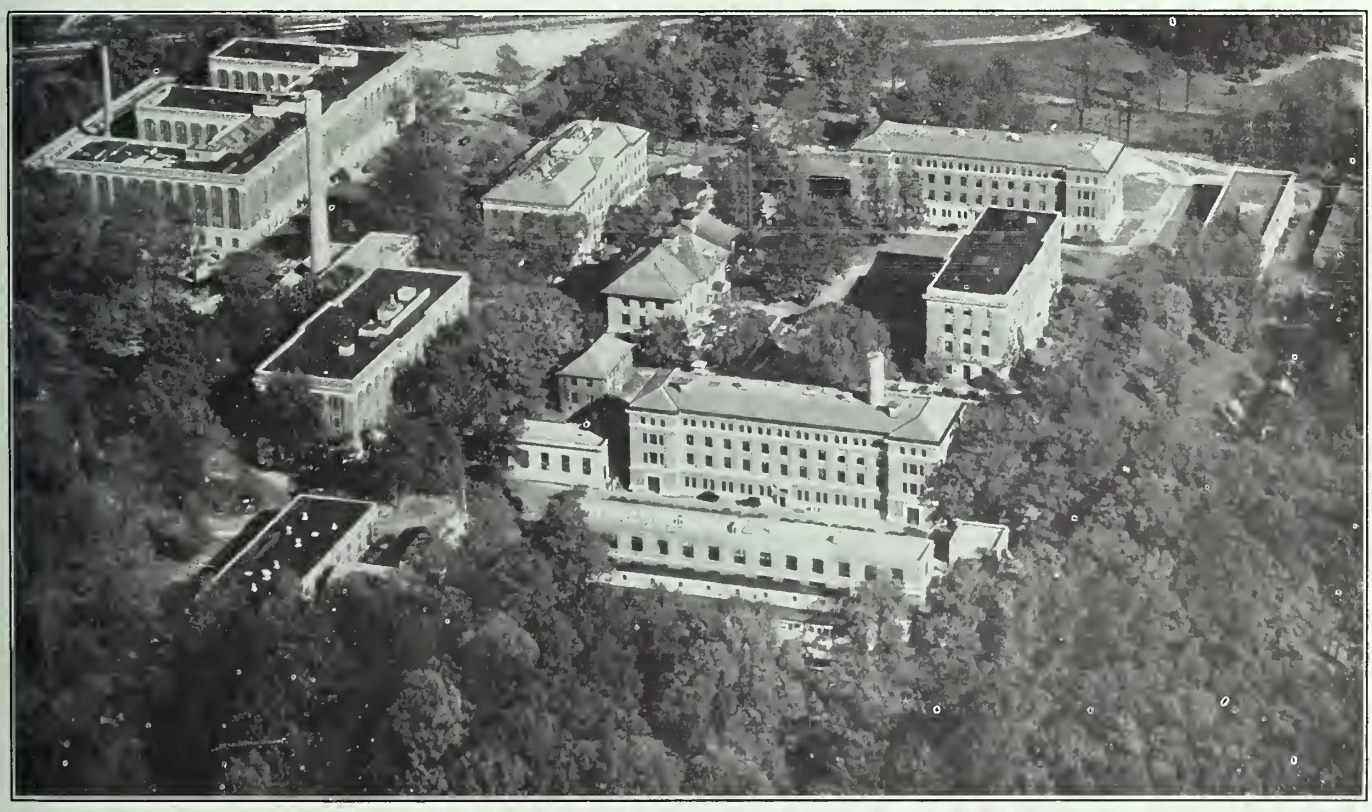
COMMERCIAL STANDARDS MONTHLY

A Review of Progress in Commercial Standardization and Simplification



AIRPLANE VIEW OF NATIONAL BUREAU OF STANDARDS

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

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U. S. DEPARTMENT OF COMMERCE
R. P. LAMONT, Secretary
NATIONAL BUREAU OF STANDARDS
GEORGE K. BURGESS, Director

COMMERCIAL STANDARDS MONTHLY
S. F. TILLMAN, Editor

DIVISIONS OF THE COMMERCIAL STANDARDIZATION GROUP

DIVISION OF SIMPLIFIED PRACTICE, EDWIN W. ELY.

The division of simplified practice was formed in November, 1921, to provide a clearing house or centralizing ageney through which the manufacturer, distributor, and consumer groups could meet to discuss their common problems and decide upon eliminations which would prove of mutual benefit to all concerned. The activities of the division are purely cooperative in eharacter. It orders nothing; it dictates nothing; the initiative must come from business itself. It has no regulatory nor police powers to enforce adherence to the simplified-practiee reeommendations that industry develops under the auspiees of the United States Department of Commeree. Its chief function is to serve as a neutral meeting ground for the purpose of bringing together producers, distributors, and consumers, whose aims are sometimes divergent and possibly antagonistic, and who would be unwilling to eooperate, except through some unbiased central agency. Following the approval of the tentative simplified-practiee recommendation by a general conferenee of all interested elements thereof, the project is then presented to the entire industry by letter referendum for its approval and written aeeeptance, the publication and indorsement of the reeommendation on the part of the Department of Commerce being dependent upon aeceptance of the program by at least 80 per cent, by volume, of the manufacturers, distributors, and users concerned.

BUILDING AND HOUSING DIVISION, J. S. TAYLOR.

The division of building and housing cooperates with business, technical, and professional groups in practically all its undertakings on building and housing. Its work to modernize building codes and to encourage improved standards for the quality of building construetion promotes the practical application of the latest development in design and use of building materials. This division was also formed in 1921.

In furthering home ownership, an effort is made to develop an enlarged, steadier, more intelligent, and more discriminating demand for soundly built dwellings, the largest single elass of buildings which the construction industries provide. The division also cooperates with many 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 in mind the broad objeetive of buildings made more useful because well located with respect to other buildings, a well-coordinated street system, and appropriate public works. Good city planning and zoning likewise encourages stability in land values and property uses, and thereby contributes to the demand for durable structures.

DIVISION OF SPECIFICATIONS, A. S. MCALLISTER.

The duties of the division of speeifications are to promote and facilitate the use and unification of specifications. In doing so it carries on activities involving cooperation with technieal societies; trade assoeiations; Federal, State, and municipal Government specifications making and using ageneies; producers, distributors, and consumers; and testing and research laboratories. The cooperation with technical societies and trade associations includes ascertaining the standardization and specification promoting aetivities of these organizations, and bringing to their attention the work being done by the commereial standardization group. The cooperation with governmental ageneies and other consumers includes the bringing of Federal specifieations and commercial standards to the attention of the maximum number of producers and the maximum number of users of commodities complying with these specifications and standards, thereby assisting in broadening the field of supply. The cooperation with produeers involves the compilation and distribution of lists of manufacturers who have expressed their willingness to certify to purchasers, upon request, that material supplied by them on contraets based on certain Federal specifieations or eommereial standards comply with the requirements thereof. The cooperation with distributors involves bringing to their attention the benefits to be derived by them as both buyers and sellers from handling nationally specified, certified, and labeled commodities. The division prepares the directories of governmental and nongovernmental testing laboratories; the Directory of Specifieations; and is working on an encyclopedia of specifications, the first volume of whieh, Standards and Specifications in the Wood-Using Industries, has been issued. It also aids in preparing the Standards Yearbook.

DIVISION OF TRADE STANDARDS, I. J. FAIRCHILD.

The commercial standards unit, now known as division of trade standards, was created on October 1, 1927, for the purpose of aiding those industrial and commercial groups desiring to establish standards of grades, quality, or measurements for their products or their purchases on a purely voluntary basis.

The division functions only at the direct request of the industry concerned. Its procedure is similar to that of the division of simplified practice, except that at least 65 per cent of the industry, by volume of annual production, must accept the commercial standard in writing before it is published by the Department of Commerce. A certification plan is applied on request as a means of increasing the effectiveness of such standards. Provision is made for regular revision of the standard through the appointment of a standing committee to consider periodieally any necessity for revision of the standard, in order that it may be kept eonstantly compatible with progress in the industry.

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BUREAU OF STANDARDS
WASHINGTON, D. C.

COMMERCIAL STANDARDS MONTHLY

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Commercial Standardization and Simplification

VOLUME 7 — WASHINGTON, D. C., JANUARY, 1931 — NUMBER 7

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AN INVITATION TO VISIT THE BUREAU OF STANDARDS

An interesting fact in the growth of the bureau is the steady increase in the number of visitors. From all over the world experts come to see the work in progress in many specialties. Not alone the experts but in growing numbers many of our people visit the bureau from a public-spirited desire to acquaint themselves with its research work. All visitors—from the newspaper men, who have called the bureau a "house of wonders," to the specialists, who use its services—are welcome, for it is their bureau in a very real sense. They are the owners of the business and its beneficiaries. The annual per capita cost of 2 cents which the average citizen pays toward the operation of the bureau yields returns sometimes a hundredfold or a thousandfold. How science turns wastes into profits, increases the useful life of materials, adds new efficiencies to industry, advances new arts, such as aviation and radio, by research and discovery—these are to be seen first-hand in the scientific and technical laboratories of the bureau.

A cordial invitation is extended to all citizens 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.

GEORGE K. BURGESS, *Director.*

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International Traffic Regulations

Pan American Republics Favor Uniformity in Vehicular Regulation

CERTIFIED COPIES of the Pan American Convention on the Regulation of Automotive Traffic in the American Republics have been sent to the signatory nations, to assist in bringing about early ratification, according to an announcement by the Director General of the Pan American Union, Dr. Leo S. Rowe. The convention, which was signed October 6, 1930, at the Pan American Union in Washington, provided for uniform rules for control and regulation of vehicular traffic, with each State retaining exclusive jurisdiction over its own highways.

The agreement was drawn originally at the second Pan American Highway Congress at Rio de Janeiro, in 1929. Signatures were affixed by the representatives of the Pan American nations who were attending the Sixth International Road Congress, during the assembly of that international organization in Washington last October.

Under the terms of the convention automobiles must be registered in the manner prescribed by the State of origin. The international registration marker, the measurements of which were outlined, shall also be carried by the vehicles. International reciprocity in registration was established in the convention.

Passing on the right when meeting another vehicle, and passing to the left when overtaking, the practice in the United States and generally throughout Latin America, was agreed upon by the contracting nations. Right of way at intersections was given to the machine on the right.

Other parts of the convention established uniform brake, horn, lighting, and mechanical requirements before an automobile could be admitted to international traffic. Danger, restriction, and direction signs were made uniform, as were regulations governing size of vehicle and loads.

The convention will become effective in each nation on the date of the depositing of ratification with the Pan American Union. When the convention has been ratified by the nations and is in effect there will be more uniformity among them than exists in the United States, in the opinion of the officials of the Pan American Union.

Nineteen of the twenty-one Pan American Republics signed the convention. They were: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, El Salvador, Uruguay, Venezuela, and the United States.

ACCOMPLISHMENTS OF THE AMERICAN STANDARDS ASSOCIATION

Annual Résumé of the Activities of the Association During 1930

By W. J. Serrill, *President, American Standards Association*

A review of the work of the American Standards Association for 1930 illustrates the fact that tools and talent are essential to good work. In our case, the tool, which we lacked in the past was the money to spread the association's usefulness. There has always been an array of talent on the standards council, the technical committees, and the staff, but the staff had been to small to do many of the things which would make American standards better known and more widely followed.

In 1930 the work of the American Standards Association gained impetus from the smoother functioning under the reorganization of two years ago and from the larger staff which the increased resources made possible. During the year a total of 46 national standards were approved by the association. This is at the rate of nearly one a week; and while judgment in such matters must not be based on quantity alone, none the less as a record of work accomplished and, more important, valuable service to American industry, it is a fact of which both the association and those who have contributed in any way to this work may well be proud.

Of the 46 standards approved, 19 were entirely new, and 27 were revisions of previous standards. Several of the new projects have been studied for nearly 10 years, although the majority of them were initiated more recently. Of the total, 8 were in the mechanical group, 7 in civil engineering, 5 chemical, 3 electrical, 2 mining, 2 woodworking, and 19 in the miscellaneous classification.

Some of these are worthy of particular note. The Safety Code for the Use, Care, and Protection of Abrasive Wheels is of concern to a great variety of manufacturing industries, and since the publication of the standard there has been a steady, heavy demand for copies. The Code for Lighting Mills, Factories, and Other Work Places is also one of wide application. It represents the result of long, scientific study and the recommendations are such as to be of practical value to architects and factory managers in planning their lighting for both economy and efficiency. The Recommended Practice for the Use of Explosives in Bituminous Coal Mines and the Recommended Practice for Fire Fighting Equipment in Metal Mines have been commented on very favorably by certain State mine department heads who say that these standards fill a long-needed requirement of the mining industry.

A group of dimensional standards, icludig those for ball and roller bearings, dimensions of cut and ground taps, and track bolts and nuts are of particular importance in the mechanical engineering field. The Safety Code for Mechanical Refrigeration, approved in November, 1930, is considered so important that several manufacturing groups are planning comprehensive promotion activities that will bring it to the attention of municipal authorities, chambers of commerce, real estate boards, State regulatory bodies, and the technical and daily press.

Sales of standards doubled in 1930.

It is indicative of increased interest to note that the sale of published standards during 1930 was more than double that of the previous year. Also an ever-increasing number of people are making use of the American Standards Association information service as an aid in studying their own particular standardization problems. Since June, 1930, the American Standards Association Bulletin, which is available primarily to sustaining members and member bodies, has been sent monthly in printed form—another improvement made possible by additions to the staff. In a printed magazine it is possible to include a larger amount of material in more convenient and usable form. Each month 250 or more marked copies of the Bulletin have been sent to magazines, trade associations, companies, and individuals as a means of securing publicity and promoting the work of the association.

Many of the activities mentioned would have been impossible of accomplishment but for the 3-year underwriting fund which brought the resources of the American Standards Association up to about $150,000 a year. A total of 16 organizations have made special contributions which for 1930 totaled $95,000. Early in 1931 an intensive effort will be made to increase the sustaining membership so that the revenue from this source may be sufficient to carry on the association's work in a way that will be of greatest practical value.

To say that standardization, as a vital factor in such a highly industrialized country as ours, is being more and more widely recognized at its real value by industry generally, and that its lessons are no longer confined to the realm of theory, but can be measured in very definite terms of dollars and cents, is a logical conclusion that may be drawn from a survey of the association's work last year.

One might look upon standardization as the third basic element in a powerful industrial triumvirate—the other two being advertising and research. There is good supporting opinion to substantiate the statement that more lasting value is to be found in sound standardization development than is to be reasonably expected from high-pressure salesmanship which has a tendency to increase the ultimate cost of goods to the final user because of the excessive cost of high-powerd sales methods.

If the American Standards Association has contributed to a better understanding of the great practical economies that can result from intelligent sandardizaion in manufacturing processes, then the application of this knowledge to the present situation should help in allaying some of the industrial ills from which the whole country has been suffering in recent months.

American Standards Association continues to grow.

In spite of the general business conditions, the American Standards Association has continued to

grow and expand its sphere of usefulness. Since the 1928 reorganization, 10 new member bodies have become affiliated with our work. Six of these national groups came in during 1930. The American Railway Association is now participating more actively in our work in a way that is exceedingly valuable both to them and to ourselves. The sustaining membership list has also been increased and revenue from this source is in excess of that of the previous year.

The facilities of an enlarged staff have permitted the association to establish close, cooperative relationship with a large number of State regulatory bodies and with many State industrial organizations. The enlistment of their interest is valuable in furthering the work of the American Standards Association by making American standards more widely known. A resolution passed at the meeting of the Association of Government Labor Officials in Industry, held in May, 1930, illustrates the far-reaching effects of such cooperation. The report, which was unanimously approved by the convention, said in part:

> It is very evident that no State legislature will be induced to enact safety laws of the right kind unless there is presented to it some definite, logical, and workable plan to be adopted and followed, which would make the laws effective. Therefore, the officials of each State are urged to study the procedure in all of the States, and out of the fund of practical experience formulate a plan that will make effective its own safety program.
>
> In the formulation of safety regulations and the adoption of specific safety devices, your committee suggests and urges the consideration of the various safety codes adopted by the American Standards Association, known as the National Safety Codes. These constitute the best thought and judgment of the foremost safety engineers and experts in accident prevention work in the United States. Sixteen of these codes have been published as bulletins by the Bureau of Labor Statistics and are available upon request.

The association still maintains a member on the planning committee of the division of simplified practice of the National Bureau of Standards. A. A. Stevenson has been the representative on this committee and was recently elected chairman.

A member of the American Standards Association staff attended a series of meetings on technical subjects which were a part of the conference of the International Standards Association held in Paris in May, 1930. Among the decisions of great interest to American industry was the election of the American Standards Association to appoint a member on the International Standards Association council beginning January 1, 1931, and the assignment to the American group of the international secretariat for the project on Nomenclature and Methods of Test of Petroleum Products.

While the total of progress for the year has been commendable, there is still plenty of work ahead. Certain of this may well be mentioned because it includes extensions of activties which have already been started.

New work planned.

First comes the permanent financing through a much larger number of companies contributing to the support of the work. As more industries become familiar with standardization developments it is inevitable that they will cooperate financially as well as otherwise. During the next year increased promotion is planned to make the American Standards Association and its functions more widely known. This will be directed with a view not only to increase the sustaining membership, but also to expand the sale of published standards. The association needs more member bodies, and more of these prospective groups need the American Standards Association for the development of standards that concern their own membership.

As an aid to these objectives more contacts must be made in the middle and far west. Until recently the staff has been too limited to develop this fertile territory. Then, too, staff members must make many more visits to industries, not only as a help in their own work but also to increase the service of the American Standards Association to its membership. The enlarged personnel has made it possible for the staff to keep in closer contact with the work of various sectional committees, many of whose meetings have been attended by staff members.

There is every indication that a much larger field of usefulness lies ahead for the American Standards Association especially with increased membership and the addition of new member bodies, because progress in both of these directions will uncover more problems requiring standardization where a final agreement on standards arrived at under American Standards Association procedure will be of practical economic benefit to producer and consumer alike.

SOCIETY OF AUTOMOTIVE ENGINEERS STANDARDS FOR TRACTOR-TRAILER CONNECTIONS

Meeting Submits Recommendations on 4-Wheel Trailer Eye and Pintle Connection

The increasing importance of having adequate interchangeability between different makes of semitrailer and trailer connections was emphasized at the November 13, 1930, meeting of the subdivision of the motor-coach and motor-truck division of the Society of Automotive Engineers, particularly from the truck operators' viewpoint. The subdivision decided to develop first a 4-wheel trailer eye and pintle connection, the standard to apply to the eye so as to leave each trailer manufacturer free to design his own type of pintle that will be interchangeable in the standard eye.

It was suggested that the eye be made 1¼-inch round-section stock with the opening 2¾ inches in diameter, and that a minimum drawbar pull of 80,000 pounds be provided for.

The subdivision is to give further study to the most desirable method of securing interchangeability of semitrailer fifth-wheel connections in the upper or lower section of the fifth wheel, which method, if embodied in a dimensional standard, should govern the size of the pin and specify its location.

Future recommendations of the subdivision on the foregoing types of connection will be circulated among the vehicle manufacturers and the operators for their criticism or approval before a final standard is adopted by the society in order to assure that whatever standards are adopted will be entirely acceptable to all branches of the industry that will be affected.

CHAIRMEN OF STANDING COMMITTEES FOR SIMPLIFIED PRACTICE RECOMMENDATIONS CONVENE

Secretary of Commerce Makes Opening Address; Periodic Conferences of this Character Favored

By Edwin W. Ely, *National Bureau of Standards*

The chairmen of standing committees in charge of simplified practice recommendations, meeting at the Department of Commerce, on November 24 and 25, 1930, unanimously indorsed the value of waste-eliminating policies promoted by the various industries under the auspices of the division of simplified practice of the National Bureau of Standards.

In the short period of nine years, American industries desirous of developing group simplification programs, have, with the cooperation of the division of simplified practice, proposed and promulgated more than 115 simplified practice recommendations covering as many commodities. A simplified practice recommendation is one of the best examples of self-government in business; it is also an example of how an industry may be helped by the nonregulatory cooperation of the Federal Government.

Standing committees, appointed by, and representing all elements in the respective industries, periodically revise the programs to keep them abreast of changing conditions in the trade. The total personnel of these more than 115 standing committees aggregate approximately 1,000 representative business men. It is apparent that the division of simplified practice has before it an opportunity to effectively and usefully organize available talent and enthusiasm.

If it is to make the most of this opportunity, and if maximum results are to be obtained from the total effort, some means must be found whereby the division may maintain adequate contact with the entire personnel of the standing committees.

Each of these committees has its own problems in promoting the use of its particular simplification program and the task of adequately revising the recommendations in terms of changing conditions. In many cases the standing committees have not been fully utilizing the facilities and experience of the division of simplified practice.

In order to afford an opportunity to consider the broader aspects of the simplification movement, and to provide a means for the exchange of experience among committee chairmen and the discussion of best methods of solving problems which are unquestionably common to all active simplified practice recommendations, the Secretary of Commerce called this conference of chairmen of standing committees.

The proposal that there be such a conference was originally projected in June, 1930, and at that time met with a ready response. When the meeting was called to order on November 24, there were present 28 committee chairmen, members of 11 other committees acting as alternates of their respective chairmen, and 11 observers from other industries. While the latter were neither chairmen nor committee members, each had been intimately associated with the development of simplified practice recommendations. The conference personnel, exclusive of the 7 members of the division's planning committee and Government officials, represented more than 50 distinct industries.

It was this group, in the market to buy each other's products, that was successful in giving added impetus to the national movement to eliminate waste, through the application of simplified practice.

In opening the conference the Secretary of Commerce, Robert P. Lamont, declared that a better understanding of waste-eliminating principles in industry would contribute substantially toward alleviating business depression, and urged that an intensive effort be made to acquaint the consumer with the benefits of simplified practice.

Secretary Lamont outlined the broader field of application of the simplified practice movement and declared that the factor which has contributed most to its successful progress has been the cooperation shown by industries in adhering to the recommendations: "But the conditions through which we have been passing," the Secretary added, "have put to a severe test and have created grave temptations to producers and distributors to depart from the recommendations.

"It is natural that each standing committee should feel that its primary duty is to its own industry and its own simplified practice recommendation. The department, on the other hand, is in a position to take a broad view of the whole simplified practice movement.

"Viewing it from this standpoint," he declared, "it has seemed that the excellent results now being secured by the committees working as units could be multiplied by further coordination. This idea or suggestion is the central theme of this conference."

Following the address of the Secretary of Commerce, A. W. Shaw, chairman of the Committee on Recent Economic Changes, presiding officer of the conference, traced the simplification movement from its origin as a war conversation measure. "The philosophy of simplification in war time," he said, "is to cut down demand; in peace time, the purpose is to lower costs so that demand can be increased."

Other speakers on the program.

Dr. George K. Burgess, Director of the Bureau of Standards and chairman of the Federal Specifications Board, advised the conference as to the extent to which the planning committee of the division of simplified practice had kept the division acquainted with the major aspects of its problems, the elimination of waste through simplification. He also described the work of the Federal Specifications Board.

Edwin W. Ely, chief of the division of simplified practice, reviewed the status of simplification, briefly described the present procedure followed in cooperating with industry, and told of the spread of the simplification idea to foreign countries and of the introduction of its study in the colleges and universities of the United States.

Dr. Frank M. Surface, Assistant Director, Bureau of Foreign and Domestic Commerce, in discussing the relationships between the work of his divisions and that of the division of simplified practice, pointed out that he is finding that the great variety of products is one of the wastes that is disturbing distribution.

Capt. D. B. Wainwright, jr., Acting Chief Coordinator, United States Bureau of the Budget, explained the functions of his office, and described the close association of simplified practice recommendations and Federal specifications in the work of Government procurement officers.

Open discussion.

The ensuing discussion of the various points on the agenda was stimulated by specific questions from A. A. Stevenson, chairman of the Planning Committee for Simplified Practice, and by pertinent statements made by Dr. Wilson Compton, secretary and manager, National Lumber Manufacturers' Association, Washington, D. C.; R. W. Johnson, engineer, Concrete Reinforcing Steel Institute, Chicago, Ill.; and Ryland L. Lockwood, vice president, United States Skid Service Corporation, New York, N. Y.

Conference results.

Among the outstanding results of the conference may be mentioned: Approval of discretionary powers of the division relative to deciding when volume of recorded acceptance warrants publication of a simplified practice recommendation, suggestions concerning the use of identifying labels, approval of the formation of regional committees, and the institution of a quarterly news-letter from the division to the standing committees.

The general tenor of the discussion indicated complete confidence in the simplification movement and in the division's procedure for assisting industry to eliminate waste.

When the motion for adjournment was made, shortly after noon of the second day, the conferees expressed the wish that the department arrange a periodic repetition of this conference, supplemented with an informal dinner or smoker.

UNIFORM SYSTEM OF STANDARDIZING VISCOSITY OF OILS

Society of Automotive Engineers System Aids Manufacturer, Dealer, and Consumer in Determining Viscosity of Oil Needed

A uniform system of standardizing the viscosity of oil has been developed by the Society of Automotive Engineers, with the cooperation of leading automotive and oil manufacturers. This system has been called the Society of Automotive Engineers viscosity numbering system, and, as the name implies, concerns itself only with that one property of oil.

Hitherto oils in the various brands have been marked light, medium, heavy, extra heavy, etc. This represented merely a classification system for each individual manufacturer, and naturally resulted in a wide variation between brands; so much so that an oil marked "light" by one manufacturer actually possessed a body or viscosity heavier than one marked "heavy" by another company.

Under the new system it is possible for the automobile manufacturer and dealer to instruct motorists as to the exact oil viscosity needed for his particular driving conditions. The system is very simple. The possible oil viscosities have been arbitrarily divided into six groups, ranging from very light oil, which is now marked "S. A. E. viscosity No. 10," to extra heavy oil which is marked "S. A. E. viscosity No. 70." The motorist is now instructed to use, for example, S. A. E. No. 40 for summer driving and S. A. E. No. 30 for winter driving.

In other words, oils may now be ordered by size or consistency of body; that is, viscosity.

While there are many factors which go to make up the quality of a motor oil and affect the service it gives the motorist, the viscosity or body of the oil is its most important single property. Indeed, say the lubrication experts, a fair quality oil of proper viscosity will give better results than an exceptionally good oil of improper viscosity or body for a given purpose.

It is obviously impossible for the automobile manufacturer to enable the customer to distinguish all the elements of quality, but it is both possible and important to find some dependable method of advising to motorist as to the proper viscosity of oil for use in a given car under certain conditions.

Standardization of this kind is only valuable when it comes into general use. The automobile manufacturers have indicated in their instruction books the Society of Automotive Engineers number of the oil to be used, and the manufacturers of lubricating oils have clearly marked their oils to show these numbers.

Motorists can assist in bringing this standardization of oil viscosity into use by asking for motor oil in accordance with the designation of the Society of Automotive Engineers.

STANDARD FOR STEEL SCREWED UNIONS REAFFIRMED

As a result of a recent survey among the manufacturers to determine adherence to the Commercial Standard for Standard Weight Malelable Iron or Steel Screwed Unions, CS7–29, a summarized report was issued on December 11, 1930, indicating that, among the six manufacturers reporting, 66.7 per cent of production conformed to the requirements of the standard.

In accordance with the recommendation of the standing committee, the existing standard was reaffirmed, without change, for another year beginning November 1, 1930.

STANDARD METHODS OF MEASURING CORROSIVENESS OF SOILS

Methods for Testing Soils, Pipes, and Protective Coatings Discussed at the National Bureau of Standards' Second Conference on Soil Corrosion

By K. H. Logan, *National Bureau of Standards*

In conducting an extensive series of tests planned primarily to determine the seriousness of soil action on buried pipes, it was learned that a very considerable number of owners of pipe lines were conducting experiments on the corrosion-resisting properties of pipe materials, the corrosiveness of soils, and the effectiveness of materials offered for the protection of pipes against soil action.

As is to be expected when investigators work independently and with little knowledge of what is being done by others, there appeared to be a needless duplication of work. Apparently conflicting results were being obtained because of the use of different methods of testing and different ways of expressing results. This confusion made it apparent that a comparison of methods and results might lead to a better agreement as to the behavior of materials under investigation.

In order to afford an opportunity for such a comparison the National Bureau of Standards invited a number of students of underground corrosion problems to assemble at the bureau in December, 1928. It was thought that the purpose of the conference would be served best by limiting the attendance to those actually engaged in corrosion investigations, and this was accomplished by issuing invitations on condition that each one accepting would present a paper or report describing some of the unpublished results of his study of corrosion. This requirement for participation in the conference tended to limit the attendance to those who could offer constructive criticism of the papers presented and to shut out those who, although interested, could contribute little.

The limitation promoted freer and more detailed discussion and gave the participants more time for asking questions and expressing their ideas. It minimized the tendency to present data from the sales-promotion point of view which is frequently manifested at conventions and assured those attending that they would receive in exchange for information imparted a manifold return of equally valuable information. This method of presenting data puts a premium on cooperation and promotes a feeling of fellowship among the participants in the conference.

Thirty-one papers were presented at the first soil-corrosion conference. A number of these papers were of a confidential nature or reported work which was in progress. About half of the papers were later published in some form.

Later experience showed that the conference was a decided stimulus and help to the study of underground corrosion, and because of this a similar conference was called for November, 1930, to be participated in by organizations rather than by individuals. Twenty-three organizations, in addition to the Bureau of Chemistry and Soils of the Department of Agriculture, and the National Bureau of Standards, contributed 30 reports. The organizations represented included 7 gas companies, 4 oil pipe-line companies, 4 pipe manufacturers, 3 manufacturers of protective coatings, 4 research laboratories, and 3 national societies or trade associations. Geographically, these organizations are distributed from the Atlantic to the Pacific coast and from the Great Lakes to the Gulf, with the intervening sections fairly well represented.

The conference may be regarded as a preliminary step toward the establishment of standards for determining and expressing soil corrosion data. Satisfactory standards can be established only after a very considerable body of data have been collected and a fair agreement reached regarding the behavior of the phenomena with which the standards are to deal. As the report on the conference will show, sufficient data are not available to justify setting up of standard methods or units for measuring soil corrosion phenomena at this time, but the need for such standards has become apparent, and there is a distinct tendency toward basing purchases of pipe material and protective coatings on the results of tests of these materials.

In order to determine the value of a material with respect to corrosion, it is, of course, essential to have a recognized unit of corrosion and a way of measuring corrosion in terms of this unit. Three units are in common use and two ways of determining corrosion are commonly used. Laboratory workers usually expose metal to be tested to some corrosive influence and determine the rate of loss of weight or in some instances the loss of strength. While loss of weight or strength may be important under some conditions, they have little relation to the usefulness of pipes in common use underground, since the pipes are usually replaced because of leaks which are the result of pitting.

It appears, therefore, that the rate of penetration of pits is a more practical measure of pipe deterioration. Unfortunately, the rate of penetration of pits is usually greater during the earlier part of the life of a pipe than later. This makes the determination of the proper rate of penetration difficult. The problem is complicated further by the fact that the life of a pipe is not the time until it is punctured, but the time until the punctures become too numerous to make repairs by welding or the use of leak clamps advisable, and this in turn depends on the location of the line, the hazard due to leaks, and the policy of the pipe line company.

Meager data available.

Data on the life of pipe are meager, and while it is now generally recognized that the life of a pipe is determined largely by the character of the soil in which it is buried, a large portion of the records of pipe-line life give little information concerning soil conditions.

There are very few corrosion records that are at all satisfactory for determining the relative merits of materials because there are few records showing the performance of different materials under similar soil conditions.

Perhaps the most extensive data which are generally available in which the several materials are exposed to similar soil conditions are the results of the National Bureau of Standards soil-corrosion investigation. This study was undertaken to determine the effects of soils on pipe rather than to compare materials, and those in charge of the experiments feel that the precision of these data is insufficient to justify comparison of materials at this time.

The question of interpretation of corrosion data is illustrated by three papers considered at the second soil corrosion conference. Each paper presented a different method of interpreting the same data. One author maintained that the size of the test piece should be taken into account in computing the rate of pitting and that the thickness of the material should be considered in determining its life. Another author showed that for practical purposes all materials under

Testing and photographing specimens of pipe coatings

investigation behaved similarly. The third author, by computing the probable errors of the data, showed that the number of samples under investigation was too small to permit a reasonably reliable conclusion to be reached regarding the relative merits of the materials. The chief value of these papers is probably their demonstration of the need for a standard method of testing and a standard way of interpreting corrosion data.

The second topic discussed at the conference was the origin and significance of electrical currents on oil and gas lines. It has been shown that many lines remote from electric railways carry currents which apparently have no relation to street or interurban railway operation. In some instances there appears to be a relation between the places where current is discharged from the line and the corrosion of the line. On other lines no relation between discharge of current and corrosion is apparent. Under certain conditions it may be possible to make use of measurements of pipe line currents to determine where lines need reconditioning, and thus avoid much of the expense now involved in locating corroded sections of oil and gas lines. The success of the proposed method will depend in part on the selection of a suitable method of measuring pipe line currents.

Reports from pipe-line operators indicate that serious corrosion recurs on only a very small portion of their lines. On this account and because of some question as to the adequacy of the less expensive coatings offered for the protection of pipe lines there has been a tendency in recent years for pipe-line owners to lay pipe without protection with the expectation of protecting certain sections later when the corrosion data on the line became sufficient to indicate where protective coatings were needed. Since the cost per foot of protected line is much greater when the protection is applied after the line is laid, a simple method for locating the sections of the right of way in which serious corrosion might occur would be of great value to pipe-line owners, and several methods of doing this have been proposed and are being used to a limited extent.

Methods of determining the corrosiveness of soil was, perhaps, the most discussed topic considered at the conference. Nine papers on this subject were presented. These papers suggested seven distinct ways of determining the corrosiveness of a soil, and data were presented showing that under some condition each method was reasonably satisfactory for practical purposes. The data presented also seem to indicate that no one method is applicable to all soil conditions.

The development of these methods and the determination of the conditions under which they give reliable results depend largely on the availability of data definitely establishing the rates of corrosion of metals in at least a few typical soils. So far, corrosion records of pipe lines have been used as a basis for estimating soil corrosiveness, but this method is very inexact and unsatisfactory because of the inadequacy of most records.

It is difficult on this account to determine the value of any of the proposed methods of testing soil corrosivity, but the simplicity of some of the methods probably justifies their use under some conditions even though complete assurance of their accuracy is lacking.

Such data as are available as the result of an examination of one long line for the purpose of determining the effectiveness of a corrosion survey indicate that the surveyors were correct in their estimate of the corrosiveness of the soil in between 70 and 80 per cent of the cases where it was possible to determine whether they were correct. It is believed that more experience will produce even more accurate results.

The study of soil corrosion naturally results in a study of methods for preventing corrosion. The most obvious method is to keep the soil away from the pipe. This has been attempted by coating the pipe, usually with bituminous material, although greases, sulphur, concrete, and other materials have been used to some extent. There is a very decided scarcity of information as to the performance of protective coatings, because of lack of data concerning the materials used, method and condition of application, need for pipe-line protection, and the significance of the changes which the coatings have undergone. In order that this condition shall not continue indefinitely, purchasers of coatings should secure from the manufacturers such adequate descriptions of the materials purchased as will enable them to identify the materials when received. Those who apply coat-

ings should see that the application is made in accordance with the specifications of the manufacturer and should record the conditions under which the application was made. Evidence as to the need of pipe-line protection should also be recorded. There is also need for recognized methods of determining the condition of protective coating after it has been on a line for several years. The question as to when a coating ceases to offer any protection is a live one.

Because of the interest in pipe-line protection the last half day of the soil-corrosion conference was devoted to a discussion of protection problems. Nine papers and reports were presented. Several new methods of determining some of the physical properties of bituminous coating materials were proposed. When additional experience with these methods has been secured, some of them may become the bases of recognized methods of determining the value of certain kinds of coatings. It appears that at present very little is known as to just what is required of a satisfactory coating.

Methods for determining the condition and usefulness of a coating are also unsatisfactory. Standardization of methods of testing coatings must, therefore, be postponed until more data are available. The conference was useful, however, in making the participants more familiar with the problems before them, and in calling attention to methods which are worthy of trial. It is hoped that in a few years another conference can be held for the purpose of considering tentative standard methods of determining soil corrosivity and the performance of protective coatings.

SIMPLIFICATION BRIEFS

Hypodermie needles.—The printed pamphlet on simplified practice recommendation No. 108–29, covering dental hypodermic needles, may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents each.

Abrasives.—The technical committee of the Producers of Electrical Furnace Abrasives, at its December 10 meeting, approved the report of the research associate for the abrasive industry on duty at the National Bureau of Standards. The work performed by the associate has been so satisfactory that the committee decided to continue it for another three months.

Dental plaster.—The necessary number of written acceptances to simplified practice recommendation on packaging of dental plaster, investments, and dental stones having been received, the National Bureau of Standards announces this schedule as in effect. The industry, through this simplified schedule, has reduced the number of sizes of plaster from 22 to 3, and investments from 26 to 13.

Refractories.—The joint committee on foundry refractories of the American Ceramics Society is at work on the preparation of a questionnaire, to be sent to all refractories manufacturers, to ascertain the diversity existing in sizes and shapes of cupola linings, with particular reference to tap hole and slag hole blocks. The data will form the basis for drafting a tentative simplified practice recommendation.

Kalsomine brushes.—The industry is being circularized for written approval to the simplified practice recommendation, recently approved by a general conference, covering the block sizes for dutch, semidutch, and baby dutch kalsomine brushes. This program will reduce the number of widths from 47 to 10, and the thicknesses from 34 to 8, with a maximum combination of 16 sizes instead of the present actual combination of 70 sizes.

Shot shells.—The suggested revision of simplified practice recommendation for loaded paper shot shells has been mailed by the National Bureau of Standards to the industry for written acceptances. Due to the trend of demand, it was found necessary to effect some eliminations, as well as additions, of several loads in the various gages in the existing recommendation. There was also added to all tables a column showing definite lengths for unloaded shells. Prior to the adoption of the original schedule, there were 4,076 varieties of loaded paper shot shells. In the present schedule there are 343 varieties.

Surgieal diagnostie instruments.—On request of the chairman of the standardization and simplification committee of the American Surgical Trade Association, manufacturers of surgical diagnostic instruments have been asked to express their opinion on the need for simplifying the shape of cord terminals used with these instruments. Should replies indicate willingness on the part of producers to undertake this program, the National Bureau of Standards, through its division of simplified practice, will assist in developing a recommended practice to meet the requirements of all concerned.

Simplified praetiee in Australia.—Australia has established as a part of the Standards Association of Australia a division of simplified practice. That organization has published a pamphlet in which it is shown that the procedure followed by the Australian body has been patterned upon that followed in promoting the simplification movement in the United States. The publication is closely similar in style and arrangement to Simplified Practice, What It Is and What It Offers, issued by the division of simplified practice of the National Bureau of Standards.

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SAFETY MEASURES FOR OUTDOOR ANTENNÆ

Antenna Supports Subjected to Vertical, Longitudinal, and Transverse Loads

By A. Halsted, *National Bureau of Standards*

The danger of accidental contact with electrical utility lines is probably the most serious hazard in connection with outdoor antennæs for radio receiving stations. Other hazards are associated with the falling of objects, due to failure of the antenna or its supports; and with lightning discharges over the antenna wires. (Handbook No. 9 of the National Bureau of Standards, entitled "Safety Rules for Radio Installations," includes rules for the strength and erection of antennæs.

The following locations should be avoided in erecting antennæs and guy wires to antennæ supports:

1. Attachments to electric supply or communication poles.

2. Crossings over or under electric supply or communication conductors.

3. Any location that brings an antenna or guy wire at a higher level than supply or communication conductors, provided the breaking of the antenna or its supports will be likely to result in contact between the antenna or guy wire and a supply or communication conductor.

If such locations are employed it must be recognized that special hazards are introduced, and that great care is necessary in the construction and maintenance of antennæ to avoid contact with the supply or communication conductors.

It is a mistake to regard 110-volt service leads as of a harmlessly low voltage. If a person standing on moist earth has hold of a bare antenna wire when it comes in contact with a worn or bare spot on the service wires, he is very likely to be unable to free himself from the circuit, and unless prompt and effective assistance is at hand he may be killed. Accordingly, when antennæ are constructed in situations mentioned above as hazardous they must be of substantial strength and reliability, and means for their safe maintenance must be provided.

Antenna supports will be subjected to vertical loads due to sleet and ice; to longitudinal loads due to the pull in the loaded antenna wires; and to transverse loads due to wind pressures on the wires and supports. To insure against falling, especially when on roofs, supports should be erected and guyed so that they are not dependent in any way on the antenna wire for stability.

Brick chimneys are not designed to resist sustained lateral forces such as might be imposed by the attachment of an antenna wire to them. Under such forces bricks may become displaced, thereby opening cracks that may result in setting fire to the building, or the displaced bricks may fall and injure people passing by.

When trees are used to support antennæ, means of compensating for swaying in the wind should be provided in order to keep the tension in the antenna wires safely below their breaking strength. This may sometimes be accomplished by allowing an excess sag.

Antennæ should be high enough to provide safe clearances above traffic. Above a traveled road they should be at least 18 feet in height; along a rural lane, 15 feet; above roadways to residence garages or above spaces accessible only to pedestrians, 10 feet. Spaces accessible only to pedestrians should be interpreted to include flat roofs where fire or other emergencies may require persons to move over them hurriedly or in darkness.

To protect buildings or persons within buildings from lightning or high voltages from contact with electrical distribution conductors, each lead-in conductor from an outside antenna should be provided with a lightning arrester. It is highly important to the efficacy of a lightning arrester to provide a ground connection of low resistance. An underground system of water piping gives the best ground connection. When such a system is not available, resort must be had to some other metallic structure which is embedded in the earth or to pipes or rods driven down to permanently moist soil.

It should be emphasized that the protective grounding conductor should preferably be of a higher current-carrying capacity than the lead-in, and guarded if in danger of mechanical damage. The reason for guarding against mechanical damage and for recommending that the protective grounding conductor be of a larger current-carrying capacity than the lead-in is to insure that when needed it will be intact and will not be fused by the current it is discharging. Loss of the grounding conductor may leave the set with a high potential above ground and dangerous to persons who might try to operate it in case of an accidental cross with other wires.

QUALITY STANDARDS FOR EGGS

New York State Bureau Asks Dealers to Maintain High Grades

To improve further the quality of eggs delivered to retailers by wholesalers and jobbers, a letter has been sent to dealers by the dairy and food bureau of the New York State department of agriculture and markets asking their cooperation.

While there has been some improvement in the quality of eggs delivered to retailers in meeting the requirements of the standards and grades set up by the State, it was pointed out by the director of the bureau, Kenneth F. Fee, that a large share of the eggs sold as grade A to retailers do not meet the standards established for that grade.

At a conference in the department recently the conclusion was reached that it is practicable to market eggs on the basis of the grades established and that one of the difficulties was that distributors of eggs have not revised their methods of handling in order that there may be full compliance with the regulations.

ACTIVITIES OF THE AMERICAN STANDARDS ASSOCIATION

A Monthly Report of Progress and Status of American Standards

The following current information relating to developments in certain standardization projects under the auspices and procedure of the American Standards Association has been furnished by that association:

Electrical definitions.

Tentative reports, which indicate that considerable progress is being made in formulating a dictionary of electrical terms, have been sent to the sectional committee on electrical definitions by subcommittees 1 and 4. These subcommittees are working, respectively, on fundamental and derived terms, and definitions covering instruments and testing. Other subcommittees have issued semifinal reports covering definite parts of their assignments. These reports, it is expected, will be available for distribution in printed form within the next few months.

Pressure piping.

Copies of the revised draft of a proposed standard on fabrication details are available for comment and criticism. The proposed standard pertains to fabrication of hangers, supports, anchors, sway bracings, and vibration dampeners.

Automatic stations.

A request of the American Institute of Electrical Engineers for approval by the American Standards Association of its standard 26, Automatic Stations, has been referred to the electrical advisory committee for its recommendation to the standards council. The standard was approved by the American Institute of Electrical Engineers in its original form in April, 1928, and the revised edition was approved on May 23, 1930. It is the revised edition which is now submitted to the American Standards Association. The request of the American Institute of Electrical Engineers is for approval of the standard as American standard under the proprietary method.

Fiber stresses of wood poles.

The American Standards Association has approved as American standard new values for the ultimate fiber stresses of wood poles. The new values which under the provisions of the National Electrical Safety Code automatically replace the old figures of 6,500 pounds for dense yellow pine and 5,000 pounds for other yellow pine, chestnut, and western red cedar are as follows: Northern white cedar, 3,600 pounds per square inch; western red cedar, 5,600 pounds per square inch; chestnut, 6,000 pounds per square inch; and southern yellow pine (creosoted), 7,400 pounds per square inch. The value for northern white cedar is unchanged from the original figure.

The agreement among the members of the sectional committee which included representatives of the telephone companies, the telegraph companies, the railways, producers of poles, forestry, and forest products associations, the National Bureau of Standards, the American Society for Testing Materials, the Canadian Department of Interior, the American Institute of Electrical Engineers, as well as colleges of forestry, marks an important step in standardization practice in the United States. The new standard is the result of an extensive study conducted by the sectional committee.

Track bolts and nuts.

A standard for track bolts and nuts has been approved by the American Standards Association as American Standard.

The new standard is based on the study of the different types of track bolts used by the various railroads and electric railways in the United States and Canada and it is thought that the recommended dimensions will cause little disturbance to existing practice. Particular attention has been given to the reduction of the number of wrench openings needed. The wrench openings are based on the American tentative standard on wrench head bolts and nuts and wrench openings. Tables giving dimensions of oval-neck track bolts, elliptic-neck track bolts, and track-bolt nuts are given. The elliptic-neck track bolts are mentioned as representing special types and sizes to be used during the transition period. Special sizes in sixteenths of an inch of oval-neck track bolts have also been added in the tables concerned for use during the transition period. On new construction the sizes in eights of an inch should be used so that the standard sizes may come into general use as quickly as possible. The special sizes are meant for replacement in existing splice bars only.

During the development of the standard, tests were carried out by the railroads and manufacturers of track bolts on samples made to the dimensions of the standard. These appeared to give satisfactory results and the American Railway Engineering Association consequently adopted the standard in May, 1930, as its recommended practice. The vote of the American Standards Association technical committee was unanimously in favor of the approval of the standard. The standard was prepared by the sectional committee on bolt, nut, and rivet proportions, under the sponsorship of the American Society of Mechanical Engineers, and the Society of Automotive Engineers.

Machine pins.

A proposal for a standard covering pins of the cylindrical and taper types is now being circulated to industry for review and criticism. The proposal has been developed by the sectional committee on standardization of machine pins as a result of a study of foreign and domestic standards on the subject.

The draft proposal covers a diameter range of taper pins from $\frac{1}{16}$ to $1\frac{1}{2}$ inches and a length range of $\frac{1}{2}$ to 12 inches. The committee has been able to reduce the number of keys now stocked from 173 to 143 and at the same time provides a suitable overlapping of sizes.

In developing the proposed standard, an effort has been made to eliminate the several objectionable features in the present nonstandard systems without pass-

ing on to industry any unnecessary burden involving replacements, and interchangeability involving the pins themselves and also drills and reamers. Althuogh some temporary inconvenience will be experienced by perhaps a dozen taper-pin manufacturers by the increase in number of sizes of raw stock due to variation in the larger diameters of the pins, it will mean, according to a statement accompanying the proposed standard, a corresponding simplification in drill sizes for a great number of taper-pin users.

The proposed standard retains the present taper of one-fourth inch per foot of length and designates the size of pin from the diameter of its smaller end, a practice which has been adopted by the standardizing bodies of several countries of Europe. The small diameter of the pins is in the usual fractional dimensions, spaced by 30 seconds from $\frac{1}{16}$ to $\frac{3}{16}$ inch diameter, by sixteenths to $\frac{3}{8}$-inch diameter, by eighths to $\frac{3}{4}$-inch diameter, and by quarters to $1\frac{1}{2}$-inch diameter. The number of diameters is reduced from 20 to 14 with a better spacing of sizes. The ends of the pins have been rounded to facilitate driving, to lessen the possibility of cutting, to prevent deformation of the side bearing surface, and to make it unnecessary to drive the pins to such an exact location in their places as pins with sharp, distinct edges.

Among the objectionable features eliminated or minimized are the following: The present arbitrary numerical symbolization which has no direct mathematical relation to the actual size of the pin; the irregular progression from one size of pin to another; adoption of large diameter as a basis for size designation.

In the general discussion accompanying the proposal it is also stated that another objectionable feature, though not dealing with pins directly, is the lack of coherent relationship between the pins and reamers. A study of the related dimensions of the pins and reamers and, in particular, the overlap of a reamer beyond both ends of taper pins of maximum lengths shows that present conditions leave much to be desired. There is a lack of uniform progression between the various sizes of reamers and in two cases the small end of the reamer is larger than the small end of a pin of maximum length. Furthermore, an agreement between various manufacturers is lacking.

The proposed American standard for cylindrical pins is intended to cover the requirements of machine pins as rod-end pins, picots, dowels, journals, idler pins, locating pins, cam-roller pins, short axles, and others, which are not standardized to any extent in this country and generally speaking are not presented as commercial articles. Each designer is required to design his own pins and each shop makes them according to these designs.

The suggested series includes 94 sizes, which compares favorably with the variety adopted as standard in Europe. The diameters and lengths of cylindrical pins vary in much the same way as diameters and lengths of taper pins, except that the maximum length is given as 8 diameters instead of 12 diameters. The use of well-defined proportions and commonly preferred sizes for diameters and lengths permits the expansion of the series for specific requirements at a later date.

STANDARDIZATION BRIEFS

Surgical gut.—The American Hospital Association has requested the cooperation of the National Bureau of Standards in the establishment of a commercial standard covering specifications for surgical gut. These specifications, it is expected may cover sterility, sizes, tensile strength, tolerances, and the rate of absorbability.

Colored sanitary ware.—A general conference to consider the adoption of six colors for colored sanitary ware as recommended by the Manufacturers Advisory Committee for this type of ware, will be held at 10 a. m., Friday, January 23, 1931, at the National Bureau of Standards, Washington, D. C.

Manufacturers, distributors, and users of this type of ware are invited to be present in order that the standard colors as finally adopted shall be acceptable to all interests.

Copying and record.—The revised specifications for copying and record: Writing, red, stamp pad, and indelible marking inks, and for typewriter, hectograph, computing, and recording machine ribbons are now ready to be submitted to the Federal Specifications Board for promulgation. The revisions contain no changes in the technical details.

Detergents.—The National Bureau of Standards is cooperating with the detergents committee of the American Oil Chemists' Society in the study of practical or washing tests, with a view to formulating a practical or performance test to measure the cleansing power or value of detergents. This work is still in the experimental stage.

Weights and measures.—State weights and measures conferences are held periodically in different sections of the United States. These meetings serve to keep the local weights and measures officials advised of the latest developments along the lines of their official duties and provide an important medium for promoting uniformity of procedure among the several jurisdictions. For example, a meeting was held in Pennsylvania during September, Massachusetts and Maine in October, and Ohio in December.

Alloys.—An investigation was made to find alloys suitable for the production of heat-treated castings capable of withstanding severe service. The machinability of aluminum-copper alloy was found to be somewhat better than that of the aluminum-silicon-magnesium alloys, although the latter can be com-

mercially machined with standard tool set-ups, and, with adaptation of tools and machining methods to suit the material, can perhaps be machined as well as the aluminum-copper alloy.

Viscometer.—In order to increase the accuracy in measuring viscosity by the Saybolt viscometer, which is the standard for lubricating oils, the National Bureau of Standards will examine Saybolt tubes. If they are of standard dimensions, and the viscosity readings are within 2 per cent of standard, certificates are issued giving corrections which must be applied to make readings agree with those of the bureau's master tube. The number of certificates issued for Saybolt tubes has increased from 53 in 1927 to 101 in 1929.

Magnetic permeameters.—The testing of magnetic permeameters (instrument for measuring magnetic permeability) is greatly facilitated by calibrated test specimens used as standards. In order to be suitable for use as magnetic standards, test specimens must conform to certain requirements; the most important of which is magnetic uniformity along their length. The Burrows permeameter was adopted as the standard method for calibration; it shows the effect of nonuniformity in the specimens, and gives the characteristics of four bars which have been found to be sufficiently uniform to warrant their use as magnetic standards.

Airplane tires.—Extensive investigations have recently been carried out in the wind tunnel of the New York University to obtain data on the drag characteristics of several types of airplane tires in an endeavor to aid in the development of a line of airplane tires of low specific air resistance. It was found that the parasitic drag of the low-pressure airplane tires tested was not appreciably greater than that of the high-pressure airplane tires in the same load-carrying class. These tests indicate that accurate airplane performance calculations can not be made if an average drag coefficient is used for all sizes and types of airplane tires.

Laboratory for physical standards.—The establishment of a laboratory for physical standards in New Zealand is now under way. It is proposed to provide standards and equipment for measurements of engineers' gages, electrical apparatus, and measuring instruments of various kinds, also for the checking of thermometers and pyrometers, and for the measurement of the candlepower and efficiency of lamps. At the present time, according to the annual report of the Department of Scientific and Industrial Research of New Zealand, there are no official electrical standards or standards of temperature or of candlepower in the Dominion, and it is expected that the new laboratory will fulfill what has now become an urgent demand.

Insulated safes.—Federal specification No. 60a for insulated safes has been proposed by the Federal Specifications Board committee on insulated safes, and is being submitted to producers and users of the product for comment. The main change involves placing the requirements relating to construction on a performance basis instead of specifying minimum size of structural members. The requirements are based, in part, on a series of loading tests of safes recently completed at the National Bureau of Standards. The specification retains the present performance requirements for fire resistance and fire and impact resistance, except that the temperature limits within the safe are based on a maximum permissible rise above the initial temperature instead of a fixed maximum temperature.

Electroplating.—During the past several years the American Electroplaters Society has maintained a research associate at the National Bureau of Standards to study electroplating problems. About a year ago it was decided to investigate the protective value of plated coatings, especially of chromium. Arrangements were then made to conduct exposure tests of plated metals in cooperation with the American Society for Testing Materials. Owing to the resignation of the research associate, this program was postponed. A new associate, P. W. C. Strausser, has just been appointed by the electroplaters' society. In the near future a conference will be held to decide upon the details for carrying out the exposure tests. It is hoped that the results of such tests will be useful in formulating specifications for electroplated coatings for definite types of service.

Propeller.—Tests were conducted recently by the National Advisory Committee for Aeronautics to determine how the characteristics of a propeller are affected by cutting off the tips. The diameter of a standard 10-foot metal propeller was changed, successively, to 9 feet 6 inches, 9 feet, 8 feet 6 inches, and 8 feet. Each propeller thus formed was tested at four pitch settings in the propeller research tunnel of the committee, using an open-cockpit fuselage and a D–12 engine. Changes of 20 per cent in the diameter of a 10-foot propeller due to cutting off the tips result in a loss of about 6 per cent in maximum propulsive efficiency at the same pitch setting. A propeller adapted to a given engine and airplane by cutting off the tips will be slightly less efficient than a specially designed propeller. The practice of cutting off propellers is justified by these tests. (Detailed results of these tests are given in the National Advisory Committee for Aeronautics Report No. 351.)

STANDARD PAPER GRADES URGED BY UNITED TYPOTHETÆ

The forty-fourth annual convention of the United Typothetæ of America, held in Boston on October 17, adopted a resolution urging the continuance of efforts with regard to the standardization of paper, as follows:

Whereas the standardization eommittee of the United Typothetæ of Americea has expended much effort to accomplish the standardization of paper grades used in the printing and publishing industry: Therefore be it

Resolved, That the standardization eommittee of the United Typothetæ of America is hereby directed to continue its efforts respecting the standardization of paper grades used in the printing and publishing industry; and be it further

Resolved, That consideration be given to the subject of the standardization of paper samples to the end that the existing numerous sizes and shapes of such material be eliminated.

STEEL REINFORCING BARS AND STEEL SPIRAL RODS

Results and Benefits of Applying Simplified Practice

By James F. McNeil, *National Bureau of Standards*

Steel reinforcing bars and spiral rods embedded in concrete have made possible many of our modern engineering achievements, principally because of their adaptability to a variety of purposes in the construction of buildings, bridges, dams, and roads.

In the middle of the last century when reinforced concrete was first put to practical use, many of the systems of reinforcing were patented by their originators. To-day, however, formulas which follow the laws of mechanics may be applied to all.

As the demand for these materials became greater, so also did the number of sizes, types, and varieties increase, until in the year 1917 dealers in steel reinforcing bars carried a minimum of 15 sizes in two grades of steel. During the World War this number was reduced considerably by the industry acting in cooperation with the War Industries Board.

When the restrictions and limitations caused by the war were lifted, many of the sizes formerly used were reinstated, and several new sizes came into existence. A third grade of bars also made its appearance at this time. It was not uncommon to find a single plan requiring as many as 18 different sizes of bars.

This diversification in sizes, types, and varieties was burdensome to all interests and the cause of much confusion to the industry. In an effort to curb the waste prevalent in this field, a general conference of representatives of the industry was held under the auspices of the division of simplified practice at Washington, D. C., on September 9, 1924, to discuss a tentative simplified practice recommendation for reinforcing bars.

The simplification program adopted by the conference was subsequently accepted by the industry, and made effective January 1, 1925. It reduced the number of cross-sectional areas of reinforcing bars from 32 to 11, or approximately 65 per cent.

Since its approval, this simplification has been reviewed by the standing committee of the industry on three occasions. In the years 1927 and 1928, it was reaffirmed, and in 1930 it was so revised as to express the cross-sectional areas in two decimal places instead of three.

A survey of production, conducted in 1928, revealed that approximately 96 per cent of the steel reinforcing bars were being made in accordance with the simplified practice recommendation.

Steel spiral rods.

In view of the successful simplification of steel reinforcing bars, metal lath, woven-wire fencing, sheet steel, and other items in this and other fields, a general conference of all interests was held, at the instance of the industry on January 26, 1926, to consider the simplification of steel spiral rods. The recommendation adopted at this conference was instrumental in reducing the number of sizes of this product from 7 to 4, or about 43 per cent. It has been effective since December 15, 1926.

Results.

A survey among the accepters, was conducted by the division, to determine the practical effect of these simplifications. Interesting quotations from replies based on their personal experience show that much benefit is accruing to members of the industry through the application of these recommendations.

One leader in this industry after the recommendation had been in effect but a short time stated that "the reduction of the number of sizes means a saving in capital investment of about $4,500,000 for the industry."

"The economies that have been effected are readily computed in savings in inventory, interest charges, saving in space, and overhead charges which are not easily estimated, and would in our case amount to $10,000 to $12,000 a year," wrote the president of a midwestern manufacturing plant.

"It necessitates our carrying less sizes in stock, which naturally saves a great deal of time and expense in storing and saves us considerable expense in changing rolls on account of rolling fewer sizes. It also saves us clerical work and increases turnover," stated another manufacturer.

"Savings are being made," said the secretary of a plant manufacturing spirals, "because less engineering and clerical work is required, inventories are smaller, yet stocks are less frequently exhausted. There is also a saving in equipment. All of these things will effect a $1,500 yearly saving to our company on its average annual sales and we believe the consumer saves at least as much."

"Being distributors, we find that simplified practice reduces very materially the capital investment also the cost of warehousing, storage, and handling expenses, especially clerical," wrote the president of a builders' supply house located in the South.

"Simplification from the distributors point of view," replied another, "reduces the capital invested considerably, due to the fact that we can concentrate on a smaller number of items, and I believe we are saving fully 33 per cent in the investment of our steel stock inventory. Likewise it reduces warehouse and storage space requirements." He further stated, "It increases turnover on account of our being able to handle the same tonnage with considerable smaller inventory."

The head of another supply house said: "we have been able to reduce our invested capital and inventory approximately 50 per cent, which aggregates $30,000 to $40,000. It reduces our storage space requirements approximately 50 per cent. The writer is of the opinion that our company is serving every possible need required by the consumer and is better off by approximately $3,000 per year as against the time we handled such a large variety of sizes."

A consumer of reinforcing bars and spiral rods replied, "it is our opinion that we should, and undoubtedly do, benefit by simplified practice in these two lines, and that ultimately it will certainly result in better value for the money and prompter delivery."

STANDARDS AS A BASIS FOR REPORTING NEWS ON FARM PRODUCTS

Standardized Nomenclature Facilitates Classification of Farm Products

By C. E. Gibbons, *Senior Marketing Specialist, Bureau of Agricultural Economics, Department of Agriculture*

The Federal market reporter, more than anyone else, is indebted to standardization for the success of his enterprise. Conducting a national, and in some instances a world-wide service, he must gather facts from many sources; correlate and analyze those facts and redistribute them to a clientele which circles the globe. To do this effectively he must have at his disposal a standarized nomenclature, and this is possible only after definite, fixed standards have been worked out for each of the many units or groups into which the commodity with which he deals is sorted or classified in the regular process of marketing.

Assume, for example, that we are considering a Federal livestock market reporter. His task, among other things, is to discover as accurately as possible and report upon past, present, and prospective supplies of livestock; also on demand, prices, and general trade conditions. Obviously he can not report on the livestock market as a whole because that is made up of many kinds, classes, ages, weights, and grades of animals, and usually each of these groups has a market all its own. Cattle may be scarce and hogs in liberal supply. The demand for sheep may be slow, whereas lambs are wanted badly. The price of vealers may be advancing sharply while that of calves remains stationary.

One cattleman has one hundred 6-month-old calves on the range and another has a lot of cows. A certain feeder has a load of yearling heifers in the feed lot while his neighbor has 2-year-old steers. One swine grower has a lot of choice-grade hogs and another has feeder pigs. Each of these men is watching the markets closely in an effort to dispose of his animals at a time when prices are highest and on the market which offers the greatest net profit. The market reporter must furnish to each of these stockmen the information on which he can base decisions. Hence, he must go into details describing prevailing market conditions as they affect each of the important groups of livestock.

In doing this he uses many group names. He speaks of steers and cows, lambs and ewes, butcher hogs, and packing sows. He refers to lightweight, mediumweight, and heavyweight animals; and finally his report is shot through with references to prime-grade, choice-grade, medium-grade, and cull-grade animals. These group names are extremely useful to the market reporter because they relieve him of the necessity of long and detailed descriptions of the different animals on which he is reporting.

For example, by using the single word "steer" he indicates a definite group of bovine animals, and immediately eliminates all other classes of cattle, such as heifers, cows, bulls, and stags. By using the word "yearling" he sets age limits on the cattle he is discussing. "Medium weight" confines the animals being reported upon within fairly narrow weight limits. Finally, by referring to choice grade he immediately depicts the degrees of conformation, finish, and quality possessed by the animals to which his report refers. Hence, by means of four group names—choice grade, medium weight, yearling, and slaughter steers—he draws a picture more detailed and more sharply defined than would be possible by using many pages of description.

All this is possible, however, only when each of the group names used possesses a standardized meaning. Each term must bear the same significance, regardless of market, season of the year, changes in supply, demand, price, or general trade conditions. In other words, there must be a definite, fixed standard for each group. It is impossible to conduct a satisfactory national market news service on any agricultural commodity without such standards.

For that reason, the Department of Agriculture, through the Bureau of Agricultural Economics, has expended much time and effort during the past few years in developing such standards. The task was of great magnitude due to the great number and diversity of agricultural products and the many methods of marketing and wide differences in market practices prevailing in various parts of the country. The wider the market for a commodity the greater is the need for fixed standards. Likewise, the market for almost any product can be broadened by the application of the principles of standardization in its production and marketing.

One of the greatest benefits and most outstanding economies which accrue from standards is the elimination of the necessity for personal inspection. A product which has only a limited local market may be merchandised fairly well without uniform standards because personal inspection is easily had and each individual buyer and seller can apply his own standards without serious interference with the marketing process. So soon, however, as buyers and sellers become widely separated, personal inspection becomes burdensome, expensive, and frequently impossible.

It is here that fixed, generally understood standards prove their worth. A man in Buffalo, New York, or Liverpool can buy a carload of No. 2 red winter wheat from a Kansas grower with every assurance that he will get exactly the kind of wheat he needs. The Kansas grower can offer his wheat to any prospective buyer in the world with entire confidence and assurance. This is possible only because definite standards for that variety and grade of wheat have been worked out, specifications drawn, and a system of applying the standards developed. The same is true of cotton, hay, many fruits, and vegetables, also several kinds and classes of livestock and meat.

A brief outline of the establishment of the department's market news service on livestock and meats may serve to illustrate conditions prevailing generally in the markets for agricultural products prior to the establishment of Federal standards and improvements which have followed and are following the use of such standards. The wholesale fresh meat markets were reported first, with offices in several of the large At-

lantic seaboard cities. A tentative schedule of classes and grades had been worked out for the use of all reporters and standardized forms for submitting reports developed. It was soon discovered, however, that wide differences in prices apparently prevailed between the different cities. Boston, for example, might be quoting choice grade steer beef at $22 per 100 pounds and New York quoting the same grade at $18, with Washington offering the same thing at $16. Obviously, freight differentials could not account for such wide disparity in prices.

Investigation quickly showed that no such differences in prices actually existed, and that the wide spread in quotations was due to the fact that the trade in Boston, New York, and Washington did not mean the same thing when they referred to choice grade steer beef, for example. It was also obvious under such circumstances the reports would be useless to anyone desiring to compare prices prevailing on the different markets, either with a view to buying or selling beef on those markets. It immediately became necessary, therefore, for the department to work out definite standards for choice grade steer beef and for all the other classes and grades as well, and require all Federal reporters to report their markets on the basis of those standards.

Shortly afterwards a survey of the midwestern livestock markets was made preparatory to establishing a Federal market reporting service on live animals. A wholly similar situation was found there. What was considered a choice grade slaughter steer on one market might not grade higher than good at another and possibly medium on a third market. Even on the same market, standards were shifted from season to season in keeping with changes in supply and demand conditions. When supplies of a given class or grade of animals were light and demand active, there was a perceptible lowering of standards. When supplies increased, accompanied frequently by a decrease in demand, requirements were almost inevitably raised, and it took a much better animal to get into a certain grade than it did during a period of scarcity.

Here again it was impossible for the department to establish or maintain a national reporting service on the basis of a multiplicity of widely divergent local standards. Hence, a single set of standards was developed and applied at all markets. In certain quarters there was some resistance to changing the established order of things, but the advantage of having "choice grade slaughter steer" refer to the same kind of an animal at Portland, Oreg.; Denver, Colo.; Chicago, Ill.; and New York, N. Y., soon became apparent to the more forward-looking members of the trade, and at the present time the Federal standards are pretty generally accepted and used.

The superiority of the Federal market news service over similar services maintained by other agencies consists largely in the fact that it is based on, and involves the use of, definite uniform standards. Under such circumstances it is possible for each market reporter to describe clearly, accurately, and succinctly just the kind, class, age, weight, and grade of animals offered on his market and the demand and prices prevailing for each. It is also possible for a reader anywhere in the country, be he producer, processor, consumer, or student, to read the Federal reports from any or all markets and make definite and accurate comparisons between conditions prevailing at as many markets as he is interested in.

The statistics compiled as an integral part of the Federal market news service are comparable at all times, not only between markets but from season to season and year to year, because they are based on the same standards. When the standards become a little better known and more generally understood it will be possible to buy and sell both livestock and meats on the basis of standard specifications just as is now done in the case of corn, cotton, and many other agricultural products for which there are official standards.

COTTON FABRIC TENTS, TARPAULINS, AND COVERS

Standardized Markings and Description of Waterproof Treated and Untreated Commodities Approved by General Conference

To standardize the markings and descriptions of waterproof treated and untreated cotton fabric tents, tarpaulins and covers, a general conference of interested representatives of cotton mills, waterproofers, manufacturers, distributors, and users held December 12, 1930, at the National Bureau of Standards, Washington, D. C., approved a proposed commercial standard covering these commodities.

In order that present manufactured stocks may be cleared without prejudice, the conference stipulated that the date on which the recommendation will become effective shall be January 1, 1932, and that all goods sold after that time will be marked on the new basis.

The standard, as approved by the conference, requires that waterproof treated and untreated cotton fabric tents, tarpaulins, and covers shall be marked with a printed tag or stencil to show the original grey goods weight on a square yard basis. Such ounce weight designation on the fabric shall be carried to the nearest one-hundredth of an ounce. In addition to the grey goods weight, waterproof treated and untreated cotton fabric tents, tarpaulins, and covers shall be marked to show the commercial type of fabric, as "single-filling duck," "double-filling duck," "Army duck," "numbered duck," "sheeting," "Osnaburg," and any other fabric that may be used. It is recommended that no marking or sales descriptions be used referring to the finished or loaded weight of waterproof-treated materials.

The elimination of markings to indicate the finished or loaded weight of waterproof-treated tents, tarpaulins, and covers is a very radical and distinct departure from the present practice of emphasizing the loaded or treated weight almost to the exclusion of all other

markings or descriptions. However, the waterproofers and the tent manufacturers feel that since the treated or loaded weight is always greater than the unfinished weight, the ultimate buyer would continue to be unduly influenced in his purchases by any mention of the treated weight even though the untreated weight be given also. In other words, the producers feel that unless the former practice of indicating treated weights is eliminated altogether and replaced by the practice of marking tents, tarpaulins, and covers to show only the weight of the untreated fabric in ounces per square yard, the desired benefits to the consumer will not be obtained.

The conference indorsed a proposal for the application of the certification plan. By this means there is provided a medium for developing lists of manufacturers willing to certify that their product conforms to the approved commercial standard. These lists will be distributed by the National Bureau of Standards to public purchasers and, upon request, to other interested purchasers.

As provided by the regular procedure of the bureau, the standard will be reviewed annually for any changes or modifications that may be necessary to keep it abreast of changing trends in the industry. To facilitate this review, the conference authorized the appointment of a standing committee to consist of J. E. Dilg, representing the National Tent and Awning Manufacturers Association, chairman of the committee; H. B. McCain, president of the Canvas Waterproofer's Association, and the Brunsene Co.; J. W. Proctor, of Wellington Sears & Co.; C. J. Stind, of Sears, Roebuck & Co.; N. C. Wiley, of the Bureau of Construction and Repair, Navy Department; H. S. Johnson, of the Cotton-Textile Institute; H. B. Marbury, of the Fulton Bag & Cotton Mills; W. E. Russell, of the Capitol Awning Co.; and Charles C. Carver, of C. F. Earechson & Co.

It was brought out during the conference that the Canvas Waterproofer's Association had received more than 500 letters from the industry indorsing the commercial standard.

In line with the established procedure of the National Bureau of Standards, the recommendation will now be submitted to the entire industry for written acceptance. As a prerequisite to publication, written acceptances must represent at least 65 per cent of production by volume and without active opposition.

SIMPLIFIED LIST OF SIZES OF ICE CREAM CUPS APPROVED

Recommendation Approved by General Conference also Provides for the Cap Diameter; Effective January 1, 1932

Recognizing the fact that there is a definite trend toward packaged ice cream, a general conference at the Department of Commerce of interested groups of the industry on December 10, 1930, approved a proposed simplified practice recommendation for sizes and shapes of ice cream cups and caps.

The approved recommendation provides for the intermediate shape container for the quart size with a cap diameter of 4.372 inches; the intermediate shape with cap diameter of 3.622 inches, and the tub shape with cap diameter of 4.372 inches for the pint size container; the intermediate shape with cap diameter of 3.280 inches and the tub shape with cap diameter of 3.654 inches for the one-half pint size container; that the present shaped cup with cap diameter of 2.750 be retained for the one-fourth pint size container (known to the trade as the 10-cent size); and the 48 to the gallon cup with cap diameter of 2.380 for the one-sixth of a pint size cup (known to the trade as the 5-cent cup.) There is provided for all cap diameters a tolerance, above or below, of 0.004 inch.

Several months ago the industry adopted simplified practice recommendations covering ice cream cans, molds, and cartons. The success of these projects led the simplified practice committee of the International Association of Ice Cream Manufacturers to study conditions existing in the industry with respect to the variety of cups being used for packaged ice cream.

It was brought out in the conference of December 10 that approximately 15 per cent of the volume of ice cream is now handled in these containers, with a certain tendency toward their increased use. Recently the Boston University Bureau of Business Research made a survey of the customer's preference for factory packaged ice cream as against that of the ice cream sold packed by the retailer. The findings of this survey showed that the next important advance in the trade will be the introduction of factory-filled packages of approximately the same consistency, flavor, and taste as the present store-packed package. This is in line with modern merchandising methods. Factory-filled containers are more convenient and economical to handle, are more sanitary, and usually contain a more uniform quantity, in a convenient form of container for home service.

The adoption of this recommendation is entirely voluntary on the part of manufacturers, distributors, and users. It is to be noted, however, that the success of this program is dependent upon the wholehearted support and acceptance of the industry. The provisions of the program will become effective January 1, 1932, and eight months, or until September 1, 1932, is allowed for the disposal of nonstandard stock.

Appreciating the fact that changes will develop in the industry over a period of time, the conference authorized the appointment of a standing committee to keep the recommendation in line with the best thought and practice of the industry. This committee will receive recommendations or suggestions for changes in the schedule and will be acted upon at the regular annual revision conference of the committee. All changes which may be recommended by the standing committee will be submitted to the industry for approval as in the case of the initial recommendation. Ridgway Kennedy, jr., chairman of the simplified practice committee of the International Association of Ice Cream Manufacturers, was selected as chairman of this standing committee. The other members will be announced at an early date.

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SIMPLIFICATION PROJECT ACTIVE IN LUMBER INDUSTRY

New Appointments Made to Central Committee on Lumber Standards; Revision of 7,000 Series of Moldings Proposed

Secretary of Commerce, Robert P. Lamont, has announced the appointment of Roy F. Morse and L. P. Lewin to active membership on the Central Committee on Lumber Standards (S. P. R. No. 16). Mr. Morse will take the place vacated through the resignation of Ray E. Danaher, and will serve on the committee as representative of softwood lumber manufacturers. Mr. Lewin will fill the vacancy caused by the resignation of Guy Gray, and will represent the city retail lumber dealer.

Both of these appointees are well qualified by many years of experience in lumber manufacture and distribution to become thus associated with the other members of the committee in carrying forward the work of lumber simplification and standardization started more than eight years ago by the organized lumber industry with the cooperation of the division of simplified practice of the National Bureau of Standards. Mr. Morse is general manager of the manufacturing department, Longview Division, Long-Bell Lumber Co., of Longview, Wash., and Mr. Lewin is past president of the National Retail Lumber Dealers Association and a director of that organization at the present time, as well as being president of the A. M. Lewin Lumber Co., Cincinnati, Ohio.

These two appointments by the Secretary of Commerce again bring the central committee up to its full complement of 11 representatives of lumber manufacturers, distributors, consumers, and technical organizations. The other members of the committee and the organizations they represent are as follows: John H. Kirby, Kirby Lumber Co., Houston, Tex., chairman of the committee; W. E. Hawley, Duluth, Missabe & Northern Ry. Co., Duluth Minn.; W. M. Ritter, Columbus, Ohio; LeRoy E. Kern, the American Institute of Architects, Washington, D. C.; F. S. Underhill, Philadelphia, Pa.; George D. Rose, Spahn & Rose Lumber Co., Dubuque, Iowa; Charles T. Fisher, Fisher Body Corporation, Detroit, Mich.; W. B. Swift, International Harvester Co., Chicago, Ill.; and E. J. Curtis, Curtis Companies (Inc.), Clinton, Iowa.

Advisory to the central committee are the consulting committee on lumber standards in the standardization of softwoods; the hardwood consulting committee and the division of simplified practice of the National Bureau of Standards; and the Forest Products Laboratory of the Department of Agriculture.

According to the announcement of the central committee there are a number of active standardization projects before the committee. One is the revision of the present 7,000 series of moldings, authorized by the joint meeting of the various committees mentioned in the preceeding paragraph, held in April, 1930, to bring their widths and designs into conformity with the American standard dressed widths for kiln dried finish, with sound lumber manufacturing practice, and with good architectural design.

The subcommittee representing lumber manufacturers associations interested in molding production, millwork manufacturers, and the American Institute of Architects, has practically completed its work of redesign and width adjustments and the new designs will soon be formally submitted by the central committee to the entire lumber industry for approval and publication.

EFFICIENT WOOD UTILIZATION PROMOTED BY PANAMA CANAL

United States' Specifications and Practices of Wood Utilization Adopted for Canal Zone

The establishment of a committee of officials of the Panama Canal Zone for the purpose of studying efficient wood-using practices and their application to canal requirements has been announced by Col. Harry Burgess, United States Army, Governor of the Panama Canal.

The Canal Zone is one of the largest purchasers of American forest products, and is interested in promoting efficient practices and economies in the purchase of forest products.

One of the principal objects of the newly established committee will be to keep in close touch with the National Committee on Wood Utilization, which acts as a clearing house for the latest developments and discoveries in the wood utilization field. Among the principal features given favorable consideration by this liaison committee are: The changing of lumber specifications to conform as closely as practicable to the commercial practice in the United States; the purchase of railway ties in accordance with the requirements of the American Standards Association; and the purchase of grade-marked lumber, that is, lumber marked with a symbol indicating the quality of each piece produced so as to facilitate inspection and storing.

Emphasis is laid on the inspection of lumber in the United States before shipment is made in order to minimize the shipper's losses in connection with rejected stock. Such inspection, the committee feels, may be arranged through the cooperation of reputable lumber associations.

End-matched lumber, which is stock provided with a groove at one end and a tongue at the other, enabling the use of lumber practically without waste, is also being considered for certain requirements, and comparison of installation costs will be made between standard flooring and end-matched lumber used as ceiling.

The committee makes recommendations involving trial of certain new wood construction methods to canal conditions. At present these methods are being investigated by the National Committee on Wood Utilization, and chiefly relate to the extensive application of steel joints, and the protection of wood against fire, insects, and decay, through preservative treatments.

"If the canal is to derive full benefit in the matter of specifications and best practices prevailing in the United States, that is, in so far as they can be adapted to the Canal Zone," said Colonel Burgess in his announcement, "it will be highly desirable that we avail ourselves of the services of the National Committee on Wood Utilization in matters pertaining to the purchase and use of lumber and wood products in the zone."

Conditions in the Canal Zone are entirely different from those applying to the home market. Canal engineers have shown marked ingenuity in overcoming the natural disadvantages to which their use of wood is subjected under tropical conditions, and engineers and builders in every part of the world where similar climatic conditions prevail are following with interest these new developments in canal wood-using practices. Eventually this experience will have an important bearing on the further development of the United States export lumber trade.

PROGRESS ON AMERICAN MARINE STANDARDS

Committee Reviews Status of Pending Proposals for Standardization

The following current information relating to developments in certain standardization projects under the auspices and procedure of the American Marine Standards Committee, has been furnished by that committee.

Oil-tight hatch covers.

A revised preliminary draft of alternative designs comprising structural details and fittings for welded and nonwelded construction, also tentative standard sizes for this type of hatch, are under consideration by the technical committee on hull details.

Hinges for ship doors.

General specifications comprising five types of bronze hinges and six types of steel hinges for various applications have been developed for joint action of the technical committee on hull details and the subject committee on joiner hardware. The types include both plain and ball bearing hinges in limited varieties of sizes. The specifications are appended by recommended rules for correct application of hinges.

Hinged water-tight doors.

It appearing that the ballot vote of the technical committee on hull details on the proposed standards mentioned in previous issues of the COMMERCIAL STANDARD MONTHLY will not be conclusive, a series of sketches showing different types of construction and fittings have been submitted to the committee for a selective vote in order to establish a definite basis for further development.

Condenser tube ferrules and tube sheets.

A proposed revised edition to supersede American Marine Standard E No. 1–1926, published in American Marine Standards Committee 21, has been developed on the basis of suggestions received from various sources and is now before the technical committee on engineering details. The proposed new ferrules are interchangeable with those covered by the former standard, the principal change being a decrease in length of ferrule from seven-eighths to three-fourths inch. The revised standard has also been amplified in a number of particulars.

Cleats for ships and docks.

A new series of proposed standards is in course of development for submittal to the technical committees on hull details and on port facilities. Although based generally upon the proposals heretofore submitted to the technical committees and membership, suggestions received from various sources are being incorporated as far as they can be correlated. One of the aims is to unify the design of heavy cleats for both ships and docks.

Index to American Marine Standards Committee publications.

Manuscript for serial and classified lists of the standards promulgated to date and classified and alphabetical indexes thereto covering the American Marine Standards Committee series of publications from 1 to 75 has been prepared for printing.

REVISED COMMERCIAL STANDARD FOR WROUGHT-IRON PIPE NIPPLES BEFORE INDUSTRY FOR ACCEPTANCE

In accordance with the recommendations of the standing committee, following consideration of comment and criticism from manufacturers of this commodity, through an adherence survey, a proposed revision of the Commercial Standard for Wrought-Iron Pipe Nipples, CS6–29, has been circulated for acceptance.

The proposed changes were recommended to bring the commercial standard into harmony with the recent revision of the American Society for Testing Materials Specification, A72–27, Welded Wrought-Iron Pipe.

The recommended revision comprises the inclusion of the A. S. T. M. definition for wrought-iron, reference to the latest A. S. T. M. specification for wrought-iron pipe, changes in actual thickness and inside diameters of the pipe to suit actual weight specified, and a few minor changes in wording and arrangement.

ADVANCEMENT NOTED IN AERONAUTICS RESEARCH

Studies Conducted at National Bureau of Standards for Improvement in Radio Services for Aircraft

Preliminary work has been started by the National Bureau of Standards on the development of a radio system to aid in preventing collisions between airplanes. The aim is to give the pilot on an airplane automatic warning of the presence and approximate position of any other craft within a radius of about 3 miles.

A fundamental limitation is that only one frequency, or at most a very few frequencies, can be made available for this service. The system proposed involves the continuous transmission of ultra-high-frequency radio waves from each airplane. Directivity of reception or transmission, or both, will inform the pilot of the direction of danger.

Progress is also reported by the bureau in the development of a combined transmitter for the simultaneous broadcasting of radiotelephone and visual type radio range beacon signals. This is designed to remove the principal limitations on the present radio aids to air navigation, which is that the pilot receives no beacon service while receiving weather or telephonic information.

A master oscillator controls simultaneously a radiotelephone transmitter and a beacon transmitter. The first transmitter supplies the carrier-frequency waves and the speech-modulated waves to an open antenna. The second supplies only the radiobeacon side bands to the beacon loop antennae.

Filter arrangements and automatic volume control have been worked out to facilitate the reception of these signals aboard the aircraft. The fundamental adjustments necessary in the experimental model of this transmitter have been completed and performance tests begun at various distances from the station. A number of tests were made at approximately 125 miles from the transmitting station; in these tests successful reception of both the voice and beacon signals was accomplished, with indications that this reception could be obtained over greater distances. Satisfactory sharpness of beacon courses was obtained. As a result of these and other tests the feasibility of the combined service is assured.

Receiving antennæ.

For some months the National Bureau of Standards has been conducting a detailed study of the characteristics and performance of airplane receiving antennæ of various types. One object of this investigation was to find an antenna arrangement having the same desirable electrical characteristics as the vertical pole antenna, but free from the problems of mechanical vibration and ice formation encountered in the use of the pole antenna. One of the advantages of the vertical pole antenna is its freedom from course errors in radio range beacon reception.

A number of different antenna arrangements have been studied, both by theoretical analysis and by practical observation in the air and on the ground. For each antenna studied, the tests in the air included observation of the received voltage, the localizing effect or variation of the received voltage in the immediate vicinity of the beacon tower, and the course errors as observed by circling the beacon.

These were compared directly with results obtained using the vertical pole antenna. The antenna arrangements studied included the inclined antenna, with both forward or backward inclination (one example of the latter being the trailing wire antenna); the horizontal dipole antenna; the horizontal V antenna; the horizontal L antenna; the inclined V antenna; the symmetrical transverse T antenna; and the symmetrical longitudinal T antenna.

The symmetrical longitudinal antenna with a vertical lead-in was found to have an advantageous combination of the desired operating characteristics. The two flat top elements lie along a line parallel to and directly above the axis of the fuselage, held by short vertical supports, considerably shorter than the usual pole antenna (10 to 18 inches instead of 5 to 6 feet). Equivalent effective height is secured through the use of the flat top.

It is essential that the longitudional T antenna be located in a position such that the electrical effect of the airplane frame acting as the counterpoise is symmetrical; this is not always possible in the case of open cockpit airplanes, but is usually possible in cabin airplanes. This type of antenna is free from course errors in radio range beacon reception. It is superior to the vertical pole antenna structurally, and in respect to ice formation, mechanical vibration, and aerodynamic resistance.

NEW ZEALAND MAY ADOPT BRITISH STANDARDS

With the development of New Zealand's secondary industries the question of standardization is becoming important, according to the annual report of the Department of Scientific and Industrial Research of New Zealand, which states that the need for adopting certain phases of standardization in the Dominion has been increasingly felt for some time.

While it is necessary to have some executive body carry the proposals into effect, it is fully appreciated that a request for standardization of any particular product or material must first be made by an industry. It is not intended for standards to be forced on any industry, but that the necessary administrative machinery should be set up where the benefit of a particular standard is mutually recognized and can be given an official status.

At an important conference of interested parties, held on July 4, 1930, the general adoption of British standards was approved, and a local committee was established to act as a liaison body with overseas standardizing associations. Modifications of British standards, such as will enable them to be made of greater application in New Zealand, will be brought to the notice of the British Engineering Standards Association.

NEW DIETARY STANDARDS DEVELOPED

Protein Content and Vitamin Potency of Marine Products Important; Cod-liver Oil has Excellent Therapeutic Properties

By John Ruel Manning, *Technologist, United States Bureau of Fisheries*

Knowledge resulting from studies in the science of nutrition is establishing new dietary standards and gradually changing old principles of diet to the great benefit of humanity, both from the standpoint of healthful living and longevity of life.

Great strides in nutrition standards have been made during the past decade. Not only has there been considerable scientific progress but, to bring into play a much-used expression, the world has become "nutrition minded." The masses are rapidly becoming better acquainted with the principles and standards of nutrition and are making far greater use of them in their daily lives than ever before.

Marine products are an extremely important potential source of numerous nutritional requirements in the dietary of man and his domestic animals. These products of the sea are valuable for their vitamin potency, protein content of a high coefficient of digestibility; and for their quantity and variety of mineral constituents.

Everyone is familiar with the excellent therapeutic properties of cod liver oil, a marine product, which has had medicinal value for hundreds of years. Cod liver oil probably plays the greatest single rôle in the rearing of children than any other standard substance of known therapeutic value.

The interest in the nutritive properties of fishery products has grown to such an extent that the Bureau of Fisheries has found it necessary recently to organize a special section of fishery science and technology devoted to this subject.

In selecting the subjects of study and research in this field, we have considered those problems which would benefit the largest number of people. Most of these studies have been pursued in cooperation with other Government organizations and with outside agencies and individuals. For a number of years the Bureau of Fisheries has maintained a research assistant at Johns Hopkins University who has been engaged in investigations of the nutritive value of various marine products through carefully controlled biochemical experiments with laboratory animals. The results of these tests have not only revealed the nutritive standards of the substances studied, but have also aided technologists of the bureau in pointing the way toward improvements in methods of manufacture which in turn would raise the standards of the finished products of the fisheries.

Cooperative research conducted.

Recently the Bureau of Fisheries, of the Department of Commerce, and the Bureau of Chemistry and Soils, of the Department of Agriculture arranged a cooperative research program for the study of marine products in nutrition. Already this working arrangement has been productive of results which offer considerable potential benefits to both the agricultural and fishery industries. These results, which have been submitted for publication, have revealed that salmon, pilchard (California sardine), and tuna oils, now used only in the arts and industries, are a cheap and plentiful source of vitamins for animal feeding. Standard improvements in the methods of production of these fish oils will probably increase their vitamin content. Other cooperative feeding tests with both laboratory and farm animals have been arranged by the Bureau of Fisheries.

It should be remembered that most nutrition investigations are carried on with animals, but the results are directly applicable to humans in many ways. Suffice it to say that marine products offer a fertile and almost virgin field for the advancement of dietary standards. It can not be too emphatically stated to workers in the science of nutrition that here lies a pioneer field of potential investigation offering rich rewards and a veritable "gold mine" of possibilities in scientific accomplishment.

COMMERCIAL STANDARDS FOR MIRRORS

The importance of quality standards was emphasized by Miss Minita Westcott, assistant secretary of the Mirror Manufacturers Association, in an address before the home-furnishings section of the American Trade Association Executives.

In her address Miss Westcott stressed the fact that the first step toward achieving a broader market has been the establishment of commercial standards for mirrors. "As you know," she said, "mirrors are made from plate glass by silvering one side. No mirror can be better than the plate of glass out of which it is made. Five grades were created corresponding to the qualities furnished by the plate-glass manufacturers. The purpose of these standards is twofold; to stabilize the product, and incidentally the market, and to inspire consumer confidence.

"In setting up these standards the qualities are defined for both manufacturer and consumer. This gives each manufacturer the opportunity to compete equally and fairly with every other manufacturer. It has a tendency to submerge price competition by making the buyer think more of quality than of price. A designation of quality on mirrors inspires confidence of the consumer in the product or in the quality of the commodity he is purchasing. He is educated to what quality means in a mirror. He doesn't buy just a piece of glass with some silver on the back of it.

"The creation of minimum quality levels for a commodity," said Miss Westcott, "gives the public a feeling that it can buy with assurance. While this will have a tendency to create more demand for the higher qualities, it will, nevertheless, inspire confidence of the consumer when he does purchase the lower grades."

COMMERCIAL STANDARD FOR INDUSTRIAL FUEL OILS

General Use of Standard Grades Would Bring Economies to all Interests; Preheating Facilitates Use of Lower-Priced Oil

By H. B. Pullar, *Secretary, James B. Berry's Sons Co.*

The constantly increasing use of petroleum fuel oils for industrial purposes, the increasing and varying sources of crude oil from which these industrial fuel oils are produced, and the rapidly changing refinery operations have created a demand for new commercial standards.

Until recent years there were comparatively few well-defined oil-producing fields and uniform methods of refining. The crude oils had certain inherent characteristics and properties, which after distillation gave uniform and definite charactertistics and properties to the residuum or fuel oils, so that the gravity of the oils quite distinctly described their other physical properties and value as industrial fuel oils.

The almost revolutionary methods in refining, the numerous cracking processes now in use, and the many new crude producing areas (with their varying grades of crude oils) have radically changed the conditions under which fuel oils are now produced, and consequently have materially changed the inherent, chemical, and physical properties of these oils so that the gravity is no longer even an indication of the characteristics of the residuum or fuel oils produced.

Fuel oils have always been and probably will always be the residue from the refining of petroleum, and if consumers are to obtain the greatest value from their use they must adjust their operations to meet the changing refinery conditions rather than expect the petroleum industry to adjust its operations to meet the consumers' demand.

For a refinery to make a limited specification fuel—unless, by chance, their operations permit the production of such a fuel oil—requires considerable trouble and expense which is not justified by its value or in its practical use, and which expense must naturally be passed on to the consumer. While, on the other hand, a consumer at a relatively small expense can usually adjust his operations so that he can use practically any type or grade of fuel oil produced, and thereby take advantage of refinery and marketing conditions as they develop.

The economical purchase of fuel oil should be on a B. t. u. (British thermal unit) basis; for heat units is what the consumer is buying, and the more he can purchase for a dollar the more benefit he will derive. The value of a fuel oil should be determined by its cost in heat units at the consumer's burner and not at the refinery.

There are many industrial plants that can, at comparatively low cost, equip themselves with insulated fuel-oil tanks and heating equipment to heat any grade of fuel oil to the desired temperature, and the cost of circulating hot fuel oil from the storage tanks to the burners is in most cases insignificant as compared to the increased efficiency in using heavy fuels, and being able to purchase the greatest number of heat units per dollar.

It is quite possible now to purchase fuel oil of from 5 to 7 gravity, or even lower, that has as high as 170,000 B. t. u. per gallon, and handle it easier and more economically than could formerly be accomplished with a 24–26 gravity fuel oil having approximately 140,000 B. t. u. per gallon.

There are, of course, a number of industrial plants that, because of the nature of their products or on account of their particular operations, require fuel oils or definite characteristics and properties, such as low sulphur content, cold test, or limited viscosity, but there is no fuel-oil consumer who is dependent upon or who specifies gravity in order to obtain a suitable fuel.

Recognizing these changing conditions, a joint conference of representative refineries, distributors, consumers of fuel oils, manufacturers of oil burners, and general interests adopted new commercial standards for domestic and industrial fuel oils which have been accepted by the industry and approved for promulgation by the Department of Commerce, and which, if they would be generally accepted by fuel-oil consumers, would be of great economical value to themselves as well as to the producing interests, and their adoption would be a big step forward in putting the fuel-oil business on an economical and solid foundation of supply and demand of heat units instead of unimportant and immaterial physical characteristics.

UNIFORM AIR RULES URGED

Standardization of Laws Important to Safety

Adoption of uniform regulations for aviation by the States was urged December 16, 1930, by Secretary of Commerce Robert P. Lamont.

Addressing a conference on uniform aeronautic regulatory laws at the Commerce Department in Washington, Secretary Lamont said standardization of laws was "one of the most important single contributions to rapid and safe development of aeronautics."

Clarence M. Young, Assistant Secretary of Commerce for Aeronautics, said from the beginning it had been recognized as essential that the fewest possible regulatory laws consistent with safety and uniformity be prescribed.

The Federal act left State regulation to the States, he said, and confined itself to interstate operations, but extended to intrastate operators the right to obtain Federal licenses.

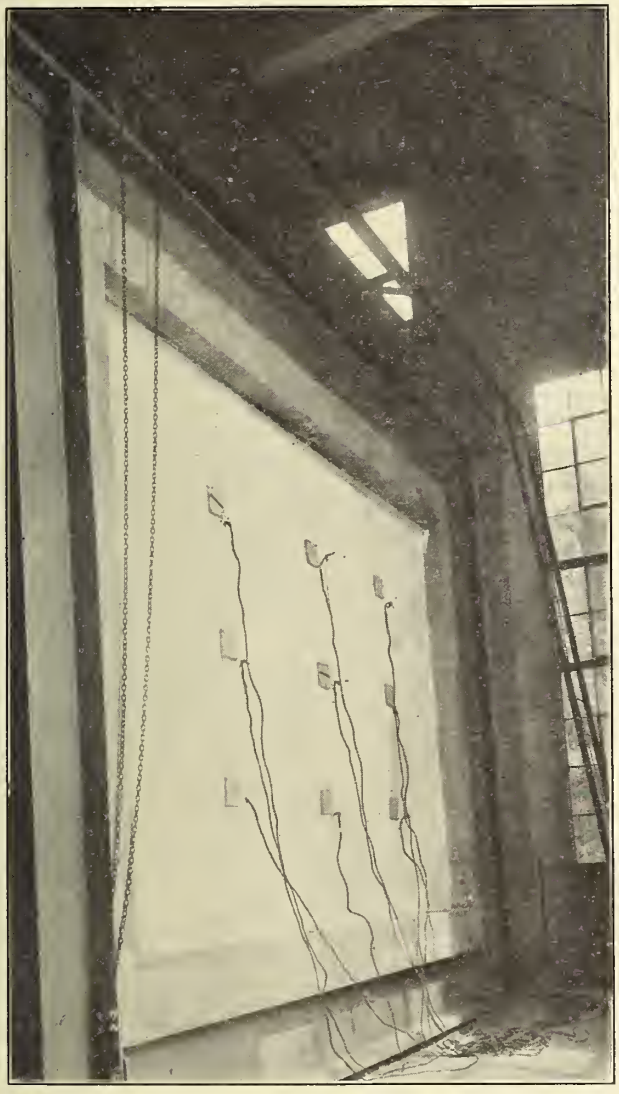
The five fundamentals of regulation, he said, are uniform basic State regulatory laws, adoption of Federal air traffic rules by the States for purposes of local enforcement, methods of local enforcement and State enabling acts for airport acquisition and control, and uniform airport field rules.

FIRE-RESISTANCE TESTS

Description of Standard Fire-resistance Tests and a Résumé of Some of the Work Undertaken

By S. H. Ingberg, *National Bureau of Standards*

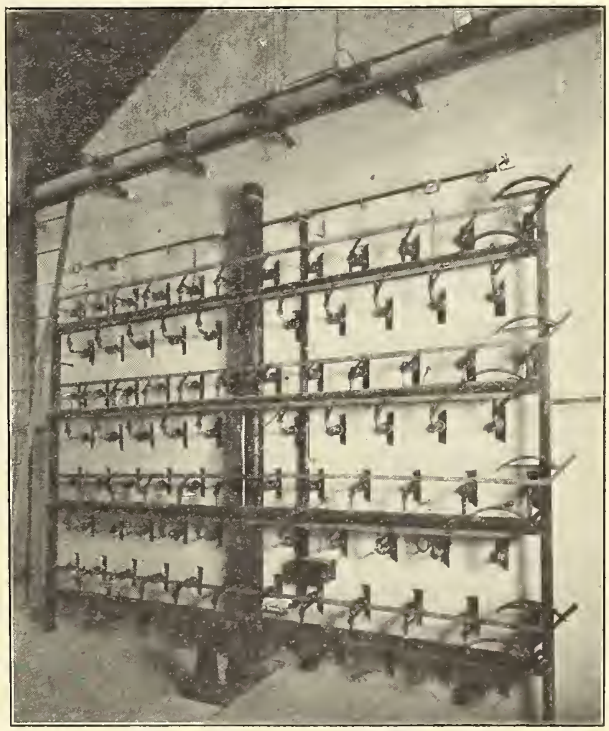
The fire-resistance activities of the National Bureau of Standards have been concerned mainly with research on the fire-resistive properties of materials and members entering into the construction of buildings, the fire hazard of materials constituting the contents of buildings, the severity of fires that can occur with given amounts of combustible building contents, and the protection afforded by devices, such as insulated record containers.



Partition in place for test forms one side of the furnace chamber

Fire resistance, if in the form of materials incorporated into the building itself, has the advantage of being independent of the human element, upon which fire prevention of many other kinds must depend. It loses little in effectiveness with age, remaining practically unchanged as long as the structure serves the purpose for which it was built. While general fire-prevention efforts and fire-detective and fire-prevention devices are of value, the building itself must remain as the chief factor in taking care of the margin of danger due to carelessness, ignorance, and crime that can not otherwise be further reduced.

The standard fire test consists in subjecting the material, construction, or device to a furnace fire, the intensity of which is so regulated that given average temperatures are obtained in the furnace chamber at stated times after the fire is started. By means of this control, approximately the same fire exposure can be obtained at different times and in different laboratories. The other requirements will vary with the type of construction of device being tested.



Back of furnace showing burners and burner controls

Thus, columns are required to support a load approximating what they would carry in a building; floor constructions and bearing walls are similarly required to support loads and also to afford resistance to flame and temperature penetration to an extent that will prevent ignition of materials in contact with the unexposed sides of the walls. Incombustile finishes must serve similarly in preventing ignition of the material or construction protected, and insulated containers must preserve their contents. The fire resistance of the material, construction, or device tested is measured by the number of hours and minutes during which these requirements are met in the fire test. Ability to withstand erosion from hose streams, as applied in extinguishing fire, is also required for walls, floors, and partitions.

Building Columns.

Among the researches completed on the basis of the above standard, are two series of tests of building columns. The column is one of the most important structural elements of a building, since failure of a single column may cause collapse of a considerable portion of a building. Requirements in different building codes varied from 2 to 4 inches protective thickness of fire-resistive materials. The results of one of the comprehensive series of fire tests have been published as a joint report by the Underwriters' Laboratories, Chicago, and also as Technologic Paper No. 184 of the National Bureau of Standards. The results of the other, which was concerned with tests of concrete columns conducted at the National Bureau of Standards, is published in Bureau of Standards Technologic Paper No. 272.

Masonry walls.

While fire walls of masonry have long been recognized as increasing the fire safety of individual buildings as well as decreasing the community hazard from spreading fires, no quantitative measurement of the protection afforded had been made until fire tests of walls, comparable in size to that of a wall panel in a building, were made by the National Bureau of Standards. The results of these tests have been published as Research Paper No. 37 in the National Bureau of Standards, Journal of Research, volume 2, January, 1929.

Roofing materials.

In efforts to decrease the community fire hazard, most municipalities impose restrictions upon the kind of roofing materials permitted within city limits or in certain portions thereof. The scope of such restrictive measures has occasioned much dispute, and at the request of organizations representing producers and users of roofing materials, a comprehensive series of tests of the fire resistance of all prepared roofing materials in ordinary use was undertaken. This has included tests of new and weathered wood shingles, and asphalt prepared roll roofing and shingles, slate, asbestos, metal, and tile roofings. Tests have also been made of painted and chemically treated wood shingles, both new and after exposure to the weather for periods of up to 12 years. Specimens of weathered wood shingle roofs covered with asphalt prepared roll roofing and shingles or with paint coatings have also been tested. For the combustible roofings, the fire resistance of the weathered roofings was generally considerably below that of the newly applied materials, although some forms of asphalt roofings showed little decrease in fire resistance after weather exposures of up to 12 years. Results of the tests also emphasize the general superiority from the fire-resistance stand-point of incombustible roofing materials, such as slate, cement-asbestos, clay and concrete tile, and metal. The results of the tests are being prepared for publication.

There was held at the National Bureau of Standards on November 6, 7, and 8, the second Bureau of Standards Soil Corrosion Conference, the purpose of which was to afford those engaged in soil-corrosion research an opportunity to compare methods of testing and to exchange ideas. The attendance was limited to representatives of organizations carrying on research work on soil corrosion who reported some unpublished results of their work. The reports belong to the participating organizations. The conference brought out the need for recognized units with which to measure corrosion and for standard methods for testing soils, pipes, and protective coatings. It appeared that the data now available are insufficient to permit the establishment of such standards.

Severity of fires in buildings.

In order that protection requirements, such as those for structural members, wall openings, and record containers be placed on a definite basis, it is necessary to be able to make reliable estimates of the severity of fires that can arise with typical constructions and occupancies involving given amounts of combustible materials per unit of floor area. This severity would have to be interpreted as equivalent to so many hours of the standard fire test, the fire resistance of the protections, constructions, and devices to be used being measured by this standard.

Since the data obtained from actual fires are inconclusive as concerns temperatures developed and the length of time they prevailed, some burning-out tests have been conducted in 1-story, fire-resistive buildings erected for the purpose; one being 15 by 29 feet; another 30 by 60 feet in plan. These buildings were fitted with old furniture and records to represent light commercial and record storage occupancies; the weight of the combustible contents ranging from 13 to 55 pounds per square foot. The results obtained indicate the possibility of establishing by this means a basis for applying materials, construction, and devices as resistance against fire with as great a degree of safety and economy as they are being applied for other structural purposes.

Other projects completed or in progress.

A paper is being prepared giving results of fire and operation tests of theater proscenium curtains and one on compressive strength of steel and cast iron at high temperatures.

Fire tests have been made of columns protected by poured and precast gypsum to supplement tests with block protections previously made. Fire, impact, and loading tests have been made of insulated safes to obtain data for revision of Federal specifications. Experimental work to determine the inherent fire hazard and protection required for household heating appliances is in progress. This was undertaken to provide a basis for protection requirements in building codes.

Considerable work on the susceptibility of materials to spontaneous heating and ignition is being conducted, some of it in cooperation with the Marine Underwriters. A survey of the amount and character of contents of typical fire resistive buildings has been made as an aid in making estimates of the probable maximum severity of fires that can occur with given occupancies.

A new furnace for conducting fire tests of walls and partitions has been recently completed. The first series of tests now in progress comprises light interior partitions of metal and wood studs, faced with different kinds of lath and plaster, wall board, or other interior finish.

SOCIETY OF AUTOMOTIVE ENGINEERS URGES STANDARDIZATION FOR MOTOR-BOAT TACHOMETER DRIVE

Recent Meeting of Motorboat Engine Division of the Society of Automotive Engineers Recommends Standard for Shaft Tachometer Drive

Greater progress in standardization that, when completed, should be of very material value to motor boat and motor boat engine manufacturers as well as the users of motor craft, is seen as the result of the October 21, 1931, meeting of the members of the motor boat and marine engine division of the Society of Automotive Engineers. As rapidly as these projects can be shaped into definite form, they will be circulated broadly to the motor boat and engine industry for study and constructive criticism.

Desirable standardization for outboard engines has been considered recently by both the members of the division and the Outboard Motor Manufacturers Association, relating principally to the mounting dimensions for this type of engine and propeller shaft ends. A subdivision has been appointed to draft a definite report on outboard engine mountings and to prepare a list of other outboard engine subjects for standardization.

In 1918 the Society of Automotive Engineers originally adopted the tachometer drive for aircraft engines, the engine end of the driving shaft of which was 0.152 inch in diameter. Because of breakages of the shaft, this diameter was increased to 0.187 inch in 1922 and remained standard until 1928, when, largely because of improved materials being used, the diameter was reduced to the original $\frac{5}{32}$-inch shaft. In the meantime, however, the $\frac{3}{16}$-inch diameter shaft had come into use by the motor-boat industry for fuel pump as well as tachometer drives.

After considerable study of the matter, those attending the meeting on October 21 voted to recommend adoption of a motorboat tachometer drive having a $\frac{3}{16}$-inch shaft and that only the engine end of the drive be adopted. All other dimensions would be virtually the same as the present Society of Automotive Engineers standard for aeronautic tachometer drives. (See p. 14 of the 1930 edition of the Society of Automotive Engineers Handbook.) The division also considered the desirability of having a standard reduction-drive ratio, but this was left for further study, with the suggestion that the ratio for engines operating at not over 2,000 revolutions per minute be at engine speed and for engines intended to operate above 2,000 revolutions per minute at half engine speed.

When the present Society of Automotive Engineers recommended practice (see p. 413 of the 1930 edition of the handbook) was formulated in February, 1929, it was intended that the couplings should be made of high-strength material and definite Society of Automotive Engineers steels were proposed, but the standards committee, in approving the report, deleted the steel specifications. The question of material has again been considered by the division because of lack of complete information in the standard regarding its applicability, and the division has now recommended that the following note be included under general information given on the handbook page referred to in this paragraph.

Material.

The design of these couplings requires that they be made of a suitable grade of steel or similar high-strength material, as cast iron is unsuitable for couplings of this type and these dimensions.

GAGE BLANKS STANDARDIZED

Pamphlet on Plain and Thread Plug and Ring Gage Blanks "CS8–30" Released

A printed pamphlet, Plain and Thread Plug and Ring Gage Blanks, Commercial Standard CS8–30, has been released by the Government Printing Office and was distributed to acceptors of record on December 6, 1930.

The standard includes details of construction for plain cylindrical plug gage blanks, thread plug gage blanks, plain ring gage blanks, thread ring gage blanks of all sizes above 0.059 to and including 4½ inches in diameter and the official monogram used to identify such gages. The recommendation applies to gage blanks only and does not attempt to set up dimensions or tolerances for finished gages.

The standard was developed by the American Gage Design Committee as a means for simplifying gaging practice through the adoption of standard designs for gage blanks and component parts. While the committee was given full support and recognition by the American Standards Association, the War and Navy Departments, and the National Screw Thread Commission, the majority of the work was contributed by the industry itself, many of the country's largest industrial units in widely diversified fields being represented by active membership on the committee. The committee's efforts in this connection were furthered by the generous cooperation of the gage manufacturers on the committee who offered, without reservation, to dedicate to public use their proprietary patent rights on any gage construction, the utilization of which might be desired by the committee.

The pamphlet includes a list of acceptors and a brief history of the project as developed by the American Gage Design Committee.

A list of the members of the standing committee is also given, which was appointed to consider semi-annually any comment or suggestions as to changes in the standard in order that it may be kept in accord with the desires of the industry and the advance in the art.

Copies of the pamphlet may be purchased from the Superintendent of Documents, Washington, D. C., for 15 cents per copy (stamps not accepted).

DESTRUCTIVE WEATHERING OF ROOFING SLATE

Formation of Gypsum During Weathering Process Gives Clue to Cause of Decay in Slates

How a natural rock composed mainly of inert minerals and possessing a high strength as well as very low porosity is attacked by the weather is a problem of considerable interest to both producers and users of roofing slate. While slate roofs are commonly considered as among the most permanent types, there are instances where this material has not come up to expectations.

During the past year the National Bureau of Standards has studied this question with the particular object of devising specificational tests. The study of weathered slates from roofs, together with numerous tests, has indicated that the decay is due to a combination of chemical and physical processes. Frost action apparently takes very little part in the decay until the material has been considerably altered from its original condition by certain chemical transformations.

It is a well-known fact that decayed slate usually shows the presence of quite appreciable amounts of gypsum, although the fresh slate is practically free from this substance. Some investigators have accounted for the formation of gypsum in decayed slate by assuming that the small amounts of sulphuric acid in the air react with the calcitic impurities.

This may account for a part of the gypsum, but it has been proved that this substance can also be formed in some slates by merely soaking and drying them several times. The formation of gypsum during the weathering process affords a clue to the cause of decay and indicates that the mineral impurities concerned in the reaction are calcite and pyrite, the necessary oxygen to complete the sulphate radicle being drawn from the air. Apparently free carbon, which is usually present in slate, aids the reaction.

The conversion of calcite to gypsum brings about expansive forces within the slate, since the gypsum molecule requires more space than the calcite molecule. Scaling of the surface of the slate results, and this action is practically always more pronounced on the covered portion of the shingle than on the part exposed to the weather. This peculiar condition is probably caused by water penetrating between the shingles during rains and the slower rate of drying there than on the exposed surface.

Laboratory experiments indicate that the formation of gypsum within the slate does not occur when the material is continually wet and that periods of moist conditions alternating with periods of dry conditions are necessary to cause the reaction. Slates having only a small amount of calcite impurity are affected by this type of decay at a very slow rate. A very dense slate containing considerable calcite is not decomposed as rapidly as a more porous one with a similar calcite content.

Some of our domestic roofing slates may be depended upon for more than 30 years of serviceable results while others are apparently good for more than 100 years.

FUEL-OIL STANDARD REAFFIRMED FOR ANOTHER YEAR

A standing committee for the Commercial Standard on Domestic and Industrial Fuel Oils has recommended the reaffirmation of the commercial standard for another year. Their decision was based largely on a report made from data furnished from the larger refining companies regarding their use of the commercial standard specifications in which the unweighted average adherence of 32 refiners was 77 per cent.

A pronounced trend toward a better understanding between refiner, distributor, and consumer is evidenced in the growing use of the commercial standard designations in the manufacture, sale, and use of fuel oils, and consequent economies have resulted from a complete understanding among all branches of the industry.

NEW AND REVISED PUBLICATIONS ISSUED BY THE NATIONAL BUREAU OF STANDARDS

Annual Report of Director of the Bureau of Standards. (Misc. Pub. No. 115.) This is the printed annual report made by the Director of the Bureau of Standards to the Secretary of Commerce for the fiscal year ended June 30, 1930. The various outstanding accomplishments of the bureau are grouped according to the subjects for which the Congress had made specific appropriations. Price, 10 cents.

Classification of Radio Subjects.—An Extension of the Dewey Decimal System. (B. S. Circular No. 385.) This is a systematic scheme of classification of subjects in radio science and engineering which is necessary in classifying references to current radio publications and also for classifying all sorts of other radio material, such as reports, reprints, drawings, books, apparatus, etc. Since the publication of Circular No. 138 (superseded by this circular) in 1923, the subject classification it presents has been used extensively by many radio research workers and engineers as well as by the radio section of the National Bureau of Standards. The present circular brings the classification up to date and makes a few changes which use has shown to be necessary. Price, 10 cents.

Dental Hypodermic Needles. (R108–29.) This is the published recommendation, as adopted by the June 17, 1929, conference of the industry. The pamphlet contains the simplified list of stock varieties of dental hypodermic needles. Price, 5 cents.

Industrial Truck Tires. (R103–29.) This is the published recommendation, as adopted by the June 6, 1929, general conference of the industry, and contains the approved schedule of dimensions for industrial truck tires. Price, 5 cents.

Manufacture of Insulating Board from Constalks. (Misc. Pub. No. 112.) This pamphlet gives detailed data about the location and quantities of cornstalks available, the physical and chemical composition of the stalks and the parts thereof, and the methods and costs of harvesting and baling the stalks and delivering them to the factory. It describes the experimental work on the manufacture of insulating board from cornstalks, from the first laboratory experiments through to semicommercial production, giving details of different ways of making pulp from cornstalks and different types of equipment used to make board from the pulp. It also contains test methods and specifications showing quality of the board produced as compared with similar products. It estimates in detail the capital and operating costs for a commercial factory and analyzes the present and probable markets for insulating board. Price, 10 cents.

STANDARD FOR DRESS PATTERNS

Dressmaking in the Home Still Important in Our Economic Life Despite Mass Production in Industry

Dressmaking, an activity of American domestic life which has given way in a large measure to mass manufacture of ready-to-wear garments, continues as an important household occupation upon which depends a wide range of related industrial enterprises.

Dressmaking in the home offers a possible avenue of economy with which the National Bureau of Standards has become identified and in which other Federal agencies, colleges and institutes, pattern designers, fashion services, and department stores are cooperating. The bureau's relation to this activity concerns the adoption of a uniform system of classification and sizes for dress patterns which enables the American woman to select a pattern which corresponds with known body measurements.

While the ready-to-wear dress manufacturers have supplanted a large part of the practice of home dressmaking, largely through immediate reproduction of new styles and through lowering of prices by mass production, the industries concerned with hand dressmaking have taken steps to stimulate interest in this activity through cooperation, improvement of service, and attractiveness of style offerings. The increasing circulation of women's style magazines is sufficient testimony of the interest in this field.

The extent to which home dressmaking is practiced is revealed in the sales of household sewing machines. In 1929, the value of production of both the hand and the electric type exceeded $21,000,000, and represented nearly 700,000 units. The trend toward the electric type of machine is noted in the census figures which shows the number of electric units produced last year to be nearly equal to the number of foot and hand machines. In 1927, the number of foot and hand machines produced was substantially greater than the electric type. More directly related to home dressmaking is the business of dress pattern manufacturing. In 1927, the production of dress patterns was valued at nearly $14,000,000.

Also identified with hand dressmaking are the fashion services, style magazines, piece goods, sewing thread, laces, trimmings, buttons, fasteners, and numerous other materials.

The standard for dress patterns which was adopted by the industry after a series of conferences with representatives of education institutions, merchants, members of the industry, and designers, was put into effect at the beginning of 1930. The sizes adopted were agreed upon after a study of anthropometric measurements, the experiences of pattern manufacturers, and consumer demand. The principal aims of the pattern standard are to facilitate the selection of patterns of the proper type and size, to minimize the necessity of alteration, and to contribute to more satisfaction in the use of dress patterns.

The adopted standard sifts the former large number of confusing classifications into eight size groups. These are ladies, misses, juniors, girls, children, infants, boys, and little boys.

Each of these groups contains a series of sizes which are based on definite body measurements. A size 6 in the girls' group, for example, would fit a measurement of 24 inches around the breast, 24 around the waist, and 36 inches from the socket bone (back of neck) to the floor. In the ladies' group, the measurements covered are bust, waist, and hip.

The measurements adopted provide the pattern producers with a uniform basis on which to make allowances, such as for fullness, style, etc., without affecting the individual or style characteristics of the pattern. They assure the consumer a suitable size or fit, regardless of what measurements or brand of pattern is preferred.

The measurements embodied in the standards adopted by the pattern manufacturers do not affect the sizes of the ready-to-wear dresses, inasmuch as dress manufacturers have their own system of sizes. The ready-to-wear makers have, however, shown considerable interest in the pattern standard as attested by the number of inquiries received from them for copies of the commercial standard pamphlets.

SIMPLIFIED PRACTICE VALUABLE AID IN PURCHASING

"The purchasing agent of to-day has realized his responsibilities, analyzed his problems, and has applied modern methods of management," said George A. Cooper, a member of the staff of the National Bureau of Standards, in an address before the Indianapolis Purchasing Agents' Association on November 26, 1930.

"The knowledge of simplification and standardization is another tested link in the chain of essential principles necessary to the art of intelligent purchasing. Many of the acceptors of simplified practice recommendations have reported savings ranging from $1,000 to $100,000; while the total annual savings of more than $250,000,000 to industry is due to the application of the recommended simplified schedules.

"Simplified practice is a method of reducing waste by eliminating unnecessary variety in industrial products. Each program must originate within the industry concerned, and the determination of which items shall be eliminated and which retained is made by representatives of all interests in general conference. The principle aid rendered by the division of simplified practice of the National Bureau of Standards is in coordinating the preliminary work, assisting to secure general adoption, and to maintain sustained adherence."

In the course of his discussion Mr. Cooper told of the present status of simplified practice and its relation to purchasing; the results which are accruing to purchasing agents through its application; and of opportunities whereby every industry may benefit through the services of the National Bureau of Standards.

WALL-PAPER INDUSTRY ADOPTS CERTIFICATION PLAN

Quality of Paper not Discernible Upon Casual Inspection; Seals or Labels to Guide Purchaser

Greater attention to quality, evidenced in better colors and coatings, has helped the Nation's wall-paper industry to maintain a satisfactory rate of business and withstand competition from other wall coverings.

Realizing the need for providing the consumer with a guarantee of quality, wall-paper manufacturers have cooperated in a plan of certification which was effected through the National Bureau of Standards. This plan entails the adherence of manufacturers to certain requirements as a basis for guaranteeing wall paper against color fading. The wall-paper industry has managed to withstand the competition of plastic wall effects and various wall treatments, largely by offering better and more attractive papers to the consumer. Its request for cooperation offered by the National Bureau of Standards in the quality certification standard is one instance in that direction, and its employment of modern designers is another.

Along with the esthetic appeal which the purchaser seeks in wall paper, a product is desired that will have a reasonably long life. Unfortunately, however, these qualities are not discernible upon casual inspection. Many low-grade papers, which find their way to the market are serious competitors with quality papers in the show room, but in actual use these papers are found to fade and discolor too quickly.

In order to induce their customers to choose a high-grade product and to provide the industry with an incentive to improve wall paper, the manufacturers are certifying through the use of seals or labels, that the quality of the paper conforms to the accepted standards.

The requirements of the wall-paper standards, in regard to color fastness, are:

> All printed papers, grounds, backgrounds, or ink embossed; in other words, all finished printed wall papers shall be resistant to light, showing no discoloration or fading when the printed side is exposed toward the rays of a carbon arc lamp, as the fadeometer or its equivalent, for a period of 24 hours. During this test the temperature of the atmosphere adjacent to the paper sha not exceed 40° C. (104° F.).

According to the producers the test with the fadeometer during the 24-hour period gives assurance that the colors will not fade for at least two years. The standard also specifies that "all paper shall be completely grounded or coated," that a certain quality of paper be used, and that the printing shall be hard enough so that the coatings will not be rubbed off when under ordinary usage. The standard does not in any way limit the variety of colors or patterns used, but affects only the quality of paper and the fastness of color.

The standard, which went into effect on August 1, 1929, has been accepted by the majority of wall paper manufacturers, decorators, trade schools, institutes, home economics colleges, vocational schools, universities, paint and wall paper trades, mail-order houses, and merchants.

The production of wall paper last year was valued at approximately $30,000,000, according to the Bureau of Census. The number of people employed in the industry totaled nearly 5,000 and there were 54 establishments listed.

REVISED SCALE FOR MOTOR FUELS

Fundamental Principle of Referring Knock Ratings to Mixtures of Pure Hydrocarbons Unchanged

Further study by the detonation subcommittee of the cooperative fuel research steering committee and the lubricants division of the Society of Automotive Engineers standards committee has resulted in revision of the proposed method of rating fuels, to read as follows:

Gasoline knock-testing results shall be referred back to heptane-octane by using a scale of octane numbers, the octane numbers to be the percentage of iso-octane (2, 2, 4, trimethyl pentane) by volume, in a mixture of iso-octane and normal heptane required to match the antiknock value of any given fuel.

This revised proposal following its approval on September 15 was referred to the lubricants division by the cooperative fuel research steering committee. The revised recommendation differs from that made on May 28, 1930, only in the definition of the term "octane number." The fundamental principle of referring knock ratings to mixtures of pure hydrocarbons is unchanged and the same two hydrocarbons (heptane and iso-octane) are recommended.

The chief reason for defining octane number as "percentage of octane in blends of heptane and octane" rather than as "parts of octane added to 10 parts of heptane" may be summarized as follows:

While either definition results in a satisfactory scale for motor fuels of to-day, which range in antiknock value from about 50 to 80 per cent octane, it appears probable that future developments may result in fuels approaching pure octane in antiknock value, or even exceeding it. If the octane numbers were defined as originally proposed, fuels equivalent to 95 per cent octane or more would have numbers which would appear entirely out of keeping with their actual antiknock value, as the "parts of octane per 10 parts of heptane" approaches infinity as one approaches pure octane.

This objection does not hold if the octane number is defined as "percentage of octane." Pure octane would have an octane number of 100 and the scale could be extended above this point by such a secondary definition as "octane numbers above 100 are defined as 100 plus the percentage of pure benzene in iso-octane-benzene blends." Whereas this may be considered as looking too far ahead, it is felt that any scale adopted should be capable of indefinite extension without abandoning the scale used for fuels of to-day.

MAKING STANDARDS EFFECTIVE

Compilation of Plans of Various Agencies to Encourage the Use of Specifications and Standards

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In the development of the national standardization movement, emphasis was naturally placed first upon the establishment of specifications and standards suitable for general use. Even up to the present time, the making and promulgation of specifications continue to receive a large share of the publicity attendant upon the general movement. It is obvious, however, that these phases of the work are only preliminaries to the actual use of standards, and it is fairly evident that such actual use will not come about automatically without effort on the part of those interested. This fact has not been overlooked by business men, and activities directed toward the effective use of standards have arisen more or less independently in many quarters.

Many progressive trade associations include among the services given to their members educational campaigns to show the value of standardization in their own business. These campaigns set forth the advantages gained by mass operation in production, elimination of waste in distribution as well as manufacture, and the reduction of sales expenses.

A considerable number of technical societies, trade associations, and consumer groups have gone further, and have taken the view that in order to make most effective use of commodity standards those standards must be understood and accepted by consumers as well as by those concerned with production and distribution. Consequently these organizations have not only encouraged manufacturers to produce commodities conforming to accepted standards and specifications, but have also taken definite steps to provide means and methods by which the buyer can identify goods complying with the specification requirements. These activities, in general, are based upon standards which have been given national standing through some recognized agency.

The following outlines set forth in brief form the methods used by a number of organizations to facilitate the use of their own or other standards and specifications by manufacturers and the identification of goods made according to those standards. Some of the information was taken from the publications of the organizations. Much of it was obtained in response to inquiries addressed to officers of American technical societies and trade associations regarding their campaigns for encouraging and facilitating the use of their standards and specifications throughout industry.

No attempt has been made to give either a summary or an outline of the widespread use being made of the specifications of certain societies by manufacturers who utilize the nomenclature classifications of these societies in identifying their products.

Many branches of the national and local governments are active in promoting and facilitating the use of their specifications and standards. The only mention made of these activities in the following outlines is in connection with the cooperation being received by technical societies, trade associations, and consumer groups from the governmental agencies:

American Association of Medical Milk Commissions permits any dairyman who agrees to undertake the production of certified milk to use the association's approved seals bearing the term "certified milk" on milk bottles. Continued use of these seals is based on weekly examination and inspection of sample milk by medical milk commissions organized in various counties throughout the country.

American Automobile Association has established a contest board whose function is to set standards and formulate rules under which competitive automobile races are run; speed tests are sanctioned for international recognition, and automotive products are tested for an unbiased opinion as to their merit. It adopts the specifications for automobiles participating in championship races. Out of the stress and strain of these races have come many refinements and improvements to the automobile. Tests of automotive and allied products under standard rules have become one of the major activities of the contest board which offers a medium for the industry to have its wares certified to the car-owning public.

American Bakers Association operates a bread-scoring department which is part of the American Institute of Baking conducted by the association for scientific research and education. As a service to bakers the association has adopted a standard form of bread record for use by bakers for scoring bread and for submitting samples of bread to the department for the purpose of receiving benefit of comparable judgment of numerous samples submitted from all over the country. The association is encouraging the scoring of all bakery products as well as the bakery itself in order to improve not only the quality and uniformity of the products but also the methods of manufacture and merchandising.

American Chemical Society has in operation a plan whereby dealers are induced to stock reagent chemicals in metric unit weights and in the standard packages recommended by the society. The names of those dealers who comply with these requirements are published in the society's journals twice a year.

American Corn Millers Federation has adopted a symbol to be licensed by the federation to all millers who will agree to conform to its specifications for corn meal.

American Dental Association recommends that manufacturers of amalgam alloys indicate by suitable labels or their equivalent that their product is guaranteed to meet the requirements of either the specifications of the association or those of the Federal Specifications Board relating to this commodity. In the event of dispute between a member of the association and a manufacturer, the association acts in an advisory capacity and designates testing laboratories having equipment for making the necessary tests of dental amalgam alloys for the purpose of determining whether or not they comply with the specifications' requirements.

American Gas Association has established a gas-appliance testing laboratory and permits manufacturers of appliances which have been approved by the laboratory as complying with its safety and performance requirements to attach to the appliances the official approval seal of the association.

American Institute of Steel Construction permits its members who adhere to its code of standard practice to use the institute's symbol as a label for their commodities.

American Medical Association has inaugurated a plan for the classification of foods which are presented for consideration to the Committee on Foods of the Council on Pharmacy and Chemistry. All foods merchandized under a label, or which are advertised in any way, may come within the scope of the committee's considerations. The committee on foods grants the privilege for display of its "seal of acceptance" on foods which have been found to comply with the requirements of its rules, regulations, and standards. The seal may be displayed on the container label, in advertising matter, or in any form of advertising display related to the product. Foods which have been termed "accepted" by the committee are

announced in the columns of the Journal of the American Medical Association and in Hygeia and listed in the book "Accepted Foods." Such accepted food products will be permitted advertisement space in the association's publications. A food for any reason not acceptable at first presentation may have opportunity for reconsideration after the necessary changes of composition or process of manufacture have been made. Foods with unacceptable claims which the submitter will not agree to correct or delete will be announced as "rejected" in the columns of the above publications, together with the reasons for rejection, and such rejected foods will not be given advertising space in the publications of the association. Food products submitted to the committee must be accompanied by complete and detailed information on manufacture, chemical composition, ingredients, and any data in support of unusual claims. Evidence must be provided that they are neither adulterated nor misbranded under the terms and provisions of the Federal food and drugs act or other Federal food statutes. A seal, if displayed on the package, must be the only seal of such character and must not appear in conjunction with the seal of any other investigative organization excepting that of a Federal Government agency. Should an accepted product for any reason become unacceptable, the privilege of display of the seal will be revoked immediately. All changes in advertisements, claims, or copy of accepted foods, composition of the product, process of manufacture, or those of any other nature, made subsequent to announcement of acceptance, must first be reported to the committee before use. Unless these requirements are strictly adhered to, the committee reserves the right to rescind the use of the seal on all accepted food products of those manufacturers who have been found guilty of violating these rules.

American Oil Burner Association has recommended a model ordinance governing the construction and installation of oil-burning equipment for use by municipal authorities having jurisdiction over such installations. In order to encourage the use of this ordinance, the association publishes and issues a circular entitled "For Clean Cities—Oil Heat and Constructive Municipal Regulation."

American Petroleum Institute grants to manufacturers the right to place its official monogram on certain standardized equipment upon certifying that the material so marked complies with all of the conditions and standards contained in the official publications relating thereto. The institute reserves the right to revoke the use of its monogram for any reason satisfactory to the board of directors.

American Society of Mechanical Engineers permits manufacturers to place the American Society of Mechanical Engineers symbol on boilers complying with the requirements and tests of its boiler construction code. In its Mechanical Catalogue special notations are employed to indicate those firms supplying equipment in conformity with standards of the American Standards Association.

American Society for Testing Materials, after consultation with a number of leading apparatus manufacturers and dealers of testing apparatus, through its executive committee, has announced the following policies:

1. The society, in general, will not formally approve or certify any specific testing apparatus as conforming to American Society for Testing Materials standards or tentative standards for that type of apparatus.

2. The society will welcome inquiries or information about testing apparatus intended to conform to American Society for Testing Materials requirements for such types of apparatus and will, through the appropriate committee of the society, point out significant departures, if any, from the society's requirements. Where no such departures are found, it will be suggested that the manufacturer place his own guarantee on the apparatus that it meets the American Society for Testing Materials requirements for that type of apparatus.

3. It is suggested that purchasers of testing apparatus secure a guarantee from the manufacturer or dealer that apparatus purchased for use in making tests in accordance with American Society for Testing Materials requirements, either standard or tentative, conforms with the specified requirements for such apparatus; and that instances of failure of apparatus to conform with American Society for Testing Materials requirements, when advertised or marketed as meeting such requirements, be reported to the society.

American Veterinary Medical Association has recommended the adoption of a uniform health certificate to accompany animals being shipped interstate. A committee of this association is endeavoring to bring about a standard classification of all veterinary biological products that are now in use for the purpose of preventing or curing diseases of animals. Each product will be placed in one of three classes or groups, as follows: Group A, those veterinary biologics which are efficient, or whose worth has been proven; group B, those biologics which are still in the experimental stage; and group C, those biologics which possess little or no value.

Arkansas Soft Pine Bureau has inaugurated a plan whereby all stock shipped by its member mills is trade-marked with the registered symbol of the bureau, and grade marked in accordance with American lumber standards relating to sizes and grades of softwood lumber recommended by the Central Committee on Lumber Standards and published by the United States Department of Commerce.

Aromatic Red Cedar Closet Lining Association recommends to its members the use of a label, on either or both package and invoice, guaranteeing that red cedar closet lining supplied by them conforms to the standard grading rules as set forth in the commercial standards relating to this item.

Ash Handle Association has recommended that manufacturers of ash handles for fork, hoe, rake, and shovel identify the grades of handles by impressing in the wood the symbol for the appropriate grade. The markings on the handles shall be made in accordance with the grading rules set forth in the simplified practice recommendation relating to these items.

Asphalt Shingle and Roofing Institute, at a meeting held in April, 1926, adopted a resolution in which the entire membership of the institute unanimously signified its willingness to certify to purchasers that commodities supplied by them on contracts based on Federal specifications have been tested and found to comply with the requirements of these specifications.

Associated Cooperage Industries of America maintains an inspection service for members and nonmembers for the purpose of passing upon the quality of cooperage material, in accordance with the established grade rules and specifications of the association, at either the mill yard or destination.

Associated Factory Mutual Fire Insurance Companies has established the factory mutual laboratories under the direction of its inspection department whose function is to test for approval only those devices which have a direct bearing on fire hazards or fire protection in factory mutual risks. Manufacturing firms whose devices have been tested and approved as to both design and construction by the laboratories are permitted to use the association's identification mark of approval on their devices. The association revises and reissues annually its alphabetical list of approved appliances, thus furnishing purchasers with up-to-date information as to what devices are approved and where they may be obtained.

Associated General Contractors of America enters into agreement with manufacturers of concrete mixers in accordance with which permission is granted to attach to each machine a standard name plate designating that it complies with Associated General Contractors standards for mixers, thereby assuring the purchaser of definite capacity and a satisfactory degree of performance. Manufacturers whose machines fail to comply with the association's standards may be denied the use of the plates.

Associated Knit Uunderwear Manufacturers of America licenses manufacturers, whether or not they be members of the association, to use the standard label adopted by the association and protected by law on garments which have been made to conform to the measurements recommended by the National Bureau of Standards. The form of the license is considered in the nature of a contract between each manufacturer and the association. The license carries with it an obligation on the part of the licensee to put up a small bond to cover the cost of an inquiry as to the abuse of the standard label where the licensee has been found guilty of such abuse. To enforce the proper use of the standard label, a committee of inquiry and correction has been set up, composed of representatives of the association and of its affiliated distributors' associations. This committee has the power to hear complaints concerning the abuse of the standard label by customers, retailers, jobbers, and manufacturers; to hear all evidence which may be brought up in connection with such complaints; and to decide whether or not a manufacturer has willfully, knowingly, and continually violated the terms of his license contract, and in such a case to revoke the manufacturer's license, giving the utmost publicity to such a revocation.

Associated Thermometer Manufacturers cooperated with the division of trade standards, of the National Bureau of Standards, in the establishment of the commercial standard for clinical thermometers. Manufacturers who have accepted the

provisions of the commercial standard have expressed their willingness to certify to purchasers that clinical thermometers manufactured by them comply with the requirements of the commercial standard. Each thermometer is to be accompanied by a certificate giving the name of the manufacturer, the place of shipment, and the date.

Associated Tile Manufacturers has adopted uniform grade names and a color scheme for grade marking, and certificates to accompany packages of various types of tiles manufactured to comply with the simplified practice recommendation relating to this group of commodities. If required in the architect's specification, typical samples of each kind and grade of tiles as specified and proposed to be used, and shop or setting drawings or rubbings, shall be submitted to the architect for approval. Each sample shall be marked with the name of the manufacturer and the grade of the tile. Approved samples shall be retained by both the architect and the tile contractor. Before setting any tiles, the tile contractor shall furnish to the architect a certificate of grade, properly filled in on the form of grade certificate issued by the association. The certificate shall be signed by the manufacturer of the tiles; shall state the grade, kind, and full quantities of tiles; and give identification marks for all packages of tiles furnished under the contract. Packages shall be branded with corresponding shipping marks, and shall be subject to inspection by the architect or his representative before being opened.

Association of American Feed Control Officials has adopted uniform types of labels for all classes of feeds. Manufacturers or jobbers are required to place labels on all packages of feeds and the registration of brands and guaranties must be filed with the association. Each package of feed must bear a complete label. The label must be printed on one side of a tag attached to the package, and must indicate the names of all ingredients, quality of the feed, name of brand, and the net weight of the feed in the package. A guaranty and label for a brand having been registered may not be subsequently so modified as to permit the lowering of the quality of the feed, unless it can be clearly shown that the modification sought to be made is consistent with the interest of the feeder. The association will cancel the registration of any feed when it has been found that the brand name is misleading in any respect, or the feed contains an injurious ingredient, or packages are incorrectly labeled with regard to ingredients, or there is evidence of misbranding or adulteration, or when labels on packages contain any statement, design, or device which tends to deceive or mislead the purchaser.

Association of Manufacturers of Chilled Car Wheels maintains a corps of inspectors who make semiannual inspection of all of the 58 associations foundries for the purpose of encouraging and facilitating the use of its specification relating to foundry standards and inspection and tests.

Association of Official Seed Analysts of North America is conducting a campaign to have the rules for seed testing promulgated by the United States Department of Agriculture become effective in the various States of the Union.

Better Bedding Alliance of America was organized chiefly to encourage the truthful labeling of the filling contents of bedding and the discouragement of any misrepresentation of the product. In order to prevent public deception and unfair competition, the alliance is promoting the passage of sanitary bedding laws which empower State inspectors to inspect bedding factories to insure that each article of bedding is correctly labeled as to the kind of filling material used and as to whether it is new or previously used.

Bureau of Explosives, which functions as an agency for cooperation between the American Railway Association and the Interstate Commerce Commission, maintains a chemical laboratory for the study of explosives and containers, and a force of traveling inspectors to insure compliance with the requirements of the specifications of the Interstate Commerce Commission dealing with the transportation of explosives and other dangerous articles.

California Redwood Association has established a department of inspection and grades through which the association supervises the grades of all redwood lumber manufactured by its member mills. Shipments which have been inspected are covered by inspection certificates bearing the official seal and signature of the association. These certificates insure purchasers that lumber so inspected conforms to the standard grades officially adopted by the association.

California White and Sugar Pine Manufacturers Association maintains a grading bureau composed of traveling inspectors who make periodic inspection of member plants in order to instruct graders in standard grading practices and to check the grades, thus insuring compliance with American lumber standards.

Canners League of California secured the adoption of a law by the California legislature requiring all canned peaches, pears, apricots, and cherries of a grade below certain approved standards to be marked "seconds. wholesome fruit unsuited for the better table grades," together with a statement indicating the density of the sirup, or, if the fruit is packed in water, a statement that it is without added sugar. This information must be lithographed on the lid of the can in letters of a specified size. These standards are in harmony with the minimum standards of the United States Department of Agriculture.

Certified Milk Producers Association of America has adopted the standardized methods of the American Association of Medical Milk Commissions for the production and distribution of "certified milk."

Commission on Standardization of Biological Stains has for one of its objects the improvement in the quality and reliability of the biological stains on the market. The commission does not manufacture or sell stains, but cooperates with manufacturers in determining whether or not stains manufactured by them comply with the requirements of certain standards. The manufacturers are urged to submit a sample of each batch of any stain to the commission for testing before it is put on the market. Any batch thus tested and found satisfactory may be sold by stain dealers under the commission certification issued in the form of labels and attached to bottles containing stains.

Common Brick Manufacturers' Association issues certificates of grading to those members whose products have been tested and found to comply with the requirements of the American Society for Testing Materials and Federal Specifications Board specifications. All members who receive the certificate of grading are authorized to use the association emblem on their products and in their advertising matter. Builders of brick walls are permitted to place the association's bronze marker in the walls as a guarantee that the walls have been constructed of tested clay products.

Concrete Products Association issues certificates of quality to its members when it is found that their products meet the requirements of the American Concrete Institute standards. Before a member can receive a certificate of quality, his product is tested by a representative of the association to ascertain whether or not it meets the standard requirements. These certificates are good for only one year and renewals can be obtained only upon tests made of new specimens. The association reserves the right to deny further use of certificates to any member whose product has been found to be below standard.

Concrete Reinforcing Steel Institute has devoted considerable study to a proposed quality mark for certified new billet steel. This quality mark, rolled into each bar, will assist the institute members to distinguish quality steel from foreign-made bars and domestic steel of questionable quality and grade. The institute has also in the course of preparation a form of licensing agreement which will permit its members to use quality certification trade-mark on steel which measures up to the required standards of grade and quality. In order to make the quality trade-mark effective, the institute has inaugurated a campaign to educate the users of reinforced steel to insist on quality marked bars in their purchase specifications.

Crown Manufacturers Association of America is assisting manufacturers in developing a crown labeling program which will conform to the requirements of Federal and State pure food and drug enforcement laws and regulations.

Diamond Core Drill Manufacturers Association has adopted an emblem to be attached to drill fittings or on packages or cartons containing the products to insure users that they are made in conformity with the requirements given in the commercial standards relating to these items. These emblems are supplied only to manufacturers whose plants are equipped with the necessary gages for producing the diamond-core drill fittings.

Durene Association of America, under a license agreement, permits manufacturers of knit or woven merchandise using yarns which fulfill the requirements of the association's standard to use the durene label or stamp with which to identify their merchandise.

Eastern Clay Products Association has adopted the standard specifications of the American Society for Testing Materials for clay sewer pipe and draintile. It has established a laboratory to which member plants submit specimens of their material for test to determine whether or not their material

conforms to standard definite requirements. In addition, the association maintains a staff of trained engineers and others specializing in their particular branch of trade association activity for the purpose of promoting and servicing the better and more extended use of vitrified clay sewer pipe and other clay products.

Glycerine Producers Association permits those members who produce radiator glycerine and follow uniformly the association's formula developed by its research committee, to sell the product under the grade name "G. P. A. Radiator Glycerine," which is the association's designation for a new grade of glycerine specially developed and manufactured for antifreeze use in automobiles and marketed in containers bearing the association's seal as part of a uniform design. Periodic tests of the radiator glycerine manufactured by member companies using the association's seal are made by the association's laboratories, in order to assure the public that the product is of uniform quality.

Grain and Feed Dealers National Association advocated the standards for grain which have been established by the United States Department of Agriculture in accordance with the grain standards act passed by Congress. In its effort to insure adherence to these standards by its members, the association has incorporated in its by-laws a clause whereby any member found guilty by the Department of Agriculture of a violation of this act stands automatically expelled from the association, and notice of his explusion is published in the association's official organ.

Gummed Industries Association has made arrangements with a commercial testing laboratory whereby acceptors of the simplified practice recommendation for No. 1 Kraft paper sealing tape may have available satisfactory means of testing tape which they manufacture, distribute, or consume. Any acceptor of the recommendation may send samples of tape for testing to the secretary of the association who will, in turn, send these samples, indentified by number only, to the laboratory for testing. The results of the test will be reported to the secretary who will, in turn, notify the sender of the sample.

Hardwood Interior Trim Manufacturers Association maintains an inspection service available only to members when they become involved in disputes arising regardiug the species, quality, quantity, or workmanship of lumber sold by them.

Hardwood Manufacturers Institute has inaugurated a "car card plan," and enters into an agreement with its members in accordance with which it issues licensed shipment certificates and a special form of envelope designed for use with such certificates, the purpose of which is to identify the grade and tally of hardwood shipments in sealed cars. Licensed members are required to place in every car containing hardwood lumber a licensed certificate, bearing the seal of the association, setting forth the contents of the car and certifying that the car was loaded by a competent inspector and guaranteed to be in compliance with the inspection rules of the National Hardwood Lumber Association. This certificate, a copy of which is sent to the association, is inclosed in the special form envelope and then placed in the car carrying the shipment of lumber, and is delivered unopened to the consignee immediately upon breaking the car seals and before the car is unloaded. The association reserves the right to revoke the license or cancel the agreement in any case where, in the judgment of the association, an improper or undue advantage is taken by any licensed member, or where the member fails to carry out any of the provisions of the agreement.

Heating and Piping Contractors National Association has developed a national program for certified heating to replace the purely local programs formerly in use. It has adopted national insignia, including a certified heatiug supplementary certificate, to be sent with each bid, the plate to be attached to each boiler, and the certificate to be issued on completion of the work to the house owner, certifying that the heating system was installed in accordance with the certified heating standards adopted by the association.

Hickory Handle Association has recommended that manufacturers of hickory handles identify the grade of each handle by impressing in the wood the symbol for the appropriate grade in accordance with the grading rules set forth in the simplified practice recommendation relating to hickory handles.

Ladder Manufacturers Association of America places its stamp of approval on ladders found upon inspection to comply with its requirements from the point of view of safety.

Malleable Iron Research Institute confines its efforts in the general standardization field exclusively to the certification of the product of member companies. Through laboratory and engineering work, the institute assists its members in the production of a product to conform to the requirements of the institute's specifications for malleable castings which are in harmony with those of the American Society for Testing Materials. Member plants submit to the institute's laboratory test pieces from every heat. Quality certificates are issued to those members whose products meet the requirements of the specifications. These certificates permit the member manufacturers to use the "certified malleable" trade-mark of the institute and to advertise their products as having been certified by it. The institute publishes regularly the names of members whose products have met the requirements of the specifications.

Maple Flooring Manufacturers Association permits member manufacturers to use the association's trade-mark on maple, beech, or birch flooring which is standardized and guaranteed by the association when passed upon by an association's official inspector, provided the grade name and species of the wood is stamped on each bundle of flooring. The association has inaugurated a "car card plan" by which it furnishes certificates to manufacturers who, in issuing them, guarantee the contents of sealed cars to be in conformity with the grading rules of the association.

Millwork Institute of California has inaugurated a certification plan based on standard minimum requirements of various grades of material, methods of construction, and quality of workmanship to be expected in millwork items. Under the plan, carefully selected manufacturers whose products conform to the provisions of the standards and who subscribe to the provisions of the license agreement, are licensed by the institute as "manufacturers of architectural woodwork." Their plants are designated by a license number issued by the institute. All products of licensed members are identified by labels or stamps carrying the words "architectural woodwork" and "certified by Millwork Institute of California," supplemented by the institute's insignia and the license number of the member furnishing the work.

Mirror Manufacturers Association advocates to its members the use of the association's self-identifyiug quality-guaranteeing label on mirrors manufactured in accordance with the several grades set forth in the commercial standard relating to this commodity.

National Association of Finishers of Cotton Fabrics has made arrangements with a commercial testing laboratory to conduct tests of all member goods to determine the degree of fastness to light and washing. Licensed finishers whose goods receive an "A" or "B" rating for fastness to light and washing are granted the use of the association's "Nafal" label, showing that the particular dyeing from which the sample was taken has passed the requirements and tests of the association's standard for fast colors. The license to use the label is automatically revoked if, by a majority opinion of the executive committee of the association, it has been found that the label was used in a manner contrary to the provisions of the license agreement. The association has adopted a standard method to be employed by the finishers of cotton fabrics for the return by finishers to the converter of all stretched as well as damaged goods, and remnants of finished merchandise over 1 yard in length. This principle which has also been adopted by the Textile Converters' Association has been established as a standard of conduct for the trade.

National Board of Boiler and Pressure Vessel Inspectors permits boiler manufacturers to place the association's approved stamp "National Board" on all boilers constructed in accordance with the American Society of Mechanical Engineers boiler code and inspected during construction by an inspector holding a national board commission.

National Canners Association, in cooperation with State canners associations, and with wholesale, retail, and consumer organizations, was instrumental in securing the passage by Congress of an amendment to the Federal food and drugs act, relating to the use of labels on canned food. The amendment provides that food products which do not meet the standard to be established by the United States Department of Agriculture shall be definitely labeled with a designation to be established by the United States Secretary of Agriculture for the identification of substandard foods. Products that meet the standard, or are above the standard of the act, can be distributed under the identical labels in use prior to the passage of the amendment. However, those products which fail to meet the standard requirements must be classed as substandard and a specific form of labeling must be used with them.

National Confectioners' Association of the United States employs consulting chemists to analyze the products of its members and others for adulteration and to determine whether or not they comply with established standards or in any way conflict with any Federal or State law. The association has adopted a code system for marking candy boxes to show the dates when shipments are received.

National Cottonseed Products Association has inaugurated a plan which has become a part of the association's trading rules for the development of standard methods for grading and evaluating cottonseed. Under this plan oil mills will base their quotations on basis cottonseed and will pay premiums for quality cottonseed containing combined qualities of oil and protein (meal) above basis standard. Likewise, off-quality product will bring less than basis cottonseed. The plan is designed to benefit all interests in the industry, namely, producers, shippers, ginners, and oil mills. In order to make its rules, definitions, and analyses effective, the association will expel any member from the organization who has been found guilty of misbranding or adulteration.

National Electrical Manufacturers Association, in its book entitled "Motor and Generator Standards," dated October, 1930, recommends "that the manufacturer guarantee that apparatus manufactured by him will deliver its rated output as indicated on the name plate, provided said apparatus is properly cared for, operated under normal conditions and with competent supervision." It also recommends "that when the apparatus is built to meet the requirements of the Government or other standard printed specifications, and the name plate clearly indicates the specifications to which the apparatus conforms, it is not necessary to include on the name plate the detailed information specified in the National Electrical Manufacturers Association rules."

National Hardwood Lumber Association maintains a staff of bonded inspectors in the principal producing and consuming centers of the country who are authorized to issue certificates on lumber shipments. These certificates are backed by this association with an adequate financial guarantee.

National Hay Association, when requested to do so, investigates the qualifications of inspectors and permits approved inspectors to make record of the association's approval on their official certificates of inspection.

National Lumber Manufacturers Association licenses the use of its "tree-mark" on each piece of lumber in conjunction with the grade-mark, trade-mark, or species mark of licensed mills that conform to the American Lumber Standards, the lumber being guaranteed by the National Lumber Manufacturers Association to conform to such specifications as may be branded thereon.

National Macaroni Manufacturers Association requires that all products manufactured by its members must be subjected to chemical tests and analyses at the association's laboratory to determine whether or not they comply with the association's standards and specifications, which are in harmony with those established by the United States Department of Agriculture.

National Pajama Manufacturers Council issues labels to its members guaranteeing that pajama measurements comply with the requirements of the commercial standard for this commodity.

National Preservers Association has sponsored a bill for congressional consideration in which are included the definitions and standards for fruit jars, preserves, jellies, apple butter, and other products, unanimously approved by the association membership. The object of the bill is to prevent adulteration or misbranding of products. It also provides that all substandard products shall be properly labeled as to their actual composition.

National School Supply Association has inaugurated a certification and labeling program whereby all janitor supplies used in schools will be properly labeled as conforming to certain standards promulgated and adopted by the association. The manufacturers or distributors of janitor supplies may submit samples of their regular janitor supply products to the association for certification purposes. These samples are tested in the laboratory of the association. When the samples tested conform to the different standards established, quality labels are issued and the companies are privileged to use the certification seals. The association also makes use of labels to identify school furniture complying in color with the standards established by the industry under the auspices of the United States Department of Commerce.

National Warm Air Heating Association has adopted a symbol which is placed on furnaces indicating that they have been installed in accordance with the requirements set forth in the association's standard code. Only those installers who have pledged themselves to install furnaces according to the standard code are entitled to use the symbol. The installation of furnaces is triply indorsed—by the installer, the furnace manufacturer, and the association.

National Wiping Cloth Standardization Association has inaugurated a guarantee plan which provides that every member of the association may continue to sell his wiping cloths under any classification or designation that he may see fit to use. At the same time certain standard classifications will be set up under which cloths will be sold with a guarantee to the consumer that they are packed in accordance with the association's standard specifications relating to quality. These cloths will be known as NAWMD Certified Wipers and each member desiring to handle wiping cloths under the guarantee will be furnished by the association with a certificate, bearing a permit number and a standard tag, which may be placed in or attached to bales or packages shipped. Members taking advantage of this plan sign an agreement to observe certain obligations.

New England Council has inaugurated a farm marketing program to encourage producers to grade and pack their products according to official State standards, and to identify them by means of quality labels placed on the containers in which the goods are packed. In making this program effective, the commissioner of agriculture in each of the six States has been granted legislative authority to establish and promulgate voluntary grades and standards for farm products. Several such grades are now in use in each State. The commissioner of agriculture has also been given the authority to adopt a suitable label for identifying such products graded and packed according to established standards. The New England quality label has been adopted by each of the six States. In establishing official grades and standards for farm products conferences are held by the commissioner of agriculture with groups of producers who are especially interested in the products for which grades and standards are to be adopted. At these conferences tentative standards and descriptive terms are freely discussed before final adoption. An attempt is made to keep the grade names, requirements, and descriptive terms as uniform as possible in all New England States, and in harmony with the recommendations of the Federal Government. Before the adopted grades and standards can become effective, they must be advertised in the press according to the law requirements of the States. Permission to use the New England quality label must be obtained from the commissioner of agriculture, and it may only be used on goods packed in accordance with official State grades. To protect the reputation of the quality label, each State department of agriculture maintains an inspection service with trained field men whose duties are to examine graded and labeled products to determine whether or not they comply with the necessary requirements.

New York Produce Exchange under its rules appoints annually a cottonseed products committee which, in turn, appoints one or more chemists and graders, whose duty it is to grade and analyze all cottonseed products submitted to them. Samples submitted for analysis are tested in the bureau of chemistry of the exchange in accordance with official methods adopted jointly by the National Cottonseed Products Association and the American Oil Chemists Society. Certificates of quality are issued and signed by chemists making the analysis or grading.

North Carolina Pine Association, at the direction of its board of directors, may employ, from time to time, for the association, a chief official inspector and as many assistants as necessary, who make regular tours of inspection to all of the mills of the members, and who also act as arbitrators in the adjustment of claims regarding inspection arising between retailers or purchasers and members.

Northern Hemlock and Hardwood Manufacturers Association has adopted a system of certified shipments of lumber whereby it enters into a licensing agreement with lumber firms to manufacture, grade, and ship lumber in accordance with the standard rules of the association. It maintains a force of inspectors who frequently visit the plants of licensed manufacturers for the purpose of checking the grading and inspection work. Only firms having competent lumber inspectors may be licensed. Under the terms of the contract a licensed firm agrees to place in each car of hardwood lumber shipped the association's licensed shipment form properly filled out to show the correct grade and tally of the lumber in the car, and to seal it within the association envelope. The buyer is thus furnished with a certified copy of the original inspector's statement of the amount and grade of lumber loaded into the

car at the original shipping point. The licensed manufacturer further agrees with the association that in case of complaint, the buyer shall unload the car and submit his tally report to the firm within five days after unloading. In the event of failure to reach adjustment, the buyer may obtain inspection in accordance with the inspection rules of the National Hardwood Lumber Association. The association may revoke the license of any manufacturer where it is found that improper or incompetent use is made of the association's shipment forms; or where the terms of the contract have been breached; or for any other reasons passed upon by the board of directors of the association.

Northern Pine Manufacturers Association maintains an inspection bureau for the purpose of supervising the grades of lumber at member sawmills in order to insure purchasers that lumber manufactured by these mills complies with American lumber standards. The bureau also furnishes reinspection service to buyers.

Paper Bag Manufacturers Institute (formerly the Grocery Bag Manufacturers Service Bureau) under a licensing agreement permits its members to use the association label on packages of bags guaranteeing the capacity of the bags to be in conformity with the standards set forth in the simplified practice recommendation relating to this item. The use of the label is also a further guaranty that the bags are packed full count, 500 bags to the package, and in accordance with the standard packing requirements adopted by the institute.

Paperboard Industries Association grants to its members the privilege of using its insignia in connection with the certificates used by manufacturers showing that boxes bearing these certificates conform to all construction requirements of the consolidated freight classification or the official express classification.

Porcelain Plumbing Fixture Manufacturers (advisory committee to the National Bureau of Standards) issue labels certifying compliance with the commercial standards for porcelain plumbing fixtures. Porcelain (all-clay) plumbing fixtures bear the trade-mark or name of the actual manufacturer and the words "Made in U. S. A." applied in such a manner as to be permanent. "Regular selection" labels are used only on such ware as conforms to the requirements for "regular selection" as set forth in the grading rules of the commercial standard for plumbing fixtures. No label is used on ware which grades lower than "regular selection." Labels are to be applied on ware only at the factory.

Rail Steel Bar Association permits its members to roll a uniform identification mark on deformed rail steel reinforcing bars produced by them. The use of this mark, which is protected by registration, signifies a willingness on the part of manufacturers to certify that bars produced by them comply with the requirements and tests of the association's standards.

Red Cedar Shingle Bureau permits its members to use labels as a mark of guaranty and indorsement on roofing shingles which, upon inspection, have been found to comply with the grading rules of the bureau, these rules being in conformity with those of American lumber standards relating to grades and sizes of cedar shingles.

Rice Millers' Association issues inspection certificates based on the grades and specifications for milled rice recommended by the United States Department of Agriculture. The association maintains a corps of samplers in the field and a laboratory equipped to test rice for condition, grade, and quality.

Silk Association of America, through its spun-silk research committee, permits manufacturers to use tags certifying that silk meets the specifications of that committee for "lavelle."

Society of Automotive Engineers limits advertising in its handbook to suppliers of automotive parts or materials which are made in accordance with the society's specifications. In each case certificates are signed by proper officials of manufacturing firms to the effect that the products advertised comply with designated specifications.

Society for Electrical Development has inaugurated a so-called "red-seal plan" for identifiying a house that is properly and adequately wired in accordance with approved specifications. The plan involves wiring specifications, an inspection, and an award. Basically, the wiring specifications consist merely of numerical values; that is, the number of circuits, switches, lighting, and convenience outlets, properly located to provide for the convenient use of the various lighting, heating, and power applications in a home. Inspection is provided locally by a representative of a duly authorized operating organization who ehecks the specifications against the job. If the wiring installation conforms to the specifications, an award is made consisting of a miniature red seal, permanently affixed to some part of the main service panel, and a certificate signed by officers of the operating organization is issued to the house.

Southern Cypress Manufacturers' Association maintains an inspection department for the purpose of checking and inspecting lumber manufactured by member mills to insure purchasers that it is graded and shipped in accordance with American lumber standards rules. Under proper inspection, member mills are permitted to stamp their lumber with the trade-mark, which has the approval .and backing of the association.

Southern Pine Association employs a staff of inspectors who make a monthly check on the member mills to determine whether or not lumber is being manufactured in accordance with the provisions of American lumber standards. Firms receiving this service are permitted to place the association grade and trade-mark of the expert grader on all of the lumber they manufacture.

Steel Barrel Manufacturers Institute maintains its own policing system for the purpose of protecting the buying public from unscrupulous deterioration of member products on the substitution of inferior material in the manufacture of steel barrels. All members have pledged themselves to adhere to the standards developed by the institute, or those established by the Interstate Commerce Commission, or those which are embodied in the rules of the consolidated classification committee, and certify to purchasers that barrels manufacured by them comply with the requirements of these standards.

Structural Clay Tile Association has adopted a certified quality label for the identification of clay products meeting certain quality standards. Member firms are permitted to use the association's label on their products for certifying that they meet the requirements of the specifications of the American Society for Testing Materials and the standards established by the association. The use of this label is restricted to materials of first quality that are specified for certain definite and recognized uses. The association reserves the right to revoke the permit to use its label when it has been found that a manufacturer has willfully misrepresented the quality of his product.

Textile Converters' Association has adopted a standard method to be employed by the finishers of cotton fabrics for the return by finishers to the converter of all stretched as well as damaged goods, and remnants of finished merchandise over 1 yard in length. This principle, which has also been adopted by the National Association of Finishers of Cotton Fabrics, has been established as a standard of conduct for the trade.

Tire and Rim Association conducts inspection work for the purpose of ascertaining whether or not tire rims constructed by its member manufacturers comply with the association's standards. Those rims which are approved are branded with the trade-mark of the association.

Tissue Paper Manufacturers Association authorizes its members to use the official label and seal of the association in guaranteeing packages of tissue paper to be in accordance with the simplified practice recommendation for this commodity. The label is issued in six different colors, each color indicating a particular grade of tissue paper.

Underwriters' Laboratories, established and maintained by the National Board of Fire Underwriters, tests appliances, devices, machines, and materials for their merits respecting life, fire, and collision hazards, and theft and accident prevention. A manufacturer, desirous of securing an examination and report with a view to listing by Underwriters' Laboratories on an appliance, system, or material, first deposits a preliminary fee as evidence of good faith and on completion of the work pays the balance of its cost as shown by accurate detailed records. As a warrant that an applicant will not incur costs beyond his expectations, a limit of expense is fixed wherever possible beyond which charges are not made. The amounts of the fees are in proportion to the nature and extent of the work required in examinations and tests. Whenever reports of appliances or materials are ready to be issued, the favorable opinion promulgated in the council report is followed by one of three forms of follow-up service with respect to subsequent factory output. The one known as label service consists of inspections of devices and materials at the factories by laboratories' engineers, and the labeling of standard goods by stamps, transfers, or labels, whereby they may be recognized wherever found. All such labels include the words "Underwriters' Laboratories Inspected."

United Roofing Contractors Association of North America permits manufacturers to use its trade-mark label on materials

inspected and found to comply with the association's specifications.

United States Shellac Importers Association has inaugurated a plan for the sampling of all shipments of shellac imported into the United States. The plan provides for a standardization bureau which shall examine each importation of shellac. An examination committee, composed of representatives of member firms, is intrusted with the duty of examining samples of the various grades of shellac and passing upon their quality in accordance with the official rules and regulations of the association. The examination committee issues certificates in triplicate on each lot examined, stating grade, mark, lot number, name of vessel, date of examination, and the committee's award. Copies of certificates are furnished to buyer and seller and another copy is filed with the association. Under the plan provision is also made for the settlement of any disputes which may arise in the operation of the plan, through existing arbitration machinery of the association.

Vitreous China Plumbing Fixtures Manufacturers (advisory committee to the National Bureau of Standards) authorizes manufacturers to employ labels for grade-marking products complying with the commercial standard for this group of commodities. Water-closet bowls, tanks, tank covers, lavatories, and all other vitreous china plumbing fixtures bear the trade-mark or name of the actual manufacturer applied in such manner as to be permanent. No name, brand, or label other than that of the actual manufacturer is used on the ware. "Regular selection" labels are used only on such ware as conform to the requirements for "regular selection," as set forth in the grading rules of the commercial standard for vitreous china plumbing fixtures. No label is used on ware which grades lower than "regular selection." Labels are to be applied only at the factory. The following wording is used on labels for "regular selection" ware: "This piece has been graded in accordance with uniform grading rules adopted by the sanitary potteries in conjunction with the United States Bureau of Standards of the Department of Commerce."

Wallpaper Association of the United States has copyrighted a self-identifying trade-mark guaranteeing wall paper manufactured by its members to be in compliance with requirements of the commercial standards for this commodity as set up by the wall-paper industry.

West Coast Lumbermen's Association, through its department of grades and manufacture, makes monthly inspection at member plants for the purpose of supervising the manufacture and grading of lumber. It inspects lumber at the plant and issues official certificates of grade and quantity of individual shipment upon request; it reinspects at point of destination, followed by the issuance of a detailed report; and it provides for and supervises the use of official grade and trade-marks at member plants. This association has provided a standard shipper's certificate which is supplied to its membership who desire to make use of it in connection with their shipments. On this certificate is stated the exact quantity, by pieces or fit, and quality of lumber loaded and serves as a guarantee to purchasers that the lumber delivered is in accordance with the statements contained in the certificate.

Western Pine Manufacturers Association maintains an experienced staff of trained inspectors who visit member mills at regular intervals to check the work of the mill graders for the purpose of determining whether or not shipments of lumber are graded in accordance with association rules. In order that lumber may be readily identified by the purchaser, the member mills are permitted to use the association's registered species trade-mark. The association has also inaugurated a "car card plan" by which member mills insert in cars of lumber leaving their plants a shipper certificate of car contents, on which is noted the amount, grade, size, and species of the material shipped.

IDENTIFICATION OF QUALITY-MADE GOODS

It will be noted from the outlines given above that of the organizations taking steps to encourage manufacturers to produce commodities complying with certain nationally recognized specifications, commercial standards, and simplified practice recommendations, many are recommending the use of labels for the purpose of identifying said commodities.

Several consumer and producer organizations have, from time to time, adopted resolutions definitely placing themselves on record in urging or requesting manufacturers to place on commodities produced by them labels or their equivalent stating that the commodities comply with the requirements of certain nationally-recognized standards or specifications. In the following outlines there are set forth, either in full or in abstract from, the resolutions adopted by these organizations:

American Home Economics Association has adopted the following resolution with reference to the use of labels on consumer goods:

"*Resolved*, That the members of the American Home Economics Association cooperate with the United States Bureaus of Home Economics and of Standards and with the American Standards Association in an attempt to secure more labels for consumer's goods which will give accurate information to the over-the-counter buyer. The members of the association have many inquiries from housewives who feel themselves handicapped in purchasing because of the lack of such labels. The very great development during the last 25 years of new kinds of household goods has resulted in confusion in the minds of ultimate consumers, and there is a demand for the development of scientific purchasing information, and be it further

"*Resolved*, That the American Home Economics Association request the American Standards Association to initiate an investigation of methods of safeguarding the interests of the ultimate consumer, when labels in terms of specifications are used. At the present time the American Home Economics Association does not have the funds for systematic work of this sort. Neither the American Standards Association, the Bureau of Home Economics, nor the Bureau of Standards has the facilities for doing such policing, but it is very important that machinery be set up for preventing the misuse of labels misleading to the purchaser."

American Standards Association, under date of March 27, 1924, adopted the following resolution:

"In the opinion of the American Standards Association the use, in the advertising of products which comply with specifications and other standards approved by the association, of proper reference to such standards, is advantageous and makes for industrial economy; accordingly, the association desires to encourage the use of such references in trade catalogues and other advertising media, but the association will in no case pass upon the merit of products, or upon their compliance with specifications or other standards; which questions it will leave to the commercial and legal agencies equipped for such work."

National Association of Builders Exchanges, at its 1929 convention, held in Youngstown, Ohio, adopted the following resolution:

"*Resolved*, That this association indorse the valuable work being done by the National Committee on Wood Utilization in general, but particularly its work on grade marking of lumber and the handbook on wood construction, believing that these two items will help materially in the elimination of irresponsible and unscrupulous contractors and material men."

National Association of Purchasing Agents, at its convention held in Buffalo, N. Y., in June, 1929, adopted a resolution, proposed by the national committee on lumber, recommending to its members that in the purchase of lumber, preference be given to grade-marked stock, other things such as price, quality and service being equal.

National Builders' Supply Association of the United States of America, through its executive committee, has adopted a resolution requesting the manufacturers of sewer pipe, hollow tile, flue lining, and coping to brand their products as to quality as well as to identify it as to manufacture by trade-mark or otherwise. Similar action was taken with reference to

wall board, requesting manufacturers both to trade-mark and to grade-mark their products.

National Paper Trade Association, at its 1930 convention, held in Chicago, Ill., adopted resolutions recommending to its membership that it request their manufacturers that they identify by numbers, designs, and wording, paper bags, tissue paper, toilet paper and towels, gummed kraft paper, binders board, and hard and soft fiber twine as conforming to the requirements contained in the simplified practice recommendations relating to these commodities. In accordance with these resolutions the association's secretary is instructed to furnish members with suitable stickers to be affixed to their orders when purchasing any of the above merchandise, thus calling the above matter to the attention of the manufacturers.

National Tent and Awning Manufacturers Association at its 1930 annual convention adopted resolutions relating to definite standard practice for the marking of waterproof fabric products with a printed tag or stencil showing the actual gray untreated fabric weight per square yard, and also for the marking of each cover or tent to show the commercial type of fabric used. These resolutions have been referred to the National Bureau of Standards as a basis of cooperation for the establishment of a commercial standard relating to these items.

Northeastern Retail Lumbermens Association, at its annual convention held in New York City in January, 1930, adopted the following resolution relating to the grade marking of lumber:

"Whereas the mixing or substitution of grades is a frequent cause of misunderstanding between buyer and seller, and leads to condemnation of lumber as a building material on the part of the consumer, be it

"*Resolved*, That we reaffirm our condemnation of the practice of substituting or mixing of grades, whether by manufacturer, wholesaler, or retailer, as being dishonest, unfair, and leading to vicious competition which defeats all efforts to create confidence in lumber as a building material. Particularly do we urge that manufacturers and wholesalers cease the practice of shipping No. 1 and No. 2 common fir dimension as one grade of lumber. And be it further

"*Resolved*, That we reaffirm our adherence to the principle of grade marking and commend those manufacturers who are leading the way toward better conditions by grade marking their lumber."

ASSOCIATION LABORATORIES FOR RESEARCH AND TESTING

Among the national associations operating laboratories for aiding their members in developing high quality materials and maintaining the standards of the industry are organizations representing the laundry owners, dyers and cleaners, dry goods merchants, and sand and gravel producers.

Laundryowners National Association of the United States and Canada controls and operates the American Institute of Laundering which provides complete facilities not only for research work, but also for a vocational training school in all departments of laundering. It also contains a commercially operated laundry for the purpose of making investigations in its efforts to develop more practical and efficient standards for the industry.

National Association of Dyers and Cleaners of the United States and Canada maintains its own laboratories to provide facilities for research work into the fundamental problems for the dyers and cleaners industry and to serve as a school for instruction whereby the standard practices developed by research can be taught to the trade.

National Retail Dry Goods Association maintains and operates the Better Fabrics Testing Bureau as a service laboratory for its member stores.

National Sand and Gravel Association maintains a research and testing laboratory in which investigations are made of the products of member plants.

Several periodicals, such as Good Housekeeping Magazine, Modern Priscilla, and Popular Science Monthly, have set up specifications for various lines of commodities and issue the equivalent of certificates of approval in the form of labels for trade-brand articles meeting these specifications. Although issuing no certificates of approval, the Ladies Home Journal is distributing a series of "clearing house leaflets" devoted to specifications for many groups of household commodities obtained from Government, State, college, or research laboratory sources. These give authoritative information to aid in the identification of quality-made goods.

NORWEGIAN STANDARDS COMMITTEE SUBMITS PROPOSALS FOR STANDARDIZATION

The Norwegian standardization committee has proposed the adoption of certain dimensional standards of German origin, covering carriage bolts, countersunk screw with square head, countersunk screw with slot, wheel bolt, screw eyes, bolts, and dowel pin.

An international proposal for standards of molds of pig iron has been submitted to the standardization committees of the interested European countries. Although the Norwegian committee has approved the principle of this proposal, the Norwegian standards differ therefrom in some respects. For example, the distance between the horns is longer in the Norwegian standard than in the proposed international standard. The foot also differs, as the English inches have been converted into millimeters and rounded up to tens, while the international proposal gives units of millimeters. The distance between the rivet holes is identical on the Norwegian and the international proposal so that the dolphins are interchangeable.

STANDARD METHODS FOR MEASURING BOYS' SHIRTS ADOPTED

The National Bureau of Standards recently announced the success of the recommended commercial standard for boys' blouses, button-on waists, shirts, and junior shirts as determined by the receipt of written acceptances representing a satisfactory majority of production. The standard is effective as of June 1, 1931.

This commercial standard is the result of a cooperative effort on the part of representative manufacturers, distributors, and users, and covers the minimum standard measurements to be used in the manufacture of this commodity. The measurements apply to the finished garment as delivered to the distributor, due allowance being made for shrinkage.

Standard methods of measuring boys' blouses for ages 6 to 16 years, boys' button-on waists for ages 3 to 10 years, junior shirts for ages 6 to 14 years, and boys' shirts with neck sizes from 12 to 14½ inches are set forth in the commercial standard which will be issued in printed form in due course.

FEDERAL SPECIFICATIONS

Twenty Revisions and Four Proposals Announced

Twenty Federal specifications have been submitted for revision and four proposals submitted for criticism and comment, according to the Federal Specifications Board. These specifications are now before the Government departments and others interested for comment and criticism.

The specifications submitted for revision also bear the new designation in accordance with the system used in the Federal Standard Stock Catalogue. Copies of the specifications and further information relating thereto, can be obtained from the Federal Specifications Board, National Bureau of Standards, Washington, D. C.

SPECIFICATIONS UNDER REVISION

F. S. No.	Commodity	New designation
213	Fire extinguishers, chemical, hand (soda-and-acid type)	O-F-355.
270	Jelly	
270	Preserves	
270	Butter, apple	
339a	Metals, general specifications for	QQ-M-151.
381a	Eggs	
381a	Butter	
381a	Cheese, American (Cheddar or American Cheddar)	
395-a-I	Wood-preservative, coal-tar creosote, for ties and structural timber.	
395-a-II	Wood-preservative, creosote, coal-tar solution, for ties and structural timber.	
395-a-III	Wood-preservative, creosote, for brush and spray treatment.	
395-a-IV	Wood-preservative, zinc-chloride, for ties and structural timber.	
395-a-V	Wood-preservative, preservative treatment	
417	Drills, breast	GGG-D-651.
421	Mono methyl paraminophenol sulphate	U-M-571.
427a	Tubing, brass, seamless	WW-T-791.
472a	Thermometers, industrial	GG-T-321.
579b	Sugar	JJJ-S-791.
635a	Jam	Z-J-71.
644a	Tapioca	N-T-101.

PROPOSALS SUBMITTED FOR CONSIDERATION

	Candy	
	Butter, peanut	
	Couplings, steam hose	WW-C-636.
	Couplings, garden hose, water hose	

EXTRACTION OF BITUMINOUS SATURATED FELTS STUDIED

Federal specifications for bituminous saturated felt for roofing and waterproofing purposes specify the weight of the moisture-free desaturated felt per 100 square feet, and require a piece of felt 2 inches wide and the full width of the roll (32 or 36 inches) to be desaturated for this determination.

For several months the National Bureau of Standards has used Soxhlet-type extractors for this purpose with very satisfactory results. The extraction tube of the apparatus used is of sufficient length to accommodate two samples rolled, and glass beads are added with the samples to reduce the volume of solvent, thus securing more frequent extractions per unit of time.

The vapor tube is insulated by wrapping with asbestos cord and the vapors are condensed in a water-cooled, worm condenser. Heat is supplied by a small electric hot plate and extractions are complete after several hours. For felts carrying a large percentage of bitumen the solvent should be changed after several extractions to prevent foaming. This method is economical of both time and solvent, it is in accordance with the specification directions, and has the advantage of not exposing the operator to solvent fumes during the extraction.

NEW METHOD FOR DETERMINING MAGNESIUM IN PORTLAND CEMENT

The maximum amount of magnesia (MgO) allowed by the Federal specification 1a, and the standard specification for Portland cement of the American Society for Testing Materials, is 5 per cent (plus a tolerance of 0.4 per cent). Since a great deal of cement is purchased under these specifications it follows that many determinations of magnesia are required.

At present the phosphate method is standard, and is quite accurate and proper for umpire analyses, but it is rather lengthy. The precipitation of magnesium by the reagent 8-hydroxyquinoline has been studied at the National Bureau of Standards, and in the January number of its Journal of Research a method is recommended for determining magnesium by use of this reagent. The recommended procedure is accurate and much more rapid than the standard phosphate method.

REGIONAL RECOMMENDATION FOR HIGH-VOLATILE BITUMINOUS COAL

Suggests Merging Regional Simplification Projects Into a Single National Program

In order to insure greater distribution of the information concerning the recommended schedule covering the simplification of sizes and terminology of high-volatile bituminous coal, known as Regional Recommendation No. 1, the National Bureau of Standards announces that the recommendation in now available in printed form. It is officially designated as Bureau of Standards Miscellaneous Publication No. 113, and may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents a copy.

This schedule applies only to high-volatile bituminous coal handled over the docks at the American head of the Great Lakes, and distributed mainly in the States of Minnesota, North Dakota, South Dakota, Montana, Iowa, Wisconsin, and Michigan.

To secure maximum results, simplification programs have been conducted on a national scale exclusively. Certain problems, however, notably in connection with natural products, can not be effectively handled on a national scale until they have been successfully solved within a limited area or region. Such is the problem at present. Although a regional program may be the source of a national simplified practice recommendation, it should never be construed as a local interpretation of a national program.

It is expected that this recommendation, applying to a limited geographical area, will become nationally known and will serve to stimulate the development of similar regional projects which will eventually be merged into a single national program. The National Bureau of Standards will be glad to supply further information on the subject.

CERTIFICATION BY LUMBER AND BRICK MANUFACTURERS ASSURED

To Distribute Lists of Manufacturers Willing to Certify as to the Quality of Their Product

Lists of willing-to-certify softwood and hardwood lumber manufacturers and wholesale lumber dealers being compiled by the National Bureau of Standards now contain the names of more than 1,900 firms. According to present plans these lists will be placed in mimeograph form and distributed to all known retail lumber dealers, numbering in excess of 13,000.

Lists of willing-to-certify manufacturers (wholesale and retail lumber dealers) will be arranged as "sources of supply" of softwood lumber complying with American lumber standards and hardwood lumber complying with the grading and inspection rules of the National Hardwood Lumber Association and distributed to public purchasing officers, Federal, State, county, and municipal agencies making purchases out of tax moneys.

More than 75 per cent of the 46 known manufacturers of sand-lime brick have expressed their desire to supply brick guaranteed by them to comply with Federal Specification No. 505. More than 450 manufacturers of common clay brick have stated that they are willing to certify to comply with all of the requirements of Federal Specification No. 504.

The survey of the brick industry has developed the fact that under certain conditions in certain localities common clay brick somewhat larger or smaller than the standard size (2¼ by 3¾ by 8 inches) is considered satisfactory, provided it complies with the specification requirements relating to strength and absorption. Arrangements have been made to list sources of supply of both standard-size and nonstandard-size bricks which meet the requirements of Specification No. 504.

ELECTRICAL MOTOR AND GENERATOR STANDARDS

Basic Standards as to Design and Construction Given in Revised Publication of National Electrical Manufacturers Association

A revised edition of its motor and generator standards has been issued by the National Electrical Manufacturers Association as a reference work of practical information on the manufacturer, test, performance, and application of alternating-current and direct-current motors and generators, frequency converters, and motor generator sets of small and large rated capacities.

The book contains the latest basic standards on the design and construction of motors and generators which are the result of both research and experience. In it are included a large number of definitions for various classes of squirrel-cage induction motors and other types of motors and generators; the simplified practice recommendation on carbon brushes (developed under the auspices of the National Bureau of Standards); minimum efficiencies, power factor, and indicated starting currents for fractional horsepower motors; ratings for large power direct-current motors, elevator motors, and general-purpose motors; also specification forms for alternating-current generators and motors.

A large number of tables have been added for the first time covering standard horsepower, speed ratings, standard compressor applications, and factors for large direct driving synchronous motors. An entire section is devoted to the standard method of connections and marking of terminals for the various types of motors and generators covered by the book.

Information regarding this book can be obtained from the National Electrical Manufacturers Association, 420 Lexington Avenue, New York, N. Y. Information regarding the simplified practice recommendation for carbon brushes and other simplified practice recommendations and commercial standards can be obtained from the National Bureau of Standards, Washington, D. C.

PRIMARY STANDARD OF LIGHT

Specifications for Fundamental Standard Submitted to Various National Laboratories for Study and Comparison

At the meeting of the international advisory committee on electricity held in Paris last June, definite specifications for a primary standard of light were submitted on behalf of the United States. These proposals put into precise form a standard originally suggested in 1908 by Dr. C. W. Waidner, deceased, formerly chief of the heat division, and Dr. George K. Burgess, associated with Dr. Waidner at that time and now Director of the National Bureau of Standards.

This standard of light has been developed and studied at the National Bureau of Standards during the past two years. It consists of a small closed tube of refractory material (constituting a "black body" or ideal radiator) immersed in a crucible containing platinum. In use, the platinum is melted by placing the crucible in an induction furnace. The bottom of the refractory tube assumes a temperature very nearly equal to that of the platinum and emits light through a small opening in the top; it is used as a standard source of light only when the platinum is at the temperature of solidification.

If the incandescent lamps, which have been used up to the present time as standards to maintain the national unit of light were to be destroyed, it is felt that the use of the Waidner-Burgess standard would make it possible to recover the unit of candlepower with far greater certainty than is given by any of the primary standards hitherto proposed.

After considering the United States proposal, the advisory committee adopted resolutions requesting the various national laboratories to examine the specifications for this standard of light submitted by the National Bureau of Standards, and to give their opinions concerning the practicability of adopting a standard of this type.

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SCIENTIFIC, TECHNICAL, AND COMMERCIAL PERIODICAL PUBLICATIONS ISSUED BY THE NATIONAL BUREAU OF STANDARDS

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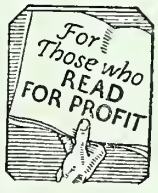

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