of grog shops was closed by law, the back doors were open by the common consent of the people; and he justly remarks that "to pass laws which are never meant to be enforced is worse than passing no laws at all." Altogether, Mr. Read's visit to America has convinced him that the prohibitory policy in connection with the liquor traffic in that country has been a failure, and it would therefore be a great mistake for us to follow their example.—*Brewers' Guardian.*

THE CONDITION OF FRENCH WORKMEN.

The British Society of Arts, just before the last French Exhibition, appointed a number of experts, in different lines of business, to prepare special reports covering the state of many of the principal industries, as represented there. One of the topics to which especial attention was directed was the condition of French workmen, which is considered with reference to: 1. Hours of work and wages; 2. Rent and cost of living; 3. Organization among workmen; 4. Technical schools and art teaching; 5. Home life.

These so-styled "Artisan Reports" have been published very tardily, ample time having been taken in their preparation; but the one above noticed, which has just been brought out, can hardly be said to add materially to the information which has many times heretofore been laid before American readers by the publication of our consular reports. Particular stress is laid on the long hours of which the French workman's day usually consists, the time of commencement varying more than in England or here, but the day usually lasting ten or twelve hours. Nothing, however, is mentioned in regard to the generally easy and comfortable way in which they work, as though the idea of accomplishing a certain amount in a given time was never an element in their calculation. The average rate of wages is generally lower than in England, though there are many trades in which they are about equal, or the difference is but slight. Mechanical engineers are reported as receiving 5½ francs per day of eleven hours, while smiths earn 8½ francs for twelve hours, fitters 6 to 7 francs, and pattern makers 7 to 9 francs for a day of ten hours, the wages of the smaller factories being slightly higher than those paid in the larger establishments; a first-class mason gets from 8 to 10 francs a day, and a second-class or rough mason from 6½ to 7 francs, an ordinary bricklayer also receiving about the latter figure. It would not be matter of surprise, if what would be considered in America a good day's work were obtainable in France at these low rates, that the French Government is laying out such vast schemes of internal improvement, in the way of railroads, canals, grand highways, and harbor improvements, but it is questionable whether, considering the amount of labor performed, the rates are really very much cheaper than here. There is one great difference, however, and that is that nearly every one in France is employed; there are few idlers among what are known as the productive classes, and not only the men but the women and children also are active participants in the labor of bread winning.

In the matter of rent and cost of living, as compared with the rates in England, these "expert" reporters vary widely in their conclusions. Probably it would be found, that under equal circumstances, there would be little variation between France and England, but it is not easy to make a comparison that is of any value, for the French laboring classes are not only extremely economical, but a large proportion of them limit themselves even as to the amount of their consumption of the extremely coarse fare on which they principally subsist. They are frugal even to parsimony, and will generally save something, no matter how small their income, stinting themselves in their daily fare, and wearing only the coarsest clothes in order to accomplish this, in all of which they follow exactly the opposite course from the English mechanic, who will have his roast beef as often as possible, and will in anything be stinted rather than in the satisfaction of his stomach, whether he saves or runs in debt, if the latter be possible.

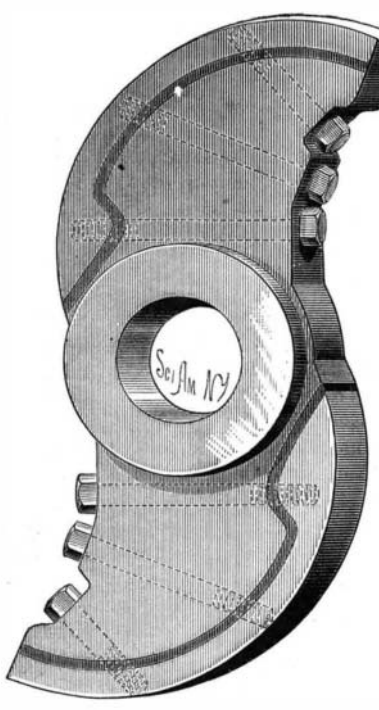
The almost entire absence of trades unions in France is noted here, as it is in almost every other treatise on French industry. The laws would not allow such associations of this kind as we have here, and the political societies or clubs, which are so numerous, though they discuss labor questions to some extent, are generally formed of members of different trades, and so have little or no influence on the rates of wages in any one industry. One great obstacle, however, to trades union organizations, and which operates most effectually in the prevention of strikes, not only in France but in Germany and other parts of Europe, is the great number of special organizations for the benefit of workmen and their families. This matter is treated as of no account in these reports, and it is stated that workmen out of employment or in distress have generally to depend on the government or private benevolence. They have not, it is true, the funds of any trades union society to fall back upon, but in a large proportion of the considerable manufacturing establishments in France a small sum is regularly set aside weekly or monthly by the employer, which is invested so as to form a fund for the relief of such cases.

Rewards are also given for exceptional merit, and for length of time in continued service, so that each year of employment in the house adds to the amount which a man or his family can obtain when old age or sickness prevents his earning his livelihood. In not a few cases, also, schooling for the children and medical attendance for the family are provided, the advantages of which are more or less freely accorded as the workman has proved himself steady and faithful. One large Paris manufacturer, employing over two thousand hands, has also founded a fund, to which he was a liberal contributor at first, and which is invested in government securities, which provides a pension on which worn-out employes, who have been in the establishment a sufficient number of years, can live comfortably on retiring, and those who remain for only five years can have, on leaving, if they leave for no misconduct or dereliction, either a small annual allowance with the privilege of again returning to work, or a lump sum if they prefer the latter. It is because there are so many benefits of this kind, accruing from continued employment and good character, in a large proportion of the French manufacturing establishments that we have so little of strikes there. There is a hearty good will and accord between employer and employed, which is not generally found here, and which goes farther to prevent labor troubles than all the laws which governments can exact or the payment of even the highest rates of which the most ardent trades unionist could ask.

IMPROVED CAM FOR STAMP MILLS.

The annexed engraving represents an improvement in the construction of cams, such as are commonly used in lifting the stamps of crushing mills. The invention consists in a removable shoe attached to the body of the cam by means of bolts, and backed by an elastic cushion or packing. This construction admits of the ready replacement of the shoe when worn, and it gives to the cam a yielding quality, which not only saves it from undue wear, but also modifies the action of the cam to such an extent as to prevent all violent and sudden blows, which are commonly so destructive to stamp mills.

Although the joint surface between the shoe and the body of the cam may be plain or corrugated, the inventor prefers the form shown in the engraving. The bolts which hold the shoes pass rather loosely through the cam body to admit of the yielding of the shoe, but they are screwed firmly into the shoe and move with it. In the cam represented by the



MOORE & DYKES'S CAM FOR STAMP MILLS.

engraving three bolts are employed to held each shoe, but we are informed by the inventors that two bolts are sufficient.

In case the shoe becomes beveled after considerable wear it can be changed from one arm of the cam to another, or to any other cams in the battery.

This useful improvement has been recently patented by Messrs. L. A. Moore and J. Dykes, San Francisco, Cal.

Zincography for Amateurs.

In a recent paper read before the London Society of Arts, Mr. Thomas Bolas, F.C.S., described zincography as a simple and easy mode of printing in the following fashion: Zincography, he said, is similar to lithography, except that a zinc plate is employed in the place of the lithographic stone. The so-called transfer paper is merely a moderately fine paper which has been brushed over, on one side, with a mucilaginous mixture, prepared by boiling together the following: Water, 1,000 parts; starch, 100 parts; gamboge, 6 parts; glue, 1 part. This paper is written upon with the ordinary commercial lithographic writing ink, which has been rubbed up with water like an artist's water-color. The writing being dry, it is necessary to moisten somewhat the back of the transfer by means of a damp sponge; after which it is laid face downward on a sheet of ordinary roofing zinc, which has been previously cleaned by means of emery cloth. Both being now passed together under the roller of a small press, the transfer adheres to the metal plate; but on damping the back of the paper it becomes easily removable, leaving the writing on the zinc. The face of the zinc plate is now gently rubbed over with mucilage of gum arabic, which is all the better for being slightly sour, and the excess of gum having been sponged off, an India rubber inking roller, charged with ordinary printer's ink, is passed over the still damp zinc plate a few times. The ink takes only on the lines of the transferred writing, and it is now merely necessary to lay a sheet of white paper on the plate and to pass both through the press to obtain an impression—an exact reproduction of the original writing.

Any number of copies can be printed by repeating the operations of damping and inking. The zincographic process, thus simplified, is rapid, economical, and within the reach of every one.

Why Teeth Decay.

Upon a careful review of the opinion and experiments of our best investigators, says Doctor S. M. Prothro in a paper read before the Tennessee Dental Association, it is conclusive that there are but two active agents in the process of dental caries, namely the action of acids and the development of a vegetable parasite, the *Leptothrix buccatis.* By actual experiments it is demonstrated that it does not require strong acids to separate the phosphoric and carbonic acids from the lime contained in the tooth substances. Even water that contains carbonic acid will dissolve the calcareous salts. And it seems from a circumstance that transpired under the eye of Mr. Spence Bate, that water alone can dissolve the teeth. A lady having two sets of artificial human teeth, placed one set in water to preserve it till she had worn out the other. At the expiration of seven years, the set that she had kept in water was as much corroded as the one she had worn in the mouth. This case corroborates a statement made by Weil and Heider, that at the end of ten days fungi had attacked the enamel and dentine of the teeth that had been kept in pure water, and that in a few weeks the tissues were pierced with holes like a sieve.

All mineral, as well as vegetable acids, act promptly on the teeth. "In forty-eight hours acetic, citric, and malic acids will corrode the enamel so that you may scrape a great portion of it away with the finger nail." Acid tartrate of lime, having a greater affinity for the lime of the tooth than for its own base, will rapidly destroy the enamel.

Grapes, in forty-eight hours, will render the enamel of a chalky consistence. Vegetable substances are inert till fermentation takes place and acetic acid is formed. Sugar has no deleterious effect, only in the state of acetous fermentation. Animal substances exert no injurious effect until putrefaction is far advanced.

Novel Mode of Preserving a Man's Reason.

A curious story is going the rounds of the English newspapers of an exhibition in the show windows of one of the leading jewelers of Vienna. The object of attraction is a brooch magnificently studded with gems, in the middle of whose chasing is inclosed the most singular of centers—four common, old, bent, and corroded pins. This brooch is the property of the Countess Lavetskofy. The pins have a history, of course. Seven years ago Count Robert Lavetskofy, as the story runs, was arrested at Warsaw for an alleged insult to the Russian Government. The real author of the insult, which consisted of some careless words spoken at a social gathering, was his wife. He accepted the accusation, however, and was sent to prison.

In one of the lightless dungeons in which the Czar is said to be fond of confining his Polish subjects, the unfortunate martyr for his wife's loose tongue spent six years. He had only one amusement. After he had been searched and thrown into a cell, he had found in his coat four pins. These he pulled out and threw on the floor; then in the darkness he hunted for them. Having found them, perhaps after hours and even days, he scattered them again. And so the game went on for six weary years. "But for them," he writes in his memoirs, "I would have gone mad. They provided me with a purpose. So long as I had them to search for, I had something to do. When the decree for my liberation as an exile was brought to me the jailer found me on my knees hunting for one which had escaped me for two days. They saved my wife's husband from lunacy. My wife, therefore, could not desire a prouder ornament."

The Wheat Harvest of 1879.

The wheat crop of the whole world for 1879 shows a deficiency of over 375,000,000 bushels, nearly 200,000,000 bushels of the deficiency falling to Europe. The following table, compiled from the *Bulletin des Halles et Marchés,* shows the yield for each large wheat raising country compared with the average yield:

	Average Yield Bushels.	Yield for 1879. Bushels.		Average Yield Bushels.	Yield for 1879. Bushels.
United States	337,500,000.	337,500,000	Roumania	27,000,000.	22,500,000
France	230,172,000.	172,125,000	Belgium	19,150,000.	14,650,000
Russia	180,000,000.	157,500,000	Portugal	6,750,000.	5,675,000
Germany	99,000,000.	90,000,000	Algeria	20,500,000.	16,875,000
Spain	94,500,000.	78,750,000	Canada	13,500,000.	13,500,000
Italy	87,550,000.	67,500,000	Australia	13,500,000.	14,650,000
Austria-Hungary	76,500,000.	63,000,000	Egypt	13,500,000.	11,500,000
Gt. Britain	83,500,000.	47,500,000	Netherlands	4,615,000.	3,375,000
Turkey	34,500,000.	29,500,000	Greece	3,500,000.	3,375,000
			Servia	3,375,000.	2,812,500
			Denmark	2,250,000.	2,250,000

How to Obtain Sleep.

The following is recommended as a cure for sleeplessness: "Wet half a towel, apply it to the back of the neck, pressing it upward toward the base of the brain, and fasten the dry half of the towel over so as to prevent the too rapid exhalation. The effect is prompt and charming, cooling the brain and inducing calmer, sweeter sleep than any narcotic. Warm water may be used, though most persons prefer cold. To those who suffer from over-excitement of the brain, whether the result of brain work or pressing anxiety, this simple remedy has proved an especial boon."

Scientific Politicians.

Says *Nature,* Marat, the notorious hero of the first French Revolution, the same who met his death at the hands of Charlotte Corday, was the author of several important works on electricity. This fact, which is not generally known, was recently brought to notice by M. A. J. Frost, who is editing the catalogue of the Ronalds Library. Most of Marat's works were written between 1779 and 1785, and several of them were translated into German. Marat was not the only one of the prominent figures of the time who worked in physical science. Arago, though his fame does not rest upon his political achievements, once enacted a chief part in the crowning of the statue of Liberty. "Citizen" Charles was as famous among the revolutionists as for his scientific attainments. Robespierre wrote an article on the lightning conductor for the *Journal des Savants;* and last, but not least, Napoleon Bonaparte on many occasions dabbled in scientific lore, and was the liberal patron of men of science.

ELECTRIC LAMP TESTS.

The Annual Report of the United States Lighthouse Board for the year ending June 30, 1879, contains an appendix that will prove valuable to all that are interested in the study of the electric light, the different methods by which it is generated, and their relative merits and disadvantages. It contains a very full list of the appliances devised in recent times, with concise descriptions of the apparatus and principles involved, illustrated by excellent cuts, some of which have appeared in the columns of the SCIENTIFIC AMERICAN, and others taken from Dr. H. Schellen's recent work. Its compact form renders it very convenient for reference. This portion of the report had its origin in a suggestion made last fall by the chairman of the Lighthouse Board to President Henry Morton of the Stevens Institute to test the various machines and lamps in use with the view of determining their relative efficiency.

It was found that there are three ways of producing electric illumination: 1. By means of the electric arc; 2. By ignited conductors; and 3. By incandescent gases, the latter of which is hardly of practical utility.

To overcome the difficulties connected with the use of the electric arc, which consist in its unsteadiness, in the wearing away and the combustion of the carbon electrodes, etc., numerous regulators have been devised. "The difficulty with all these," we are told, "is, that however well they may regulate everything else, they cannot regulate the minute accidental variations in the structure of the carbon poles during their consumption." The effect of this is to wear away the poles unequally and to cause the arc to shift its position, so that in the space of a few minutes, the intensity of the light measured in a given direction fluctuated between 400 and 2,000 candle power. Nevertheless, since the great improvements recently made in the homogeneity of the carbon poles and in the regulating machinery, and since the introduction of reflectors, the electric arc is no longer too unsteady to use for practical purposes.

In the production of the electric light by ignited conductors, the difficulties are that there is a great wastefulness of energy and consequent costliness, and that the conductors are rapidly disintegrated. A current that would furnish an electric arc of 1,000 to 2,000 candle power would not generate a light of more than 50 to 100 candles when used to ignite a platinum wire, and the platinum so used would soon become brittle and break up.

Higher temperatures were obtained with small rods of carbon placed in exhausted tubes, but they were soon vaporized and disintegrated. At this time Edison had not yet given up platinum. The report concludes that none of the lamps so constructed have proved practically useful as yet, and then goes on to give an historical account of the different inventions of this class for future reference. To show the loss of energy resulting from the division of the current several experiments are described. In one of them a given current produced a light of 65 burners when concentrated on a single lamp; when divided between two lamps, it was reduced to 7½ burners each; among three lamps to 1⅛ burners each, among four to ¾; and among five to ½ burner.

The subject of electromotors, or instruments for producing electric currents, is treated next. To show that the galvanic battery is not economical, the following calculation is made. Weight for weight coal has almost six times the available energy of zinc, and the price of zinc is about 25 times that of coal. Hence to make gas from coal and burn it will be cheaper than to obtain electricity from zinc and turn it into light, unless the loss in the former case is 150 times greater than in the latter.

It follows from this that electric lighting did not become a practical problem until 1831, when Faraday discovered the fact that electricity could be produced from magnetism. Since then numerous magneto-electric machines have been invented, seventeen of which are described and their principles explained. Of these the following were tested in the Physical Laboratory of the Stevens Institute: the Siemens, the Wallace-Farmer, the Brush, the Arnoux-Hochhausen, the Weston, and the Maxim.

The Wallace-Farmer and the Arnoux-Hochhausen machines having been withdrawn after preliminary trials, the remainder were thoroughly tested to find out which was best adapted for use in the Lighthouse Department.

To measure the intensity of the light, Sugg's photometer was used in a dark room temporarily fitted up in the Physical Laboratory. At the same time the power employed to drive the machine was measured by means of a transmitting dynamometer designed by Mr. William Kent, a graduate of the Stevens Institute.

In the following table will be found a résumé of the results obtained. The first column contains the name of the magneto-electric machine used in each series of experiments; the second contains the kind of self-regulating lamp employed, the word "hand lamp" indicating that the distance between the carbons was regulated by hand; the third column shows the amount of illumination; thus in the first line the figure number 3,297 means 3,297 times the light obtained from one standard candle burning two grains of stearine a minute; the fourth column indicates the horse power actually used; and the last column, found by dividing the third by the fourth, shows the number of candles obtained per horse power:

Machine.	Lamp.	Average candle power.	Average horse power.	Av'ge candle power per horse power.
Maxim (ordinary type)..	Maxim..... ..	3,297	5·483	729
Maxim.....	Hand lamp	3,930	5·585	704
Siemens	Siemens....	4,651	4·863	956
Siemens	Siemens	4,548	4·742	959
Weston	Hand lamp	8,585	4·769	1,800
Weston	Maxim	7,787	4·683	1,663
Weston.....	Siemens..... .	7,262	5·056	1.436
Weston.....	Weston	6,063	4·552	1,332
Maxim (with magnets of low resistance)...	Maxim	7,524	7·400	1,017
Brush..	Brush	4,365	2·8467	1,533
Brush.....	Siemens.....	3,532	3·9573	1,194

The report concludes with the following words: "In conclusion, your committee would report that they find several of the machines and lamps, with which they have experimented, sufficiently efficient and reliable to warrant further experiment in the nature of a practical test in one of the coast lighthouses."

C. F. K.

The Melbourne Exhibition of 1880.

Mr. Thos. R. Pickering, United States Government Agent for the Melbourne Exhibition, publishes the following general regulations of the Royal Colonial Commission:

1. The Exhibition will be opened on the 1st day of October, 1880, and closed on the 31st day of March, 1881. It will be open evenings.

2. There are no differential duties, and all exhibits will be admitted free of duty for the purpose of exhibition. Facilities will be given for the sale of exhibits, delivery to be made after the close of the Exhibition.

3. The protection of inventions capable of being patented, and of designs, is secured by the patent laws of Victoria.

4. If exhibits are *not* intended for competition it should be so stated by exhibitors, that they may be excluded from examination by the International Jury.

5. The general reception of articles in the Exhibition buildings will commence on June 1, and no articles will be received after August 31t. Arrangements will be made for transporting goods from the port of Melbourne, or the several railway stations, to the Exhibition grounds, at a fixed rate of charges.

6. All expenses of freight, marine insurance, etc., should be prepaid by the exhibitor, but if that be inconvenient, the Victorian General Commission, through its agents in New York and Boston, will, if desired, undertake the transportation, custom house formalities, unpacking and arranging the products for exhibition, the expense incident upon such work to be regarded as a first charge upon the exhibits, to be deducted from the net proceeds in the event of their being sold. Should such exhibits, however, not be sold, but be claimed by the exhibitor or his authorized agent at the close of the Exhibition, then such sums as may have been disbursed by the Commission or any of its agents must be paid before such goods are delivered.

7. No work of art nor any article whatever exhibited in the buildings, parks, or gardens, may be drawn, copied, or reproduced in any manner whatsoever without the permission of the exhibitor. The Commission reserves the right of authorizing the production of general views.

8. By the introduction of steam power, which will be supplied gratuitously, it is proposed to afford facilities for presenting not only the machinery for any given manufactures, but the manufactures themselves; and it is further intended that space shall be afforded for the production in the Exhibition of interesting objects by manual labor.

9. The Victorian General Commission is prepared, if required, to make arrangements for the construction of show-cases by contract at a price per cubic foot, the cost to be borne by the exhibitor using the same.

10. The Commission will take precautions for the safe preservation of all articles in the Exhibition, but will be in no way responsible for damage or loss of any kind, or accidents by fire or otherwise, however caused; facilities will be afforded exhibitors for insuring their goods.

11. The awards shall be based upon written reports adopted by the jurors.

Reports and awards shall be based upon inherent and comparative merit, the elements of merit being held to include considerations relating to originality, invention, discovery, utility, quality, skill, workmanship, fitness for the purposes intended, adaptation to public wants, economy, and cost.

Awards shall consist of gold, silver, and bronze medals, and a certificate of honorable mention, together with a special report of the jurors on the subject of the award.

Each exhibitor shall have the right to produce and publish the report awarded to him, but the Commission reserves the right to publish and dispose of all reports in the manner it thinks best for public information, and to embody and distribute the reports as records of the Exhibition.

No commissioner who is an exhibitor or a member of a firm exhibiting shall take any part in the selection or appointment of jurors in those classes in which he exhibits.

No person interested either as a partner or *employé* in a house exhibiting shall be a juror in the classes in which such house or person exhibits.

The size of the medals (for prizes) will be two inches and a half, the design having been adopted.

12. Exhibitors are particularly requested to mark the trade price of the articles exhibited, so as to facilitate the judgment of the jury, as well as for the information of visitors.

13. Exhibitors will not have to pay rent for space occupied by them in the Exhibition.

REGULATIONS FOR THE UNITED STATES SECTION.

Congress having made no appropriation for the payment of freight upon goods sent to the Australian Exhibitions, and having assigned no government vessels to the duty of transportation, the United States Commission will assume no direction whatever of the movement of goods either to or from Australia.

Upon the delivery of the goods within the Exhibition buildings at Melbourne, and the payment of all charges by the exhibitors, the United States Commission will see that they are properly assigned to the space allotted the United States, and that they are catalogued.

The expense of installation must be borne by the exhibitors, and the United States Commission will not be responsible for expense of any kind in connection with the handling, storage, or the loss or injury of exhibits.

An agent with written authority duly filed, and whose qualifications are satisfactory to the Secretary of the United States Commission, will be the acknowledged representative of an exhibitor, but when goods are exhibited in the name of an agent—awards, though recommended by jurors, are not allowed by International Commissions; it would be well, therefore, for those who intend exhibiting for competition to make application in their own name.

The Buenos Ayres Exhibition.

The following are the principal regulations affecting exhibitors at the forthcoming South American Industrial Exhibition, to be held in Buenos Ayres in 1880:

1. The Exhibition will be opened on September 15 and closed on December 15, 1880. 2. Foreign exhibitors of industrial, agricultural, and all other machinery, suitable for the requirements of this country, admitted in accordance with the regulations of the Exhibition. 3. Applications for space required must be made on or before the 1st of May, 1880, addressed Al Presidente de la Comision Esposicion, Secretaria de Club Industrial, Buenos Aires. 4. The charge to foreign exhibitors will be 5 dols. (1*l.* sterling) per square meter. 5. Articles intended for exhibition will be admitted from the 15th of June to the 15th of August, 1880. 6. No articles presented for exhibition can be removed until the close of the Exhibition. 7. All articles exhibited must figure under the name of the parties soliciting their admission, and any prizes awarded will be given in the same name. 8. Exhibitors may inscribe the names of the manufacturers or agents on the goods exhibited as well as their own. 9. All goods intended for the Exhibition will be admitted by the Customs free of duty, but must come expressly for the Exhibition, and as a guarantee that such is the case, each lot of goods must come accompanied by a certificate from the Argentine Consul at port of shipment. 10. All goods not reshipped after the close of the Exhibition must pay the customary duties.

We learn from the Argentine Consul General, No. 60 Wall St., New York, that foreigners can only compete in respect to exhibits of improved machinery.

Scientific Societies.

At recent meetings of scientific and professional societies in this city, officers for the ensuing year have been elected as follows:

New York Academy of Sciences: President, John S. Newberry; First Vice-President, Thomas Eggleston; Second Vice-President, B. N. Martin; Corresponding Secretary, A. R. Leeds; Recording Secretary, O. P. Hubbard; Treasurer, J. H. Hinton; Council, D. S. Martin, G. N. Lawrence, A. A Julien, A. C. Post, W. P. Trowbridge, Louis Elsberg; Curators, B. G. Amend, C. F. Cox, B. B. Chamberlin, Charles A. Seeley, W. H. Leggett; Finance Committee, T. B. Coddington, Philip Schuyler, Thomas Bland.

American Ethnological Society: President, Alexander J. Cotheal; Vice-Presidents, Charles E. West, LL.D., and Charles C. Jones, Jr.; Corresponding Secretary, Charles Rau; Recording Secretary, T. Stafford Drowne, D.D.; Treasurer, Alexander J. Cotheal; Librarian, Henry T. Drowne; and Executive Committee, George H. Moore, LL.D., Asa Bird Gardner, LL.D., and Henry T. Drowne.

American Institute of Mining Engineers: President, Wm. P. Shinn., of St. Louis, Mo.; Vice-Presidents (in place of those whose term expires this month), James A. Burden, of New York; Dr. Charles B. Dudley, of Altoona, Penn.; and Persifer Frazer, Jr., of Philadelphia. Managers (in place of those retiring this month), James C. Bayles, of New York; W. S. Keyes, of San Francisco; and Percival Roberts, Jr., of Philadelphia. Treasurer, Theodore D. Rand, of Philadelphia; Secretary, Dr. Thos. M. Drown, of Easton, Pa.