a favorable report. If any of them feels aggrieved at our language, let him say so, and we will prove its literal accuracy."

"The helpless creatures are only human moles. As they burrow in their 'dim galleries,' what can they know of the inner world, which their predecessors only discovered at the moment when communication was interrupted between them and their fellow grubbers?"

"See what will happen at this Detroit meeting: Their Entomological Club will have heated debate upon trapdoor spiders, and acrimoniously discuss whether the male *mygale avicularia* has a darker shade of brown than the female on the upper segment of the body, and more ciliæ to the square inch; after which, as an appetizer for dinner (champagne and fixings on the lake), mention will be made of that Dismal Swamp louse, which (see Trans. 1874) the surveyors found always pointing its nose to the north, whichsoever way they might lay it down. Professor Hilgard will enquire, across the room, of Professor Dawson, whether the Myriapoda with two antennæ, so highly esteemed by the scolopendra tribes of India, are more nutritious than the date palm. Professor Youmans will propose to the Club the election to honorary membership of the "correspondent of the Department of Agriculture" whose discovery of mortality among bots, upon the application of a decoction of tansy he had appropriately noticed at page 384, Vol. VII, No. 39 of *Popular Science Monthly*. Professor E. B. Elliot will show that he was right and Professor H. E. Davis wrong in the number of young *lepidoptera* which, when placed end to end, will measure a mile, —the true figures being $0174 \times b - y542\frac{1}{2} = A's$.

"The anthropological subsection will no doubt give prominence to a discussion upon measles as a religious element among the Andamanese; and an adjournment could hardly be reached without a fight over the old puzzle, whether it is probable that the American stovepipe represents the form of the prayer cylinder of the lacustrians. If Professor Buchanan, who has forgotten more about anthropology than any of them ever know, should attempt to crowd upon them the complete study of man in all his relations, he will be coughed down and the floor granted to somebody who has a speech ready upon the reticulated button hole of the Bengalese Rajpoot's coat. And yet they are not happy.

"Have we done any injustice to the American and British Associations—for they are both alike? Consult the printed volumes of *Transactions*, in which may be found a record of some of the very papers above enumerated, and others about orange peel oil, fat women, hyena's dens, and the blastoderms of birds' eggs.

It is their own affair whether they study this or that science, and prefer to use the few hours they have on earth in discovering the nature of the respiratory organs of the shark or any other ignoble tomfoolery, to studying the spiritual part of Man and his intermundane communications, attractions, and perils."

[For the Scientific American.]

THE HEATING SURFACE OF BOILERS.

The questions sent to us in regard to boilers continue to multiply, and we imagine that we have received inquiries on all the points connected with the subject. We propose, therefore, to devote some space to answering these questions more in detail than is possible in our correspondence column; and after disposing of the topic indicated by the title of this article, we will give some directions in regard to setting boilers, proportioning them for engines of given size, etc.

There is some difference of opinion among engineers in regard to what parts of a boiler are to be considered in estimating its heating surface; but in the rules which are appended, the methods most commonly employed are adopted.

(*a*) Cylindrical boilers: These, forming the simplest class of boilers, consist of plain cylinders, sometimes with and sometimes without steam drums. The heating surface of such a boiler is half the surface of the shell, or it is equal to $1{\cdot}5708 \times$ the diameter of the boiler $\times$ the length. It is to be observed that, in this and in the rules that follow, all dimensions are to be taken in feet; so that, in applying the rule, any proportions that are expressed in inches are to be divided by 12, before making the calculation. Thus: Suppose that a given boiler has a diameter of 36 inches and a length of 20 feet: its heating surface is the product of 1·5708, 3, and 20, or about 94¼ square feet.

(*b*) Cylindrical flue boilers: A boiler of this class is a cylinder with two large flues. Its heating surface is half the surface of the shell, increased by the sum of the interior surfaces of the flues, or $1{\cdot}5708 \times$ diameter of boiler $\times$ length $+ 6{\cdot}2832 \times$ interior diameter of flues $\times$ length.

For the sake of illustrating this rule, suppose that a flue boiler has a diameter of 48 inches or 4 feet, and a length of 22 feet, and that the interior diameter of each flue is 15 inches, or 1¼ feet. Then the heating surface is equal to the product of 1·5708, 4, and 22, or nearly 138¼ square feet, increased by the product of 6·2832, 1·25, and 22, or about 172½ square feet, making the total heating surface 311 square feet.

(*c*) Cylindrical tubular boilers: As the name implies, these boilers are cylinders containing a number of tubes. To find the heating surface of such a boiler, take half the surface of the shell and add it to the interior surface of the tubes. Expressing this rule in a similar manner to the foregoing, it may be said that the heating surface of a cylindrical tubular boiler is equal to $1{\cdot}5708 \times$ diameter of boiler $\times$ length $+ 3{\cdot}1416 \times$ number of tubes $\times$ interior diameter of a tube $\times$ length.

Example: A cylindrical tubular boiler has a diameter of 42 inches or 3½ feet, is 16 feet long, and contains 40 tubes, each having an interior diameter of 3⅜ inches, or 0·323 feet. What is its heating surface?

Answer: The product of $1{\cdot}5708 \times 3{\cdot}5 \times 16$ is nearly 88 square feet.

The product of $3{\cdot}1416 \times 40 \times 0{\cdot}323 \times 16$ is about 649 square feet.

So that the whole heating surface is 737 square feet.

When the dimensions of a tubular boiler are given, the outside diameter of the tubes is usually stated, so that twice the thickness must be subtracted to obtain the diameter to be used in the calculation. The thickness of tubes by different makers varies somewhat, but those given below are average values, and can generally be used without serious error. The table gives dimensions of standard sizes of tubes, as well as a column of heating surface, which will greatly facilitate calculations.

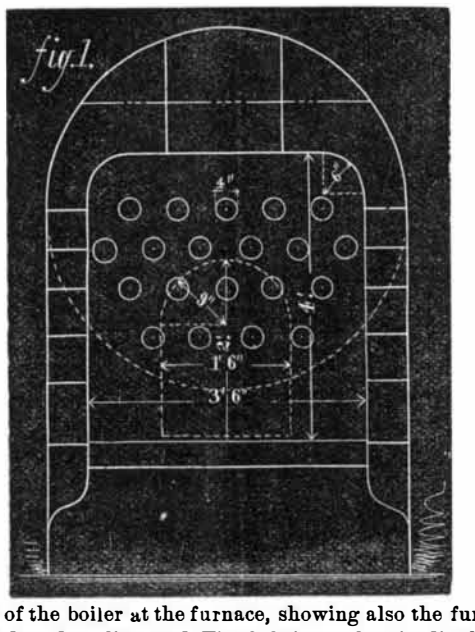
Outside diameter in inches.	Thickness in inches.	Internal diameter in inches.	Internal diameter in feet.	Heating surface in in square feet, per foot of length.
1 25	0·072	1·106	0 0922	0·3273
1 5	0·083	1·334	0·1112	0·3926
1·75	0 095	1·560	0·1300	0·4589
2·	0 095	1·810	0 1508	0 5236
2·25	0·095	2 060	0·1717	0·5890
2·5	0·109	2 282	0·1902	0 6545
2·75	0·109	2 532	0·2110	0·7200
3·	0·109	2·782	0 2318	0·7853
3·25	0 120	3 010	0 2508	0 8508
3·5	0 120	3·260	0·2717	0·9163
3·75	0·120	3·510	0·2925	0·9817
4·	0·134	3·732	0 3110	1·0472
4·5	0·134	4·232	0·3527	1·1790
5·	0·148	4·704	0 3920	1·3680
6·	0·165	5·770	0 4808	1·5708
7·	0·165	6·770	0 5642	1·8326
8·	0·165	7·770	0·6475	2·0944
9·	0·180	8·640	0·7200	2 3562
10·	0·203	9·594	0·7995	2·5347

To illustrate the use of the table, suppose it is required to find the heating surface of the tubes in a boiler which contains 60 tubes, each 3 inches outside diameter and 12 feet long. The total length of tubes in the boiler is 12 times 60, or 720 feet, so that the heating surface is 720 times 0·7853, or about 565 square feet.

(*d*). Locomotive and vertical boilers: In this class, the furnaces are contained within the boilers. The heating surface of such a boiler is all the surface in the furnace increased by the interior surface of the tubes.

Locomotive boilers: The furnaces of boilers of this class do not all have the same form of cross section, so that the rule for determining the heating surface cannot be, generally, expressed precisely in detail. It may be said, however, that the heating surface of a locomotive boiler is equal to the length of the line bounding the cross section of the furnace $\times$ the length of the furnace $+ 2 \times$ the area of the cross section of the furnace — the area of the furnace door — the number of tubes $\times 0{\cdot}7854 \times$ (the interior diameter of a tube)^2 + the number of tubes $\times$ the length of the tubes $\times$ the heating surface of a tube per running foot.

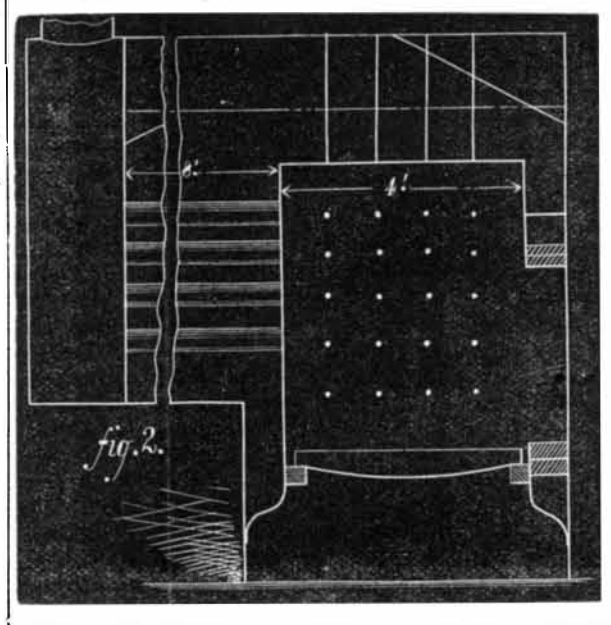
As an example of the use of this rule, suppose it is required to determine the heating surface of a boiler having the dimensions noted in Figs. 1 and 2—Fig. 1 being a cross



section of the boiler at the furnace, showing also the furnace door in dotted outline, and Fig. 2 being a longitudinal section. The length of the line bounding the cross section of the furnace is the sum of $3{\cdot}5 \times 2 + 2{\cdot}5 + 1$ multiplied by 1·5708, or about 11·07 feet. The area of the sides and top of the furnace is 4 times 11·07, or 44·28 square feet. The area of the cross section of the furnace is the sum of the products of $3{\cdot}5 \times 3{\cdot}5 + 0{\cdot}5 \times 2{\cdot}5 + 0{\cdot}5 \times 0{\cdot}7854$, or about 13·89 square feet. The cross section of the tubes is the product of $20 \times 0{\cdot}7854 \times (0{\cdot}311)^2$, or about 1·52 square feet. The area of the furnace door is the sum of the products of $1{\cdot}5 \times 1{\cdot}25 + 0{\cdot}3927 \times (1{\cdot}5)^2$, or about 2·76 square feet. The interior surface of the tubes is the product of $20 \times 8 \times 1{\cdot}0472$, or about 167·55 square feet. Hence the heating surface of the boiler is $44{\cdot}28 + 2 \times 13{\cdot}89 - 1{\cdot}52 - 2{\cdot}76 + 167{\cdot}55$, or about 235½ square feet. This example shows the general method to be employed for locomotive boilers, and the dimensions that are to be taken.

2. Vertical boilers: The furnaces of these boilers are ordinarily cylindrical, so that the rule for the heating surface is as follows: $3{\cdot}1416 \times$ diameter of furnace $\times$ hight of furnace $+ 0{\cdot}7854 \times$ (diameter of furnace)^2 — number of tubes $\times 0{\cdot}7854 \times$ (interior diameter of a tube)^2 + number of tubes $\times$ length of tubes $\times$ heating surface of a tube per running foot.

Example: Required the heating surface of a vertical boiler, having the following dimensions: Diameter of furnace, 24 inches, hight of furnace, 18 inches, 40 tubes, each 2 inches outside diameter, 6 feet long. The heating surface is the sum of the products of $3{\cdot}1416 \times 2 \times 1{\cdot}5 + 0{\cdot}7854 \times 2^2 + 40 \times 6 \times 0{\cdot}5236 = 138{\cdot}23$, diminished by $40 \times 0\ 7854 \times (0{\cdot}1508)^2 = 0{\cdot}72$, or 137·51 square feet.



These rules might be extended, so as to include sectional and marine boilers, together with some special forms which are occasionally used: but it is believed that they are sufficiently comprehensive to apply to nearly all boilers employed in this country for stationary and portable engines. The simple manner in which they are expressed, and the illustrative examples accompanying them, will doubtless be appreciated by the reader.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The meeting this year is a light one in point of attendance; but the lack in this respect is in a measure compensated for by the absence of ponderously technical papers and the substitution of essays having a more practical bearing upon the scientific questions of the day. While a cardinal object of this association is the interchange of ideas of all kinds among its learned members, the nature of such interchanges should, we think, be subordinated to considerations of public instruction and benefit, and hence dissertations on abstruse points and technicalities unintelligible to all save those versed in the particular branch of Science involved, might well be reserved for dissemination through narrower channels, leaving a clear field for the discussion of subjects within the general public comprehension. It is impossible to publish such papers in their entirety, and equally impossible to prepare fairly intelligible abstracts. We give below a *resumé* of the essays thus far read.

Professor Lovering described an acoustic method of measuring the velocity of electricity. He stated that a wire from Cambridge to San Francisco, thence back through Canada to Massachusetts, about 7,200 miles in all, transmitted a message in two thirds of a second, and that some of this time was wasted through thirteen repeaters. The system proposed consisted in utilizing the vibrations of tuning forks, which may indicate intervals of one ten-thousandth of a second, or even less.

Professor Farquharson read an account of recent

EXPLORATIONS AMONG INDIAN MOUNDS,

which resulted in the discovery of thirty skeletons, several copper implements, and a pulley or spindle wheel of terra cotta. In one skeleton two of the neck bones were found anchylosed, giving evidence of a disease rare at the present time among adults, and from which they only survive by very careful treatment.

Professor E. B. Andrews compared the Ohio and Virginia sides of

THE GREAT ALLEGHANY COAL FIELD.

On the Kanawha there are 3,100 feet of productive coal measures below the horizon of the Pittsburgh coal. The remarkable belt of coal seams found on the Kanawha, between Charleston and Kanawha, on Coal river, on the Guyandotte, and on the upper waters of the Twelve Pole, and on the Tag and Louisa forks of the Big Sandy, is the finest belt of bituminous coal in the United States. The professor traced the probable direction of the great West Virginia geosynclinal trough, and expressed the opinion that it had a connection with the ancient ocean to the southwest by the way of Tennessee.

Professor J. S. Newberry gave descriptions of some newly discovered

ANCIENT FISHES

found in the Devonian and carboniferous rocks of Ohio Among these was the entire bony structure of the *dinichthys Terellii*, the hugest of all the old armor-plated ganoids. The dorsal shield weighed 30 pounds. Drawings of another species of *dinichthys* were shown, in which the maxillaries and mandibles were set with teeth instead of being sharp-edged. Professor Newberry explained that the *dipnoans* of Africa and South America, the *lepidosiren* and *protopterus*, were descended from these ancient plated ganoids, and were the last remnants of a group of fishes which in the Devonian age not

only ruled the seas, but were the most powerful and highly organized of living beings. Many other interesting specimens were exhibited by Professor Newberry, all of which will be described in the reports of the geological survey of Ohio.

NEW YORK GEOLOGY.

Professor James Hall read a paper on the geology of the Catskill Mountains, and stated that explorations have proved that the range is composed of several nearly parallel synclinal axes, and the culmination portion, at Lookout and Roundtop, is caused by the slight convergence and junction of three of these synclinals, which are so closely crowded together.

Professor Cope defended the

THEORY OF EVOLUTION

by reference to North American tertiary mammals, commenting on the fact that the human skeleton contains so many characteristics of earlier forms; he said that the quadrumana, and afterwards man, had won their way to pre-eminence rather by development of mind than by that of the physical system. It was not so much a case of the survival of the fittest as of the survival of the most intelligent.

There was a debate on the question of:

ARE POTATO BUGS POISONOUS?

Professors A. R. Grote and A. Kayser maintained the negative, and stated that they had boiled down the bugs, producing a colorless liquid, offensive in smell, but clear and alkaline. Other bugs were digested in alcohol. The distilled liquid administered to frogs produced no effect either when introduced into the blood or into the stomach. The tincture killed the frog when injected, but this was due to its acid properties. It was concluded that the bug is not poisonous, and the evil effects noted on burning the insect were probably due to the presence of Paris green.

Professor C. V. Riley replied to the effect that he felt assured of genuine poisoning from the bug, in cases which he had examined. Professor Cope related further experiments on frogs, and said that the frog liquid administered to the reptiles made them very sick. The most plausible suggestion offered during the debate was that the frog poison is probably volatile, and in the process of making decoctions and tinctures, the poison, when heated, escaped into the air.

A PROPOSED INSECT COMMISSION.

A memorial was submitted to the meeting and approved, which addresses Congress with relation to the establishment of a national insect commission. The document states that the damage done by the noxious insects in the United States amounts to $300,000,000 per annum. The subscribers propose either the reorganization of the Department of Agriculture, under the control of the highest scientific authories, or the appointment of a commission of five persons, to wit: Three entomologists, one chemist, and one botanist, eminent in their respective branches of science, to be chosen by the Council of the National Academy of Science, and approved by the Secretary of the Treasury, with salaries adequate for the responsible work. The duty of this commission would be to investigate the causes which affect injuriously agricultural interests, and to suggest the best means of diminishing the losses.

The results of such investigations should be embodied in brief reports, containing practical instructions and made accessible at a small price; or the results should be made useful, by personal education, to every farmer in the country.

LOCUSTS AS FOOD.

Professor Riley believes that grasshoppers make a good article of diet. He says that he fried them and roasted them, and that they have a pleasant, nutty flavor. They are equally good eating, either boiled or stewed. We congratulate the professor, both on his gastronomic discovery and on his courage. His name bids fair to be linked by posterity with that of the man who first ate an oyster.

More about insects, a branch of creation which seems peculiarly interesting to the assembled scientists this year, is found in the papers of Professor W. J. Beal and Thomas Meehan. The former discussed

CARNIVOROUS PLANTS;

and after detailing past discoveries, said that the *Martynia* of our vegetable gardens catches immense numbers of insects, one plant of small size destroying 7,200 of its prey. The hairs seem to have small glands at the ends, which secrete a sticky substance. The insect is soon killed and sucked dry.

Professor Meehan disputed several assumptions relative to the

INSECT FERTILIZATION OF PLANTS.

He concluded that the great bulk of colored flowering plants are self-fertilizers; that only to a limited extent do insects aid fertilization that self-fertilizers are every way as healthy and vigorous, and are immensely more productive than those dependent on insect aid, and that, when plants are so dependent, they are the most fitted to engage in the struggle for life.

Professor Gillman gave a description of his explorations on the upper lakes, during which he found a large number of

ANCIENT HUMAN RELICS.

Many of the skulls were perforated at the highest point, the holes measuring between ⅛ and ¼ an inch. Several mounds opened gave evidence of the cremation of the bodies inhumed.

Professor Cope read a fine essay on the

DISTRIBUTION OF BATRACHIA AND REPTILIA IN NORTH AMERICA.

He said that the characteristics of these families are such as to make them especially useful in the inquiry as to the actual relations between the structures of animals and the physical nature of the regions which they inhabit. The naturaldivisions of the batrachian and reptilian *faunæ* in America were stated to be six, namely, two east of the plains, he northern or eastern, the southern or austro-riparian; the entral, extending from the eastern boundary of the plains to the Sierra Nevada; the Pacific, west of that range; the Sonoran, including New Mexico, Arizona, and a portion of Northern Mexico. Lastly, the Lower California region, embracing the peninsula of that name. The eastern and austro-riparian regions embrace all of the *batrachia* (especially salamanders) and the turtles; the Sonoran embraces nearly all of the lizard; the Pacific region includes a nearly equal percentage of all the divisions excepting the tortoises. The relations of these distributions to physical peculiarities are as follows: First, as to temperature: The two Southern regions of North America are the austro-riparian and Sonoran. These regions include nearly all the North American genera, and three fourths of the species. In Central America and Mexico, it is the central plateau and the high mountains which support the North American forms, while the South American genera and species are distributed along the Sierra Caliente of the east and west coasts. Thus it is evident that temperature has a controlling influence in the distribution of reptilian life on the North American continent, and that conditions of humidity are effective in determining the distribution of *batrachia*, and to a less degree of *reptilia*.

The following officers were elected for the next meeting, which is to be held at Buffalo, N. Y.: President, William B. Rogers, of Boston, Mass.; General Secretary, Thomas C. Mendenhall, of Columbus, Ohio; Vice-President of Section A, Charles A. Young, of Hanover, N. H.; Vice-President of Section B, Edward S. Morse, of Salem, Mass.; Secretary of Section A, Arthur W. Wright, of New Haven, Conn.; Secretary of Section B, Albert H. Tuttle, of Columbus, Ohio; Treasurer, Thomas T. Bouve, of Boston, Mass.; Permanent Secretary, Professor Putnam

Abstracts of other papers read will appear in our next issue.

The Death of Donaldson the Aeronaut.

About the middle of July last, Mr. Washington A. Donaldson, the well known aeronaut, in company with a Mr. Grimwood, a newspaper reporter, started on a balloon ascension from Chicago. The trip was intended to be one of the many which constituted a part of the attractions of Mr. P. T. Barnum's traveling show; and accordingly, after an afternoon performance of the circus, Donaldson and his companion ascended amid the usual cheering of the multitude. All accounts agree to the statement that the balloon and its appurtenances looked dangerously weak. The globe itself was of cotton, and old and weatherbeaten, while the netting showed frequent marks of half-made repairs. Shortly after the balloon had departed, a violent storm arose, the track of which intersected that of the air ship, as indicated by the direction in which the latter was swiftly borne over Lake Michigan.

No tidings of the aeronauts were obtained until after the lapse of several days, when the captains of arriving vessels reported sighting the balloon, close to the surface of the lake and apparently dragging its car in the water. Reports of a similar nature followed, not unmixed, however, with conflicting stories of the safe landing of the travelers; but the latter on investigation proved untrue.

As the public is familiar with Mr. P. T. Barnum's ingenuity in converting all sorts of phenomenal circumstances into useful advertisements for his show, a very large number of persons, ourselves included, suspected that the disappearance of Donaldson was intentional, and that, in due time after the excitement had abated, he would return with some marvelous yarn, eminently attractive to the curious and gullible. The recent discovery of the body of Grimwood on the shore of the lake leaves no question, however, but that the daring aeronaut is actually lost, and that at last, after surviving voyages in paper balloons, and in balloons filled with hot air, after indulging in his taste for blood-curdling gymnastics on the trapeze while above the clouds, *ad libitum*, he at length has fallen a victim to the dangers which he had grown to despise.

In a certain sense, Mr. Donaldson's death is a loss to Science; for although his proclivities tended more toward the sensational, and his achievements were accomplished more by sheer rashness and pluck than through any desire for scientific investigation, still he possessed many qualities which eminently fitted him to be a pioneer in a branch of knowledge regarding which so much remains to be practically discovered. He had considerable inventive ability, and courage enough to attempt tasks before which the majority of men would shrink; and these qualities, coupled with an extended experience, gave fair promise that in the future his efforts might result in useful data toward the solution of the problem of aerial navigation.

DECISIONS OF THE COURTS.

United States Circuit Court.---Northern District of New York

PATENT BARREL HEAD LININGS.—GEORGE A. REED *vs.* LOUIS REED AND GEORGE FOLTS.

[In equity.—Before Wallace J.—October, 1874.]

The claim of letters patent for an "Improvement in Head Linings for Barrels," granted to George A. Reed, May 11, 1873, namely: "As a new article of manufacture, barrel head linings prepared in the manner specified, when bundled as shown and described" is invalid.

As both head linings and hoops had been made by machinery, and were articles of trade, and as hoops had also been crimped by machinery, the patentee merely produced an article which was the result of more mechanical skill and care in its manufacture than that previously sold and used; but this result did not involve the faculty of invention.

Although the crimpled machine-made head linings are an improvement upon the article used prior to their introduction, and, as such, have secured the approval of the trade and become a valuable commodity of manufacture and sale, the improvement is not the proper subject of a patent.

The sole merit of bundling the head linings is that it renders the commodity more attractive to purchasers, and more convenient for the purposes of sale. There is nothing in this result that is patentable.

(*James A. Allen*, for complainant.
John Van Voorhis, for defendants.)

NEW BOOKS AND PUBLICATIONS.

MANUAL OF QUALITATIVE CHEMICAL ANALYSIS. By C. Remigius Fresenius, Director of the Chemical Laboratory at Wiesbaden, and Professor of Chemistry, Natural Philosophy, and Technology at the Wiesbaden Agricultural Institute. Translated into the New System and Edited by Samuel W. Johnson, M.A., Professor of Theoretical and Agricultural Chemistry in the Sheffield Scientific School of Yale College, New Haven, Conn. Price $4.50. New York city: John Wiley & Son, 15 Astor Place.

This book fills a place in our scientific literature that has for some time been vacant. Nearly all our manuals of analytical science have long been antiquated; and although several small treatises have been issued, in which the latest results of contemporary research have been recognized and the new nomenclature has been employed, the authoritative text book of Dr. Fresenius, to whom, more than to any other master, the progress of this science to its present nearly absolute perfection is due, was in danger of becoming obsolete. Professor Johnson deserves the thanks of the scientific world for the labor and care he has given to the publication of this important work, which now receives as it were a new life. No book on the subject which we have yet seen approaches this in perspicuity and excellence of method. It deals with each subject in a strictly scientific manner, accompanying the student from test to test, and noting down the results and the inferences therefrom with a certainty that amounts to demonstration. We commend it to all students of chemistry, not only for its accuracy and completeness, but for the inductive reasoning employed throughout, which is the very foundation of all scientific investigation.

THE PRIMER OF POLITICAL ECONOMY, in Sixteen Definitions and Forty Propositions. By A. B. Mason and John J. Lalor. Price 75 cents. Chicago, Ill.: Jansen, McClurg, & Co.

Although the authors of this excellent treatise are careful to assert that it is only a primer, we are bound to state that the most elementary truths contained in it are little known to many who claim to be well versed in the science, and especially to have some panacea for the widespread poverty and distress which has reigned in our manufacturing interests for nearly two years. The writers have no fear in placing before the world many unpalatable facts, and in deducing from them a policy which will restore prosperity to our trades. Every ignorant person in the country is now talking tariff and currency; and a little common sense, as embodied in these incontrovertible propositions, is especially welcome at the present time.

NOTES ON BUILDING CONSTRUCTION, Arranged to Meet the Requirements of the Syllabus of the Science and Art Department of the Committee of Council on Education, South Kensington, England. Part I, First Stage or Elementary Course. London, Oxford, and Cambridge, England: Rivingtons. Philadelphia, Pa.: J. B. Lippincott & Co., 717 & 719 Market street.

The author of this work (who modestly conceals his name) states that these notes are compiled for the use of students of building science; but the book is really a valuable text book on the art of practical architecture, treating the subject with thoroughness, and leaving nothing unsaid that could inform the pupil as to the best possible practice. It is well arranged and edited.

UTILITY OF THE SLIDE RULE, a Treatise on Instrumental Arithmetic. By Arnold Jillson. New York city: A. J. Bicknell & Co., 27 Warren street.

The use of ready reckoners saves an immense amount of labor in all trades; and by far the most compendious reckoner is the engineer's slide rule. A little slip of wood with brass mounting, easily carried in the pocket, it gives a means for effecting all kinds of mensuration of surfaces and solids, gaging, weighing metals and other materials, calculating powers of engines and capacities of appliances for transmission of force, and even for reckoning compound interest. Mr. Jillson has written a valuable little book, which fully describes all the uses of this instrument; and he has, moreover, applied the slide rule to many novel purposes, especially in the textile manufactures We commend this pocket volume to all our readers.

A SUMMER IN NORWAY, with Notes on the Industries, Habits, and Customs of the People, etc. By John Dean Caton, LL.D., Ex-Chief Justice of the Supreme Court of the State of Illinois. Price $2.50. To be had of all booksellers. Chicago, Ill.: Jansen, McClurg, & Co.

This book is a readable account of a holiday spent in a country which is, in many respects, one of the most interesting in the world. It is generally well written, and the author appears to be observant and accurate; and no doubt the slight touches of egotism with which the volume abounds are almost inseparable from a book of travels, which is nearly sure to be more or less of a personal history.

DESIGNS FOR MONUMENTS. By W. B. Franke, Architect. New York city: A. J. Bicknell & Co., 27 Warren street.

This book contains forty folio plates, showing over one hundred designs for cemetery monuments in all forms and styles. Many of the ideas embodied in the drawings are strikingly original and in good taste; while the variety exhibited enables any one to find a memorial suited to his purpose and his means. The details are all fully elaborated, making the plates serve as working drawings. It is a handsome volume, and does credit to the publishers.

CATALOGUE OF RAILWAY, MACHINISTS', AND MANUFACTURERS' SUPPLIES. By H. A. Rogers. New York city: H. A. Rogers, 19 John street.

This is a very handsome volume of 272 pages, on which is represented nearly every article that can possibly be needed in an engine or machine shop The engravings are admirably executed; and the book, although but a trade catalogue, gives much valuable information as to many branches of the mechanical arts.

THE WATCHMAKER, JEWELER, AND SILVERSMITH. a Monthly Journal devoted to the Interests of Watchmakers, Jewelers, Silversmiths, Opticians, and Kindred Trades. Subscription, $1.25 (gold) a year. London, England: 8 Cross street, Hatton Garden.

A readable, well arranged periodical containing much varied information on the trades to which it is specially addressed.

LASALLE'S POCKET MAP OF THE COMSTOCK LODE. Mounted in Pocket Book Form. Price $2.50. San Francisco, Cal.: Le Count Brothers, 417 Montgomery street. New York city: F. F. Taylor, 16 Broad street.

A neatly executed map of the remarkable district of Washoe, Nevada, in which the intricacy of the mines and their immense capacity are forcibly shown. Some valuable explanatory statistics are added to the volume.

THE SILVER AND LEAD DISCOVERIES IN NEWBURYPORT, MASS., AND ITS VICINITY. With a Map. By Charles J. Brockway. Price 50 cents. Boston, Mass.: A. Williams & Co., 283 Washington street.

This is an historical account of the Massachusetts silver, gold, and lead ores, of which we heard so much a few months since. There does not, at present, seem to be great probability of Mr. Brockway's estimates of wealth being realized.

THE WOOL CARDER'S VADE MECUM, a Handbook of the Woolen Industry. By W. C. Bramwell. Terre Haute, Ind.: Express Printing Company.

An excellent practical treatise, containing much valuable information and some useful tables.

PURCELL'S RAILROAD POCKET BOOK. Price 25 cents. Louisville Ky.: Saxton Publishing Company.

A set of well compiled distance tables.