side, it is proved by my statements that in this peculiarity both the Dresden Codex and the Palenque tablet differ from the Codex Troano-Cortez. For in the latter document the beginning of the years is in the days kan, muluc, ix, cauac. This is proved by Codex Troano 23-20, when compared with the Dresden Codex 25-28. From this, and the general character of the Codex Troano-Cortez, we may safely infer that this manuscript is of a later date than the Dresden Codex, and, perhaps, of a somewhat different locality.

Alluding to 9 C 9 D of the Palenque tablet, Professor Thomas remarks that on plate 48 and twice on plate 50 of the Dresden Codex no number-symbol is attached where the day is the twentieth of the month. This is obviously an erroneous statement; for in all the three cases named, and also in the Palenque tablet, there is a particular element attached to the hieroglyph of the month; and this particular element reveals itself as a graphic representation of the two eyes of the man (uinic), the substitute of the head of the slain, which I have shown is the usual representation of the man (uinic) or the number twenty (uinal) (see Zeitschrift für Ethnologie, XIX., pp. 237–240.

With reference to Professor Thomas's last remarks, I will add that the symbol of the hand, as it is seen in the hieroglypth mūnik, is to be understood as a sign-language character for "to eat," and therefore has the phonetic value chi (compare the hieroglyph chikin, west). The figure of the outstretched hand occurs as a substitute for the hatchet, the probable expression of the sound ch'ac, "to cut." The proper phonetic and figurative value of the outstretched hand seems to be pax, "to beat."

DR. ED. SELER.

Steglitz, Germany, June, 1892.

A Grape Vine Produces Two Sets of Leaves During the Same Season.

THE scarcity of information upon the production of leaves at abnormal times furnishes an excuse for the following communication.

In the yard adjoining me there is a large grape-vine of several years' growth. A month ago this was a vigorous plant; the leaves were numerous and healthy, and the branches were loaded with grapes. About that time numerous caterpillars attacked the vine, and in less than a week there was not a leaf left upon it. Numerous petioles, bearing fragments of the principal veins, were all that remained of the foliage. The grapes began to shrivel, and the smaller twigs to show signs of premature decay.

But the end was not yet. About a week after the leaves were destroyed, buds located at the nodes — buds which normally would have remained dormant until next year — began to develop a second foliage. Although not yet full-grown, these leaves have given a new lease of life to the vine. The few shriveled bunches of grapes that have survived the great draught upon their moisture are rapidly regaining their plumpness. The plant is itself again.

One fact is worth noting; although almost four weeks have elapsed since the leaves were destroyed, the petioles remain attached to the stems. These petioles are as green as ever, and in most cases they retain short bits of the principal veins of the leaves. Near the petioles these veins are green, but their free extremities are shriveled and brown.

C. H. TURNER.

University of Cincinnati, July 10.

BOOK-REVIEWS.

The Stone, Bronze, and Iron Ages. A Popular Treatise on Early Archæology. By John Hunter-Duvar. London, Swan Sonnenschein & Co. New York, Macmillan & Co. 285 p. \$1.25.

As the author claims for this book no other character than that of a popular treatise, it will be sufficient to inquire whether it is a fair representation of the most approved views of the science, as expressed by those who have made it a speciality. This it usually is, although the author, who never quotes his authorities, has inserted opinions here and there which are certainly not those generally accepted. For instance, he understates the artistic

relics of the Palæolithic period; he assumes that the weapons of the river drift were more ponderous than those of later date; he asserts that no idols have been recovered from the stations of that epoch; and that no human remains have been unearthed from the European kitchen-middens. Our countrymen will also be surprised to learn that Mound City is another name for St. Louis (p. 142).

In spite of such slight blemishes, the book can be recommended as a convenient and usually accurate manual of this attractive science. It begins at the beginning, tracing the story of man from early post-tertiary times through the drift and cave periods in Europe, and the neolithic, bronze, and iron ages. There are special chapters on the lake-dwellers, fossil man, myths, pottery, sepulture, and art, and one on the mound-builders of the Ohio Valley.

Journal and Proceedings of the Royal Society of New South Wales. Vol. XXV. 1891. 348 p.

The creditable publications of this active society have already reached their twenty-fifth volume, and it comes replete with entertaining material. Several reports from the Sydney Observatory on celestial photography will have interest for the astronomer; articles on Kaolinite and the microscopic structure of Australian rocks will attract the geologist; the causes of death among sheep and rabbits in Australia will be welcome to the agriculturist; the folk-lorist will turn with pleasure to Mr. Pratt's translations of songs and myths from Samoa; while the mechanicians and cranks will be glad to read about a ship which can be propelled by the action of the waves alone, and a flying machine which is to navigate the sky by the motive power of compressed air. This is certainly a varied repast, at which each may find a dish to his liking.

AMONG THE PUBLISHERS.

A WORK on the "Migration of Birds," by Charles Dixon, will shortly be published by Messrs. Chapman & Hall.

- Messrs. Longmans, Green, & Co. have issued a third edition, revised and enlarged, of Professor E. Λ. Schäfer's "Essentials of Histology." The intention of the author is to supply students with directions for the microscopical examination of the tissues
- —A "Dictionnaire de Chimie industrielle" is being issued in parts, under the direction of A. M. Villon, by the "Librairie Tignol." It gives an account of the applications of chemistry to metallurgy, agriculture, pharmacy, pyrotechnics, and the various arts and handicrafts.
- Henry Stevens & Son, 39 Great Russell Street, London, promise for next month Henry Harisse's "Discovery of North America: a critical, documentary, and historic investigation, with an essay on the early cartography of the New World," etc. This important work by the foremost investigator in the field will make a quarto volume of 800 pages, with 23 plates and many illustrations in the text, and will be issued to subscribers in three styles, ranging in price from £5 to £12 16s. Only 360 copies are to be printed.
- The American Society for the Extension of University Teaching, Philadelphia, has just issued five monographs on various phases of the university extension movement, being reprints from the Proceedings of the Society. These are: "The Place of University Extension in American Education," by William T. Harris, U. S. Commissioner of Education; "The Organization and Function of Local Centres," by Michael E. Sadler, secretary of the Oxford University Extension Delegacy; "The Church and University Extension," by Rev. John S. Macintosh; "The Ideal Syllabus," by Henry W. Rolfe; and "The University Extension Class," by Edward T. Devine.
- With the number for July, the "Annals" of the American Academy of Political and Social Science begins its third volume. The first article in the current number is entitled "Cabinet Government in the United States." It is by Professor Freeman Snow of Harvard, and is an answer to the many pleas for the adoption

in the United States of cabinet government as known abroad. The next article is by Mrs. S. L. Oberholtzer, and relates how much good "School Savings Banks" have done and are doing. Professor J. B. Clark of Smith College has a paper on "Patten's Dynamic Economics." in which he explains the latest system of political economy, taking up Professor S. N. Patten's recent book as a basis for his remarks. Professor Léon Walras of Lausanne contributes an article on the "Geometrical Theory of the Distribution of Prices," in which he presents a geometric picture of the causation of the prices of all commodities. Besides these there are articles by Mr. B. F. Hughes on "Basis of Interest," by Leo S. Rowe on the "Conference of the Central Bureau for the Promotion of the Welfare of the Laboring Classes," by Takekuma Okacla on "Taxation in Japan," and the usual book-reviews and

- W. H. Lowderwilk & Co., Washington, announce that they have assumed the publication of "Hickcox's Monthly Catalogue of Government Publications," which they will complete up to date and issue regularly and promptly in the future. Mr. Hickcox will edit the catalogue as heretofore, but all rights in the work have been purchased by the publishers. Up to this time the work has been prosecuted under many difficulties, and the pecuniary returns have been very inadequate, by reason of which facts it was not kept up with the regularity which its importance demanded. It is expected to issue early in July the first six numbers of 1892, under one cover, succeeding numbers to follow early in each month thereafter. As rapidly as the matter can be prepared the back volumes will be completed and sent to subscribers. It is not expected that the undertaking will prove a remunerative one, but it is hoped that there will be a return sufficient to repay the actual outlay of money. The work is of the utmost value to every person who has occasion to handle or consult the current publications of the government, and these publications are now so varied and comprehensive that persons interested in any branch of science or business must appreciate it.

- Under the title of "The Cambridge Natural History," Macmillan & Co. have in active preparation an important series of volumes on the Natural History of Vertebrate and Invertebrate Animals, edited, and for the most part written, by Cambridge men. While intended in the first instance for those who have not had any special scientific training, the volumes will, as far as possible, present the most modern results of scientific research. Thus the anatomical structure of each group, its development, palæontology, and geographical distribution, will be considered in conjunction with its external character. Care will, however, be taken to avoid technical language as far as possible, and to exclude abstruse details which would lead to confusion rather than to instruction. The series will be under the general editorship of Mr. J. W. Clark, the university registrar, and Mr. S F. Harmer, superintendent of the Museum of Zoölogy. The following writers

Publications Received at Editor's Office.

BUSH, GEORGE G. History of Higher Education in Massachusetts. Washington, Bureau of Education. 8°, paper. 455 p.
HUNTER-DUVAR, JOHN. The Stone, Bronze and Iron Ages. New York, Macmillan & Co. 12°. 285 p. \$1.25.
MAYO, A. D. Southern Women in the Recent Educational Movement in the South. Washington, Bureau of Education. 8°, paper. 330 p.
MERZ, CHARLES H. Influenza. Sandusky, O. Beecher & Co., Printers. 12°, paper. 96 p.
U. S. DEPARTMENT OF AGRICULTURE. Foods and Food Adulterants. Part 7: Tea, Coffee and Cocoa Preparations. Washington, Government 8°, paper.

Cocoa Preparations. Washington, Government. 8°, paper.

-Experiments with Sugar Beets in 1891. Washington, Government. 8°, paper.

-Record of Experiments with Sorghum in 1891. Washington, Government. 8°, paper. EISMANN, August. Essays upon Heredity. Trans. by E. B. Poulton and A. E. Shi.ley. Vol. II. Oxford, Clarendon Press. 12°. 236 p.

Reading Matter Notices.

Ripans Tabules: for torpid liver. Ripans Tabules banish pain.

Societas Entomologica.

International Entomological Society, Zurich-Hottingen, Switzerland.

Annual fee, ten francs.

The Journal of the Society appears twice a month, and consists entirely of original articles on entomology, with a department for advertisements. All members may use this department free of cost for advertisements

relating to entomology.

The Society consists of about 450 members in all countries of the world.

The new volume began April 1, 1892. The numbers already issued will be sent to new members

For information address Mr. Fritz Ruhl, President of the Societas Entomologica, Zurich-Hottingen, Switzerland.

SCIENCE CLUBBING RATES.

10% DISCOUNT.

We will allow the above discount to any subscriber to Science who will send us an order for periodicals exceeding \$10, counting each at its full price.

N. D. C. HODGES, 874 Broadway, N. Y.

Exchanges

[Free of charge to all, if of satisfactory character, Address N. D. C. Hodges, 874 Broadway, New York.]

Taxidermist going out of business has quantity of finely-mounted specimens of North American birds, mammals and reptiles and skins of birds for sale, including a full local collection of bird skins, showing some great variations of species; also quantity of skulls with horns of deer and mountain sheep, and mounted heads of same. Will give good exchange for Hawk Eye camera with outfit. Apply quickly to J. R. Thurston, 265 Yonge St., Toronto, Canada.

For exchange.—A fine thirteen-keyed flute in leather covered case, for a photograph camera suitable for making lantern slides. Flute cost \$27, and is nearly new. U. O. COX, Mankato, Minn.

To exchange; Experiment Station bulletins and reports for bulletins and reports not in my file. I will send list of what I have for exchange. P. H. ROLFS, Lake City, Florida.

Finished specimens of all colors of Vermont marble for fine fossils or crystals. Will be given only for valuable specimens because of the cost of polishing. GEO. W. PERRY, State Geologist, Rutland, Vt.

For exchange.—Three copies of "American State Papers Bearing on Sunday Legislation," 1891, 82,50, new and unused, for "The Sabbath," by Harmon Kingsbury, 1840; "The Sabbath," by A. A. Phelps, 1842; "History of the Institution of the Sabbath Day, Its Uses and Abuses," by W. L. Fisher, 1859; "Humorous Phases of the Law," by Irving Browne; or other works amounting to value of books exchanged, on the question of governmentallegistation reference to religion.

For Sale or Exchange for books a complete private chemical laboratory outfit. Includes large Becker balchemical laboratory outht. Includes large Becker Dalance (200g to 1-10mg), platinum dishes and crucibles, agate motors, plassification apparatus, etc. For sale in part or whole. Assert of the file of Silliman's Journal, 1862-1885 (62-71 bound); Smithsonian Reports, 1854-1883; U. S. Coast Survey, 1844-1865. Full particulars to enquirers. F. (ARAM SIE. JR, Pomfret, Conn.

Wanted, in exchange for the following works, any standard works on Surgery and on Diseases of Children: Wilson's "American Ornithology," 3 vols.; Coues' "Birds of the Northwest' and "Birds of the Colorado Valley," 2 vols.; Minot's "Land and Game Birds of New England; 'Samuels' "Our Northern and Eastern Birds; althe Reports on the Birds of the Pacific R. R. Survey, bound in 2 vols., morocco; and a complete set of the Reports of the Arkansas Geological Survey. Please give editions and dates in corresponding. R. ELLSWORTH CALL, High School, Des Moines, Iowa.

To exchange Wright's "Ice Age in North America" and Le Conte's "Elements of Geology" (Copyright 1882) for "Darwinism," by A. R. Wallace, "Origin of Species." by Darwin, "Descent of Man," by Darwin, "Man's Place in Nature," Huxley, "Mental Evolution in Animals," by Romanes, "Pre-Adamites," by Winchell. No books wanted except latest editions, and books in good condition. C. S. Brown, Jr., Vanderbilt University, Nashville, Tenn.

Wants

Any from a fine the for which he is qualified by the sine in a fine the for which he is qualified by the sine in a fine the for a teacher of science, chemist, draughtsman, or what of a teacher of science, chemist, draughtsman, or what the Botton, if from the first the first of the suitable character of singular the Any person seeking information on any freship in the address of any scientific man, or who can in any way use this aclumn for a purpose consonant with the nature of the paper, is cordially invited to do so.

A JOHNS HOPKINS graduate (1892) desires a position as instructor in mathematics and physics. Address A. B. TURNER, Johns Hopkins University, Baltimore, Md.

WANTED.—A collection of postage stamps; one made previous to 1870 preferred. Also old and curious stamps on original letters, and old entire U.S. stamped envelopes. Will pay cash or give in exchange first-class fossils, including fine crinoids. WM. F. E. GURLEY, Danville, Ill.

WANTED.—To purchase laboratory outfit; bal-ances, evaporating dishes, burettes, etc., wanted translation for cash. C. E. SPEIRS, 23 Murray street, New York, P. O. Box 1741.

WANTED.—The services of a wide-awake young man, as correspondent, in a large menufacturing optical business; one preferred wide has there on the knowledge of the control o Address of Science, 874 Broadway, New York.

WANTED.—We want any and +ll of the following, W providing we can t ade other books and magazines or buy them cheap for cash: Academy, London, vol. 1 to 28, 35, Jan. and Feb., '89; Age of Steel, vol. 1 to 66; American Antiquarian, vol. 1, 2; American Architect, vol. 1 to 6, 9; American Art Review, vol. 3; American Field, vol. 1 to 21; American Geologist, vol. 1 to 6; American Machinist, vol. 1 to 4; Art Amateur, vol. 1 to 7, O.t., '4; Art Interchange, vol. 1 to 9; Art Union, vol. 1 to 4; Art Amateur, vol. 1 to 46; Godey's Lasty Ebolk vol. 1 to 20; New Englander, vol. 11; Zoolegist, series 1 and 1, Series 3 vol. 1 to 14; Allen Armendale (a novel). Raymer's 'Old Book' Store, 243 4th Ave. S., Minneapolis, Minn.

WANTED.—By a young man, a Swarthmore College junior, a position as principal and the college in Where College Bonners Bonners Bonners College Bonners Swarthmore College, Penn.

WANTED.—To act as correspondent for one or two daily or weekly papers. Have worked on paper for about two years. Would like a position on editorial staff of humorous paper. Address GEO. C. MASON, 14 Elm St., Hartford, Conn.

TRANSLATOR wanted to read German architec-tural works at sight (no writing). One familiar with technical terms desired. Address "A.," Box 149, New York Post Office.

are engaged upon the groups which precede their names: Mammals, Mr. J. J. Lister; Birds, Mr. A. H. Evans; Reptiles and Amphibia. Dr. Gadow, F.R.S.; Fish, Mr. W. Bateson; Mollusca, Mr. A. H. Cooke; Polyzoa, Mr. S. F. Harmer; Brachiopoda, Mr. A. E. Shipley; Insects, Mr. David Sharp, F.R.S.; Myriapoda, Mr. F. G. Sinclair; Arachnoida, Mr. C. Warburton; Crustacea, Professor W. F. R. Weldon; Coelenterata, Mr. S. J. Hickson; and Sponges, Dr. W. J. Sollas. It is hoped that some of the volumes which are already far advanced may appear in the course of next year. The series will be fully illustrated.

-- The Biblia Publishing Company of Meriden, Conn., has just issued its initial monthly number of "Ancient Egypt in the Light of Modern Discoveries," edited by Chas. H. S. Davis, Ph.D., and Rev. Camden M. Cobern, Ph.D., with an introduction by Rev. W. C. Winslow, LL.D. Over one hundred illustrations will appear in the twenty-four monthly parts; in the June issue are maps of Egypt as a whole, of Upper Egypt, of Lower Egypt, of the Basin of the Nile, of the Canal of Joseph, and of Egypt during the

pluvial period; this opening chapter treats of "Egypt and Its Original Inhabitants," and it is largely ethnographical in its cuts and letterpress.

-Mr. F. Turner contributes to the April number of the Agricultural Gazette of New South Wales a paper on the carob bean tree as one of the commercial plants suitable for cultivation in New South Wales. The Agricultural Department distributed a quantity of seed last year, and some healthy young plants raised from this seed are now growing in several parts of the colony. Mr. Turner expects that when the tree becomes better known to cultivators it will be extensively grown to provide food for stock, more especially during adverse seasons. The carob can not only be trained into a very ornamental shade tree, but may be planted as a wind-break to more tender vegetation. He advises all who cultivate it to keep bees, if only a single hive. It is astonishing, he says, how many flowers these industrious insects will visit in the course of a day, and be the agency whereby they are fertil-

Torsford's Acid Phosphate,

Recommended and prescribed by physicians of all schools

FOR

DYSPEPSIA. NERVOUSNESS. EXHAUSTION,

and all diseases arising from imperfect digestion and derangements of the nervous system.

It aids digestion, and is a brain and nerve food.

Descriptive pamphlet free. Rumford Chemical Works, Providence, R. I.

Beware of Substitutes and Imitations.

A TEMPORARY BINDER

for Science is now ready, and will be mailed postpaid on receipt of 75 cents.



This binder is strong, durable and elegant, has gilt side-title, and allows the opening of the pages perfectly flat. Any number can be taken out or replaced without disturbing the others, and the papers are not mutilated for subsequent permanent binding. Filed in this binder, Science is always convenient for reference.

N. D. C. HODGES, Publisher,

874 Broadway, New York.

LITERARY OUTFIT FREE

\$4.00 actual value for \$1.00. Sample copy of "Lit erary Light," 10 cents (postal card won't do).

rary Light," 10 cents (P. Address, Literary Light,
Minneapolis, Minn.

STERBROOK'S STEEL PENS.

OF SUPERIOR AND STANDARD QUALITY. Leading Nos.: 048, 14, 130, 135, 239, 333 For Sale by all Stationers.

THE ESTERBROOK STEEL PEN CO., Works: Camden, N. J. 26 John St., New York.





For INVENTORS. 40-page BOOK FREE. Address W. T. Fitzgerald, Attorney at Law, Washington, D.C.

GEM OPALS. Cut ready for setting. Having purchased a large lot at the Mexican locality, we are offering them at about one-fifth jeweiers' prices; 50c., \$1, \$1.50, \$2, \$3. This is a rare opportunity to secure a fine gem very cheap. 100 pp. Mineral Catalogue 15c., in cloth 25c. Supplement 2c. GEO. L. ENGLISH & Co., Mineralogists, 733 and 735 Broadway, New York City.

THE WEEKLY BULLETIN

OF NEWSPAPER AND PERIODICAL LITERATURE.

Catalogues and Classifies Each Week THE PRINCIPAL CONTENTS OF THE PERIODICAL PRESS.

That huge mass of material heretofore inaccessible to the eager student is now rendered available. Special attention is invited to the Bulletin's

INDEX OF TECHNICAL LITERATURE

Send for a free sample copy and learn how

The Bulletin Supplies The Articles Catalogued.

Address THE WEEKLY BULLETIN. 5 Somerset Street, - - Boston, Mass.



WORLD-ENGLISH. 25 Cents.

HANDBOOK WORLD-ENGLISH. 25 Cents.

Ex-President Andrew D. White, of Cornell University, says: "I believe that the highest interests of Christian civilization and of humanity would be served by its adoption."

"So set down, our tongue is the best for the world to unite upon."—Brooklyn Eagle.

"The idea of Mr. Bell has much to recommend it, and the presentation is charmingly clear."—American, Phila.

"The result is a language which cannot fail to meet with acceptance."—Boston Traveller.

"World English deserves the careful consideration of all serious scholars."—Modern Language Notes.

Sent, postpaid, on receipt of price.

Sent, postpaid, on receipt of price.

N. D. C. HODGES, 874 Broadway, New York.

FOSSIL RESINS.

This book is the result of an attempt to collect the scattered notices of fossil resins, exclusive of those on amber. The work is of interest also on account of descriptions given of the insects found embedded in these longpreserved exudations from early vegetation.

By CLARENCE LOWN and HENRY BOOTH 12°. \$1.

N. D. C. HODGES, 874 Broadway, N. Y.

POPULAR MANUAL OF VISIBLE SPEECH AND **VOCAL PHYSIOLOGY.**

For use in Colleges and Normal Schools. Price 50 cents Sent free by post by

N. D. C. HODGES, 874 Broadway, N. Y.