conclusion, and repeats it with added evidence in the Internationales Archiv für Ethnographie (Bd. VIII., Heft. III., 1895). The cradle of Mayan culture, he maintains, was south of the peninsula of Yucatan and in the interior. The subject which leads up to his statement is offered by the decorations on some ancient earthenware vases from Guatemala, which are described and portrayed.

Basing an article on a similar series of pottery from the same district, Dr. E. Seler, in the Verhandlungen of the Museum of Ethnography of Berlin, points out that throughout western Guatemala, Quirgua probably included, the fictile art and the decorative designs have such close analogies that all this territory must have been under the immediate influence of the cultured nation whose highest products we see in the remains at Copan. The question now presents itself, was it about Copan, in the extreme east of the Mayan territory, or about Palenque and Ococingo, in its western extremity, that this culture had its origin?

ANCIENT MEXICAN HIGHWAYS.

In a lecture delivered last August before the German Anthropological Society (reported in the Correspondenz-blatt, September), Baron von Brackel described several highways constructed by the ancient inhabitants in western Michoacan. They are six or seven feet wide, laid with unhewn large stones, the surface slightly shelving so as to shed the water freely, protected by stone facing, both above and below, where there is danger of the banks giving way. Their direction is almost rectilinear, and evidently the deep ravines and water courses were crossed by hanging bridges, as the road continues either side of them. The paving was so thoroughly done that many miles of it are in perfect condition.

Although in many parts the stones have been taken away for modern constructions, the speaker believed that it would not be difficult to trace out and map the whole system of these highways. As far as he had accomplished this, they appear to center toward some distant point, which he thinks may be the Bay of Maruata, on the Pacific coast. The vicinity of Coalcoman, where these highways are especially noticeable, is rich in copper and other minerals, and the idea suggests itself that these paved paths were built to facilitate the transportation of such materials to the seashore.

D. G. Brinton.

SCIENTIFIC NOTES AND NEWS.

HARVARD COLLEGE OBSERVATORY.

Prof. E. C. Pickering announces in circular No. 3, the discovery of a new variable star of the Algol type. The star B. D. + 17° 4367, magn. 9.1, whose approximate position for 1900 is in R. A. $20^h\ 33^m.1$, December + 17° 56′, appears to be a variable star of the Algol tpye. On July 18, 1895, Miss Lousia D. Wells found that no trace of this star appeared on the photograph I 4359, taken with the 8 inch Draper telescope on September 26, 1891, exposure 16 m. On 71 other plates taken from June 30, 1890, to October 5, 1895, the star appears of its normal brightness. On December 12, 1895, at $10^h\ 42^m$ Greenwich Mean Time, Prof. Arthur Searle, who had watched this star on several nights, found it more than a magnitude fainter than usual. During the next half hour it diminished about half a magnitude more. Meanwhile, a photograph taken with the 8 inch Draper telescope, I 14036, confirmed the diminution in light. Unfortunately, at $11^h\ 15^m$ G. M. T., clouds covered the region, and the star, although carefully looked for, was not seen again that evening. The change in brightness appears to be rapid and the range of variation to be large, exceeding two magnitudes. The nearest bright star is B. D. + 17° 4370, magn. 7.0, which follows 14^s and is south 1′. The variability of B. D. + 17° 4370 has been suspected by Espin (English Mechanic, Vol. LXII., 334) and also independently by Mrs. Fleming in 1890.

SWEDISH MARINE ZOÖLOGICAL STATION.

THE December number of *Natural Science* contains an interesting account, by Mr. F. A. Bather, of a visit to the Marine Zoölogical Station at Kristineberg, on the Island of Skaftö, Sweden, on the south side of the Gullmar-fjord. The fjord cuts deep into the land, and has a varying bottom of clay, gravel, rock, *Zostera*, algæ, shells and mud; immediately outside Kristineberg it reaches a depth of thirty fathoms, and six miles further up a little over eighty fathoms. A number of rocky islands shelter the mouth of the fjord against the sea. Animal and vegetable life are richly represented and provide a boundless field for research.

The station was established in 1877 through the efforts of Sven Lovén. The initial endowment was the sum of $15,000 bequeathed by Anders Fredrik Regnell to the Royal Academy of Science in order to found a Zoölogical Station that should belong to the Academy. The Swedish government placed $2,775 and a gunboat completely equipped at the disposal of Sven Lovén during the summers 1877–9 to facilitate the study of the animal life of the Swedish seas, and this aided greatly in the first development of the station.

The laboratory provides working rooms for ten persons exclusive of the common room. It is furnished with aquaria and all necessary apparatus and supplies. The station is only open during the three summer months, as lack of funds (the yearly appropriation granted by the government is but $550) does not permit it to be open at other times. For the same reason foreign students are not admitted. The students at the station are provided with work tables and all necessary appliances without charge, with no further expenses than those for board and lodging, which would amount to about $18 a month.

Mr. Bather suggests that the station might with advantage be opened to foreign students who would gladly pay for the privilege of studying at Kristineberg. Under the present arrangement the student loses the great advantage of free intercourse with his colleagues from other countries.

'TIMBER.'

BULLETIN No. 10, of the Division of Forestry, of the U. S. Department of Agriculture, contains a discussion of the characteristics and properties of wood by Mr. Filibert Roth. The monograph enters into details concerning the weight, moisture, shrinkage, mechanical and chemical properties of wood, its durability and decay. It points out how different kinds of wood may be distinguished, and concludes with a list of the more important woods of the United States. In the introduction Mr. B. E. Fernow, Chief of the Division of Forestry, emphasises the fact that, although wood has been in use so long and so universally, there still exists a remarkable lack of knowledge regarding its nature in detail, not only among laymen, but among those who might be expected to know its properties; as a consequence, the practice is often faulty and wasteful in the manner of its use, and Mr. Fernow indicates ways in which it may be used to advantage.

Mr. Fernow says that "wood is now, has ever been, and will continue to be, the most widely useful material of construction. It has been at the base of all material civilization. In spite of all the substitutes for it in the shape of metal, stone and other materials, the consumption of wood in civilized countries has never decreased; nay, applications in new directions have increased its use beyond the saving affected by the substitutes. Thus, in England, the *per capita* consumption has increased in the last fifty years more than double, a fact which is especially notable, as the bulk of the timber used there must be imported, while iron and coal are plentiful in Great Britain. In the United States we can only estimate from the partial data furnished by census returns. By these we find the *per capita* consumption to have increased for every decade since 1860 at the rate of from 20 to 25 per cent. There is no country in which wood is more lavishly used than in the United States, and none in which nature has more bountifully provided for all reasonable requirements. In the absence of proper efforts to secure reproduction, the most valuable kinds are rapidly being decimated, and the necessity of a more rational and careful use of what remains is clearly apparent. By

greater care in selection, however, not only can the duration of the supply be extended, but more satisfactory results will accrue from its use.''

GENERAL.

THE Results of the motocycle contest promoted by the *Times-Herald* of Chicago are more hopeful in promise than in performance. When the prizes were offered on July 11 there were only known to be three self-driven road vehicles in the United States, but there were about seventy-five entries for the contest on November 2. As the time drew near, however, it became evident that only a small part of the vehicles would be ready. The contest was consequently postponed until November 28, but a a purse of $500 was offered for a preliminary race on November 2. The only two wagons to start were the Durea and the Benz-Müller, both gasolene motors, and only the latter completed the course of 92 miles, which it accomplished in 9 h., 30 min. On November 28, after snow and on roads as bad as possible, six contestants started, four with gasolene motors and two with storage batteries, but only the two wagons mentioned above completed the course.

WE learn from the *American Naturalist* that the Australian Museum at Sydney still suffers from small appropriations by Parliament, and during the year 1894 it was working with a reduced staff and with practically no money for increase or publication. Dr. Ramsay, owing to ill health, has resigned his position as curator after 20 years' service, but still retains a connection with the Museum. Mr. Robert Etheridge, Jr., has been appointed as his successor. The total income for the year 1895 was about £6,000. 120,000 persons visited the museum during the year, 34,000 coming on Sundays. Among the most interesting additions to the museum were a number of relics of Capt. Cook, the list of which would seem to indicate that this antipodal museum has about as large a collection of specimens collected by Capt. Cook and of memorials of him as has the museum at Oxford. The museum has also received a considerable collection of aboriginal pottery from Arkansas.

TWENTY-SIX fellows and foreign members of the Royal Society died during the year preceding the recent anniversary meeting. It is perhaps worthy of note that the average age of these distinguished men of science at the time of their death was 76.8 years, which is far beyond the average. This is in part due to the fact that members are not elected to the Royal Society at an early age, but it indicates that scientific pursuits are conducive to a long life. Three members lived respectively to 95, 97 and 98, and eleven were over eighty years of age.

MR. M. S. BEBB, known for his researches and publications upon American Willows, died at San Bernadino, California, on December 5, at the age of 62 years. Mr. Bebb had published numerous and important papers on the genus *Salix*, and was preparing a monograph on the subject at the time of his death.

WE have received from Prof. Elisée Reclus a pamphlet describing his plan for the construction of a terrestrial globe on the scale of 1 : 100,000. This globe would have a circumference of about 400 metres, and elevations of 1 kilometer would be represented by 1 centimeter. It is proposed to cover the globe with a second globe for protection, this to be painted on the outside so that the large features may be seen at a distance. M. Reclus believes that such a globe would promote geographical discovery and topographical knowledge. It should be erected in the neighborhood of London, New York or Paris, and would cost about $4,000,000 (!), apart from the details of the relief.

WORK is now being commenced for the first time on the coal fields of Newfoundland. Cook announced to the Royal Society as long ago as 1766 that he had discovered coal on the island, and several workable seams of coal have been discovered and explored by Mr. J. P. Howley, director of the Geological Survey of Newfoundland. Newfoundland has important copper mines (it is eighth among the copper producing countries of the world), iron mines, etc., and the discovery of coal adds greatly to the productiveness of the mines and manufactures of the island.

THE Field Columbian Museum of Chicago has issued the first number of a series of Botanical Monographs (56 800 pp. and an index), which is entitled 'Contribution to the Flora of

Yucutan,' by Charles Frederick Millspaugh. The collection which forms the basis of this monograph was made last January, during an expedition to the ruined city of Chichen Itza, and the Islands of Mugeres and Cozumel, and is, according to the author, incomplete and fragmentary, on account of the excessive dryness of the season and the rapidity of movement of the party. The expedition was generously planned and carried forward by Mr. Allison V. Armour, of Chicago, and as it was conducted in his steam yacht it gave an opportunity of visiting the islands that would otherwise have been unattainable. In order that the work should be made as complete as possible, a careful compilation was made of all the publications concerning previous collections.

A SIMILAR report, by Mr. John M. Holzinger, has been issued by the U. S. National Herbarium of the Department of Agriculture, on a collection of plants made by J. H. Sandberg and assistants principally in northern Idaho, but to some extent in the adjacent parts of Washington and Montana, in the year 1892. The monograph contains 287 pages and includes a catalogue of species and a list of 1272 specimens obtained on the expedition. An index is appended.

ARRANGEMENTS have been made with the Metropolitan Telephone and Telegraph Company of New York by which the Weather Bureau will transmit information regarding weather forecasts to the general public. Any one may hereafter call for answers to special questions at any time and be sure of an immediate answer. Moreover, any subscriber who wishes to have all important weather news can send his name to the telephone company, and he will thereafter be telephoned by them whenever any marked change is expected.

AT the Annual Meeting of the Royal Society of Edinburgh, which took place on November 25th, the following officers were elected: President, Lord Kelvin; Vice-Presidents, Prof. Copeland, Prof. James Geikie, the Hon. Lord Maclaren, the Rev. Prof. Flint, Prof. J. G. McKendrick and Prof. Chrystal; General Secretary, Prof. P. G. Tait; Secretaries to Ordinary Meetings, Prof. Crum Brown and Mr. John Murray; Treasurer, Mr. Philip R. D. Maclagan; Curator of Library and Museum, Mr. Alexander Buchan.

WE learn from the American Geologist of the death, on October 27th, of Antonio del Castillo, director of the Mexican Geological Commission.

THE death is announced of Rev. A. E. Phillimore Gray, of Wallasey, England, a well-known authority on antiquarian and archæological subjects. He was elected a Fellow of the Society of Antiquarians in 1887.

THE annual meetings of the American Economical Association under the presidency of Prof. John B. Clark of Columbia College, and of the Political Science Association of the Central States, under the presidency of Prof. Albion W. Small of the University of Chicago, will be held at Indianapolis beginning on December 27th and continuing until January 2d. The first-named association will hold sessions on December 27th, 28th and 30th, and the latter on December 30th and January 1st and 2d. The program for Decemer 31st is a joint one.

SENATOR SQUIRE introduced in the Senate on December 10th a bill providing for the increase of members of the engineer corps of the navy to 303, and providing for the teaching of naval engineering in properly qualified technological schools.

AT the eleventh annual dinner of the London Institution of Electrical Engineers, on December 13th, speeches were made by the president, Mr. R. E. Compton, the Duke of Cambridge, and others. Sir J. Crichton Browne said that electrical engineers had added enormously to those nervous diseases with which he and his colleagues had to deal. Their discoveries had increased the strain and stress of existence, and had contributed to those wear and tear diseases that were one of the features of modern civilization.

PROFESSOR W. A. HERDMAN delivered a lecture on 'The Culture of the Edible Oyster' before the Malacological Society of London on December 12th. The lecture dealt with the cultivation of the oyster and chiefly with its cultivation in France. Among the important

features of the French system is that of devoting certain places to one stage of the work, and other places to other stages. From Arcachon, for example, after being cultivated up to the age of about two years, the oysters are brought up for further advancement elsewhere and for fattening for the market. Prof. Herdman gave a warning in regard to the fat green oysters, the green in some cases being simply a disease, in which the true blue had got mixed up with the yellow. He remarked that the oyster cultivators, in drawing off the water periodically, trained the oyster to keep its mouth shut when out of the water, which is a point of some importance when it comes to be laid out in the market. The Italian method of culture differed from the French, inasmuch as the former is conducted on the vertical principles, by suspension of the oyster with ropes or twigs in deeper water, whilst the French method is the horizontal, in shallow beds from a few inches to a couple of feet deep. The oyster is said to live as long as twenty years, and those fittest for the market are of the age of about five years. Prof. Herdman stated that the American oyster is more prolific than the English oyster, producing as many as 60,000,000 ova at a time. The typhoid germ does not flourish in sea water at an ordinary temperature, but the question of typhoid fever, as propagated by oysters, is under Government investigation and is not yet settled.

UNIVERSITY AND EDUCATIONAL NEWS.

IT is reported that $300,000 of the $1,000,000 given by Miss Culver, to the University of Chicago, will be used for the erection of a laboratory of biology on the grounds of the University. An Inland biological station will probably be erected near the Yerkes Observatory on Lake Geneva, and the Marine Biological Laboratory at Woods Holl will be strengthened. About one-half of the entire sum is to be reserved for endowment. The buildings and endowments are, whenever it is suitable, to be named after Mr. Hull, from whom Miss Culver inherited the money.

MRS. MARTHA W. BROWN, of Manchester, N. Y., bequeaths to Dartmouth College a sum of money to be left to accumulate until it reaches $40,000, when it is to be used to endow the chair of Physiology to be called 'The William Brown Professorship of Human Physiology.'

DR. CHARLES PALACHE has been appointed assistant in mineralogy at Harvard University. Dr. Palache received the degree of B.S. from the University of California in 1891, was fellow in mineralogy there in 1892–93 and honorary fellow in 1893–94, received the degree of Ph. D. in 1894, and has spent the last year in advanced work at Göttingen.

WE have received from the Missouri Botanical Garden an announcement concerning garden pupils and garden scholarships. Three scholarships will be awarded by the director prior to the first of April next, and applications should be made not later than March 1st. The value of the scholarships is for the first year $200, for the second $250, and for the third and fourth years $300, together with free lodgings.

THERE are said to be 2,610 medical students attending the several schools at Philadelphia; of these 900 are at the University of Pennsylvania and 725 at the Jefferson Medical College.

THE Herbarium of the University of Wisconsin is making special efforts to collect all plants that grow in the State. Mr. L. S. Cheney has been for several years in charge of the field of and herbarium work of the Botanical Survey of Wisconsin, and has already examined the plants of the Wisconsin River Valley from the headwaters to the Dells. Prof. Barnes believes that the function of State collections should be to represent the local fauna and flora, leaving the accumulation and maintenance of great collections to institutions which are established or endowed for this purpose, where proper provision can be made for their use.

LADY HERSCHEL has placed copies of observations made at the Cape of Good Hope by the late Sir J. F. W. Herschel, Bart., at the disposal of the trustees of the Mathematical Scholarships of the University of Oxford, with a request that one copy should be given annually to that candidate for the Senior Scholarship who distinguishes himself most in the part of the examination which relates to astronomy.