made with the head of some famous warrior was believed to confer on women the possibility of similarly heroic offspring!

THE PRE-HISTORY OF NORTHERN EUROPE.

MAN first entered northern Europe in the Neolithic period; but that period, for that locality, is divided into an older epoch, when flint implements were not polished, and a later, when they were polished. The first of these was the age of the oldest Danish kitchen-middens; the oak was abundant there and in Scandinavia; but the men of the time did not carry on agriculture. The climate was warmer than it had been since. This epoch closed about 3000 B. C.

About that time the cultivation of barley and wheat was introduced, polished flint implements were manufactured, the beech began to abound, and the later refuse heaps and the dolmens were constructed. The distribution of this early culture indicates that it approached the north of Europe from the Iberian peninsula and probably from North Africa.

Such are the conclusions reached by Dr. E. H. L. Krause, in *Globus*, Bd. LXXI., No. 9, from the works of Andersson, Montelius and Meitzen.

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SCIENTIFIC NOTES AND NEWS.

HOW FLOWERS ATTRACT INSECTS.

PROFESSOR FÉLIX PLATEAU, of Ghent, has been making further careful experiments in the open air to determine what part the corolla and other conspicuous parts of the inflorescence of flowers bear in attracting insects, and has reached some results strikingly at variance with generally received opinions.

His first series of experiments (see SCIENCE, N. S., III., 474) were made on composite flowers with radiate inflorescence and resulted in the conclusion that their form and color play no part in attracting insects, these being guided by some other sense than sight—probably by odor.

In a second series he mutilated flowers of Lobelia, Œnothera, Ipomaea, Delphinum, Centaurea, Digitalis and Antirrhinum, with a wholly similar result, viz, to show that the colored organs of these flowers play a very unimportant rôle.

Further experiments, related in a third paper, lead him to make the following statements as their conclusion:

1. That insects show the most complete indifference for the different colors which flowers of the same species or of the same genus may present.

2. That they fly unhesitatingly toward flowers habitually neglected by them on account of their total lack or small supply of nectar, the moment one places in them an artificial nectar, represented by honey.

3. That they cease their visits to flowers from which the nectiferous portions have been eliminated (but in which the inflorescence remains intact) and that they renew their visits if one afterward replaces the eliminated nectar by honey.

The details of these experiments and observations are given with the utmost care and their importance cannot be questioned. The results are published in the *Bulletin* of the Belgian Academy.

SCIENTIFIC EXHIBITS OF THE GOVERNMENT AT THE TENNESSEE EXPOSITION.

DR. W. F. MORSELL writes that the government scientific exhibits for the Tennessee Exposition, which opens on May 1st, are well advanced. Exhibits will be made by the National Museum, taken from its numerous departments, and the Smithsonian Institution will include in the complete set of its publications the book prepared in celebration of its semi-centennial. The Bureau of International Exchanges will show the extent of its work, and astronomical photographs will be sent from the Astrophysical Observatory. The Zoological Park will send a model of the Park about seven feet square, and the Bureau of American Ethnology will present a Kiowa camping circle.

The exhibit of the United States Geological

Survey will embrace two cases of minerals and a case of fossils. It will also include a suite of the rocks of the Educational Series. This is one of a number of duplicate suites, each consisting of 156 typical rocks, which the Geological Survey has been preparing for a number of years, to be distributed to universities and colleges for purposes of instruction. In addition to the above, the Survey will show twelve or fifteen relief models, most of them very fine, and a large collection of the topographic maps and geologic folios, as well as a number of transparencies and pictures of various kinds.

The exhibit of the Department of Agriculture is designed to show as completely as possible the character of the scientific work which this Department is doing in developing the agricultural resources of the country. Each one of the scientific bureas and divisions will have its allotted space, with characteristic exhibits of its peculiar functions. The Weather Bureau will show a complete set of the instruments used in observing the weather, with its maps, charts, etc.; the Bureau of Animal Industry, typical specimens of animal parasites and illustrations of animal diseases; the Forestry Division, the forest resources of the country, particularly of the South; the Division of Entomology, the insects most injurious to Southern crops, with wax models of the corn and the cotton plant, insecticide apparatus, etc. The office of Fibre Investigations will show specimens of economic fibres (hemp, flax, etc.); the Division of Pomology, wax models of native fruits; the Division of Vegetable Pathology, specimens illustrating typical plant diseases; the Division of Biological Survey, the birds and wild mammals of the country, and the Division of Botany, useful and harmful plants. This Division will show also specimens of the various useful seeds, and will illustrate the methods employed in the Department's seed-testing laboratory. The space allotted to the Division of Agrostology will be devoted to a display of the grasses used for forage, for binding sandy soils, etc.

GENERAL.

Professor Henry Sidgwick, professor of ethics in Cambridge University, has been elected a member of the Danish Royal Society of Sciences; Professor Rudolf Heidenhain, professor of physiology at Breslau, a member of the Royal Society of London, and Dr. Salenski, sometime professor of zoology in the University of Odessa, a member of the St. Petersburg Academy of Sciences.

The Honorary Medal of the Royal College of Surgeons was presented to Lord Lister and Sir James Paget at the last meeting of the Council of the College. This medal has been conferred but eight times previously during the present century—on the last occasion on Sir Richard Owen.

Professor J. Mark Baldwin, of Princeton, has been awarded the gold medal offered by the Royal Academy of Science and Letters of Denmark for the best work on a general question in social ethics.

Dr. Karl Bohlin, of Upsala, Sweden, has has been appointed Astronomer to the Royal Academy of Sciences and Director of the Observatory at Stockholm.

At a meeting of the Royal College of Physicians, of London, on April 12th, Mr. Samuel Wilks, M.D., F.R.S., was re-elected President of the College. A portrait, by Sir Thomas Lawrence, of Sir Henry Halford, President of the College from 1820 to 1844, was received from the executors of his grandson, the late Sir Henry St. John Halford, who had bequeathed it to the College.

At the public exercises held on February 22d in honor of the twenty-first anniversary of the Johns Hopkins University, Professor Welch, on behalf of the friends and associates of Professor Newcomb, asked that he sit for a portrait to be given to the University. The remarks of Professor Welch as reported in the University *Circular* were as follows: "The custom which prevails in many foreign universities of celebrating, by some memorial, epochs in the lives of distinguished teachers and investigators connected with the university is one which can only be commended. A similar custom is finding increasing favor within recent years in this country, where so few material honors attend success in university and scientific careers. The colleagues and other friends of Professor

Newcomb desire to manifest their affectionate regard and their high appreciation of his services to science and to this University, and to mark an epoch in his life, by asking him to sit for a portrait to be painted in oil and presented to the Johns Hopkins University. It is just forty years since he left the work of a school teacher in the State of Maryland to engage in the mathematical service of the United States government. It is twenty years since he became senior professor of mathematics in the United States navy and editor of the *American Ephemeris and Nautical Almanac*. For many years he held the post of Astronomer in the Naval Observatory at Washington. With the Johns Hopkins University he has been closely associated since its foundation. He has been honored in unusual degree by academic distinctions and by election to membership in learned societies both in this country and Europe. His numerous contributions to science have received the highest possible recognition. This is not the occasion, nor am I the one, to attempt to estimate, in detail, the significance and the value of these contributions. The judgment of one's own peers is the test of the worth of discoveries in pure science. The great mathematician, Professor Cayley, has pointed out the rare combination, in Professor Newcomb's publications, of mathematical skill and power and of good, hard work devoted to the furtherance of mathematical science. When the blue ribbon of science, the Copley medal, was conferred upon our colleague by the Royal Society of London, attention was publicly called to the fact that he had won his distinction especially by his contributions to the science of gravitation and that his name was worthy to be remembered in the domain forever associated with the illustrious Isaac Newton. Professor Newcomb, your friends and colleagues now ask permission to place your portrait by the side of that of your colleague, Professor Gildersleeve, that thus there may be here silent and enduring tokens of the honor which this University bestows upon the man of letters and the man of science." Professor Newcomb responded briefly, acceding to this request.

WE recently expressed the hope that the valuable physiological library of the late Professor Du Bois-Reymond might be secured for an American institution. We now learn that Dr. Nicholas Senn has bought the library and has presented it to the Newberry Library of Chicago.

IT is stated that the widow of the late Professor Charcot has resigned the annual pension of 2,000 francs which she received from the State, in favor of other widows and children of professsors or *Agrégés* of the Faculty of Medicine of Paris who have died without leaving provision for their survivors.

PRINCETON UNIVERSITY will send its fourteenth geological expedition to the West during the coming summer. The party will be under the direction of Professor Scott and will make paleontological and geological studies and collections in South Dakota.

PROFESSOR LAWRENCE BRUNER, of the University of Nebraska, sailed April 27th for Buenos Ayres, where he will spend a year investigating the injurious locusts which have recently increased enormously in three of the eastern provinces of the Argentine Republic. Professor Bruner goes out under the employment of a commission of business men and bankers of Buenos Ayres, who have raised a large sum of money for the purpose of fighting the locusts, and who, very wisely, decided that the first step should be to engage an expert of great experience and acknowledged reputation. The commission applied to the United States Minister, Mr. W. I. Buchanan, and Mr. Buchanan wrote at once to Major H. E. Alvord, of the United States Department of Agriculture, asking him to consult with several of the directors of the agricultural experiment stations in the United States and to select the best-fitted person for the work. The committee at once chose Professor Bruner, who has secured a year's leave of absence from the University of Nebraska. No better choice could possibly have been made. Professor Bruner was connected with the U. S. Entomological Commission in its thorough investigations of the Rocky Mountain locust, or Colorado grasshopper, in 1876 to 1880, and has since become known as one of the foremost workers on the order of Orthoptera in the United States. He has de-

voted much time and attention to migratory species.

We regret to record the death of M. Lucien Biart, a French physician resident in Mexico, who made contributions to ethnology and natural history. The Paris Museum of Natural History contains botanical and ornithological collections made by him.

Mr. Otis E. Bullock died in New York from yellow fever on April 22d. He contracted this disease in Central America while on his way to make collections in natural history for the Frank Blake Webster Co., of Hyde Park.

President Mendenhall lectured before the National Geographical Society, Washington, on February 23d, his subject being 'Weighing the Earth.'

The Illinois Child Study Society will hold its third annual congress at Englewood, Chicago, from April 26th to May 1st. It will be presided over by Colonel Francis W. Parker, and addresses are expected from President G. Stanley Hall, Professor John Dewey, Professor William L. Bryan and other leaders in the movement for the scientific study of children.

The Canadian Electrical Association will meet at Niagara Falls, Ontario, on June 2d, 3d and 4th.

An Educational Museum will be opened at the State House, Boston, on May 1st. It will include the exhibits of the Massachusetts schools at the Columbian Exposition, together with the work of other schools, school appliances and a pedagogical library.

The *Astronomical Journal*, Cambridge, Mass., offers for sale several complete and partial sets of the *Journal*, founded by B. A. Gould in 1849, with an interruption from 1861 to 1885. The complete set is offered for $70, or without the first volume, which is very rare, for $55.

Dr. Walter Wenga will edit and A. Priber, Berlin, will publish a new journal, *Zeitschrift für Criminal-Anthropologie.*

A journal devoted to the applications of the X-rays to medicine and surgery, entitled *La radiographie*, has been established in Paris. It is edited by Dr. Paulin-Méry.

The Paris Municipal Council has voted $1,000 towards the cost of installation and maintenance of a skiagraphic laboratory at the Trousseau Hospital.

The French Chamber has allowed a sum of 297,000 francs for the payment of expenses incurred on account of defensive measures taken against the plague.

The Executive Council of the Massachusetts State Board of Trade, at a meeting on April 21st, passed the following resolution: "That the Board recognizes the great advantages which the general adoption of the metric system of weights and measures will promote, favors not only its general use and practice, but also endorses the bill now before the Congress of the United States which provides for the adoption of this system as the only system in the several departments of the United States government. And, further, that the Secretary of the Board inform the chairman of the Committee on Coinage, Weights and Measures of the vote of this Board."

President McKinley and Secretary Sherman have recommended that Congress make an appropriation of $350,000 for the representation of the United States at the Paris Exposition of 1900. Such provision will doubtless be made, and we hope that the example of Germany and other nations at the Chicago Exposition will be followed, and that scientific and educational matters will be well represented.

The Executive Committee of the Tennessee Centennial Exposition (which opens May 1st and continues six months) has petitioned the Board of Trustees of Vanderbilt University for the release of Dr. William L. Dudley, professor of chemistry, for the remainder of the present academic year, in order that they might engage his services. The University authorities granted the request, and the Centennial management has elected Dr. Dudley to the position of 'Director of Affairs,' giving him full charge of the executive management of the Exposition.

At a meeting of the Royal Botanical Society of London, on April 10th, the Secretary, Mr. J. B. Sowerby, gave an account of the cultivation and manufacture, into paper, of esparto grass, illustrating it by specimens and growing plants from the gardens. According to the report in the

London *Times*, the raw material is chiefly obtained from the north of Africa, Algiers being the center of distribution. The plant producing it, *Stipa tenacissima*, is capable of living under the most adverse conditions, being often found flourishing in the deserts in places where no other vegetable life can exist. It was suggested by the lecturer that this would be a most suitable plant by means of which the deserts of Sahara might not only be reclaimed, but turned into a source of profit. For many years past esparto grass has very largely superseded rags and similar substances in the manufacture of paper, and enormous quantities are annually imported to England for the purpose. Samples of paper made of esparto, in various stages of its manufacture, were shown by Mr. Layton, from the mills of Messrs. Weir, of Alloa, who consume over 7,000 tons of this material per annum.

SIR BENJAMIN STONE, M.P., has been in correspondence with the authorities of the British Museum on the subject of a proposal to establish a national photographic record collection. In a letter to the Board of Trustees of the British Museum, Sir Benjamin Stone offered for acceptance a series of 100 platinotype photographic views of Westminster Abbey, hoping that this would be the commencement of a national photographic record and survey collection to be under the direction and in charge of the British Museum authorities. In replying to Sir Benjamin Stone the Trustees state that they are in full agreement with him that such a record survey collection, if carefully and systematically brought together, cannot fail to be of the greatest value and interest both to the present and to future generations, and they are most willing to take charge of the photographs which from time to time may be deposited with them. It is proposed to form a preliminary committee to organize the work and to invite to act upon it, representatives of the Royal Society, the Society of Antiquaries, the Royal Photographic Society, the Royal Institute of British Architects, the Royal Archæological Institute, the Royal Geographical Society, the Trustees of the British Museum, and others. The Council of the Warwickshire Photographic Survey have promised a first contribution of 100 pictures of that county.

A COMMITTEE of the House of Commons, consisting of Sir E. Hamilton, Sir A. Godley and Mr. G. H. Murray has been appointed to inquire into the organization, pay and duties of the staff of the British Museum, including the system under which the staff is recruited and the reasons for or against competitive examination, either limited or otherwise; the classification, scale of salary, and hours of attendance required to insure the efficient and proper discharge of the duties of the establishment, and whether it is practicable to assign clerical and routine work wholly or in part to clerks of the second division; and, generally, any matters connected with the Museum establishment in regard to which they may be of opinion that alteration of existing regulations is desirable.

AN exhibition of agriculture and forestry will be held in Vienna by the Imperial and Royal Agricultural Society from May 7 to October 9, 1898. The following sections are intended to be of an international character: (1) Machinery and implements for agriculture and forestry. (2) Machinery and implements for agricultural industry. (3) Dairy machinery and appliances. (4) Fertilizers, feeding stuffs, and chemical products for agricultural and forest purposes. (5) Veterinary science. (6) Agricultural improvements, building and engineering. (7) Agricultural and forest education, research work, statistics and literature.

MR. C. T. HEYCOCK, F. R. S., lectured before the Royal Institution on April 8th on 'Metallic Alloys and the Theory of Solution.' According to the London *Times* the lecturer showed a number of experiments which established an analogy between the solution of a substance such as sugar in water and the solution of metals in each other. Just as the freezing point of a solution of a salt in water was lower than that of pure water, so the freezing point of a solution of a metal, such as thallium, in mercury was lower than that of pure mercury. After explaining that there was no essential difference between the two phenomena he stated that the remarkable theory of Van t'Hoff, to the effect that a substance in dilute solution existed within the liquid in a state resembling a gas, afforded the best clue to the interpreta-

tion of the results. This contention was supported by means of a table proving that the results arrived at by experiment agreed with those predicted by the theory. He showed that a weak solution of permanganate of potash when frozen yielded at first nothing but pure colorless ice, all the color, and hence all the salt in solution, becoming concentrated in the central unfrozen part. While seeking to establish that the same held true for the metals Mr. Neville and himself had hit on a method which he believed to be one of importance and which was shown that evening for the first time. Gold was very readily dissolved by metallic sodium, and if a solution of gold in sodium were allowed to solidify very slowly then sections cut from the solid alloy would appear perfectly uniform to the eye. If, however, the sections were placed on a photographic plate and exposed to the X-rays, on developing the plate a picture was obtained showing the actual structure of the solid alloy, the sodium being transparent to these rays, while the gold was opaque. By means of lantern slides sections were exhibited cut from sodium-gold alloys containing different percentages of gold. These sections showed that crystalline plates of sodium traversed the mass both horizontally and vertically, and that the gold, as the solution solidified, had become concentrated between the crystalline plates of sodium. The analogy between the solidification of an alloy and the solidification of an aqueous solution was thus established.

UNIVERSITY AND EDUCATIONAL NEWS.

The will of the late Judge B. R. Shelden, of Rockford, Ill., bequeathes $100,000 to Williams College, $100,000 to the Hampton Institute and $10,000 to Rockford College.

It is stated in the New York *Medical Record* that Dr. William H. Welch and Dr. William Osler, of the Johns Hopkins Medical School, of Baltimore, have declined the call extended to them by the University of New York, which has lately been consolidated with Bellevue Hospital.

Professor Albert Bushnell Hart has been promoted to a full professorship of physics at Harvard University.

Professor W. F. Edwards has been elected President of the Washington University, Seattle, in the place of Dr. Mark W. Harrington.

Dr. Andr. Lipp has been appointed professor of analytical chemistry in the Polytechnic Institute at Munich. Professor Sissingle, of the Polytechnic Institute of Delft, has been called to the chair of physics in the University of Amsterdam, and Dr. George Scheffers, of Leipzig, to an assistant professorship of mathematics in the Polytechnic Institute in Darmstadt. Dr. Wülfing, docent in mineralogy at Tübingen, and Dr. Max Siegfried, docent in physiology at Leipzig, have been promoted to assistant professorships.

DISCUSSION AND CORRESPONDENCE.

THE RE-DISTRIBUTION OF TYPE-SPECIMENS IN MUSEUMS.

I can't think why Mr. F. A. Lucas, in his most friendly review of my paper 'How may Museums best Retard the Advance of Science?' (Science, April 2, V., p. 543), should say: "Mr. Bather seems to use the term type a little vaguely, as one does not feel quite sure whether he means type or typical material." The term I used was 'type-specimen,' which has for me, and doubtless for Mr. Lucas, one meaning and one only. The question raised in my paper has been much discussed of late in England; permit me to put my view, which differs from that of Mr. Lucas, without satirical obscurity.

The object of museums is after all to advance and not to retard science. Take the case of a provincial museum, say at Thurso, in the extreme north of Scotland; suppose that this museum by some chance acquires a single specimen of a new Mexican beetle; suppose that some wandering 'Koleopterolog' from Germany chances on this and describes it in the *Zoologischer Anzeiger*. The specimen is now a type-specimen, "and no museum," says Mr. Lucas, "can afford to permanently part with these." But does the retention of this specimen at Thurso, in charge of some underpaid jack-of-all-trades curator, do anything