

while they are fresh in mind. I observed the cerebral figures for some hours, repeating the observations previously reported. When the dawn faintly illuminated the window frame I was able at one stage of brightness to see both the frame and the figures. Placing the fingers of the two hands against the outer ends of the eyeballs, I displaced them simultaneously in opposite directions; this was repeated a number of times in rapid succession. As a result there appeared two images of the frame moving in opposite directions. The retinal figures seen in front of the frame still remained single and did not move. Granting that there was no error in my observation, I cannot imagine a more conclusive proof as to the cerebral nature of the light.

The problem is really one of importance. If this light is cerebral we have a means of distinctly observing some of the phenomena in the brain. The cerebral figures are intimately associated with the contents of dreams. I believe also that the forms of the figures of cerebral light are intimately connected with the phenomena of nutrition in the brain. I find at the present time that my figures are quite different from those which I have been accustomed to observing in past years; this may correspond to a radical change in the condition of the nervous system which I have observed to have taken place during the past six months. I find also that the figures on first awakening from sleep are very different from those that are seen when the mind becomes fully awake. Systematic observations by medical men may show that diagnostic conclusions can be obtained by asking patients to describe their cerebral figures.

The question at the present time concerns the sufficiency of the observations. If they are correct and reliable there is, I believe, no escape from the conclusion that the figures are cerebral. I can see no reason to believe that my carefully and repeatedly made observations are erroneous, but it is highly desirable to have them confirmed by other observers.

E. W. SCRIPTURE.

PSYCHOLOGICAL LABORATORY,  
YALE UNIVERSITY, NEW HAVEN, CONN.,  
May 29, 1899.

#### PROFESSOR SIMON NEWCOMB.

THE issue of *Nature* for May 4th contains an admirable portrait in photogravure of Professor Simon Newcomb, together with an article describing his scientific work by M. Loewy, Director of the Paris Observatory. M. Loewy says:

Newcomb must be considered, without contradiction, as one of the most celebrated astronomers of our time, both on account of the immensity of his work and the unity of view which marks the choice of the subjects treated by him.

All is linked together in our solar system; the study of the motion of each one of the celestial bodies forming part of it is based upon the knowledge of a great number of numerical data, and there exists no fundamental element whose influence is not reperused on the entire theory of these bodies. To endeavor to build up the theory of our whole planetary world on an absolutely homogeneous basis of constants was an almost superhuman task.

After giving an extended account of some of Professor Newcomb's more important contributions M. Loewy concludes:

We have only been able to give a short sketch of Newcomb's achievements; he is gifted with a prodigious power of work, which is testified by the extraordinarily long list of his researches.

The reception which has been accorded to them by all competent men points to their author as one of the most illustrious representatives of celestial mechanics.

This activity has embraced the most diverse branches of astronomy. Not only has he given a great scope to the intellectual movement of his country, but he has also contributed, in a very successful manner, to elevate the level of the civilization of our age, enriching the domain of science with beautiful and durable conquests.

#### SCIENTIFIC NOTES AND NEWS.

OXFORD University conferred, on June 8th, the degree of D.C.L. on Professor Simon Newcomb.

THE new biological laboratory of Adelbert College, Western Reserve University, was dedicated on June 13th. An address was delivered by Professor W. K. Brooks.

PROFESSOR W. C. BRÖGGER, of the University of Christiania, the distinguished Norwegian geologist, has accepted an invitation to deliver the second course of the George Huntington Williams memorial lectures at the Johns Hopkins

University, in April, 1900. Professor Brögger has published a series of memoirs upon the geology of southern Norway that have given him rank among the leading investigators of his time. Professor Brögger comes as the successor in the Williams course to Sir Archibald Geikie, the Director-General of the Geological Surveys of Great Britain and Ireland, who opened the lectureship two years ago with a course upon 'The Founders of Geology.' Professor Brögger will lecture upon 'Modern Deductions regarding the Origin of Igneous Rocks.'

PRESIDENT MCKINLEY has appointed a commission to determine the best route for a canal across the Isthmus of Panama or Nicaragua as follows: Rear-Admiral John G. Walker, retired; Samuel Pasco, of Florida; Alfred Noble, C. E., of Illinois; George S. Morrison, C. E., of New York; Colonel Peter C. Hains, U. S. A.; Professor William H. Burr, of Columbia University; Lieutenant-Colonel Oswald H. Ernst, U. S. A.; Lewis M. Haupt, C. E., of the University of Pennsylvania, and Professor Emory R. Johnson, of Pennsylvania. The sum of \$1,000,000 has been appropriated for the expenses of the Commission and a number of surveyors will accompany the party which will shortly leave for Colon.

THE Editorial Board of the *National Geographic Magazine* has been enlarged, and, as appears from an announcement in the June number, an effort is being made to extend the field of usefulness of the journal. The new Board is as follows: Editor, John Hyde, Statistician of the U. S. Department of Agriculture; Associate Editors, A. W. Greely, Chief Signal Officer, U. S. Army; W. J. McGee, Ethnologist in Charge, Bureau of American Ethnology; Henry Gannett, Chief Geographer, U. S. Geological Survey; C. Hart Merriam, Biologist of the U. S. Department of Agriculture; David J. Hill, Assistant Secretary of State; Charles H. Allen, Assistant Secretary of the Navy; Willis L. Moore, Chief of the U. S. Weather Bureau; H. S. Pritchett, Superintendent of the U. S. Coast and Geodetic Survey; O. P. Austin, Chief of the Bureau of Statistics, U. S.; Eliza Ruhamah Scidmore, author of 'Java, the Garden of

the East,' etc.; Carl Louise Garrison, Principal of Phelps School, Washington, D. C.; Assistant Editor, Gilbert H. Grosvenor, Washington, D. C.

THE Cape of Good Hope University has conferred the degree of D.Sc., on Mr. A. W. Roberts, of Lonsdale, for his astronomical discoveries and the degree D.Litt. on the Rev. Dr. Brincker for researches on the native language.

PROFESSOR KOCH and his assistants have been pursuing their investigations on malaria at Grosseto, a town between Rome and Genoa, where much land has been reclaimed from the marshes, thus greatly reducing the prevalent malaria.

PROFESSOR LARS FREDRIK NILSON, Director of the Agricultural Chemical Experiment Station at Stockholm, died on May 14th, aged 59 years.

M. ADOLPHE LEGEAL, a French geologist, has been killed by the natives while making explorations in the French Soudan.

A CABLEGRAM to the daily papers from Japan states that a party of scientific men, eleven Japanese and one German, the names not being given, while making explorations near Tosang, on the Liao Tung Peninsula, were made prisoners by Russian cavalry and shot as spies, without a trial.

WE are requested to announce that the Royal Academy of Sciences of Turin will award in 1903 the first Vallauri prize for the most important work on physical science (the term being used in its widest sense) published during the four preceding years. The value of the prize is about \$6,000, and it is open to Italians and foreigners on equal terms. Professor Tommaso Vallauri, Senator of the Kingdom of Italy, who died in 1897, left his whole estate to the Turin Academy for the establishment of two prizes, one for scientific research and the other for the study of Latin literature.

WE have now received a proof of the announcement of the approaching Dover meeting of the British Association, which, however, does not contain much information beyond what has already been published. The President, Professor Foster, will deliver his address on Thursday evening, September 14th. Professor Charles Richet will lecture on Friday evening on 'La vi-

bration nerveuse,' and on Monday evening Professor Fleming will lecture on the 'Centenary of the Electric Current.' Members of the Association Française pour l'Avancement des Sciences will visit Dover on Saturday, September 16th. Members of the British Association are invited to visit Boulogne on Thursday, September 21st. The Vice-Presidents for the meeting are the Lord Archbishop of Canterbury, the Marquis of Salisbury, the Mayor of Dover, the Major-General Commanding the Southeastern District, the Right Hon. A. Akers-Douglas, M.P., the Rev. F. W. Farrar, Dean of Canterbury, Sir J. Norman Lockyer and Professor G. H. Darwin.

THE Swiss Society of Natural Sciences will hold its 82d annual meeting at Neuchâtel from the 31st of July to the 2d of August. In addition to a number of special lectures the Society meets in seven sections as follows: (1) Physics, Mathematics and Astronomy; (2) Chemistry, Pharmacology and Hygiene; (3) Zoology and Anthropology; (4) Botany; (5) Geology, Paleontology and Mineralogy; (6) Medicine, and (7) Agriculture. At the same time the Swiss Societies of Geology, Botany and Zoology hold their annual sessions. A number of interesting excursions have been arranged and foreign men of science are assured of a cordial welcome.

THE position of superintendent of tree planting in the Division of Forestry, Department of Agriculture, salary \$1,800 per annum, will be filled by Civil Service examination on July 11th. The subjects and weights are as follows:

1. Forestry and Tree-planting, .....60
2. Botany, .....10
3. English, .....10
4. Training and Experience, .....20

THE position of instrument maker at the Naval Observatory, Washington (salary, \$1,500 per annum), will be filled by an examination on the same day. The examination will be almost exclusively confined to practical questions relating to the construction and mechanical operation of telescopes of large size.

THE recent action of President McKinley providing for the exemption of the higher scientific positions in the Smithsonian Institu-

tion from Civil Service examinations was taken at the recommendation of the Board of Regents, who find that leading men of science will not take these examinations.

THE annual convention of the Association of Agricultural Colleges and Experiment Stations will be held in the hall of the California Academy of Sciences, from the 5th to the 7th of July. In addition to the ordinary meetings, which are always of much interest, arrangements have been made for an excursion of the delegates on a special train for a study of the agricultural industries of California. It will be possible for delegates to make the trip to California by paying about a single fare. Further information may be obtained from the Secretary, Professor Edward B. Vorhees, New Brunswick, New Jersey.

THE Association of Official Agricultural Chemists will hold its sixteenth annual meeting at the same time and place as the Association of American Agricultural Colleges and Experiment Stations. Information concerning this meeting can be secured by addressing the Secretary, Dr. H. W. Wiley, Department of Agriculture, Washington, D. C.

THE American Medical Association held its fiftieth annual meeting at Columbus, Ohio, last week. The President, Dr. Joseph M. Matthews, in his address, recommended that the society be permanently located in Washington, and that its journal be published in that city. Professor W. W. Keen, of Philadelphia, was elected President of the Association, and it was decided that the next meeting should be at Atlantic City, New Jersey.

THE Congress of the Royal Institute of Public Health of Great Britain will be held in Blackpool from September 21st to September 26th, under the presidency of the Marquis of Lorne. There will be four Sections: (a) Preventive Medicine and Vital Statistics; (b) Chemistry and Meteorology; (c) Engineering and Building Construction; (d) Municipal and Parliamentary.

THE City of Bristol is now arranging for the establishment of a reference scientific library, made possible by a bequest of £50,000 from the late Mr. Stuckey Lean.

A TELEGRAM was received at the Harvard College Observatory on June 12th from Professor E. Keeler, at Lick Observatory, stating that comet Holmes was observed by Perrine June 10<sup>a</sup>.9644 Greenwich Mean Time in R. A. 1<sup>h</sup> 15<sup>m</sup> 31<sup>s</sup>.6 and December + 17° 29' 39'' Faint. This comet was originally discovered by Holmes in London, November 6, 1892, and has a period of about seven years. By January 12, 1893, it had become very faint, but on January 16th it was found to have undergone a remarkable change, an outburst of light having occurred. It resembled a bright planetary nebula of about the seventh magnitude, the nucleus being at first very hazy, but afterwards becoming sharper and about as bright as a star of the eighth magnitude. On January 1, 1894, it could not be found with the 26-inch refractor of the Washington Observatory, being then fainter than the magnitude 14.

*Popular Astronomy* gives an interesting statement of the progress which is being made in the new reduction of the Piazzi star observations. Dr. H. S. Davis, who recently resigned from the Columbia University staff, in order to devote himself more exclusively to this work, is to be congratulated upon the cooperation which his zeal has obtained. Professor Porro and Dr. Balbi, of Turin, will reduce the transit right-ascension observations, and Dr. Gill, of the Cape of Good Hope Observatory, will reobserve the southern Piazzi stars. All the Piazzi stars are being redetermined for 1900. Miss Flora Harpam is aiding most efficiently in the computation, while Miss Catharine W. Bruce places astronomy under still greater obligations of gratitude by generously contributing to remove the financial obstacles. In the twenty years about 1800 Piazzi made some 125,000 observations. When Dr. Davis has reduced these with modern accuracy they will afford a valuable catalogue of some 8,000 stars for the beginning of the century now closing.

At a meeting of the Royal Geographical Society, on May 29th, a paper was read by Dr. Francisco P. Moreno on 'Explorations in Patagonia.' According to the report in the London *Times* he pointed out that up to quite recent times the geography of the southern part of the

New World had been in a very backward state. Having recounted his own travels, he remarked that Patagonia did not merit the bad reputation given to it, but, on the contrary, a vast field for human initiative existed there, with a healthy soil capable of supporting a large population. It was evident to him that they had in Patagonia a portion of the Antarctic Continent, the permanency of which, in so far as its main characteristics were concerned, dated from very recent times. So, then, the history of the Patagonian plateau was connected with the problem of the southern continent, which to so great an extent had disappeared. He had handed to the staff of the British Museum duplicates of the extinct and present animal remains of Patagonia and of its flora, as well as of those obtained by the La Plata Museum, of which he was Director; and he trusted that, with such competent collaboration, it would soon be easy to give an exact idea of Patagonian biology.

At the annual meeting and conversazione of Selbourne Society, on May 31st, Sir John Lubbock, the President, spoke of the advantages of the Wild Birds' Protection Act and pointed out the importance of the enclosing of the unenclosed area of the New Forest.

At a meeting of the Accademia Medica di Roma, held on April 30th, Drs. G. Bastianelli and Bignami read a summary of the results of their investigations on the Cycle of Life of the Parasites of Tertian Fever in the *Anopheles Claviger*. They are, according to *The British Medical Journal*, as follows: The large pigmented forms of the Tertian parasites, incapable of multiplying in man, may be distinguished morphologically into two categories; some, with a large vesicular nucleus and little chromatin, represent the female (macrogamete); others, richer in chromatin, the male (microgametocyte of zoologists). In the middle intestine of the male *Anopheles Claviger* six microgamete (flagella) generally protrude, one of which fecundates a macrogamete after the chromatin of the latter has undergone a process of reduction. The fecundated macrogamete penetrates into the middle intestine of the *Anopheles*, where it develops,

passing through a cycle of life similar to that described by Ross for the proteosoma of birds in the gray mosquito, and by the anthus and grassi for the semilunæ in the Anopheles Claviger. In this cycle of life the Tertian sporozoon remains distinguishable by its morphological characters from that of semilunar origin; the young forms are distinguished principally by the form of the sporozoon and the characters of the pigment; the forms undergoing development by the size of the bodies produced successively by nuclear division; the mature forms are distinguished as a rule by the disposition of the residue of segmentation, perhaps also by the size. The distinction of the species of malarial parasites, therefore, remains unaltered. The same conclusion is also obtained from the third experiment, which demonstrates that the semilunæ which have given only Tertian at first, passing through the Anopheles Claviger, maintain unchanged their specific characters. The study of the life of the Anopheles in the Roman Campagna explains, in a satisfactory mode, the behavior of the Tertian at the change of the seasons. It has been demonstrated experimentally that very few punctures—indeed, even one only—by the infected Anopheles may produce the infection in man.

A CIRCULAR letter has been issued by the committee arranging for a University of Birmingham, asking for subscriptions to make the first endowment £300,000. A copy of Mr. Andrew Carnegie's letter giving £50,000 to the fund is enclosed. As this is of interest to American men of science we quote it in full:

Langham Hotel, London, May 9, 1899.

DEAR MR. CHAMBERLAIN.—You have interested me in your proposed University at Birmingham for the people of the Midlands. May I suggest that an opportunity exists for such an institution to perform a great service for the whole country? After the members of the Iron and Steel Institute had returned to New York from their tour of observation through the United States, the officials dined with me. Many pleasing short speeches were made; the close of one I have never forgotten. A partner in one of your foremost steel companies said: 'Mr. Carnegie, it is not your wonderful machinery, not even your unequalled

supplies of minerals, which we have most cause to envy. It is something worth both of these combined; the class of scientific young experts you have to manage every department of your works. We have no corresponding class in England.' Never were truer words spoken. Now this class you must sooner or later secure, if Britain is to remain one of the principal manufacturing nations, and it seems to me the Midlands is the very soil upon which it can most surely be produced. If I were in your place I should recognize the futility of trying to rival Oxford and Cambridge, which, even if possible, would be useless. These twin seats of learning have their mission and fulfil it, but Birmingham should make the scientific the principal department, the classical the subsidiary. If Birmingham were to adopt the policy suggested, taking our Cornell University as its model, where the scientific has won first place in the number of students, and give degrees in science as in classics, I should be delighted to contribute the last £50,000 of the sum you have set out to raise, to establish a scientific department. I am sure our people of the Birmingham across the Atlantic will heartily approve this gift to their prototype on this side of the water, for what does not the younger owe of its greatness and prosperity to the old land. Bessemer, Siemens, Thomas—the triumvirate through whose inventions we have been enabled to make and sell steel by the millions of tons at three pounds for a penny—all made their experiments in your midst. Let the gift, therefore, be considered as only a slight acknowledgment of a debt which Pittsburgh, the greatest beneficiary of your steel inventions, can ever hope to repay.

Wishing you speedy success, sincerely yours,

ANDREW CARNEGIE.

WE learn from *The British Medical Journal* that a grand *festa* has been held in Reggio, Emilia, in honor of the first centenary of the death of Lazzaro Spallanzani, who was born at Scandiano, in Modena, January 12, 1729, and died at Pavia, February 12, 1799. Spallanzani studied at Bologna, took holy orders, and in 1775 was elected professor of logic, Greek and rhetoric at Reggio. Among his works are: *Le osservazioni microscopiche sulla teoria della generazione di Needham e Buffon*, in which he defended the doctrine of biogenesis against those authors; and *Dei fenomeni della circolazione* and *Memorie sulla respirazione*. Spallanzani was the first who saw the circulation of the blood of warm-blooded animals under the microscope. He made use

of the hen's egg during the development of the chick.

INQUIRIES as to the schools in which leading men in various professions were educated have been made by *The School World*, and the results for men of science are abstracted in *Nature*. Of 250 representative men of science—mostly Fellows of the Royal Society—chosen for the present inquiry, one-fifth received their early education either in private schools or at home under tutors. The schools which claim the greatest number of old pupils in the selected list are Edinburgh High School, Edinburgh Academy and Aberdeen Grammar School. The Scotch schools are followed, as regards the number of old pupils of distinguished eminence in science, by the City of London School and King's College School. Eton, Harrow and Rugby succeed these, and are in turn followed by Liverpool College, Royal Institution School (Liverpool) and St. Paul's. The remarkable point brought out by this comparison, says *Nature*, is the small part the great public schools have taken in training the leaders in science of the present day. When the men who are now in the foremost rank among philosophers were receiving their early education science was almost, if not quite, omitted from the public school curriculum, with the result that comparatively few boys from such schools have become eminent in the scientific world. The neglect of science in comparison with other subjects is shown by the fact that Eton, Harrow, Rugby, Winchester, Westminster and one or two other public schools, though comparatively poor in their scientific record, are shown to have furnished the greatest number of leading men in Parliament, the church and the law, Eton leading the way as regards numbers in each of these classes.

THE Regents of the University of the State of New York have voted that the Secretary be authorized to sell any of the University publications at half price to any university institution or to any teacher or officer of such institution, and to give such publications outright to such depositories as shall be registered as entitled to such consideration because they agree to preserve and catalogue the publications and make them

available for public use. Pamphlet editions of the reports giving administrative details and information as to the workings of the department may be given away; but scientific contributions of the museum staff and other valuable matter printed as appendices to the reports, and the bound volumes containing such matter, shall not be for free distribution, but shall be sold at a nominal price approximately covering cost of paper, presswork and binding.

#### UNIVERSITY AND EDUCATIONAL NEWS.

IN addition to Professors Picard, Mosso and Ramón y Cajal, whom we have already announced as lecturers at the decennial celebration of Clark University, to be held July 5th to 8th, we are informed that Dr. Ludwig Boltzmann, professor of theoretical physics at the University of Vienna, and Dr. August Forel, formerly professor of psychiatry at the University of Zurich, will give short courses of lectures.

MR. B. H. DUKE has made an additional gift of \$50,000 to Trinity College, at Durham, N. C.

THE degree of Bachelor of Science has been given to 170 candidates by the Massachusetts Institute of Technology.

IT is reported that nine professors at St. Petersburg University have resigned as an expression of sympathy with the grievances of the students.

THE Rev. William H. P. Faunce, D.D., pastor of the Fifth Avenue Baptist Church, New York, has accepted the presidency of Brown University.

DR. D. J. BIEHRINGER and Dr. Tröger have been promoted to assistant professorships of chemistry in the Institute of Technology at Braunschweig. Dr. Abegg has qualified as docent in physical chemistry in the University of Breslau; Dr. Schultze in zoology in the University at Jena; Dr. Kowalevsky in mathematics in the University of Leipzig; Dr. Feitler in physical and theoretical chemistry in the Institute of Technology at Vienna; Dr. von Oppolzer in astronomy and astrophysics in the German University at Prague, and Dr. Relstab in physics in the Institute of Technology at Braunschweig.