languages of European nations. His "History of the American Civil War," a work which appeared between the years 1867 and 1870, when the bitter animosities of the strife were still raging, is distinguished by an impartiality of tone and a philosophic elevation remarkable in a historian, and trebly remarkable in one who wrote in times so little remote from the stirring events recorded. In 1874 Dr. Draper published a "History of the Conflict between Science and Religion," a work which attracted some notice, and for which a preface was written by Prof. Tyndall to introduce the work to English readers. Though unequal to the preceding works in merit, and marred by assumptions that detract from its value, it nevertheless showed great vigour of intellect and philosophic power.

Dr. Draper leaves two sons, both of whom are known to science: Prof. John Christopher Draper, whose works on Physiology are well known on both sides of the Atlantic, and Prof. Henry Draper, whose labours in spectrum analysis, and on the construction of silvered glass specula for telescopes, are too well known to require mention. Dr. Draper leaves behind him an honourable and well-won fame; and his removal leaves a gap amongst the older generation of American scientific men which a few years ago would have been irreparable. Happily amongst the younger generation there are many whose talents have amply qualified them to step into the gap. In the breasts of all who desire the progress of science, regret for the loss they have sustained cannot but be mingled with satisfaction that the mantle falls upon the worthy shoulders, not of one successor, but upon a crowd of apt followers in the footsteps of the departed veteran.

NOTES

ALL but Fellows of the most recent date will hear with regret of the death, on Saturday, of Mr. Richard Kippist, who for nearly fifty years acted as librarian to the Linnean Society. Born in 1811, he was, when quite a lad, clerk in the office of Mr. Joseph Woods, F.L.S., architect, and an accomplished botanist. His taste for botany either originated or was acquired when under that gentleman, with whom he travelled, and afterwards assisted in the publication of "The Tourist's Flora." Mr. Woods leaving London for Lewes, Mr. Kippist, in February, 1830, entered the service of the Linnean Society, then in Soho Square. On Prof. Don's (the librarian's) death in 1842, Mr. Kippist, then an Associate of the Society, was elected by the Fellows his successor. Mr. Kippist contributed various botanical papers to the Linnean Society, which were published in their *Proceedings* and *Transactions*; the most important of which was that on the existence of spiral cells in the seeds of *Acanthaceæ*. He was an original Member of the Royal Microscopical Society, and an Associate of the Royal Botanical Society, Regent's Park. For a number of years Mr. Kippist suffered from asthma and chronic bronchitis, which materially affected his earlier active habits. He retired from office in 1880, after fifty years' service. He identified himself completely with the Society and its officers, securing the esteem of successive presidents and Councils, and the respect of succeeding generations of Fellows. Latterly he carried his methodical habits and his zeal for the Society's welfare to a degree that might have been distasteful to those younger Fellows who were not acquainted by experience with his life-long, single-minded devotion to the Society. These qualities, however, were duly appreciated by those conversant with the affairs of the Society, and whenever opportunity served, fit expression was made of the sense entertained of the value of his services, so that when, a year or two since, Mr. Kippist's failing health no longer enabled him to discharge his duties, the graceful action of the Council in allowing their old servant to retire on full pension was universally approved of by the Fellows. Mr. Kippist's complete devotion to the duties of his office left him little leisure for other work, while his modest, retiring habits led him to shun society. His published memoirs are therefore few in number, but they are marked with the scrupulous fidelity so characteristic of the author. They relate exclusively to botanical subjects.

PREPARATIONS for the forthcoming Electrical Exhibition are drawing their slow length along. The only really complete exhibit at present is that of the Postmaster-General, and this, as an historical exhibit, is very good indeed. The South-Eastern Railway also made a very good show, and the Electric Light and Power Generator Company are in position; but much remains to complete the Exhibition, and it will be another fortnight before it can be considered ready for inspection. On the evening of the 17th inst. the Edison lamp was shown in operation. The Concert Room was illuminated by over 200 of these pretty little lamps, each of which gives 16 candle-power. An extremely handsome chandelier was erected in the centre of the room, and its effect was very brilliant. The steadiness and uniformity of the Edison incandescent lamp is very marked and it compares in this respect very favourably with the Swan and the Lane-Fox lamps. A large party gathered together and dined between the rays of this brilliant light, but, as it very often happens under such circumstances, an accident occurred which put out the lights for nearly an hour. This was, however, the fault of the engine, the safety-plug of which had blown out. The Exhibition generally produced a very favourable impression.

THE Geographical Society have now on exhibition a relief map of the equatorial region of Africa, constructed within the last twelve months for Col. Grant by Mr. James B. Jordan. The area included in the map is nine times greater than the British Isles, and nearly nine times less than the total area of Africa. It was therefore considered necessary to adopt the horizontal scale of one inch to twenty-five miles, and the vertical scale of one inch to five thousand feet. This gives an exaggerated idea of the mountains, but in relief maps this cannot be avoided if we wish to show the principal features of a country. The construction of the relief was a work of nearly twelve months. An accurate map had to be made on a given scale from carefully collected data; this was transferred to clay by a kind of pantagraph of Mr. Jordan's (senior) invention, a cast taken, and the present relief map constructed of papier-maché. There were several reasons for making it of this material: one, its lightness would enable it to be hung like a picture; another, the impossibility of its cracking and chipping as clay does; it represents nature better, and it can be easily repaired if the housemaid pokes a hole through it with her brush. When looked at in the light striking upon one side, the aspect of Africa in the interior is no longer the barren waste of the maps of fifty years ago; the interior, with its deeply-set lakes and the swelling lands round them, looks as if it could not but be inhabited by human beings, and it is so. All the data as to altitudes, latitudes, longitudes, and sections were taken from the accounts of the several travellers who have discovered or visited the interior, and Mr. Jordan has, in his well-known painstaking and conscientious manner, followed out the observations of these authors in a most accurate manner. Though it is clear to all that the model cannot be sufficiently correct where no observations had ever been made, still with his skilful hand and artistic taste, Mr. Jordan has produced a relief map which would bear comparison with any in Europe.

WE learn that the report that the bodies of the missing *Jeannette* men have been found on Wrangel Land is erroneous; they are no doubt those of part of the crew of the whaler *Vigilant*. Several of the members of the expedition have reached Jakutsk. The French journal *L'Exploration* publishes an extraordinary letter purporting to have been received from one of the members

of the expedition, describing the wandering of the ice-bound *Jeannette*, the horrors and beauties of an Arctic winter, and other features, which must be the product of a French imagination. Has some wag been imposing an extract from one of Jules Vernes' works on our guileless contemporary? Of course no credence is given to the authenticity of the letter at the *New York Herald* Office; it seems clear that no such letter could have reached Europe yet, and certainly there was no Frenchman on board the *Jeannette*.

AMONG the special articles in the *Annuaire* of the Bureau des Longitudes (Paris, Gauthier-Villars) for 1882 are a historical sketch of the development of astronomy, by M. Faye; on the intra-Mercurial planet, by M. Tisserand; and M. Janssen's pape. on his photograph of Comet *b* 1881, with copy of the photograph. From the same publishers we have the *Annuaire* of the Montsouris Observatory, which is largely devoted to meteorology. Besides various tables for the use of agriculturists, and a variety of meteorological tables, we have several chapters discussing in detail agricultural meteorology; a meteorological *résumé* of the agricultural years 1873-81; chemical analyses of air and water; general investigation on atmospheric Bacteria; purification of sewage, &c.

A MOVEMENT is on foot in the United States, we learn from the *Daily News*, for securing the adoption of a uniform standard of time throughout that country. Considerable disagreement exists, however, as to the best standard to be adopted—that is, whether Washington or New York, or Pittsburg or Greenwich time shall be observed. The strongest claim appears to be put forward in favour of Washington, not only as being the capital city, but as possessing the well-known Naval Observatory, which, being the only national astronomical institution, should, it is contended, do for the United States what Greenwich does for Great Britain. The Signal Service Bureau proposes to utilise its system of telegraphic communication for distributing accurate time signals to all important points.

A REMARKABLY rapid disappearance of a flaming solar protuberance was observed last August by Herr Spörer, who describes the phenomena in the *Astronomische Nachrichten*. About 5 p.m. on the 2nd this protuberance was observed with broad base and intense luminosity, reaching a height of about one minute, while further out it appeared as a loose, less luminous cloud; the entire height being about four minutes. Herr Spörer, having passed to another part of the sun's disc for about five minutes, was surprised to find on return that in this short time the whole lower part of the protuberance had completely disappeared, while all that remained of the upper part was a few small isolated clouds.

WE have received several of the sheets of the "Enciclopedia Popular Ilustrada de Ciencias y Artes," which is being published in Madrid under the care of Mr. Frederick Gillman, Mining Engineer there. Mr. Gillman seems to be doing most of the work himself, and the undertaking is a formidable one. It is, however, highly creditable; the text is evidently based on the best existing English and German Cyclopædias, and the abundant illustrations are nearly all that could be wished. When one considers the state of education in Spain, Mr. Gillman's attempt to diffuse elementary instruction in this form must be regarded as a really philanthropic undertaking, to which we wish the greatest success.

THE colour of water forms the subject of a recent inaugural dissertation by Herr Boas, in Kiel (*Wied. Beibl.* No. 11). After reviewing previous observations, he describes his own experiments, the first of which were qualitative, sunlight being sent through water in a zinc tube about 46 feet long, closed with glass plates. Distilled water thus gave a fine deep blue-green colour; the red was quite gone, the yellow feeble, while the maximum brightness was in the green. Water of the Kiel supply let no light through the length of the tube stated; with half the length it appeared deep orange; blue and green failed. In his quantitative experiments the author illuminated two screens with the same light-source (sodium light or a gas flame), before which was placed red glass, or sulphate of copper solution. The light from one screen went through water in a tube; that from the other along the tube outside. Both beams were brought into a position for comparison by means of total-reflection prisms; the screens were shifted till equal brightness was reached, and from their position the coefficients of absorption could be approximately inferred. The decrease of absorption towards the blue in the case of distilled water is thus clearly shown Herr Boas further studied the polarisation of the light issuing from the water, by depolarising it. It was weakly polarised in a plane passing through the sun and the direction of the beam. Experiments with a view of detecting fluorescence had a negative result.

ON Saturday afternoon a series of interesting experiments on a practical scale were carried out in the grounds of the Crystal Palace with asbestos paint, in order to test its qualities as a protective covering against fire. This paint is a new and special preparation of asbestos, and is being introduced by the United Asbestos Company, of 161, Queen Victoria Street, E.C. The asbestos in a finely divided state is mixed with a fluid material, and is used in a similar manner to other paints. Unlike them, however, it is uninflammable, and not only so, but is capable of communicating this valuable attribute to such substances as it may be applied to. This applies alike to cotton fabrics and to timber or other inflammable materials used for constructive or decorative purposes. Hence its great value in connection with theatrical properties and appliances, especially those connected with the stage arrangements. Several experiments were made, all of them reported completely successful so far as proving that the paint is a powerful protection against conflagration.

AT the coast it may readily be observed that a red coloration is very common among invertebrate animals, and even fishes. And according to M. de Merejkowski (*Compt. rend.* Paris Academy of Sciences), even the animals coloured yellow, brown, green, and black have always a scarlet red pigment, which in their case is hidden by others. The red pigment, he finds, is always the same substance, viz. that known as *tetronerythrine*; he has verified its presence in 104 species (invertebrates and fishes). The question arises, What is the physiological *rôle* of this widely expanded substance? The author finds evidence that it corresponds to hæmoglobin in higher animals; serving for cutaneous respiration by virtue of its great affinity for oxygen. Thus, as regards distribution in organs, wherever oxygen has to be largely consumed by the tissues, there tetronerythrine is abundant. This is illustrated by skin tissues in immediate contact with the oxygen of the water; by the organs of respiration (*e.g.* in sedentary annelids, the tetronerythrine is concentrated in the branchiæ, the rest of the body having only traces); by muscles, and such an organ as the muscular foot of Lamellibranchiates. Next, as to distribution in the animal kingdom: sedentary animals are often redder and have more tetronerythrine than errant animals; the latter, which by constant change of place, are always in water holding plenty of oxygen, not having the same need of a special substance to increase the oxygen absorbed by the tissues. Then the fact that tetronerythrine occurs by preference in invertebrates, where hæmoglobin is wanting (and only exceptionally in higher animals), points to similarity of function in these substances. It is further pointed out that animals provided with yellow cells (parasitic algæ), which are proved to produce free oxygen in the tissues, are without tetronerythrine, or have very little of it.

THE following appointments to the staff of the Normal School of Science and Royal School of Mines have been made by the

Lord President of the Council:—J. F. Main, M.A., D.Sc., Professor of Mathematics and Engineering at University College, Bristol, Assistant Professor of Mechanics and Mathematics; F. Orpen Bower, B.A., Demonstrator of Botany at University College, London, Lecturer on Botany; Frank Rutley, F.G.S., Assistant Geologist on H.M. Geological Survey, Lecturer on Mineralogy; J. Russell Smith, Instructor in Mechanical Drawing.

THE Lord President of the Council has appointed Mr. Haddon, Professor of Zoology in the Royal College of Science, Dublin, Assistant Curator in the Natural History Department of the Dublin Science and Art Museum.

MR. J. M. SCHUVER has forwarded to *Petermann's Mittheilungen* an account of his proceedings since his departure from Cairo last January. He reached Khartum on March 19, and leaving again on April 4, he travelled by way of Senaar to Famaha (Fazogl), where he arrived on April 28. Fadassi was reached on June 12, and on the way Mr. Schuver ascertained that the Termat affluent of the Blue Nile rises in the Sori Mountains, west of Fasuder, and not half a degree to the south near Belletafa, as has been supposed. There is a stream called Turmat near Belletafa, but it is an affluent of the Jabus. At Fadassi Mr. Schuver met with a series of misfortunes, and was himself taken seriously ill with fever. On July 30, however, he was able to start on a trip to the south, and after thirty-eight days' travelling returned to Fadassi. During this journey he explored the Amam country, which is watered by two affluents of the Jabus, as well as that of the Legha Gallas; he also proved that the Jabus rises a degree further south than is shown to be the case on Petermann's map, and that the great Lake and River Baro are situated a degree further to the south of Fadassi, and he defined the exact line of water-parting between the two Niles as far as the 8th parallel. Mr. Schuver intended to start from Fadassi on January 1 of this year to explore the vast unknown regions down to the equator, but in so doing he will have to make a considerable *détour* to the west to avoid the country of the Legha Gallas, from which in his previous visit he escaped with great difficulty.

A PRIZE of 5000 lire (say 190*l.*) is offered by the Reale Istituto Veneto "for the best history of the experimental method in Italy." The application of this method to the physical sciences is chiefly to be expounded, with special regard to all that is noteworthy in the four centuries from the beginning of the fifteenth to the end of the eighteenth, including the discovery of the Voltaic pile. Some account is also required of the progress and rapid development of the economic and social sciences by means of the experimental method. Memoirs must be sent in before the end of February, 1885. Foreigners may compete, and the language may be Italian, Latin, French, German, or English.

MAJOR W. GWYNNE HUGHES, Deputy Commissioner of British Burma, has just published a useful little volume on the hill tracts of Arakan, of which he was lately superintendent. Two of its sections are devoted to their history and ethnology, and the volume is accompanied by a map (scale 32 miles to an inch) of the eastern frontier of British Burma.

PROVINCIAL museums have begun to appear in Russia, and we learn that the Natural History Museum opened last week at Yaroslavl already contains 50 skulls, 250 birds, 500 birds' nests, with eggs, a complete collection of seeds of all wild plants, 1200 fossils, and 5000 minerals, together with interesting collections of useful and noxious insects and plants, and a collection of plants classified according to the soils they grow upon.

NUMEROUS antique objects have recently been found in an ancient German tomb near Lindelbach (Franconia), and have been presented by the proprietor to the University of Würzburg. They all date from the Bronze Age.

COL. VENUKOFF, now in Paris, has written to the Geographical Society there, stating that the exploration of Turcoman Land by Russian topographers is progressing rapidly, and that Lieut. Loukiomov has proceeded as far as Seraks on the banks of the Tejent River. At the same sitting letters have been read from the French exploring party in Central Africa. They had been written from Bokhara to M. Bischoffsheim, who, not confining his assistance to astronomers, has been the principal patron of the expedition. A later telegram to M. Bischoffsheim states that the party had arrived at Krasnovodsk.

THE recently published volume of the "Materials for the Geology of Caucasus" contains a paper, by M. Batsevitch, on the naphtha-valley of the Apsheron peninsula. Towards the north, east, and south the valley is bounded by a *cirque* of Pliocene rocks of the Aralo-Caspian formation, and towards the west by the mud-volcano Bog-Boga. The valley itself, three miles long and three miles wide, is filled by naphtha-bearing formations, and it contains the richest wells of Balakhan and Sabuntchi. Towards the west it joins the great crevice, or rupture of rocks, which runs west and east from the mud-volcano Saghilpiry. As to the origin of the Apsheron naphtha, the author considers it a result of gaseous emanations from submarine mud-volcanoes of the post-Pliocene period.

THE telephone has penetrated even to Russian Turkestan, as we learn that Samarkand is in telephonic communication with Katty Kourgan, forty-four miles distant.

THE death is announced, at the age of ninety years, of the widow of the late Sir William Fairbairn.

ACCORDING to Mr. G. Levison the light emitted by the little fire-flies that abound in the neighbourhood of New York exhibits, when examined in the spectroscope, a peculiarity worthy of note. The blue and violet rays are wanting, and those of least refrangibility are predominant. In the light emitted, of the various preparations of phosphorus itself very little can be discovered except green rays.

PROF. KONRAD KELLER, of Zürich, the well-known zoologist, is about to undertake a scientific exploring tour to the shores of the Red Sea. The journey will last several months.

GLARUS has been the scene of another great landslip. A mass of rock 300 metres high has fallen from the summit of the Rothrisi, swept away a forest above Ennenda, devasted some valuable land, and destroyed the roads. It fortunately missed the village, and no lives were lost. There being nothing in the weather to account for the many landslips that lately have occurred in Switzerland, the phenomena are ascribed in great measure to the frequency of slight earthquake shocks, twenty-one of which have been observed in various parts of the country since the beginning of December.

THE *American Naturalist* announces the death, at the age of twenty-seven years, of Mr. J. D. Putnam, President of the Davenport Academy of Natural Sciences, the success of which is largely owing to Mr. Putnam's exertions. Mr. Putnam had devoted considerable attention to entomology.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus radiatus* ♀) from India, presented by M. Kessels; a Ring-tailed Coati (*Nasua rufa*) from South America, presented by Mr. John Verinder; three Young Otters (*Lutra vulgaris* ♂ ♂ ♀), British, presented by the Reading Angling Association; seven European Scorpions (*Scorpio europæus*) from Nice, presented by Mr. T. D. G. Carmichael, F.Z.S.; two Macaque Monkeys (*Macacus cynomolgus* ♂ ♀) from India, two Arabian Gazelles (*Gazella arabica* ♂ ♀) from Arabia, deposited.