the pathological changes in the tissues of the same, can be of great value to the physician, much more has yet to be done. The serious investigator is more impressed with what has yet to be done, than elated with what has already been accomplished. It is with great pleasure that I read in the columns of NATURE of the continued advances of those well fitted to engage in the study of the properties of Röntgen rays in the physical laboratory; and while we have reason to be pleased that the rays have been clearly proved to be of great value in the diagnosis of certain affections, every part of the apparatus must be investigated and improved upon before we obtain thoroughly satisfactory results. JOHN MACINTYRE.

SCIENCE IN THE MAGAZINES.

PROF. H. F. OSBORN, curator of vertebrate palæontology in the American University of Natural History, New York, contributes to the *Century Magazine* a popular account of prehistoric quadrupeds found in the Rockies during the past few years, and to be exhibited to the public at that museum in October. Interest in his description is greatly increased by nine remarkably fine illustrations (reproduced from water-colour drawings by Mr. Charles Knight), designed to give an idea of the animals as they probably appeared in life in their natural surroundings. Another interesting article in the *Century* is made up of extracts from the journals of the late Mr. E. J. Glave, whose journey to the Livingstone Tree had such a melancholy termination. On July 8, 1894, Mr. Glave reached the tree beneath which Dr. Livingstone's heart is buried. Jacob Wainwright, the Nassick boy who read the burial service, cut on the tree the words: "Dr. Livingstone, May 4, 1873. Yazuza, Mniasere, Vchopere." The body was roughly embalmed and carried to Bagamoyo, on the coast opposite Zanzibar, afterwards to be taken to England and buried in Westminster Abbey. As to the tree, Mr. Glave wrote in his journal: "Although done twenty years ago, the inscription is in a splendid state of preservation. The tree shows no disfigurement, and, moreover, the carving is not on the bark but on the grain of the tree itself. It is a hardwood tree, three feet in diameter at the base; at thirty feet it throws out large branches; its top is a thick mass of foliage. When Livingstone died the heart and other viscera were buried beneath this tree, and the bark was cleared off for a space of two and a half feet square; in this space Jacob Wainwright (whose account my discovery verifies to the letter) carved the inscription with no dunce's hand, the letters being well-shaped and bold. The tree is situated at the edge of the grass plain, and is very conspicuous, being the largest tree in the neighbourhood. It is about five miles south south-west from the present site of the village of Karonga Nzofu, an important Bisa chief, whose father was a friend of Livingstone. Chitambo's is now ten miles away. It was originally near the tree; in fact, Livingstone died a few minutes' walk from the old village of Chitambo." The tablet which Mrs. Bruce—the daughter of Livingstone—sent out by Captain Bia and Lieut. Franqui to commemorate the explorer's death, was put up by them eight miles from the spot where he died, and was afterwards carried off by the chief of a slave caravan.

"There is scarcely a modern skull preserved in our great anatomical museum beside those of abnormal malefactors. There is no fairly representative collection of the variations of our race; and there is no means of learning the characteristics of it in contrast to those of other races. This is far more the case in other directions; any solid comparative study of man's framework is as yet utterly impossible. Of many races not a single skeleton is preserved; and those of which we know a little are only shown by a few scanty specimens, of which the history and details are scarcely ever recorded. Of both past and present races a collection of at least a few dozen specimens of each race, precisely dated and localised, are the smallest amount of material which would enable us to begin a scientific treatment of the varieties of man." So writes Prof. Flinders Petrie in the *National Review;* and he suggests that, to systematise the study of man, a large museum should be established where examples of every object of human workmanship can be preserved. He is sanguine enough to think that this great repository of the works of man will be realised in the course of a few years. Such an institution would undoubtedly be of service to science. From this proposal of Prof. Petrie's, ethnologists may profitably turn their attention to a paper on "African Folk-Lore," contributed by A. Werner to the *Contemporary*. While staying for some months in East Central Africa, the authoress collected a number of traditional tales of the Mangánja, and she now relates them. Many of these stories deal exclusively with animals; and all of them proceed on the assumption that animals, human beings, and inanimate objects feel and act in much the same manner. There is a striking similarity between these myth-stories and the stories of "Uncle Remus"—a fact which goes to confirm the opinion that the latter originated with the African.

Prof. Ray Lankester reviews Mr. Archdall Reid's speculations on "The Present Evolution of Man" in the *Fortnightly*. "Mr. Reid," he says, "seems to be under the impression that the lines, or rather two of the lines of the present evolution of man have been definitely and satisfactorily indicated by his speculations. I am far from admitting that he has done more than demonstrate and draw attention to some tendencies of that evolution. . . . I am by no means convinced that the present and future evolution of man is being determined exclusively or even mainly in the simple way and by the obvious factors which he has placed before us."

Two editorial notes in *Scribner* deserve mention. In one a plea is made for the adoption of the metric system throughout the United States. The Bill introduced last session, and which will again be brought before Congress in the coming session, provides for the substitution of the metric system immediately in practically all the departments of the Government of the United States, and the adoption of the metric system of weights and measures as the only legal system to be recognised after the first day of January, 1901. The second note referred to is on Summer Schools, or vacation courses. It appears from a report of the U.S. Bureau of Education, that more than three hundred vacation courses, dealing with all branches of knowledge, are now held at various educational centres throughout the world.

In the *Strand Magazine*, Sir Robert Ball, continuing his series of astronomical articles, describes the discovery of Neptune, his treatment of that well-worn subject being illustrated with several interesting pictures. A number of reproductions from curious photo-micrographs form the chief feature of Mr. W. G. FitzGerald's article on "Some Wonders of the Microscope" in the same magazine. There is also a story dignified as an "Adventure of a Man of Science," which has for its scientific foundation the cure of madness by mysterious capsules. Even this flimsy basis is better than the description, in last month's *Strand*, of the use of a camera to obtain a photograph, by means of Röntgen rays, of a stolen diamond inside the thief's body. We should have thought it was known by this time that cameras are not used in Röntgen photography. Sir C. H. T. Crosthwaite shows a little better acquaintance with the subject in a story entitled "Röntgen's Curse," contributed by him to *Longman's*. The central figure of the story concocted a liquid which, when painted on the insides of his eyelids, made him as perspicaceous as a platino-cyanide screen excited by Röntgen rays. The capacity thus gained proved anything but a source of enjoyment to the experimenter. The idea may be good enough for a story, but a cautious man of science would have tried his wonderful liquid on one eye, and not on both.

In the *Sunday Magazine* there are two popular articles of interest to naturalists: one describes and illustrates sculptures of animals adorning a number of ecclesiastical buildings; and in the other Mr. C. J. Cornish writes on nightingales' nests, his account being illustrated by photographs from life.

Chambers's Journal has, as usual, several popular articles on science.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

MR. H. R. NORRIS, Mathematical and Science Master of Ipswich Grammar School, has been appointed Head-master of Barry Intermediate and Technical School, Glamorganshire.

THE Finance Sub-Committee of the Bradford Corporation recently held a special meeting and decided to allocate the following grants under the Technical Instruction Act:—Bradford Technical College, £2875; Free Library, £300; Boys' Grammar School, £500; Girls' Grammar School, £100; Mechanics' Institute, £300; School Board, £1000; Church Institute, £100; Blind Institute, £50.

THE Holiday Courses of Lectures delivered last month at Jena are reported to have been a great success. The lectures were grouped as follows:—(*a*) Natural Science, including Astronomy, Botany, Physics, Zoology; (*b*) School Hygiene, Physiological Psychology, Philosophy, Pedagogics; (*c*) Conversational German, Literature, History. The attendance at the courses was better than at those of last year's gathering, no fewer than 108 being present, representing thirteen nationalities. Seventeen of the students were English.

THE Committee of Technical Instruction, in their annual report to the Oxfordshire County Council, remark "that the District Committees have in most cases carried out their duties in a satisfactory manner. Those District Committees who have availed themselves of the assistance of the Parish Councils have found the benefit of so doing, as they have been able to get into closer touch with the needs of each parish." The wisdom expressed in the last paragraph seems obvious; yet we are afraid the hint needs to be repeated to other than the District Committees located in Oxfordshire. The report in question tells of much good work accomplished.

THE Report of the Governing Body of the Battersea Polytechnic for the years 1893-94-95 contains much information of a gratifying character. During the period the institution has been open—some two years—not less than 6000 individual students have attended its classes. The sum of £67,840 has been raised; the Polytechnic is in receipt of its full endowment, and is now in its third educational session, with a regular attendance of 2850 students. In accordance with the provisions of the scheme, and the requirements of the chief industries of the neighbourhood being borne in mind, it was, at the outset, decided that the initial work of the Polytechnic should consist of (*a*) evening classes for young men and women in technology, science, art, domestic economy, music, commercial and general subjects, with provision for gymnastics and other recreative and social work; (*b*) day schools for boys who have passed through the elementary schools and desire further education of a technical and scientific character; (*c*) Saturday classes of an advanced character for teachers. Success all along the line seems to be the summing up of the report.

THE British Consul-General at Frankfort, in the course of his latest report, quotes certain official information supplied to the Italian Government in regard to the cost of University study in Germany. To obtain the degree of Doctor of Law at Berlin costs 1300 marks, and for a Doctor of Medicine about twice that sum. The details are as follows:—Fee for matriculation, 18 marks; fee for examination for the medical faculty, 242 marks; diploma fees for the law faculty, 335 marks; for the faculty of medicine, 440 marks; fees for all lectures necessary to pass the various examinations in the law faculty, 400 to 500 marks, and in the medical schools, 800 to 1200 marks. To these must be added 150 marks for printing the candidate's dissertation, 300 marks for books for a law student, and 500 marks for the books and instruments of a medical student. These, of course, do not include the cost of living. For a law student who studies in a town where his parents do not live, 5000 marks must be allowed for board, lodging, and clothing during his course, and 7600 to 8000 marks for the 4½ years of a medical student's course. The cost of a civil engineer's course, including that of living, is estimated at 6000 marks for four years. At other German Universities the cost would be somewhat less, but the difference would not be very great, for the main item—the cost of living—is very much the same in all University towns. Foreign students often prefer the smaller Universities, especially those in South Germany.

A RECENTLY published Parliamentary paper shows that out of the funds entrusted to the Board of Agriculture for educational purposes in Great Britain during the financial year ended March 31 last, sums amounting to £7850 have been distributed in specific grants to eighteen institutions named. Since the first grant made by Parliament in 1888 the sums have increased from £2930 to £7850. These sums are divided under two main heads—general agricultural education under collegiate centres, including dairying and experiments (this item has increased from £200 to £6100); and special and provisional grants, which have decreased in eight years by nearly £1000. Major P. G. Craigie, Director of the Intelligence Division, who has drawn up this report for the President of the Board, says that considerable local efforts are now being made to make up for the conspicuous lack of educational facilities among the agricultural community of Great Britain to which the inquiries of the Departmental Committee of 1887-88 directed attention. The grants awarded were to the following eight collegiate centres in England and Wales:—University College of North Wales, Bangor, £800; Yorkshire College, Leeds, £800; Durham College of Science, Newcastle-on-Tyne, £800; University College of Wales, Aberystwith, £800; University Extension College, Reading, £700; University College, Nottingham, £450; Cambridge and Counties Agricultural Education Committee, £400; South-Eastern Agricultural College, Wye, £150; to the Eastern Counties Dairy Institute, Ipswich, £300, and the British Dairy Farmers' Association £300—in each of these two cases for dairy instruction; and to the Bath and West and Southern Counties Society £350, for special cheese and cider research and agricultural experiments. This brings the total for England and Wales to £5850. The remaining £2000 is distributed in Scotland thus:—Two collegiate centres, Glasgow and West of Scotland Technical College £650, and University of Edinburgh £550; University of Aberdeen, for agricultural instruction, £150; Scottish Dairy Institute, Kilmarnock, for dairy instruction, £300; the Highland and Agricultural Society, £100, and the Aberdeen Agricultural Research Association, £100—in both cases for agricultural experiments; and the Royal Botanic Garden, Edinburgh, £150, for instruction to working foresters and gardeners.

SCIENTIFIC SERIALS.

Symons's Monthly Meteorological Magazine, August.—"The Thames run dry," by the Editor. It is less than 200 years since men walked across the bed of the river, near London Bridge; but the old bridges were almost like weirs in the obstruction offered to the flow of the water. The various dates since the year 1114 are given, the last being September 14, 1716. In this year, owing to a long drought and a strong westerly storm at the time in question, the Thames lay perfectly dry above and below bridge, with the exception of a very shallow channel, and many thousand people are said to have passed it on foot.—The first use of kites in meteorology, by A. L. Rotch. It has been stated that the first use of a kite in connection with meteorology was by Dr. Franklin in his experiments on atmospheric electricity in 1752; but Mr. Rotch points out that Dr. A. Wilson, of Glasgow, explored the temperature of the higher regions by raising a number of paper kites, with thermometers appended, in 1749. An account of one of the experiments is contained in *Trans.* Roy. Soc. Edin., vol. x. part 2. This method was successfully employed on several occasions in that and the following year.

Wiedemann's Annalen der Physik und Chemie, No. 8.—Contact electricity, by W. Nernst. The author formulates a theory of contact electricity based upon ionic velocities. Both ions of an electrolyte must diffuse equally rapidly, as otherwise an enormous accumulation of electricity would take place. The unequal velocities due to the unequal mobility of different ions must be compensated by a potential difference $\frac{dP}{dx}$. Hence the equation

$$U\left(\frac{dp}{dx} + c\frac{dP}{dx}\right) = V\left(\frac{dp}{dx} - c\frac{dP}{dx}\right),$$

where U and V are the mobilities of the anion and kation, p the osmotic pressure, and c the concentration of the solution.—Bolometric investigations of the absorption spectra of fluorescent substances and ethereal oils, by Bruno Donath. The measurements were made with a quartz prism, and all lenses were replaced by mirrors. It was found that the fluorescent bodies uranine, eosene, fluoresceïne, æsculine, and chlorophyll show no absorption of the thermal spectrum down to wave-lengths of 2·7 μ. A chlorophyll solution 3·2 mm. thick has a region of strong absorption extending from the visible band in the red to the green rays. This region cannot be detected by the eye alone.—Emission spectrum of a black body, by Willy Wien. The author endeavours to reduce the number of hypotheses at the basis of the present theories of radiation. He also utilises Maxwell's theory of the distribution of velocities of molecules, but otherwise obtains his results on purely thermodynamic lines.—The new elements in cleveite gas, by J. R. Rydberg. This is an attempt to disentangle the spectrum of the supposed third new constituent of the gas from cleveite. The author calls