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

it "parhelium" (Pa) and assigns to it an atomic weight of about 3.—Distance action of the force of absorption, by W. Müller-Erzbach. The author claims to have proved that the absorptive force exercised, say, by iron oxide upon carbon bisulphide vapour is capable of acting across a thin layer of a substance like water or glycerine which is perfectly neutral itself. This molecular force is, unlike that of ordinary molecular attraction, capable of action at distances not exceeding 0·0025 mm. across intervening bodies.—Röntgen rays, by Otto Müller. In the course of an attempt to produce diffraction of X-rays, a shadowgraph of wire gauze was obtained under a metallic cylinder which screened the plate from the action of the rays. The distance between cylinder and plate was 20 cm. The author interprets the observation as a proof of the turbidity of the air to some at least of the X-rays, and ascribes the effect to diffusion.

Bollettino della Società Sismologica Italiana, vol. ii., 1896, No. 2.—New methods for geodynamical investigations, by G. Grablovitz. A valuable description of the instruments erected in the geodynamic observatories of the island of Ischia, including various forms of levels, horizontal pendulums, instruments for measuring the vertical movements of the ground, and seismoscopes.—New form of continuously recording seismometrograph, by A. Cancani.—On the so-called presentiment of earthquakes by animals, by A. Cancani.—On some facts resulting from microseismic observations, by G. Vicentini. A reprint of a paper already noticed in NATURE.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, August 31.—M. A. Chatin in the chair.—The Perpetual Secretary announced the death of M. Henri Résal, member of the Section of Mechanics.—On the subject of prime numbers, of which any given number cannot be a primitive root, by M. de Jonquières.—External characters and modes of distribution of the small tubercles or tuberculoids of the Leguminosæ, by M. D. Clos. A morphological study of the tuberculoids on the roots of nine sub-species of the Papilionacæ. In the two other groups of the Leguminosæ Cæsalpiniæ and the Mimosæ, the presence of the tubercles is by no means so frequent as in the Papilionacæ.—Memoir on the Law of Newton and on some problems in general mechanics, by M. E. La Combe.—On the effect of systematic errors in levellings of precision, by M. Ch. Lallemand. It is shown that, with a few exceptions, levellings of precision are subject to systematic errors, which may vary from ·05 mm. to 0·3 mm per kilometre, and hence are of more importance than the accidental errors to which, up to now, attention has been chiefly directed. It has not been found possible to connect these systematic errors with the particular instruments employed, with the observers, with the nature of the ground, or with the atmospheric conditions.—On a class of propositions analogous to the Miquel-Clifford theorem, by M. Paul Serret.—The deflection of the X-rays behind opaque bodies, by M. E. Villari. A gold-leaf electroscope, placed in the cone of shadow of a sheet of lead, was found to be discharged by the X-rays at rates which showed that the shadow was deepest at the centre.—Researches on the double chlorides, by M. R. Varet. A thermochemical study of the double chlorides formed by mercuric chloride with other chlorides.—Action of the soluble oxidising ferment from mushrooms on the phenols insoluble in water, by M. E. Bourquelot. The two naphthols are oxidised by this ferment in a manner that may serve to distinguish them, α-naphthol giving a violet colouration, β-naphthol a white precipitate, which dissolves to a yellow solution in ether.—On the freezing-point of milk, by MM. Bordas and Génin. Fifty samples of milk gave freezing points varying from − 0°·44 C. to − 0°·56 C., and the conclusion is drawn that the determination of dilution with water by cryoscopy is neither simple nor certain.—On the organisms causing disease of the silk-worm, by M. J. M. Krassilschtschik.—A telegraph cable attacked by Termites, by M. E. L. Bouvier.—On the secretory nerves of the trachea, by M. V. Thébault.—On the conjugation of the zoospores of *Ectocarpus siliculosus*, by M. C. Sauvageau.—On the velocity of sound, by M. G. W. Pierces.—On the resolution of the general equation of the fifth degree, by M. L. Mirinny.—On the geographical situation of submarine islands, by M. Reilly.

GÖTTINGEN.

Royal Society of Sciences,—The *Nachrichten*, Part 2 (Mathematico-Physical Section), 1896, contains the following memoirs communicated to the Society:—

April 25.—On the theory of automorphic modular groups, by R. Fricke.—On an optical effect of an electric field conditioned by the dependence of the dielectric coefficients on the strength of the field, regarded from the standpoint of the electromagnetic theory of light, by F. Pockels.

May 9.—Researches from the Göttingen University Laboratory (IV.), by O. Wallach. (1) Condensation-products of cyclic ketones, and syntheses within the terpene group; (2) a bicyclic ketone $C_{14}H_{22}O$; (3) benzylidene-methylhexanone $C_7H_{10}O : CHC_6H_5$; (4) dibenzylidene-methylhexanone $C_6H_5CH : C_7H_8O : CHC_6H_5$; (5) benzylidene-menthone; (6) benzylidene pulegone; (7) dibenzylidene-suberone $C_6H_5CH : (C_7H_8O) : CHC_6H_5$; (8) dibenzylidene-methylpentanone $C_6H_5CH : C_6H_6O : CHC_6H_5$.—On the principles of Hamilton and Maupertuis, by O. Hölder.

June 20.—Attempted demonstration of orientation in the surface-conduction of electricity; on the continuous transition of an electrical property through the boundary-layer between solid and fluid bodies; on the conduction of electrified air; an experiment on magnetic currents, each by Ferdinand Braun.

July 4.—A contribution to the theory of complex magnitudes consisting of n primary units, by David Hilbert.

July 18.—Fluorescence and the kinetic theory, by W. Voigt.—On the change in the mode of vibration of light in passing through a dispersing or absorbing medium, by W. Voigt.

BOOKS AND SERIALS RECEIVED.

BOOKS.—Outlines of Psychology: E. B. Titchener (Macmillan).—Babylonian Magic and Sorcery: L. W. King (Luzac).—By the Deep Sea: E. Step (Jarrold).—British Association, Liverpool, 1896. Excursion Guide-book (Liverpool, Philip).—A Dictionary of the Economic Products of India. Index (Calcutta).—The Book of the Dairy: Dr. W. Fleischmann, translated by C. M. Aikman and R. P. Wright (Blackie).—Elementary Quantitative Chemical Analysis: Dr. F. Clowes and J. B. Coleman (Churchill).—Lehrbuch der Algebra: Prof. H. Weber, i. Band (Braunschweig, Vieweg).

SERIALS.—Geological Magazine, September (Dulau).—Geographical Journal, September (Stanford).—Edinburgh Medical Journal, September (Pentland).

CONTENTS.