

investigation by Mr. F. Marchand (*Abhandl. der math. phys. Classe der Königl. Sächs. Ges. der Wiss.*, No. 4, 1902, p. 393). The average weight of the brain for men between fifteen and fifty years of age is 1400g., that for women 1275g. The smaller size of the female brain is not dependent on shorter stature, as the median brain weight of women is absolutely smaller than that of men of similar size.

The *Mittheilungen der Deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens* (Band viii, Theil 3) contains two long articles, one by Mr. P. E. Schiller on the etiquette of present-giving in Japan, which is full of quaint customs, and another by Prof. Karl Florenz on the new agitation against the Japanese letter-forms. These, which are of Chinese origin, weigh like an intolerable burden on Japanese progress. Dr. Florenz adds an elaborate essay on comparative European and Japanese phonetics, illustrated by numerous diagrams of palates. This appears to be a valuable contribution to the subject of comparative phonetics.

The interesting excavations in the caves of Baoussé-Roussé, undertaken by the liberality of the Prince of Monaco, under the able direction of M. l'Abbé de Villeneuve and with the assistance of M. Lorenzi, the enthusiastic and skilful *préparateur*, have resulted in important discoveries. The work has been accomplished with the greatest thoroughness and exactitude. Dr. R. Verneau has published in *l'Anthropologie* (tome xiii. No. 5, p. 561) an illustrated account of his study of the remains from the "Grotte des Enfants," in which he states that although the Cro-Magnon type of man is found at a depth of 7m. 05, at 70m. lower two skeletons were found which presented a very clear negroid appearance, but they are not true negroes. His hypothesis is that earlier than the race of Cro-Magnon and later than the race of Spy, a third ethnic element was present on the Riviera which presented negroid characters.

We have frequently directed the attention of ethnologists to the mine of information concerning the customs, beliefs and handicrafts of civilised and uncivilised folk that is to be found in the pages of our contemporary *Globus*. The articles are generally a record of first-hand observations, and the majority of them are illustrated. Another feature of the journal are the careful summaries of contemporary geographical, ethnographical and archaeological literature. The following titles taken from the current volume (lxxxii.) illustrate the range of subjects:—A historical-ethnological study on gynæcological "ex voto," by Dr. E. Blind, with illustrations (p. 69); Dravidian folk-poetry, by Mr. W. Gallenkamp; dwarfs in history and tradition, by Mr. D. MacRitchie. In the previous volume, there were papers by Mr. G. Thilenius on prehistoric pygmies in Schlesien (p. 273), and by Mr. J. Kollmann on pygmies in Europe and America. Prof. K. Weule raises the question (vol. lxxxii. p. 247) whether there are dwarf people in New Guinea. His remarks are based on photographs of three men whose stature ranged from 1201m. to 1205m. Further evidence must be obtained before we can be sure whether these are a true pygmy people or only dwarfed Papuans. Name-giving and marriage among the Orang Temia of the Malaka Peninsula, by Hrolf Vaughan Stevens, edited by H. Stöner (p. 253). An article by Mr. G. Knosp on the Annamite Theatre is illustrated by a coloured plate. An interesting *résumé* of archaeological, somatological and ethnographical researches in Portugal is given on pp. 283-289. Dr. C. Kassner describes and figures (p. 315) various ethnographical survivals in Bulgaria, amongst others the suspended boards that are used as gongs.

In the current number of the *Reliquary and Illustrated Archaeologist* is the first of a series of papers on prehistoric Dartmoor, by Mr. R. Burnard, which promises to be a valuable contribution to the archaeology of a most interesting region. A few years ago, extremely little was known about the monuments of Dartmoor, but thanks to the labours of the Dartmoor Exploration Committee of the Devon Association for the Advancement of Science, Literature and Art for the past six years, a considerable amount of information has been obtained. The present communication deals with hut-circles.

Designs cut in rocks have previously been recorded from New Caledonia, but M. Archambault in *l'Anthropologie* (xiii., 1902, p. 689), gives a number of photographs of petroglyphs that he has discovered, and certainly many of them are very remarkable, and they open out a promising field for inquiry. Unfortunately, the author was unable to obtain any information from the natives respecting them, but it does not follow that all knowledge about them has passed away, and it is to be hoped that

fresh endeavours will be made to elucidate their signification. In the same journal will be found a further paper by M. Ch. de Ujfalvy of his series on the "Iconographie et Anthropologie Irano-Indienne," in which he deals with the physical type of living Hindus, based on the researches of Risley and Crooke. He alludes to Nesfield's view regarding the caste system, and upholds his conclusions in opposition to Risley's adverse criticism.

The French are masters in the art of popularisation of science; to take a recent example, one can buy for 60 centimes a carefully compiled, up-to-date summary of French archaeology by Zaborowski ("Bibliothèque utile," F. Alcan, Paris). In the seventh edition of "*l'Homme préhistorique*," the French people can learn the opinion of specialists on the ancestry of man and the main characteristics of the men of the various archaeological epochs. The tools, weapons, artistic efforts of Palæolithic man are described. The feature of this excellent little book is the prominence paid to the transition period between the Palæolithic and Neolithic periods. The Bronze and Iron ages are merely alluded to.

In the current number of *Man*, the monthly journal of general anthropology which is published under the direction of the Anthropological Institute, besides several papers on the physical anthropology of different peoples, there are interesting contributions on the use of diagrams for craniometrical purposes. Archaeology, mainly Egyptian Mediterranean, is particularly well represented. The arts and crafts of various peoples are described in numerous interesting papers, and comparative religion is well to the fore, the discussions on totemism and on the Supreme Being in Sarawak being more especially noteworthy. The articles and notes in *Man* are written in non-technical language, and as they are of such general interest, the journal deserves to reach a wide circle of readers.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

PROF. J. J. DOBBIE, professor of chemistry in University College, North Wales, has been appointed director of the Edinburgh Museum of Science and Art.

ON Thursday, April 2, a meeting will be held in the map room of the Royal Geographical Society, when Prof. Elisee Reclus will speak on the subject of geographical education, with special reference to his globular contoured maps, globes and reliefs, of which he will exhibit examples. All interested in the improvement of cartographical methods are specially invited to attend and take part in the discussion.

FIFTEEN science professors of Calcutta colleges have, it is reported in the *Pioneer Mail*, signed a protest against the proposals of the recent Universities Commission in connection with the teaching of science. Their memorial points out that the principal recommendations of the Commission regarding science teaching tend to discourage instruction in science, for, they continue, the Commission propose to exclude it altogether from entrance examinations, and make it optional for the higher examinations; so that if the recommendations of the Commission are adopted, students will be allowed to obtain the highest degrees of the university without being required to acquire a knowledge of even the rudiments of any branch of science at any stage of their university training. Dr. MacKichau, Vice-Chancellor of the Bombay University, in a speech at Convocation on February 24, proposed that a fund of not less than twenty lakhs of rupees be raised to found a science school in the University of Bombay. Part of this money must, he said, come from the public; Government may be safely trusted to provide the remainder. Part of this fund would be employed to provide buildings for the science laboratories and to equip them with the necessary appliances; part of it in providing instruction by professors appointed by the University, aided by lecturers supplied by the various colleges at its request.

WHAT is known as the "National Diploma in Agriculture" is administered by a joint board elected by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland. This diploma took the

place of one which was originally granted by the Highland Society. Teachers of agricultural science have alleged that the regulations in connection with the national diploma are unsatisfactory, but notwithstanding the attempts of the Agricultural Education Association to secure their improvement, the joint board seems unwilling to alter the conditions of awarding diplomas. Prof. Wallace, of Edinburgh University, enumerates some of the disadvantages attached to the present state of affairs in a recent pamphlet, and among them he mentions that Scottish students have to travel twice to Leeds to be examined by a board from which teachers of agriculture are practically excluded, that the present scheme encourages cramming, and that it is national only in name. Prof. Wallace has obtained the opinion of the Solicitor-General of Scotland as to the position of the Highland Society in relation to its Charter on Education, 1856. This Charter empowers and requires the council of the Highland Society to appoint a board of examiners and to grant diplomas, and the opinion of counsel is that by its action in 1899 in agreeing to the joint board, the council of the Society is not acting in conformity with the provisions of its Charter. Prof. Wallace is, it appears, entitled to take steps to compel the council to proceed in accordance with the Charter.

THE following announcements of gifts to higher education in the United States have appeared in *Science* since the beginning of December, 1902:—Mr. James Stillman, 20,000*l.* to Harvard University for the endowment of a professorship in comparative anatomy. Mr. Peabody has offered to the University of Georgia a 10,000*l.* building, provided the Legislature will appropriate to the University for maintenance the sum of 2000*l.* a year for two years, and make improvements costing 240*l.* A bequest of 16,000*l.* was made to Yale University by the will of Mr. Benjamin Barge. Mr. Morris Jesup, 2000*l.* to Princeton University. Mr. John D. Rockefeller, 200,000*l.* to the University of Chicago, to be added to the endowment, and other sums amounting to 105,200*l.* have been given to the same university. Tulane University has been made the residuary legatee of the late Mr. A. C. Hutchinson, and it is expected that it will receive 200,000*l.* The University of Rochester has received 2000*l.* from Mrs. Steele. Yale University will ultimately receive 10,000*l.* for the aid of poor students by the will of the late Mrs. Courier. Dr. D. K. Pearsons has given to Illinois College, Jacksonville, 10,000*l.*; to Fargo College, Fargo, N. D., 10,000*l.*; to West Virginia Conference Seminary, Buchanan, 10,000*l.*; to Pomona College, at Claremont, 10,000*l.*; and to Fairmount College, Wichita, Kas., 5000*l.* This makes the total of Mr. Pearsons's contributions to colleges 800,000*l.* Mr. Henry Phipps, 60,000*l.* for the establishment in Philadelphia of "The Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis." Cornell College, Iowa, has added 14,300*l.* to its endowment funds. A friend whose name is not yet made public gave 10,000*l.* Mr. Fred W. Brown has given 2000*l.* Harvard University received 10,000*l.* by the will of Rebecca C. Ames, the income to be used for the support of poor students. The University of Pennsylvania received gifts during the year to the value of 187,370*l.* Mr. Robert E. Woodward, 10,000*l.* to the Brooklyn Institute of Arts and Sciences. The Duke de Loubat, 20,000*l.* to Columbia University for the establishment of a chair of American archæology. Oberlin College has received an anonymous gift of 10,000*l.* from the same donor who recently gave 10,000*l.* By the will of the late Prof. Waterhouse, Washington University received 5000*l.*, and Harvard University and Dartmouth College each 1000*l.* Mr. S. M. Inman, 5000*l.* toward the proposed Presbyterian university to be erected in Atlanta, Ga. Cornell University has received an anonymous gift of 30,000*l.* for the establishment of a pension fund. Mr. James B. Colgate, 20,000*l.* to Colgate University, Hamilton, N.Y., to which he had already given more than 200,000*l.* Mr. Andrew Carnegie, 20,000*l.* to Western Reserve University for the establishment of a school for the training of librarians. Columbia University received 2000*l.* for the establishment of a scholarship by the will of Mrs. Banker. It thus appears that in three months universities and colleges of the United States have, owing to the liberality of American citizens, benefited to the extent of more than one and a quarter millions sterling.

NO. 1743, VOL. 67]

### SCIENTIFIC SERIAL.

*Journal of Botany*, March.—Under *Limonium* Mr. E. S. Salmon discusses the varieties and synonyms which Hooker, in his "Student's Flora," places together under *Statice auriculæfolia*.—The fresh-water algæ reviewed by Messrs. W. West and G. S. West are mostly small Chlorophyceæ, and include five new species and a new genus, *Polychaetophora*.—The notes on Myricaceæ contributed by Dr. Rendle were prompted by a rearrangement of the British Museum plants consequent upon Chevalier's recent revision of the group, whereby certain forms are separated from *Myrica* to form the new genera *Gale* and *Comptonia*.—The diagnoses presented by Mr. Spencer Moore refer to new sympetalous plants collected in the Coolgardie district of W. Australia.—The following short articles occur:—"Rubi of the Neighbourhood of London," by Rev. W. M. Rogers; "*Lepidium Smithii*," var., by Mr. F. Townsend; "Possible Use of Essential Oils in Plant Life," by Dr. G. Henderson.

### SOCIETIES AND ACADEMIES.

LONDON.

**Royal Society**, March 5.—"The Differential Invariants of a Surface, and their Geometric Significance." By Prof. Forsyth, F.R.S.

The present memoir is devoted to the consideration of the differential invariants of a surface; and these are defined as the functions of the fundamental magnitudes of the surface and of quantities connected with curves upon the surface which remain unchanged in value through all changes of the variables of position on it. They belong to the general class of Lie's differential invariants; and some sections of them were obtained about ten years ago by Prof. Zorawski, who, for this purpose, developed a method originally outlined by Lie. Earlier, they had formed the subject of investigations by a number of geometers, among whom Beltrami and Darboux should be mentioned.

Prof. Zorawski's method is used in this memoir. In applying it, a considerable simplification proves to be possible; for it appears that at a certain stage in the solution of the partial differential equations characteristic of the invariance, the equations which then remain unsolved can be transformed so that they become the partial differential equations of the system of concomitants of a set of simultaneous binary forms. The known results of the latter theory can then be used to complete the solution.

The memoir consists of two parts. In the first part, the algebraic expressions of the invariants up to a certain order are explicitly obtained; in the second, their geometric significance is investigated.

An invariant, which involves the fundamental quantities of a surface  $E, F, G, L, M, N$  (these determine the surface save as to position and orientation in space) and their derivatives up to order  $n$ , as well as the derivatives of functions  $\phi, \psi$ , of position on the surface up to order  $n+1$ , may itself be said to be of order  $n$ . The invariants up to the second order inclusive are obtained. It appears that, if two functions  $\phi$  and  $\psi$  occur, all the invariants that occur up to the second order can be expressed algebraically in terms of 29 algebraically independent invariants; while, if only a single function  $\phi$  occurs, all the invariants that occur up to the second order can be expressed in terms of 20 algebraically independent invariants.

The significance of these respective aggregates of 29 and of 20 invariants is obtained in connection with curves

$$\phi = 0, \psi = 0,$$

drawn upon the surface. The investigation reveals new relations among the intrinsic geometric properties of a curve upon a surface. In particular, up to the second order, four such relations exist for a single curve, and their explicit expressions have been constructed.

March 12.—"On the Histology of *Uredo dispersa*, Erikss., and the 'Mycoplasm' Hypothesis." By Prof. H. Marshall Ward, F.R.S.

The paper deals with a detailed study of the histological