these currents will be broken up by different local circumstances; and the speed of the currents will vary at various places, but there will always be a system of equatorial and polar currents. Is it not admissible then to suppose, asks Maury, that the cold waters coming from the north and the warm waters issuing from the Gulf of Mexico and made lighter by the heat of the tropics, will act relatively to each other in the same way as the water and the oil in the preceding example?

The Gulf Stream was at one time regarded as a branch of the Mississippi; but this notion must be abandoned since it has been proved that the volume of the Gulf Stream is many thousand times greater than that of the river, and that its water is salt, while the water of the Mississippi is fresh. Next, Benjamin Franklin's idea was generally adopted, viz., that the trade-winds drive the waters before them into the Carribean Sea, whence they issue more slowly in forming the Gulf Stream. Maury, however, refuses to accept this explanation; he admits that the trade-winds may increase the speed of the stream in the strait of Florida, but he maintains that it is impossible for these winds to give such an impetus to the Gulf Stream as would make it traverse the whole of the Atlantic as a markedly distinct current. He caps his objections to the theory of Franklin by remarking, that as surely as a river flows along its bed only under the influence of gravity, so the course of the Gulf Stream in the midst of the ocean necessitates the existence of a never-ceasing moving force; in short, he says, if gravity did not exist, the waters of the Mississippi would never leave their source, and, were it not for a difference of specific weight, those of the Gulf Stream would remain for ever in the tropical regions of the Atlantic. But as Maury disputes the correctness of Franklin's statement, viz., that the surface of the sea is above the normal level in the Gulf of Mexico, and that the water tends by virtue of its weight to rush towards the north, and as observation has proved that along the western edge of the Gulf Stream there flows a current of those cold waters which descend southwards as far as Florida Strait, he can no longer maintain his first opinion as to the cause of the Gulf Stream. He is forced to resign the hypothesis that the water of the Gulf Stream, on account of its greater degree of saltness, has a specific gravity greater than the water of the polar seas, to which it flows in virtue of its great density, causing a current in a direction contrary to the lighter waters of these colder regions. But from the moment that Maury supposes that the ocean currents have their origin at the time when the water of the tropics is lighter, and that of the Gulf Stream heavier than the water of the Polar seas, his point of view becomes uncertain and difficult to sustain; and he fails all the more signally in presenting the question of the currents in its true light, from the fact that at that time there existed no exact method of obtaining the specific gravity of the water of the ocean, the degree of saltness of the different seas being then unknown.

(*To be continued.*)

PHYSIOLOGY FOR WOMEN*

By Physiology we should understand a knowledge of the functions of the human body, and of the laws which regulate and maintain its various actions. The physiology of plants and of the lower tribes of animals (Botany and Zoology) are described by two other Professors in the University, and there will be little enough time for me to condense and give an account of what is now known of the subject, even as I have limited it. Whatever useful information, however, can throw light on human physiology, derived from every collateral science, will be made use of to assist inquiry. After some preliminary lectures on the histology, chemistry, the physical and vital properties of the tissues, I shall more especially dwell on the two great functions of nutrition and innervation. The former involves an acquaintance with what constitutes a proper food for man—how it is prepared by mastication, insalivation, digestion, chymification, sanguification, and respiration, to form the blood; how out of this blood the tissues are formed; and how, after these have fulfilled their proper uses, they are separated from the body in the act of excretion. The latter comprehends a description of the functions of mind, including the mental acts, sensibility, sensation, volition, and the varied kinds of motion; of the functions of the nerves; of the special senses, such as smell, taste, touch, sight, hearing, and the muscular sense of voice and speech; and lastly, of sleep, dreams, somnambulism, catalepsy, trance, witchcraft, animal magnetism, &c. &c. Of the subjects included under these heads it is impossible to overrate the importance in reference to their relation to the health and happiness of man, his physical and moral welfare, his social relations, his national resources, and the prosperity of his race. I have long formed the opinion that physiology, besides being essential to the medical student, should be introduced as an elementary subject of education in all our schools—should be taught to all classes of society. It is an ascertained fact that 100,000 individuals perish annually in this country from causes which are easily preventible, and that a large amount of misery is caused by an ignorance of the laws of health. The clergy should especially study it—first, with a view of diminishing the difference in thought existing between literary and scientific men; and, secondly, because their influence on the people from the pulpit, and as parish ministers, is so important. All other professions and trades, however, might beneficially study physiology, especially newspaper editors and reporters, who diffuse a knowledge of useful things among the public; and architects, who have not yet learnt to build dwelling-houses and public halls properly ventilated. But women, in all classes and degrees of society, have more to do with the preservation and duration of human life even than men. It has been argued that, inasmuch as even the brutes know instinctively how to take care of their young, so must women be able to do the same. But the human infant is the most helpless of creatures, and nothing is more lamentable than to witness the anxieties and agony of the young mother as to how she should manage her first-born. In no system of education are women taught the structure and requirements of the offspring which will be committed to their charge; and certainly no error can be greater than to suppose that the senses and instincts are sufficient for teaching man as to his physical, vital, and intellectual wants. The enormous loss of life among infants has struck all who have paid attention to the subject, and there can be no question that this is mainly owing to neglect, want of proper food or clothing, of cleanliness, of fresh air, and other preventible causes. Dr. Lankester tells us, when ably writing on this topic, that, as coroner for Central Middlesex, he holds one hundred inquests annually on children found suffocated in bed by the side of their mothers, and he calculates that in this way 3,000 infants are destroyed in Great Britain annually alone, attributable in nine cases out of ten to the gross ignorance of those mothers of the laws which govern the life of the child.* But women are the wives and regulators of the domestic households. They also constitute the great mass of our domestic servants. On them depends the proper ventilation of the rooms, and especially the sleeping rooms, in which all mankind on an average spend one-third of their lives. Children are too often shut up all day in crowded nurseries, and when ill, are subjected to numerous absurd remedies before medical assistance is sent for. Their clothing is often useless or neglected, the dictation of fashion rather than of comfort and warmth being too frequently attended to. The cleanliness of the house also depends on women, and the removal of organic matter from furniture and linen, the decomposition of which is so productive of disease. Further, the proper choice and preparation of food is entrusted to them,—all these are physiological subjects, the ignorance of which is constantly leading to the greatest unhappiness, ill health, and death. Among the working classes it is too frequently the improvidence and ignorance of the women which lead to the intemperance and brutality of the men, from which originate half the vice and crime known to our police offices and courts of justice. Additional arguments for the study of physiology by women may be derived from the consideration of—(1) the effects of fashionable clothing—the tight lacing, naked shoulders, thin shoes, high-heeled boots—often subversive of health; (2) the great objects of marriage—the production of healthy offspring—and all the foresight, care, and provision required, but too often neglected through ignorance, to the danger both of mother and child; (3) the proper employment of women, which should be regulated with regard to their conformation and constitutions; and (4) nursing the sick, which is one of the most holy occupations of women, and which would be much more intelligently done if

* Abstract of the Opening Lecture of the Ladies' Course of Physiology, delivered in the University of Edinburgh, Nov. 2, by Prof. Bennett.

* See his excellent pamphlet, "What shall we Teach; or Physiology in Schools." London: Groombridge & Sons, 1870.

they possessed physiological knowledge. Doubtless those who regard this study as too difficult and technical for young men, will decry it also for women; yet it so happens that for them nothing is so truly interesting as this science. The examination-papers of school-girls of the Ewart Institution, Newton-Stewart, contain an amount of information in physiology perfectly astonishing. Seldom have medical students given better answers. And yet it has been argued that physiology was far too difficult and technical a subject to be studied even by the students in Arts of our University. Hence women in all ranks of society should have physiology taught to them. It should be an essential subject in their primary, secondary, and higher schools. So strong are my convictions on this subject, that I esteem it a special duty to lecture on physiology to women, and whenever I have done so, have found them most attentive and interested in the subject, possessing indeed a peculiar aptitude for the study, and an instinctive feeling, whether as servants or mistresses, wives or mothers, that that science contains for them, more than any other, the elements of real and useful knowledge.

SOCIETIES AND ACADEMIES

London

Geological Society, November 8.—Joseph Prestwich, F.R.S., president, in the chair. Mr. Henry Hicks was elected a Fellow, Dr. Franz Ritter von Hauer, of Vienna, a Foreign Member; and M. Henri Coquand, of Marseilles, a Foreign Correspondent of the Society. The following communications were read:—1. A letter from the Embassy at Copenhagen, transmitted by Earl Granville, mentioning that a Swedish scientific expedition, just returned from the coast of Greenland, had brought home a number of masses of meteoric iron found there upon the surface of the ground. These masses varied greatly in size; the largest was said to weigh 25 tons. Mr. David Forbes, having recently returned from Stockholm, where he had the opportunity of examining these remarkable masses of native iron, took the opportunity of stating that they had been first discovered last year by the Swedish Arctic expedition, which brought back several blocks of considerable size, which had been found on the coast of Greenland. The expedition of this year, however, has just succeeded in bringing back more than twenty additional specimens, amongst which were two of enormous size. The largest, weighing more than 49,000 Swedish pounds, or about 21 tons English, with a maximum sectional area of about 42 square feet, is now placed in the hall of the Royal Academy of Stockholm; whilst, as a compliment to Denmark, on whose territory they were found, the second largest, weighing 20,000 lbs., or about 9 tons, has been presented to the Museum of Copenhagen. Several of these specimens have been submitted to chemical analysis, which proved them to contain nearly 5 per cent. of nickel, with from 1 to 2 per cent. of carbon, and to be quite identical, in chemical composition, with many aërolites of known meteoric origin. When polished and etched by acids, the surface of these masses of metallic iron shows the peculiar figures or markings usually considered characteristic of native iron of meteoric origin. The masses themselves were discovered lying loose on the shore, but immediately resting upon basaltic rocks (probably of Miocene age), in which they appeared to have been originally imbedded; and not only have fragments of similar iron been met with in the basalt, but the basalt itself, upon being examined, is found to contain minute particles of metallic iron, identical in chemical composition with that of the large masses themselves, whilst some of the masses of native iron are observed to enclose fragments of the basalt. As the chemical composition and mineralogical character of these masses of native iron are quite different from those of any iron of terrestrial origin, and altogether identical with those of undoubted meteoric iron, Prof. Nordenskjold regards them as aërolites, and accounts for their occurrence in the basalt by supposing that they proceeded from a shower of meteorites which had fallen down and buried themselves in the molten basalt during an eruption in the Miocene period. Notwithstanding that these masses of metallic iron were found lying on the shore between the ebb and flow of tide, it has been found, upon their removal to Stockholm, that they perish with extraordinary rapidity, breaking up rapidly and falling to a fine powder. Attempts to preserve them by covering them with a coat of varnish have as yet proved unsuccessful; and it is actually proposed to preserve them from destruction by keeping them in a tank of alcohol. Mr. Maskelyne stated that the British Museum already possessed a specimen of this native iron, and accounted for its rapid destruction on exposure by the absorption of chlorine from terrestrial sources, which brought about the formation of ferrous chloride. This was particularly marked in the case of the great Melbourne meteorite in the British Museum; he had succeeded in protecting this, as well as the Greenland specimen, by coating them externally, after previously heating them gently, with a varnish made of shellac dissolved in nearly absolute alcohol. He considered it probable that a meteoric mass falling with immense velocity might so shatter itself as to cause some of its fragments to enclose fragments of basalt, and even to impregnate the neighbouring mass of basalt with minute particles of the metallic iron; but he considered the question of meteoric origin could only be decided by examining the same mass of basalt at some greater distance from the stones themselves, so as to prove whether the presence of such metallic iron was actually characteristic of the entire mass of the rock. Prof. Ramsay referred to the general nature of meteorites and to their mineral relationship to the planetary bodies, and remarked that, supposing the earth to have in part an elementary metallic core, eruptive igneous matter might occasionally bring native iron to the surface. Mr. Daintree mentioned that he had been present at the exhumation of the Melbourne meteorite, and that at that time there was little or no trace of any exudation of ferrous chloride, the external crust on the meteorite being not above $\frac{1}{32}$inch in thickness. 2. "On the Geology of the Diamond-fields of South Africa." By Dr. J. Shaw, of Colesberg. Communicated by Dr. Hooker, F.R.S. The author described the general structure of the region in which diamonds have been found. He considered that the diamonds originally belonged to some metamorphic rock, probably a talcose slate, which occupied the heights during a late period of the "trappean upheaval," to which he ascribed the origin of the chief physical features of the country. This upheaval was followed by a period of lakes, the traces of which still exist in the so-called "pans" of the region; the Vaal river probably connected a chain of these lakes; and it is in the valley of the Vaal and the soil of the dried up "pans" that the diamonds are found. The author referred also to the frequent disturbance and removal of the diamentiferous gravels by the floods which prevail in these districts after thunder-storms. 3. "On the Diamond-gravels of the Vaal River, South Africa." By Mr. G. W. Stow, of Queenstown, Cape Colony. Communicated by Prof. T. Rupert Jones. The author described the general geographical features of the country in which diamonds have been found, from Mamusa on the south-west to the headwaters of the Vaal and Orange Rivers. He then indicated the mode of occurrence of the diamonds in the gravels, gravelly clays, and boulder-drifts of the Vaal Valley, near Pniel, including Hebron, Diamondia, Cawood's Hope, Gong Gong, Klip Drift, Du Toit's Pan, and other diggings. By means of sections he showed the successive deepenings of the Vaal Valley and the gradual accumulation of gravel-banks and terraces, and illustrated the enormous catchment area of the river-system, with indications of the geological structure of the mountains at the headwaters. The specimens sent by Mr. Stow, as interpreted by Prof. T. R. Jones, showed that both igneous and metamorphic rocks had supplied the material of these gravels. The author concluded that a large proportion of these materials have travelled long distances, probably from the Draakensberg range; but whether the original matrix of the diamonds is to be found in the distant mountains or at intermediate spots in the valleys, the worn and crushed condition of some of the diamonds indicates long travel, probably with ice-action. Polished rock-surfaces and striated boulders, seen by Mr. Gilfillan, were quoted in corroboration of this view. Mr. Woodward mentioned that Mr. Griesbach and M. Hübner had been over the country described in these papers, and had communicated a map of it to Petermann's Journal. Mr. Griesbach stated that the rock described as metamorphic in the paper was by M. Hübner regarded as melaphyre, and that in some parts of the Vaal Valley the beds of the Karoo formation might be seen *in situ*. He disputed the possibility of any of the gravels being of glacial origin. He was convinced that there were no metamorphic rocks on the western side of the Draakensberg; those regarded as such probably belonged to the Karoo formation. Prof. Tennant commented on the large size of the diamonds from the Cape, of which he had within the last few months seen at least 10,000, many of them from 30 to 90 carats each. Some broken specimens must, when perfect, have been as large as the Koh-i-Noor. Mr. Tobin corroborated the infor-