

or a sandbag, or by falling heavily on the ground after being blown up in the air, there is a more or less complete retrograde amnesia of variable length of time. In a case of simple "shell shock" it is impossible to say whether the patient was unconscious during the whole period of time of which he has lost all recollection of the events that happened, or whether during the whole or a part of the time he was conscious, but owing to the "commotio cerebri" the chain of perceptual experiences was not fixed.

In the majority of cases "shell shock" affects only the higher cortical centres; in severe cases the vital centres, as in apoplexy, alone continue to function, and the patient is in a dazed condition, and he may automatically perform complex sensori-motor purposive actions of which he has no recollection whatever. Several cases of this kind have come under notice, one of the most trustworthy being a history obtained from an officer. His company had dug themselves in a wood; he went out into the road to see if a convoy was coming, when a large shell burst near him. It was about two o'clock in the morning and quite dark; about 4.30 a.m. it was quite light, and he found himself being helped off a horse by two women who came out of a farm-house. He had no recollection of anything that happened between the bursting of the shell and this incident.

The frequency with which these cases of shell shock suffer from terrifying dreams at night and in the half-waking state points to the conclusion that a psychic trauma is exercising a powerful influence on the mind by the thoughts reverting to the terrifying experiences they have gone through, and their continuous influence on the subconscious mind may account partially for the terrified or vacant look of depression on the face, the cold blue hands, feeble pulse and respiration, sweats and tremors, some or all of which signs of fear the severer cases manifest. As these dreams cease to disturb sleep, so these manifestations of fear tend to pass off and give place to the sweet unconscious quiet of the mind. Occasionally during the waking state contemplation of the horrors seen provokes hallucinations or illusions which may lead to motor delirium or insane conduct. A number of striking illustrative cases were given.

Speech defects are a common symptom of "shell shock." Of these mutism is the most common; it may be associated with deafness. Unable to laugh or cough sonorously, to whistle, or to whisper, indeed, to produce any audible sound, mutes are able nevertheless to express their silent thoughts by writing. The cause of the muteness is due to loss of power of phonation. Major Mott discussed this subject very fully in a paper read before the Society of English Singers.³ Besides mutism and aphonia, stuttering and stammering are not uncommon conditions. There is no difference between the mutism and aphonia met with in "shell shock" and that of hysteria; the manner in which it disappears is similar; even a trivial circumstance, in which attention is taken off its guard and the mute is surprised by an emotional shock, may cause the patient suddenly to speak.

A very interesting case was narrated of a grenadier who, when admitted, was blind, deaf, and mute; he was, however, extremely sensitive to skin impressions; indeed, it seemed as if the mind focused attention on the perceptual avenue which had not been functionally dissociated by the shock. His sight was restored to him quite suddenly, and he was then able to communicate his silent thoughts by writing. His power of recognition was good, but his recollection was a blank for the whole period of time he had been

³ "The Psychic Mechanism of the Voice in Relation to the Emotions." *Brit. Med. Journal*, December 15, 1915.

in France, and he could give no information regarding the circumstances which led to the condition he was in. A few days later he became very emotional, and suddenly recovered his hearing and speech.

Although mutes are unable to speak voluntarily, yet under the influence of terrifying dreams they often call out in their sleep. One man had been shouting in his sleep and was told this the next morning by a comrade; he was so surprised that he said, "I don't believe it."

Various functional paralyses are common, and an injury often determines the seat of the paralysis by suggestion; thus a man may be blown up and bruised on his hip or shoulder, and a fixed idea is engendered that the limb is paralysed. Functional paralysis of the lower extremities in consequence of injury of the back is a common condition; likewise various disorders of gait and station, tremors, coarse and fine, tics, and choreiform movements are other manifestations of motor functional disorders. Hyperæsthesia, or increased sensibility of the skin to stimuli, and anæsthesia are of frequent occurrence. One of the commonest and most troublesome symptoms is hyperacusis, or sensitiveness to noises; and when the Zeppelin raid occurred many serious relapses took place. It would take too long to detail the manifold symptoms that may arise in consequence of these functional neuroses.

Major Mott does not employ hypnosis or psychoanalysis; he considers these modes of treatment unnecessary, as he has cured numbers of cases by making a careful examination of the patient, and then assuring the paralysed, the tremulous, the mutes, and others that there is no organic disease, and that they will certainly recover. An atmosphere of cure is necessary; therefore when a patient with functional paralysis comes with crutches or sticks, the first thing he does is to order them to be taken away, for they are not required. Many men who had been paralysed weeks and months have thus been cured in a few hours or a few days. Massage and electricity, and all other treatment which suggests a disease, he deprecates. He strongly advocates diversion of the mind from the recollection of the late terrifying experiences by music, games, and amusements of all kinds, and he appealed to the charitable public to provide such for the new Maudsley Hospital of the London County Council, Denmark Hill, which has been recently taken over by the War Office for the treatment of 200 of such cases as those to which he referred.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Special Board for Biology and Geology have made the following grants from the Gordon Wigan Fund:—30*l.* to the Department of Geology towards meeting the deficit in the working of the department; 40*l.* to the Department of Botany for assistance to the curator of the herbarium in his work on the British flora; 30*l.* to Prof. Punnett, in order that the Botanic Garden Syndicate may continue to offer special facilities for plant-breeding experiments; 5*l.* to the curator in entomology for the care and development of the collections of insects; 15*l.* to Prof. Gardner for the provision of special lectures in parasitology in connection with the diagnosis of disease.

THE council of the Teachers' Guild has arranged for a conference on educational reform, to be held on Saturday, April 8. Specialists in various grades of education—university, technical, secondary, and

primary—have been invited, and also well-known leaders in industry and commerce. The chair will be taken by Sir Henry Miers, and the draft prepared to be submitted to the conference for approval suggests the following subjects to be dealt with by committees of experts:—(a) Reforms in administration, including co-ordination of various grades of education; (b) the relation of technical colleges, university courses, and research scholarships to manufactures; (c) training of women for professional, technical, and commercial occupations, and for domestic life; (d) improvements in the curricula of schools and in instructional materials and methods, so as to make them more purposeful and adaptable to after life; (e) extension of educational facilities to all juveniles after fourteen; (f) training and status of teachers, and research in education; (g) medical service and physical education; (h) character training and training for leisure; (i) reform of examinations, also of methods of selecting candidates for public appointments, and for promotion within educational institutions.

ARRANGEMENTS have been made for the usual short summer course at the Oxford School of Geography for teachers and others interested in geography; but the meeting will not take place this year unless a prescribed minimum number of applications is received by the middle of April. If this number is reached an introductory lecture will be given on the afternoon of August 3. There will be two lectures and at least one period of practical work or an excursion each day. There will be short courses on selected topics of physical, historical, and political geography (especially geographical problems affecting the war and the British Empire), on transport and trade routes, on the teaching of geography, and on the Oxford district. The fee will be 3*l.* for the whole course; a number of students will be accepted for lectures only at a fee of 2*l.* for the course, or of 2*s.* for single lectures. Further particulars will be issued as early as possible in May. Names cannot be sent in too soon, addressed to the Vacation Course Secretary, School of Geography, 40 Broad Street, Oxford, to whom, also, all requests for further information should be sent.

THE paper on "Part-time Education for Boys and Girls," which Mr. J. H. Reynolds read at the Conference of Educational Associations last January, has been circulated in pamphlet form. The paper is rich in impressive facts, which demand the earnest consideration of British statesmen. Mr. Reynolds points out there are 71,000 half-time children, chiefly in the textile districts of the north, to-day. There are some 193,000 children who have entirely left school on reaching the age of thirteen. The number of young people in England and Wales between the ages of fourteen and seventeen was, according to the last census, 2,030,195, to which must be added nearly 200,000 who had left school and entered into employment at thirteen, giving a total of at least 2¼ millions. About 436,000 of these were receiving some sort of education, leaving a net total of upwards of 1,800,000 young people who had ceased to continue their education at day or evening schools. There are in England and Wales 236,000 children below fourteen working half-time or full-time, and 200,000 more working for wages while attending school for full-time. As Mr. Reynolds urges, there is an imperative necessity for a compulsory system of continued education for all children leaving the elementary school at fourteen, who enter into employment, and it might extend from six to eight hours per week throughout the greater part of the year, meaning annually some 270 hours of systematic instruction extending over at least three years.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, March 23.—Sir J. J. Thomson, president, in the chair.—G. Green: The main crests of ship waves, and on waves in deep water due to the motion of submerged bodies. The fundamental problem of ship waves is to determine the wave disturbance produced by an arbitrary pressure system advancing over the free surface. The present paper gives a general method of obtaining the solution of the moving pressure problem in the form of an integral, and proceeds to the evaluation of the integral in some particular cases of ship waves.—E. H. Nichols: Investigation of atmospheric electrical variations at sunrise and sunset. Observations were made for a period of fifteen minutes before and fifteen minutes after both sunrise and sunset, using the Wilson compensating gold-leaf electroscope for conductivity and earth-air current, and two Ebert electrometers for measuring the positive and negative electric charges. The results show a decided uniform decrease in the value of electrical quantities throughout the sunset period, but the solar effect at sunrise is not at all pronounced. The potential curves for Kew Observatory were analysed for the years 1912 and 1914 for the 30-minute period at sunrise and sunset, and monthly means obtained for 5-minute intervals, these being corrected for diurnal variation. There is a general increase in the potential at both sunrise and sunset, being more noticeable in the winter months, but there is no evidence of any sudden change. It is possible that the electrical variations observed may be of assistance in elucidating the problems of wireless transmission.

PARIS.

Academy of Sciences, March 13.—M. Camille Jordan in the chair.—H. Douvillé: A family of Ammonites, the Desmoceratidæ: an attempt at a rational classification. The value and subordination of characters.—M. de la Vallée-Poussin was elected a correspondant for the section of geometry in the place of Félix Klein.—J. Guillaume: Observations of the sun made at the Observatory of Lyons during the third quarter of 1915. Observations were possible on eighty-five days, of which fifty-one were consecutive, from July 24 to September 12.—Arnaud Denjoy: Differentiation and its inverse.—Grace Chisholm Young: Derived numbers of a function.—Maurice Le Pen and Jean Villey: The measurement of the power of motors.—C. Dauzère: The crystallisation of phenyl ether.—E. Briner: The mechanism of reactions in *aqua regia*. A study of the reaction $\text{HNO}_3 + 3\text{HCl} = \text{NOCl} + \text{Cl}_2 + 2\text{H}_2\text{O}$, which is shown to be reversible. The system was proved to be monovariant, three phases and two independent components.—Carl Störmer: The altitude of the aurora borealis observed from Bossekop (Norway) during the spring of the year 1913. A large number of simultaneous photographs of the aurora were taken from the extremities of a base line 27.5 kilometres long, leading to 2500 determinations of the height. The results are given, both in graphical and tabular form. The heights vary from 86 to 180 kilometres, with a maximum frequency at 105 to 106 kilometres.—Ph. Flajolet: Perturbations of the magnetic declination at Lyons (Saint Genis Laval) during the third quarter of 1915.—F. Jadin and A. Astruc: The manganese in some springs of the Pyrenees range. There is a certain relation between the amounts of manganese and total mineral matter in a water. Ferruginous waters usually contain a high proportion of manganese. It was noted that although sodium sulphide waters contain extremely minute proportions of manganese, yet the algæ growing round these springs contain this element in relatively high pro-