

tions. The loss of function in aphasia might therefore be indicated as that of "propositionising." But though this term suggests a conception which covers the larger number of facts, it does not comprise every aspect of the loss of function. Dr. Head suggested, therefore, that these functions should be spoken of as "symbolic thinking and expression," though even this phrase does not quite satisfactorily define the group of processes affected. It is not all symbolic representations, but symbols used in a particular manner which suffer in these disorders. There are four fairly well marked groups of functions into which he now proposed to divide "symbolic thinking and expression" on the ground that they are dissociated in different ways under the influence of organic injury. These are (1) verbal defects, (2) syntactical defects, (3) nominal defects, and (4) semantic defects.

Dr. Mourgue's contribution was in no sense opposed to Dr. Head's conclusions. It dealt with a rather different aspect of the case, and seemed indeed to supplement the general theory in a remarkable way. Dr. Mourgue had given particular attention to some characteristic cases of aphasia in which the sufferers were themselves skilled in the treatment of the disorder and able on recovery to record and analyse their experience. The particular cases cited were the autodiagnosis of Dr. Saloz and Prof. Forel, and also a case recorded by van Woerkem. In all these cases the speechlessness of the aphasic state was comparable with the kind of indistinctness of psychical elements often experienced in the dream state. There was complete preservation of intuitive thought, but absence of imagery, or at least of verbal imagery. The will is unaffected, and may even show exaltation, but there is an absence of discrimination and differentiation—characters which, from a somewhat different point of view, Prof. Bergson has described as essentially belonging to intelligence.

Prof. Bergson said that the communication which Dr. Head had presented constituted a complete rejection of the theory of aphasia which for a long time had been classic. It offered in its place the quite new theory that aphasia was the disorder of a special faculty of symbolising, which might be said to be a certain aspect of intelligence. The classical theory of aphasia might be described as a complete metaphysic. So long ago as the years 1892 and 1893 he had himself been led by a question of pure metaphysics to study the relation of mind and body. He found that philosophers had given us only very vague ideas on this subject, and he determined, therefore, to study the facts of the relation without any philosophical presuppositions. It was extraordinarily ambitious, for he had no technical scientific equipment. Gradually, however, the problem of the relation of mind and body transformed and narrowed itself into the problem of the relation of memory to the brain, then of the memory of words, and then of the meaning of words. Surprise followed surprise. The theory of Broca then held the field, complicated by the work of Kussmann and Lichtheim. Nerves converge on nervous centres, there are strange communications between the centres, the path from A to B is not the same as the path from B to A, and every theory called for some new theories to explain each particular case studied. He appealed to his neurologist and psychologist friends, but he was ill-received; and when some years later he attacked their theories in his book he was looked on with pity. He was not surprised, therefore, when Prof. Pierre Marie gave the results of his anatomical researches, based on Broca's work, and, indeed, on a restudy of the actual brain which Broca had dissected. Long before this, psychology had itself shown the old theory to be impossible. The theory

had, in fact, broken down before a psychology of common sense which called for scarcely any effort of introspection. A perception, in fact, is already memory, for a perception has duration. A part of the perception is memory, therefore, even while the perception still remains. Where does perception begin to be past? All the hypotheses were contradicted by simple self-observation. Prof. Pierre Marie proceeded to demonstrate a new theory of aphasia. He reduced it to two things: (1) A certain disorder of articulation which he named *anarthrie*, and (2) a certain enfeeblement of intelligence.

Prof. Bergson then referred to his own studies of aphasia. What had struck him most forcibly in the records of a great number of cases was a certain powerlessness in the patient to analyse or decompose his perception. Deafness to words was a concomitant symptom rather than a distinct factor. There were cases where persons after complete recovery and restoration had described their experience by saying that they heard perfectly well, but seemed to be listening to a continuous sonorous blur. One of Charcot's patients could hear the clock strike quite well, but could not distinguish the strokes. In verbal blindness, another form of aphasia, it is very remarkable to observe in some of the cases the difficulty the person has to decompose and analyse his perception. He will want, for example, to write a letter of the alphabet, and may succeed, but he will begin where he would not ordinarily begin; he is seen to lack the sense of the organisation of the letter, and when he produces it he has not synthetically constructed it. When we listen to persons speaking a foreign language we are in the condition of some of these aphasics. We hear perfectly, but we cannot repeat the whole of the sounds; they appear to us crushed, as it were, into a formless mass without bones or joints, a sonorous continuity. He had himself, following another line of investigation, been led to attribute capital importance to nascent movements, tendencies, and outlined actions—movements sketched, as it were, and not carried out. An idea is a grouping together of virtual actions. The continuity of thought is simply a continuity of attitudes and of virtual movements not executed, sometimes scarcely delineated. The brain, and in particular the cerebral cortex, indicates an enormous number of initiated actions. Instead of considering the spinal cord as a diminished brain, we ought to think of the brain as a completed spinal cord. Coming back to the special case of aphasia, he asked himself whether, in order to understand speech, we had not got to undertake a work of disintegration of the movements of articulation, neither completely voluntary nor completely automatic. There are certain beginnings of movements which are not carried out. They are partly automatic, partly voluntary, for our mind projects our actions in advance of their accomplishment.

Prof. Bergson concluded by expressing his profound admiration of Dr. Head's researches on the question of aphasia; they appeared to him of capital importance for psychology, and even for metaphysics.

### University and Educational Intelligence.

BIRMINGHAM.—An appeal is being issued for 500,000. in aid of the funds of the University. The finances are in a critical condition; there is a debt of 130,000., which absorbs at present 8000. per annum, necessary extensions of building have had to be made, the staff is deplorably underpaid, and the entry of new students is a heavy one. In spite of the 25 per cent. increase in the fees of new students, these fees will still represent only about 30 per cent. of the cost of

providing the instruction, so that the greater the entry the greater the need for money.

This session the working of the faculty of science will be rearranged, much of the work previously done by the meetings of faculty being delegated to Boards of Studies. The latter consist of professors and selected members of the non-professional staff, and the following boards have been constituted: Mathematics, physics, chemistry, engineering, and biology. It is hoped that the new arrangement will do something towards relieving the congestion of business in the faculty, which has recently been serious. The boards will report to the faculty.

CAMBRIDGE.—Dr. Ff. Roberts, Clare College, has been appointed junior demonstrator in physiology, and Mr. T. R. Parsons, Sidney Sussex College, additional demonstrator in physiology.

The Vice-Chancellor has announced a very generous gift of 25,000*l.* from Sir Dorabji Tata, Gonville and Caius College, towards the expense of new buildings for the engineering school. A further anonymous gift of 2000*l.* has also been received. Part of the new buildings are already very nearly complete. Amongst the large entry this year are to be found fifty officers of the Royal Engineers and a small number of officers from the Royal Air Force and the Corps of Signals—a welcome connection between the Services and the scientific side of the University. The number of naval officers in residence has been reduced owing to the heavy pressure on the accommodation. The question of the admission of women to the University comes up for discussion in the Senate House on Thursday, October 14.

DR. JAMES G. GRAY, lecturer in physics at the University of Glasgow, has been appointed to the newly established Cargill chair of applied physics in the University.

THE *Times* announces that Mr. T. D. Owen, a leading Welsh metallurgist, has given 10,000*l.* to the University College of North Wales for the foundation of a chair in his name of electrical engineering and hydro-electrics.

DR. J. NEWTON FRIEND, hitherto headmaster of the Science and Technical School, Victoria Institute, Worcester, has succeeded Dr. T. Slater Price as head of the chemistry department of the Birmingham Municipal Technical School.

DR. MARION B. RICHARDS, of the chemistry department of Aberdeen University, has been appointed assistant to Dr. R. H. A. Plimmer, head of the biochemical department of the Rowatt Research Institute in Animal Nutrition, Aberdeen.

It is announced by the *Times* that Prof. A. B. Macallum, professor of biochemistry in the University of Toronto, and administrative chairman, honorary Advisory Council for Scientific and Industrial Research of Canada, has accepted the new chair of biochemistry at McGill University.

DR. C. DA FANO will begin a special course of eight lectures on "The Histology of the Nervous System" in the physiology lecture theatre of King's College University of London, on Wednesday, October 13, at 4.30 p.m. The course is free to all students of London colleges and to medical men and others on presentation of their visiting-cards.

At a meeting of the Old Students' Association of the Royal College of Science to be held on Tuesday next, October 12, at the Imperial College Union, Prince Consort Road, South Kensington, London, S.W.7, Mr. J. W. Williamson will deliver an address entitled "The Proposed University of Science and

Technology: Can a Useful and Worthy University be Based on Pure and Applied Science?" The chair will be taken at 8 p.m. by the president of the association, Sir Richard Gregory.

In connection with the University Extension Board of the University of London, Prof. John Cox will commence on October 8, at 7.30 p.m., an interesting course of lectures on "The Bases and Frontiers of Physical Science" at Gresham College, Basinghall Street, E.C.2. The first part of the courses will be devoted to a review on the broadest possible lines of the concepts and laws of Nature on which traditional physics has been built up. The later lectures will deal with Einstein's views and the principle of relativity. Admission to the first lecture is free.

## Societies and Academies.

### PARIS.

Academy of Sciences, September 13.—M. Léon Guignard in the chair.—F. E. Fournier: The apparent displacement of some stars in the total eclipse of the sun of May 29, 1919.—A. Blondel: The calculation of electric cables by the use of vectorial functions with real notation. The method described has the same advantages as when imaginary quantities are employed, but only real quantities are utilised in the demonstration. It is based on the introduction of vectorial series.—V. Smirnoff: Some points of the theory of linear differential equations of the second order and automorphic functions.—E. Jouguet: The velocity of waves in elastic solids.—C. Camichel: The transmission of energy by the vibrations of water in pipes. Remarks on some recent publications of M. Constantinescu, and a statement of the work done by the author on the same subject.—E. Canals: The estimation of calcium and magnesium in different saline media. A study of the conditions under which, in acetic acid solutions, it is possible to separate completely calcium and magnesium from salts of iron and aluminium.—G. Zeil: The rôle of building corals in lithospheric re-adjustments.—C. Störmer: Some rays of aurora observed on March 22, 1920, which reached a height of 500 km. The aurora borealis of March 22 was photographed from seven stations under favourable conditions. The stations were connected by telephone, and simultaneous photographs were taken from two or three stations at a time. About 620 photographs were obtained, and they show that the summits of some of the rays reached an altitude of 500 km. above the earth.—A. Chevalier: The origin of the cider apple-trees cultivated in Normandy and Brittany.—F. Vlès: The spectral properties of the tetanus toxin. Spectrophotometric studies of the ultra-violet absorption spectra of the effects of heating and of the addition of antitoxin to solutions of the tetanus toxin.—A. Marie and L. MacAuliffe: The influence of life in Paris on the race. A study of 1509 Parisians of the poorer classes, 850 of whom were born of provincial parents, 294 of Parisian parents, and the remainder of one Parisian and one provincial parent. The Paris climate and town life lead to modifications which are thus summarised: The hair and eyes less pigmented than in the rest of France, more marked cranial development in proportion to height, and shortening of the limbs.—J. L. Dantan: Budding in *Antipathella subpinnata* and *Parantipathes larix*.

### HOBART.

Royal Society of Tasmania, August.—His Excellency Sir W. L. Allardyce, president, in the chair.—H. H. Scott and C. Lord: *Nototherium Mitchellii*. Its evolutionary trend: the skull and such structures as related to the nasal horn. In their third paper on the