

teristic between the lethal action of normal urine and that of the insane. (2) Special actions; these are qualitatively the same in the two groups of cases, except that some of the urines from the insane have an antidiuretic power. The myotic power is frequently increased in the insane. The convulsive producing power is often marked, and in cases of *folie circulaire* is present even when the patient is well.

There exists a relationship between certain actions of the urine—myotic power and antidiuretic power; and certain clinical signs—contracted pupils and increase of the density of the urine.

J. R. GILMOUR.

3. Physiological Psychology.

The Psychological Geography of the Brain Cortex and the Doctrine of Flechsig [*La Géographie psychologique du Manteau cérébral et la Doctrine de Flechsig*]. (Reprint from *Rev. de Psychol. clin. et thérapeut.*, 1900.) Bianchi, L.

Professor Bianchi claims to have pointed out seventeen years before Flechsig the existence of zones of association in the cortex. He recapitulated the views of the German professor already explained in this JOURNAL, and observed that Flechsig assigned to his anatomical researches a much greater importance than they really merit. He puts the question, Does the myelinisation of the fibres of the hemisphere follow a constant law? And if this be admitted, are we warranted in believing this geographical anatomy of development to be the foundation of a species of psychological geography? To judge by the changes which Flechsig has made in his own scheme, it does not appear that the complete development of the nerve-fibres occurs in an order so constant as to justify the inferences he makes upon them. Bianchi thinks that we may logically hold that the zones of association are but zones of perception arrived at a greater degree of development. He observes that it is not probable that there are in the brain cortex distinct areas set apart for sensations and the memory of these sensations. He thinks that the large portion of the brain in the occipital and parietal lobes has a visual function, and that in the anterior portion are registered the visual images which have associated the images of the graphic signs of words. All the large area of the cortex, called by Flechsig the parietal association zone, is nothing else than a portion of the hemisphere destined for the visual function in all its degrees, from the simplest to the most complicated. The perception of light has its seat in the calcarine fissure, the cuneus, and the occipital pole; while the oculo-motor functions, and the perception of the images of objects and the graphic signs associated with them, the more ideal products of mental activity, are recognised in the anterior portions of the visual sphere. Dr. Bianchi thus goes on:—"Nothing authorises us to regard this region of the cortex as the anatomical substratum of the highest intellectual processes in which are associated the images furnished by the different areas of perception and sensation,

because no clinical observations hitherto published are favourable to such a hypothesis. If, with bilateral lesions of the occiput in addition to the mind-blindness, a state of dementia more or less deep is also observed, we may suppose that in such cases the dementia is occasioned by the loss of that large part of the intellectual estate which is constituted by the visual images of the outer world. On the other hand, it is not enough to affirm that abnormal excitement of a sensory zone brings with it hallucinations, and that irritation of the so-called zone of association induces mental confusion, for as yet there are no proofs furnished by pathological anatomy to confirm such assumptions."

Bianchi does not think that the histological examination of the brain supports Flechsig's views about particular zones of association. We have known, since the researches of Meynert, that the occipital lobe has always presented an essentially complex structure (seven layers instead of five in the motor zone). Ramon-y-Cajal has declared that microscopic sections of the different zones—sensory, motor, and associative—can be distinguished at a glance. Nevertheless Bianchi thinks that we are not justified in attaching to these not well-marked differences in structure, such different functions in the way Flechsig does. The structure of the perception areas should be simpler than that of the association areas; but this is not found to be so. Bianchi observes that Flechsig's view, which assigns to his posterior zone of association the highest intellectual dignity, is refuted by the simple fact that grave dementia often follows the word-deafness caused by a lesion of the first temporal convolution. This part of the sphere of language is comprised within the limits of Flechsig's area of auditory sensation and perception (primordial territory, No. 7, and partly in the intermediate territory, No. 23). After this fact it is impossible to assign distinct areas to the functions of hearing in general and that of the hearing of words in particular. It seems rather that the two functions occupy the same zone (superposed), though there is a marked predominance on the left to the function of language. "In my opinion," adds Bianchi, "few regions of the cortex have such numerous and extensive connections with the rest of the brain, and are so intimately connected with mental activity, as the first temporal convolution of the left hemisphere."

In reference to the motor zone, the Italian professor observes that there is a countless series of movements which are executed from the data of our perceptions; and this being so, what we call the motor zone must also be the zone of association much more than Flechsig's great posterior inferior zone, because the former utilises the data of all the sensory zones situated behind or below. Nevertheless the fibres of the motor zone are the first to have the myelin sheath. Evidently the fibres which first become matured are not the only ones which reach the motor zone, and if, in the course of development, many other fibres reach it from all the other points of the cortex, of what value is the distinction between the zones of projection and the zones of association? Dr. Bianchi holds that in front of the motor area up to the border of the frontal gyri there is what he calls the area of evolution of the motor zone. Here he places the centre of writing, which, however, is still in the way of formation, because humanity

has only taken to writing for a very short time. The brain, he tells us, is in a state of perpetual evolution. If Bianchi means that a new anatomical area or areas with a new function have been evolved in the human brain within historic times he is going far in advance of any evidence. Déjerine has objected to a centre for writing in the left hemisphere allowing us to write with the left hand. Indeed, men can learn to write with the foot. To which Bianchi replies that to establish a centre one must learn to write easily and rapidly. Still this might be acquired by constant practice with the foot. I have seen a man without arms copying pictures in the Brussels Gallery with the brush between the toes. Bianchi, however, admits that the graphic centre may change its locality with individual circumstances. We thus arrive at the view that particular exercises forming particular aptitudes have a tendency to annex particular portions of the brain cortex.

The Italian physiologist does not seem averse to follow out his own line of argument, and admit that centres may be found for playing on the piano and other acquired accomplishments. And why not centres for singing, archery, shooting, or bicycling? That such aptitudes should permanently connect themselves with areas of the cortex and form centres permanently attached thereto will not be readily received.

Bianchi argues at length, that the frontal lobe is the organ of the physiological fusion of all the sensory and motor products elaborated in the other regions of the cortex, where the different sensory and motor functions have their respective seats. It is the organ of the conscious and historical synthesis of the two great factors of mental life, the one somatic or emotional, the other representative and intellectual.

Bianchi argues strongly against the view that the frontal lobes are the organs of inhibition. He finds a difficulty in seizing upon the meaning of this theory. He cannot think that the power of inhibition is a specific function exercised by some organs of the nervous system upon other subordinate organs. In his opinion, every organ of the nervous system, and especially every part of the cortex, can at different times be a centre of inhibition or an inhibited organ. Every time that a centre of perception enters into intense function under the influence of an adequate stimulus, it becomes by reason of its increased activity a centre of inhibition to the other organs with which it has anatomical relations. The sight of a picture which astonishes us, of a spectacle which pleases us, or the reading of a book which interests us, puts in a state of tension one of the cerebral areas, the visual zone, and the frontal lobes. But while the visual zone is thus active, a feeble noise, which in a state of repose would be heard, is now unheeded, because the auditory centre is inhibited by the visual centre, and is thus unable to transform into perceptions the sound-waves which come to it; nor can it transmit to other regions of the cortex the products of its function so as to induce further mental combinations. If the acoustic stimulus is powerful, it throws the auditory centres into high function, and then the sound becomes perceptible; but the moment the auditory centre enters into active function the visual centre is inhibited, the power of visual perception is diminished, and

the frontal region works in another direction, establishing relations with the auditory zone. No doubt the frontal lobes have the power of direction over the other parts of the nervous system; but nervous activity is one. There is no special apparatus for inhibition in the brain.

W. W. IRELAND.

Acuteness of Sensation in Children in Relation to Age and Sex [*La sensibilità nei fanciulli in rapporto al sesso ed all'età*]. (*Arch. di Psichiat.*, vol. xxii, fasc. iii, 1901.) *Di Mattei*.

The author has examined tactile, olfactory, and gustatory sensibility in 160 children of both sexes, aged from four to twelve years, and has further investigated in a number of Jewish children the condition of tactile and general sensibility, and sensibility to pain, comparing the acuteness of these forms of sensibility with the extent of mental capacity and with the degree of degeneracy (as measured by the number of stigmata) in the individual subjects.

The sexes were nearly equally represented in the series, and two groups were distinguished, those aged from four to eight, and those from eight to twelve. The ordinary methods of examination were employed, and the results are given in detailed tables.

The author arrives at the following conclusions:

(1) As compared with boys, girls show a larger proportion of individuals with acute tactile and olfactory sensibility; in regard to gustatory sensibility, the proportion of the acutely sensitive is higher in girls for sweet tastes, lower for bitter, and equal for saline.

(2) In Jewish children tactile and general sensibility were acute in a larger proportion of girls, sensibility to pain in a larger number of boys.

(3) Comparing the two age-groups, the younger boys showed a lower ratio of acutely sensitive subjects in all forms of sensibility, except that to saline tastes, where the proportion was equal, and that to bitter tastes, where it was superior to that in the group of older boys. The results were similar with girls, except in regard of sensibility to bitter and saline tastes, where the conditions were reversed.

(4) In Jewish subjects of both sexes the younger children presented a higher proportion of individuals with acute general sensibility, and a lower proportion with acute sensibility to pain.

(5) No definite relation could be made out between the number of stigmata of degeneracy in an individual, and the acuteness of his tactile sensibility.

The author's general conclusions are that, as a rule, sensibility is more acute in girls than in boys, and that in children of both sexes it increases with the progress of age.

W. C. SULLIVAN.

On the Mental Fatigue of Children in Health and Disease [*Ueber geistige Ermüdung der Kinder im gesunden und kranken Zustande*]. (*Psychiatr. Wochenschr.*, Nos. 20, 21, Aug., 1900.) *Anton, G.*

Dr. Anton draws attention to the greater liability of the nervous system to disturbances during its stage of development, and in particu-