

tion to give them, on parole, a very high degree of liberty. I dare to say so in a country where there are so many adherents of non-restraint.

If many convicts were submitted to treatment similar to that practised in our lunatic asylums, would relapses be so frequent? I have the firm conviction that the future will solve this question, and the more promptly because governments would understand the great necessity of introducing in a short time a medico-psychological service in all their prisons.

Neural Action Corresponding to the Mental Functions of the Brain. By FRANCIS WARNER, M.D., F.R.C.P., Physician and Lecturer on Therapeutics and Materia Medica at the London Hospital.*

While working purely on the lines of physical science it will be admitted that all observations recorded should be described in terms connoting physical phenomena, so given as to be capable of repetition, and, if possible, of measurement. No forces and no causes can be admitted as potent except those known to physiology and other branches of physical investigation. It follows that in dealing with the mental functions of the brain—here termed psychosis—we have nothing to do with “mind as an abstract entity” or with processes of feeling and consciousness, and must confine our attention to neural acts without either admitting or denying the existence of other potencies with which, while working on the lines of physical science, we are not concerned.

I will confine my remarks to action in the brain of man, as it may be inferred from facts observed. It is convenient to commence with observations in the infant when the neural arrangements are congenital, and trace by observation the development of indications of psychosis under impressions received from the environment.

In the healthy and well-developed new-born infant universal, slow, spontaneous movements, particularly in the digits and other small parts, are seen; this I have described as microkinesis.† It is not at first co-ordinated by impressions from the environment. In neural action it is inferred to correspond

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† See Tuke's “Dictionary of Psychological Medicine.”

with slow spontaneous action of many separate nerve-centres. At the age of three months some temporary co-ordination of the microkinesis is seen, the hands, head, and eyes moving towards an object, but this effect immediately follows the stimulus. There is some potentiality for psychosis.

At the age of four or five months the sight of an object may temporarily inhibit the microkinesis—attention is attracted. Head, eyes, and hands turn towards the object seen, then all movement is arrested for a moment; subsequently the child performs a new action, and seizes the object. Here, I think, we see the earliest indication of something that may be called “mental action.” It seems to me from observation of this “period of inhibition of microkinesis or latent period of the impression” that neural action of a new kind is observed, for this latent period is followed by a new action, and it must be inferred that during the latent period the neural arrangements were prepared for the new action. What can these neural arrangements be? Let us reconsider the facts, and see what they may teach us. Microkinesis indicates spontaneous action of many separate nerve-centres; the period of inhibition of movement indicates temporary arrest of their efferent function in producing movement, and this is an active result of a sight impression; it cannot be a period of negative-action, for it is followed by visible new action clearly sequential to the impression. I infer that an active neural arrangement (diatactic action) was formed among the centres by the impress of sight during the period of arrest of motor function. Let *a, b, c, d, e* represent separate, visible parts acting spontaneously; we infer separate spontaneous action (motor) in nerve-centres A, B, C, D, E. During the period of arrest of microkinesis A, B, C, D, E are not exercising motor function, but it is inferred that they are still active, for later we observe new movements, *ab, ad, ce* indicating the co-ordinated action of AB, AD, CE. It is this neural arrangement (diatactic action) for the action of nerve-centres in certain groups during the temporary arrest of their motor action that I infer to correspond to a simple mental act.

How is the intellectual power evolved? Following the hypothesis just given we must inquire how the neural arrangements for the action of cells in certain groups are established. There appears to be a law of widespread import concerning cellular growth and action. “Like cells co-nourished, and performing their function synchronously under control of some stimulus, tend afterwards to act together in similar groups, and

this tendency is strengthened by repetition." Thus co-ordination of nerve-centres is built up. In the case of the infant, suppose the sight of the red ball forms groups AB, AD, CE, indicated by movements *ab*, *ad*, *ce*, on repetition of the experiment the action becomes more exact and more similar on successive occasions. In adult life neural arrangements corresponding to ideas (percepts) are formed by sight of objects, and the printed page, repetition of the sight thereof, deepens the impression and fixes it, and the neural impress is retained; trains of thought may thus be established, leading in the end to expression or action. In the adult, as in the child, inhibition of movement is favourable to thought, the motor action is suspended and replaced by the formation of a series of neural groups, which finally produce an expression by movement. A train of thought must, according to the hypothesis, correspond to the preparation of groups of centres for action in a series under some stimulus whose repetition is followed by increasing rapidity and accuracy, *e.g.*, repetition of a poem frequently read or a series of motor exercises imitated by sight from the teacher. The laws of logic may be shown to be in harmony with the physiological law. Good intellectual action does not produce more physical wear than defective action, because there is no greater amount of nerve energy in one group of cells than in another corresponding; the value of the intellectual act depends upon its complete control by the stimulus. Sound intellectual function is in harmony with the environment, because it has been built up by it.

I have but briefly sketched my own ideas on a difficult subject, hoping to learn from others the results of their observations and study.

Sensations of Cephalic Pressure and Heaviness. Carebaria, Pesanteur de tête. Kopfdruck. By HARRY CAMPBELL, M.D.

Among the many abnormal cephalic sensations the following constitute an important group:—

- a. Sensations of pressure upon the head.
- b. Sensations in which the head seems heavy.
- c. Sensations of a vaguer character, though probably related to the other two, the patient often complaining of a heaviness in the head.

To this group the terms "carebaria," "pesanteur de tête,"