

JOSEPH COOK'S MONDAY LECTURES.

"THE OFFICES AND FUNCTIONS OF THE BRAIN," DELIVERED IN THE OLD SOUTH CHURCH, BOSTON, DECEMBER 29TH, 1879.

Place on the hand a glove and close tightly the fingers and palm. If you see the glove for the first time in the position which it will then have, it will be very difficult to tell of what it is made in the concealed inner portions. The brain is a similarly folded glove. The most important business of Mental Physiology is to open this palm in which whole philosophies as to the conduct of life in every department lie hid. Within the last twenty years, this hand, holding the most important secrets of culture, has been slowly unfolding. Although the unspeakably precious philosophical fruit which the palm has in it has not yet dropped, science is nevertheless in a condition to proclaim as established several great propositions as to the physiology and functions of the brain.

1. Excitation of certain definite regions of the brain produces certain definite physical movements.

I take a rabbit and give it chloroform, and arrange the brain as you did that of the dog, by removing the skull and exposing the throbbing surface of the cranial substance. I apply the electrodes to point after point. There is in the rabbit a much larger development of the olfactory nerves and ganglions, than even in the dog, and so we find in the latter an animal governed by its sense of smell. The dog is superior to the man in this particular sense. In spite, however, of the various differences between the brains, I find the corresponding spots producing the same effects when touched by electricity. Here I apply that marvellous agent [illustrating by a drawing], and the hind feet of the rabbit are moved; at the second place, and the front feet move; at the third, and although the rabbit does not produce any audible sound, its jaws and lips stir as though it would do so if it could.

2. At least fifteen centres are fully proved now by repeated experiment to give rise to certain definite motions.

3. Most of these centres are in the middle portion of the brain.

4. Large parts of the front and rear of brains do not respond to electrical stimulation.

5. Destruction of these definite brain regions already mentioned causes complete and enduring paralysis of the corresponding movements. There may be a diffusion of the electric current through the substance of the brain. There is, therefore, as some think, room for two theories here. The whole fruit has not yet dropped from this folded palm.

6. By both positive and negative evidence, therefore, the weight of authority in physiological science now supports the doctrine of the localization of functions in the brain.

7. Out of the great doctrine of the localization of functions in the brain, thus made a part of established science, what follows? Phrenology? Not yet. I say not yet, for I do not know but that a new and revised phrenological map may some day come from thorough modern investigation.

It is no part of my purpose this morning to defend the pseudo-science of phrenology. I am not an utter disbeliever in the outlines of it, neither am I an utter believer in it. It is, of course, everywhere confessed that Gall and Spurzheim made great advances in physiological science, and that their method of unfolding the brain instead of slicing it was a discovery of the very highest consequence. This has been of late years admitted by all authorities. In advance of their time, they were right in proclaiming the doctrine of the localization of functions in the brain, and of the effects of quality and quantity and of temperaments in organization.

With these cautions against being misunderstood, I proceed to come dangerously near to what you may think extravagant doctrine, and yet I go no further than this successor of Sir William Hamilton, Professor Calderwood, goes; no further than Ferrier goes; and not as far as Professor Alexander Bain. In the books of the latter, there is an estimate of phrenology rather too favourable, as most severe judges think.

8. It is everywhere conceded that the brain is the organ of mind.

9. The doctrine of temperaments is a part of established science.

10. Although smaller subdivisions of the cranial mass are in debate, it is conceded that the intellec-

tual, the moral and the social faculties have their localized separate seats in the brain.

11. It is conceded concerning the larger divisions of the brain, as well as in regard to the brain as a whole, that, other things being equal, size is a measure of power.

12. Quality, however, is as important as quantity.

13. It is conceded that the stronger faculties easily combine with each other.

14. It is conceded that in the brain, as in other organs, growth results from exercise.

15. It is conceded that balance of organization is the pre-requisite of unforced harmony of action in the faculties.

16. It is conceded that every faculty has its correlate in the external world.

It is here that we reach a height from which bursts upon us a landscape, portions of which stretch far beyond the powers of exploration possessed in our age by any philosophy.

It is agreed that the intellectual faculties are connected with the front part of the brain. But we have as distinctively a moral nature and a social as an intellectual, and we exercise the former as well as the latter through the brain. The former have organic seats as truly as the latter. If I put my hand on a nervous bulb giving the sense of odour, you say that I have proof before me that there is odour in the external world to match it. If a part of the brain enables us to perceive the relations of cause and effect, I shall find that there are such relations in the external world. Carry this invulnerable principle unflinchingly into the field of the higher faculties. Why am I not giving good proof that there is a God when I shew you that we are physically endowed with organs which are the seats of faculties by which we irresistibly worship and feel a sense of obligation to a Power above us, and a dependence upon that Power? Every fully-organized man has in him these faculties, and somewhere they are provided in the brain with a local seat. It is not necessary for me to know where, any further than the established general doctrine of the localization of functions in the brain points out. From a keen perception of odour by any animal I may safely conclude that it possesses nervous apparatus for such perception, even if I do not know where the apparatus is. Or conversely, from the nervous apparatus I might prove that the power of perception of odour exists, and has something to match it. So with the vivid, moral perceptions of man. It is a part of man's nature to worship; a sense of obligation belongs to him as naturally as a hand or an eye; and there must be a correlate to match this faculty.

17. The existence of a faculty proves the existence of its correlate.

18. But there is in man a definite faculty for the apprehension of the connection of cause and effect, and so we have a right to be certain that cause and effect exist in the eternal world.

19. A definite faculty exists in man, prompting him to worship a Supreme Being, and we have a right to be certain that such a being exists.

20. A definite faculty exists in man prompting him to obedience to moral law, and allowing him no intelligent peace except in such obedience; and we may, therefore, be certain that a moral law exists, and that obedience to it is necessary to our peace with our environment.

21. The religious truths thus taught by physiological science as to the condition of man's peace are the same with those taught by ethical science and by revelation.

22. It is self-evident that peace and health of soul are unattainable unless every faculty is harmonized with its own correlate, and with all the correlates of its companion faculties.

23. The law of the ascent of life also applies to the domain of mental physiology, and shews that peace can come only from the harmonization of man's entire nature with his own environment.

24. Culture, therefore, is to return to the Greek ideal as to the development of body and brain, and to the Christian for that of the soul, and will find Hellenism and Christianity as harmonious with each other as pedestal and statue.

"Peace I leave with you. My peace I give unto you. Not as the world giveth, give I unto you." "These things have I spoken unto you that your joy might remain in you, and that your joy might be full." These, indeed, are texts out of the Holy Word of

Revelation, but they are also texts out of the depths of the book of the nature of things. They are flaming passages out of the slowly opening pages of these fateful human faculties from which we cannot escape, and which have correlates with which they must be harmonized, and from which we cannot flee. Here, as everywhere, axiomatic theology lifts aloft the wide illumination of the self-evident truth that two cannot walk together unless they are agreed. Here, as elsewhere, axiomatic theology proclaims the necessity of our harmonization with the law of the ascent of life. These things saith Mental Physiology, another name for the Divine Revelator, that in harmony with self-evident truth ye might have peace; and that in the Christ by whom the brain, and Orion and all the hosts of the outer heavens of the stars, and the inner heavens of the soul, were arranged under law, ye might have joy, and that your joy might be full.—*N. Y. Independent.*

GROUNDLESS ANXIETY.

The "Country Parson," whose "Recreations" have afforded us so much pleasure, relates the experience of a clerical friend, which is both amusing and instructive. This friend had just been admitted to orders in the Episcopal Church. As was very natural, he had taken the next most important step in life. He had married, and on a salary of five hundred pounds had commenced housekeeping. With his income, he knew he must manage his affairs with prudence and economy, and he hoped that he would be able to make his year's ends meet. But he suspected, as the weeks passed by, and the outgoes were numerous, and the servants wasteful, and the calls on his purse many and pressing, that he was getting in arrears. The quarter ended. Bills were all in and paid. The amount expended was one hundred and twenty-five pounds, which, as the calculation was made, was at the rate of six hundred pounds a year, one hundred pounds more than his salary. He was overwhelmed at the discovery. Visions of the debtor's prison floated before his diseased imagination. He would be disgraced as a clergyman. His reputation in the estimation of his wife's relations would be sadly damaged. The poor man carried a heavy load, day after day, and at night sleep fled from his pillow. At last, as one day he was brooding over his forlorn condition, and thinking of the dismal prospects before him, he once more multiplied his expended one hundred and twenty-five pounds by four, and found that the result was five hundred pounds instead of six hundred pounds—just the amount of his salary. At once the cloud on his spirits disappeared. A happier man could be found nowhere than he. I should not be surprised if the next sermon he wrote was from the text, "Be careful for nothing; but in everything, by prayer and supplication, with thanksgiving, let your requests be made known unto God." If his wife's brother or sister came to dine with him the next day, he met them with a cheerful face, and welcomed them to the best dinner the market could afford.

How often has the Heavenly Father, thus lifted loads of groundless anxiety from the hearts of His burdened children. During the years of general depression, which we hope are coming to an end, what cares have pressed upon many weary and cast-down souls. The faith which should make practical our Lord's injunction, "Take no thought for the morrow," has sometimes been very weak. Its trial has been great, and sometimes the strain so severe on it that it would seem as if it would snap. But in thousands of cases it has stood the test. A gracious Providence has been found to be better than our fears. Like our clerical friend, we find we have made miscalculations. We forecast troubles which have never come, because they had no foundation in reality. Our fears having proved needless, we thought we should never again give way to them. At last, we said, we are safely anchored, and we shall never again be driven out upon the dreary waste of waters. But has it been thus with us? When once more the storm has risen, and the rude winds have beaten upon us, have we remained at our moorings? In dark hours of disappointment have we been able to look up and say, "Though He slay me, yet will I trust in him?"—*Rev. J. C. Stockbridge, D.D., in Christian Weekly.*

GOOD prayers never come creeping home. I am sure I shall receive either what I ask or what I should ask.—*Bishop Hall.*