

— Science Notes. —

MIND AND MATTER.

ALTHOUGH it has been proved, up to a certain point, by the methods of research enumerated in this column last week, that different parts of the brain are concerned with different movements of the body, this localisation of function appears not to be sharply defined. In the simile employed by Dr. Waller, "The various activities making up the business of the brain do not all take place all over its surface as in a country without towns or villages, where all kinds of industry go on in every hut or tent; nor are the different activities absolutely restricted to certain spots as if in walled towns. The brain cortex is not comparable with either of these extreme cases; its territory must be recognised as possessing towns with special industries, but towns with straggling and overlapping suburbs, and industries which are, indeed, predominant each in a given centre, but not exclusive of all other industries in that centre, nor excluded from other centres in which other industries predominate. In this qualified sense, localisation of function in different parts of the brain must be considered to be established."

The "motor centres" in the brain, which, by their activity, give rise to movements of the body, must either coincide or be connected with other centres called sensory. It is the function of the latter to receive *news*, as it were, of an impression made by an object on the retina, or of sound waves affecting the mechanism of the internal ear. When such impressions have, by travelling along the appropriate nerves, reached the brain, they throw the sensory centres into activity (in a way no one can fully explain), and the owner of the brain *sees* or *hears*. The coincidence or connection between sensory and motor centres is proved by the fact that activity in the first will cause activity in the second in a fraction of a second, as when a man raises his arm to ward off a blow, or starts off to run a race on receiving the signal.

A somewhat ludicrous example of the connection between sensory and motor centres is obtained by vigorously scratching a cat or dog behind the ear. Very frequently the hind leg of the same side begins to work as though the animal were scratching its own ear. Observation of this action seems to prove that the above is the probable explanation, as the animal could have no difficulty in bringing the paw to the ear (as it does not do), if it felt irritation in the ear and desired to relieve it by more vigorous scratching.

Records have been made, by the use of an electromagnet, of the actual time which elapsed, in certain individual cases, between the application of a tactile, auditory, or visual stimulus, and the giving of a signal (arranged previously) to intimate that the subject of the experiment has felt, heard, or seen, as the case may be. This interval, called the reaction time, is evidently made up of three periods:—(1) The transmission of the impression along the sensory nerve; (2) the development of a sensation and of a consequent impulse to move; (3) the transmission of the impulse along the motor nerve. The reaction time varies according to the kind of stimulus applied, the subject operated upon, and with many other conditions. Thus, the

answering signal from a certain subject came in fourteen-hundredths of a second in the case of touch, in sixteen-hundredths of a second in the case of hearing, and in eighteen-hundredths of a second in that of seeing. With regard to individuality, we are informed that it is not the case that people reputed to be quick and "wide-awake" have a shorter reaction time than those of an apparently sleepy and phlegmatic temperament.

Notes on Art.

THE LOAN COLLECTION OF PICTURES,
GUILDHALL.

AGAIN the Corporation of London has brought together, evidently with great care, a magnificent collection of paintings. It is an ideal Exhibition, wherein many of the works are well-known masterpieces, and all deserve careful examination. To those of us who are accustomed to make a loving study of art, it is an added pleasure to see old friends, such as No. 27, *An Idyll, 1745*, by Sir John Millais, exhibited in the Royal Academy in 1884. It shows us a piper-boy in regimental costume of the last century, playing the fife to three little Scottish maidens reclining on the grass near him. The painting of the boy's face is marvellous, so is that of the nearest girl; the whole picture is what it professes to be, "an Idyll," simple and natural—indeed, so sweet and simple it is, that, at first, it is difficult to realize how entirely masterly the painting is. Another picture, which also claims to be *An Idyll*, is No. 19, by Sir F. Leighton, who has treated his subject in quite another way—not simply, certainly, for here, not young maidens, but two beautiful women are reclining at the base of a tree, whose branches overhang them "thick-leaved ambrosial." A shepherd is sitting piping at their feet—very exquisite, it all is, more subdued in tone than Sir Frederick's pictures usually are—the distance is very lovely. A masterpiece, too, is No. 8, by E. J. Poynter, R.A., *Israel in Egypt*. It is so utterly real; we feel the great heat, the atmosphere is stifling, the masses of miserable slaves are struggling to drag along the burden their "great oppressor," Rameses II., has laid upon them.

"They did set over them taskmasters to afflict them with their burden,

"And they made their lives bitter with hard bondage.

"All their service wherein they made them serve was with rigour."

In no other picture that we have ever seen has the truth of the bondage in Egypt been made such a real thing.

No. 9, *Procris*, is a strong work by Mrs. Ernest Normand. In the painting of the face and head there is great beauty, but the treatment is too modern, or, perhaps, we are too used to the quaintly-touching rendering of the classic story of the death of Procris, in our National Gallery. Miss Clara Montalba and Lady Butler are both well represented, we are glad to see. No. 33, *Scotland for Ever*, by Lady Butler, the famous charge of the Scots Greys at Waterloo, is a vigorous picture full of spirit, movement, and terrible reality. It is interesting to notice at the Exhibition

[previous page](#)

[next page](#)