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PART 1.—ORIGINAL ARTICLES.

On Thought without Words, and the Relation of Words to Thought. By WILLIAM W. IRELAND, M.D.

(*Continued from page* 438.)

The condition of uneducated deaf mutes often nearly approaches that of a being destitute of language. It is true that even if they are not taught signs they contrive a few of their own invention; but these signs are of a very simple kind, and neither fitted nor intended to express any abstract notions, so that the deaf and dumb are in a much worse condition for obtaining knowledge than the blind. The deaf mute sees everything, but understands nothing; whereas in using the senses still remaining to him the blind man is guided by the words of others into true interpretations. We thus find that the deaf and dumb in the narrow circle of their own cogitations are in a very benighted condition, but it would be absurd to say that they do not possess or exercise reason. After they have become educated and are able to communicate by signs or writing, deaf mutes sometimes detail what they remember of the bounded state of their intellect before being sent to school. They record accidents and events which have made an impression on their mind; but it is clear that their speculations upon the nature and causes of things have never gone below the surface. In the Reports of the American Asylum at Hartford, there are a number of answers to questions put with a view to find out what were the thoughts of uneducated deaf mutes. One of them when asked, What did you formerly think when you saw a person die? replied that he thought "he was deceiving the people, and that he would rise up." He thought that "a man that was died was buried alive, and wondered that he did not rise from the dead in a few days." Other deaf

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mutes by observing that the dead bodies of animals rotted away, arrived at a nearer idea of death. They rarely thought that they would die themselves, and an existence beyond the grave occurred to none. Many attended public worship for years without knowing what was the object of it.

In regard to the origin of men and animals, we are told in the Forth-sixth Annual Report, they were found not to have reflected much, if at all. One or two seemed to have formed the opinion that the world had always existed, and that there had always been a succession of the beings inhabiting it; while most of them had not given a single thought to the subject. The following quotations are taken from their answers to the question on this point:—

"I never attempted to suppose who made the world, nor how it came into existence." "I had no idea of the beginning of the world nor of the beings it contained." "I knew nothing concerning the origin or the beginning of the world." "I had never reasoned about the origin of the world." "I had thought that the world and beings were always the same." "I believe I used to think that this world stood itself always, and that the people too were descended from generation to generation without origin."

As has been already observed, it is too hasty an assumption that the mind can only attend to one object or mental process at once. In some states, such as in reverie or dreaming, or where great concentration of mind is used, the whole attention may be lavished upon one subject; but in general there are a number of parallel acts of consciousness going on. We have a more or less vivid sense of our antecedents, our position, of the lapse of time, and other accompanying circumstances. We do not remember, or at least quickly forget all our parallel acts of consciousness, our memory generally running back along that line to which we have paid the most attention. We can carry on two distinct mental processes much more easily than two similar ones. Thus we can go on thinking and riding, or thinking and skating better than thinking on two subjects at once. We can remember the words of a song and the music at once, and go on dancing at the same time much easier than remembering the words of two songs at once. Occasionally, I have succeeded in attending to two parallel lines of thought, and what is more difficult in recalling them to memory. Once when reading a French book, some one addressed me, when I both listened, answered, and at the same time went

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on reading the book. On interrogating my memory, I found that I could recollect both what I heard, what I had answered, and what I had read. It would appear that this faculty of attending to many things at once or seeing several things at a glance can be increased by practice.

"Robert Houdin relates, in his autobiography, the mode in which he prepared himself and his son for the performance of the trick which he termed 'second sight;' the success of it mainly depending upon the rapidity with which the information given by sense-impressions could be apprehended and interpreted, and the accuracy with which (for a short time at least) they could be remembered. In the first instance Houdin put down a single domino, and required his son to name the total number of points, without counting them, which each could readily do. Two dominoes were then tried, and after a little practice, the total number of points on both was correctly named by each at the first glance. The next day the lesson was resumed, and they succeeded in naming the points on four dominoes at a single glance; on the following day those of six; and at length they found themselves able to give, without counting, the sum of the points on twelve dominoes. This result having been attained, they applied themselves to a far more difficult task, over which they spent a month. The father and son passed rapidly before a toy shop, or any other displaying a variety of wares, and each cast an attentive glance upon it. A few steps farther on each drew paper and pencil from his pocket, and tried which could enumerate the greater number of the objects momentarily seen in passing. The son surpassed the father in quickness of apprehension, being often able to write down forty objects, whilst his father could scarcely reach thirty; yet, on their returning to verify his statement, he was rarely found to have made a mistake."*

This accomplishment was utilised in persuading people that the son possessed the gift of clairvoyance. It may be said that the mind passes very rapidly from one object of attention to the other, and that we thus mistake processes which occur successively for processes which occur simultaneously, though, if these processes appear simultaneous, the presumption surely is that they are so till

* Quoted in a lecture on "Modern Spiritualism," by W. J. Marshall, M.D., Greenock.

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this is disproved. If we imagine ourselves conscious of viewing four bodies at once, while we really view them in succession, here is an instance of four mental processes, accompanied by consciousness, in which the succession of three of them has instantaneously passed out of the memory.

We can remember words both as sounds and as symbols; the latter is a double process, in which we remember the word and the idea too. Sometimes the word fails to recall the idea, or the idea fails to recall the word; and sometimes we have ellipses of thought without words. In general, however, the word forms the link between the object and the memory of it. There is a remarkable mnemonic power in speech. Thoughts unassociated with words very soon die away from the memory. Even intense feelings, when never expressed, are soon forgotten.

There is no doubt that speech powerfully supports thought. Our words are definitions which contain ideas more or less generalised and common to different minds. We thus learn to fix our own ideas, and to follow the order of the thoughts of other men, so that we can build up conclusions from one stage to another and go back to examine what we have done. In arranging words, like builders erecting a tower, we lift the materials which in turn elevate us to a higher position. With ordinary men, educated through words, it is easy to see that there must be a great difficulty in carrying on a train of abstract thought without symbols, whether spoken or written words, figurative signs like those of the deaf and dumb, or ideographic characters like those of the Chinese. At the same time, when some writers pronounce that we could have no abstract ideas without words, I cannot even pretend to understand what they mean. A child recognises that one colour is common to snow, milk, the lily, a piece of paper, and to a bit of chalk. Can he not hold this in his mind without the word white, or albus, or blanc? Is it not clear that though men cannot communicate their abstract ideas to one another without words, that the ideas must be gathered in the mind before the mind recognises it, so as to give it a distinctive name, just as a flower must be known to the sight ere it is labelled with a title? Imbecile children often recognise and separate colours and short numbers before they know their names. Perhaps people may somewhat overlook how much abstract ideas enter into our daily life. One cannot spend a shilling in buying different articles without having recourse to abstract notions.

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Jessen remarks* that "the greatest thinkers, as was the case with Newton, can so bury themselves in their own thoughts that they neither see nor hear what is going on before them. They think, no doubt, in such moments without words, which only arise when, through reflection, they have arrived at a result. On this account his biographer assures us Newton could give no account of the manner and way in which he had arrived at the results of his thinking, for we remember our own thoughts and their course only by means of the words by which they are represented."

It seems possible that a very superior mind might gain now and then in dealing with ideas unrepresented by symbols, but this assuredly is not the ordinary course of thought with ordinary men.

No doubt words sometimes impede thought, as language not copious enough, and of inferior construction and cultivation, and full of ambiguous phrases or equivocal inflections, leads men into illogical paths. Moreover, all speech tends to lead men from what is particular and incommunicable to what is felt in common and can be easily described. Therefore, our attention is powerfully drawn from the subjective to the objective, and we cease to think of what is difficult to express in words. Thus speech, while it leads the mind to some things, may lead it away from others.

While running alongside with speech there are occasions in which thought asserts its distinctness. We elaborate ideas, but find that we cannot express them in words; we think of persons or things, we have the conception in our mind, but the names and the words do not come; we propose one expression after another, and reject them successively, till our memory supplies the word or combination of words of which we are in search, or perhaps, after groping for a while, we abandon the attempt to clothe our meaning in words till we are in a happier vein or we find what expresses our ideas in the works of some master of language. Men coin words or adopt them from foreign tongues, and if they express ideas not already fitted by suitable symbols, they soon fall into common use.

In some minds there seems to be a disparity between the power of thinking and the power of expressing thoughts. Men who approach close to a subject and bring out new

* "Verhältniss des Denkens zum Sprechen, Allgemeine Zeitschrift für Psychiatrie." Band xxii., p. 366. 1865.

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views sometimes have a great difficulty in stating their thoughts in words. John Hunter is a memorable example of a man of this type. "One of the few intellectual defects that can be traced in him," says Paget, "was the great inequality of his powers of language and thought. In every mind thoughts and words are so interwoven that each shares always the qualities of the other. Thoughts and words are like mutual reflectors: if either of them distorts an object placed between them, the other cannot but receive the distorted image and reflect it. Or each is, alternately, master and servant. Now, thought employs words for its expression, and then these same words take part in directing the next thoughts. If either be defective or erroneous, the other suffers.

"Hunter was a great master of facts, and in plain and customary English he could with great power collect, compare, arrange, and construct whatever could be made from them; but he was not a master of words. His large, strong mind does not in anything show that subtilty which, whether in thinking or in writing, can accurately employ many words of scarcely different meanings—a quality which is very necessary for the consideration of abstract ideas, and in which a defect is a hindrance, not only to the expression of thoughts, but to the process of thinking.

"Hunter's defect in this respect may have been due, in part, to his neglect of early education, but chiefly, I think, it was natural. In many other things he corrected all the faults that could be referred to neglected education; in language, whether in speaking or writing, he was, to the last, deficient; and his thinking power, strong as it may have been by nature, was hindered and baffled by its weak associate." †

Hunter's knowledge was of a thoroughly real character: he did not think through the thoughts of other men, but interrogated Nature closely. Perhaps this was one of the reasons he hesitated in words. With so many gaps in his knowledge as one must feel who deals with Nature as an investigator, with so many unsatisfied questions in his mind, he might hesitate at accepting ordinary words as definitions, for no true thinker is ever satisfied with words as most men use them.

The study of aphasia has already thrown much light not

† Paget, "Hunterian Oration," 1877, p. 18.

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only on the physiology of the brain, but upon the mental characteristics of speech; and as cases accumulate, and are more carefully analysed and compared, we may expect to learn more. Often the record of interesting cases has been neglected or rendered of dubious value by the want of the preliminary knowledge requisite to examine an aphasic so as to bring clearly out the distinctive failings. To enlarge upon the subject at present would take up too much room, but I am unwilling to conclude without alluding to the confirmation derived from aphasia of the principles laid down in this article.

Dr. J. Hughlings Jackson states a view, shared by Bain and Ferrier "that when we remember a word there is faint excitation in the highest centres for articulatory movements; when we remember, and also say that word aloud, the excitation is stronger, and currents spread down to lower centres of movement, and these reach the articulatory muscles." We have seen that as some imbeciles understand speech without speaking themselves, their language may consist purely of remembered sounds. Probably normal speech is made up of remembered sounds, the excitation of motor articulatory processes and the mental recognition of such excitations. At any rate, we know that, by a destruction of a small part of the brain, the under surface of the third left frontal convolution, where it overlaps the island of Reil, a man may be suddenly deprived of the power of speaking.

The variations of aphasia are often very perplexing to one who wishes to reach some stable generalisation. The movements of the tongue and other parts of the vocal apparatus are not paralysed, though there is often a greater or lesser amount of hemiplegia on the right side; the power of speaking is lost, but the patient can understand what is said to him. The power of writing is lost with that of speaking, save in those rare cases in which the patient can still trace words which he can no longer utter. Sometimes the aphasics can read writing; sometimes, though, they can neither read nor speak—they can repeat words said to them, or copy writing. In many instances the mind is more or less weakened. The material lesion of the brain is not always fixed to one spot; but, in the great majority of aphasics, it is situated in the left side, and near the operculum or the island of Reil. Dr. Ferrier's experiments by the electric excitation of the brain show that movements of the lips and

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tongue may be aroused by the application of the electrode to analogous parts of the brain in monkeys, dogs and other animals.

In aphasia, all the intellectual powers, save those concerned in the utterance and reception of words, may be left unaffected. The patient can use all his senses, act intelligently, play at cards, draughts or dominoes, and in other ways show powers of foresight and calculation.

Trousseau had a patient who was seized with aphasia while he was sitting at whist; he played with his usual ability, and noticed nothing amiss till the game was over, when he found that he had lost his speech. A little after it was ascertained that he was unable to follow the words in a book. The application of leeches caused the aphasia to disappear, when he was able to explain what he had experienced.

Dr. Lordat, a distinguished Professor of Medicine at Montpellier, after a fever suddenly lost for several months the power of speech. So thoroughly was the memory of words destroyed that he did not understand a single word said to him. But he tells us that he could combine abstract ideas, and distinguish them properly, without having any word to express them, and without thinking at all about their expression. "I experienced," says M. Lordat, "no embarrassment in the exercise of thought. Accustomed for so many years to the work of instruction, I was able to arrange in my head the principal propositions of a lecture, and to find no more difficulties in the changes that I chose to introduce in the order of my ideas." Trousseau has stated his conviction that Lordat was labouring under an illusion, and that the intellectual faculties of the learned Professor had in reality suffered more than he was aware of. Trousseau remarks that before the attack of aphasia in 1828 Lordat delivered his lectures in an admirable manner without any notes; but, after the cure of the attack, he could not even deliver from memory the lectures already written out, having always to read them off from the manuscript. Trousseau argues from this that Lordat's intelligence must have been profoundly altered, and his strictures are re-echoed by Kussmaul.* But

* *Op. cit.* p. 20, 21. Dr. Augusto Tamburini, in his able "Contribuzione alla Fisiologia et Patologia del Linguaggio, Reggio-Eemilia," 1876, after referring to Lordat's case, observes: "It is evident that verbal formulæ are not absolutely necessary to the exercise of thought, especially when it occupies itself with the objective and the concrete."

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it might be replied that the fact that Lordat had to read his lectures only proved that the power of expression was permanently injured, which may be granted without affecting the argument. Kussmaul's observation that Lordat had already accumulated a rich store of ideas through language is more to the purpose. That thought should be carried on under increased difficulties, when disconnected with words, is what might be expected; but we have so many attestations from aphasics that they could observe, reason and reflect while words were wanting, that we may confidently appeal to the results of the study of disordered conditions of speech following disease of the brain for a confirmation of our views. In reading over papers on aphasia, we have occasionally been struck by apparent incongruities of thought, and would have liked to be able to ask a few questions of the authors. For example, do these learned anatomists hold that all thoughts, or at least all abstract ones, come into being in one small corner of the brain, at the flap end of a convolution, away from the central parts of the great hemispheres, and out of the direct line of the conducting tracts? What function is left to the rest of the left hemisphere? Has the right hemisphere nothing to do with abstract ideas? Or, if it requires to get its inchoate abstractions something better than "automatically registered," is it obliged to get them passed over to the left side of the brain to be finished off by the end of the third frontal gyrus, the true seat of all abstract thought?

I do not profess to have completed a survey of the subject, which has still its obscure questions; but, in assigning a more limited rule to speech, I think that there is an accordance between mental analysis and anatomical and physiological data.

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