urgently, I will again repeat that I cannot sufficiently recommend a hand-in-hand resort to constitutional and topical means, for it is only by a judicious application of both that really satisfactory results can be obtained.

[To be concluded.]

MEDICAL PSYCHOLOGY.

By ROBERT DUNN, F.R.C.S., etc.

[Concluded from p. 275.]

Phenomena of the Intellectual Consciousness. To perceive and to think are distinct mental acts; for perception, as we have seen, speaks to us from *without*, but intellection from *within*, so that the mental processes are here reversed. And while, on the one hand, all our immediate or intuitive knowledge has its origin in perceptive experience; so, on the other hand, all our representative knowledge is the creation or product of the mind's own intellection and introspection, of imitation, imagination, ratiocination, and reflection: for these, with memory and volition, are the distinguishing phenomena of the intellectual consciousness. It is through them that man is raised so immeasurably high in the scale of being above the brute creation, and that the human mind attains to its culminating phase of development in the highest reason, and the freest will. Rising above sensation, and above perception, man soars to the region of representative knowledge, grasping through his intellectual faculties and reflecting powers abstract ideas, and necessary and universal truths, and finding articulate utterance and expression for them through the noble faculty of speech, in language.

There are, as we have seen, instinctive intellectual intuitions, primitive beliefs, and primitive judgments; but, in the development of the intellectual consciousness, the imitative and imaginative faculties are the first to come into play, and to begin the work of abstraction. Man is from his cradle an imitative animal; and in the infancy of the race, in remote antiquity, he first sought to embody, through the imaginative faculty, his perceptive intuitions, his inward or mental images, and representative ideas, in the outward realities of nature, as their signs or symbols, and afterwards set himself to work, by means of his hands and with the chisel and the pencil, to mould, form and fashion images of those objects of nature, in which he had embodied his mental images and generalised ideas, and also to make pictorial representations of them. Such of old, were the winged bulls of the Assyrians, and such the hieroglyphics of the Egyptians; and thus, through the imaginative and imitative faculties, were sculpture and painting, however rude in their beginnings, his first step in the process of abstraction. For, until signs are employed, our mental images are not held clearly apart; they merge like dissolving views into one another. Our life in fact, without them, would be more like a dream than a waking reality, portions of a thousand different ideas perpetually combining with and melting into one another. But, when once symbolised or embodied in signs, our generalised ideas are no longer, but cease to be, mere subjective representations; for, being thrown into fixed and significant types, which perform, though imperfectly, the office of abstract ideas, they exist in the mind altogether apart from the region of immediate or inward experience, as independent intellectual realities; and, as such, become distinct and intelligible objects of contemplation and thought, which can be placed at pleasure either within or without the consciousness of the moment. But still man could not be said to have achieved his first step in the freedom of human thought, until, instead of objectifying his inward images in existing outward realities, he had, by his creative mental energy, produced, invented, and constructed his own sign, phonetic or visi-

ble, for the embodiment of the intellectual idea, "the sign for the thing signified." And this he has done in language, creating a new external world, and transferring into it the phenomena of his inner life. For "in language the sign, whether spoken or written, is objective. It appeals to the fears; it comes to us from the outward world, and is constructed from the elements of nature around us. At the same time it has no natural meaning, and contains no thoughts, apart from the mind which created or uses it. Its whole force consists in its being the embodiment of an idea; in brief, it is idea objectified." (Morell's *Psychology*.)

Now, constituted as man is, and endowed with the faculty of speech, his exclusive prerogative, it is as natural, when vividly affected, that he should give expression and find utterance, in articulate sounds, for his feelings, emotions, ideas, and thoughts, as that he should voluntarily use his locomotive powers in progression. It is true, that the scream of alarm, the shriek of horror, and the laugh of surprise, like the scowl of hatred, are natural signs, and not conventional ones, like articulate words. But having an instinctive apprehension of the gestures, cries, and other signs of natural language, he gradually ascended from these to the acquisition of articulate speech, by giving, step after step, conventional names to objects and actions, emotions and passions, generalisations and abstractions. Among all the races of man, the instinctive impulse is irresistible to give utterance in articulate sounds to the feelings, emotions, and thoughts; and not only to fix upon articulate sounds, or names, as representatives of his intuitive cognitions or conceptions of things, but also to find expressions for the different qualities and states of things. And thus to the natural language of inarticulate sounds, gestures, and actions, he first added the conventional language of signs, and afterwards, in the fulness of time, alphabetical writing and the invention of printing consummated the intellectual benefits derived from the noble prerogative of speech.

Language thus implies a train of thinking; it is the circulating medium of our thoughts, the minister of thought and its interpreter. But without ideation, without mental images and representative ideas, there could be no thought, and without thought language would cease. Still thought there may be, indeed thought there is, in the case of the unfortunate and uninstructed deaf mute, independent of and without language. Nay, without speech, man, by virtue of his perceptive and intellectual faculties, can observe objects, and mentally arrange, associate, and form them into groups. He can judge of their properties and qualities, compare them and even deduce inferences; but how weak and incomplete are these processes of thought when language is wanting! without the agency of words, how limited and contracted would be those of generalisation and abstraction! As an intellectual instrument, language is intermediate between perception and thought. We reproduce in speech the mutual relations of objects, the relations of our thoughts to objects, and the order and relations of our thoughts to themselves. Nevertheless words are purely conventional, they have no natural meaning of their own, and contain no thoughts apart from the mind which created and uses them. Written notional words are the symbols or representatives of objectified ideas, and all notional words belong to the region of representative ideas, after these ideas have attained their most general character; and although words cannot excite the feelings like a gesture, or warm the imagination like a picture, they are the indispensable machinery in the process of generalisation and abstraction. And "in this way it is that they serve to construct the more general outline of knowledge. Hence the wonderful power which words possess on the whole process of thought; hence the capacity they attain, after the teachings of experience have paved the way, for ex-

pressing the very essence of the things to which they relate; hence, too, their use in forming a broad platform, on which the results of all the lower processes of mind are plainly recorded, and from which we can commence those higher forms of mental activity, which give to reason its all but infinite range, and all but omnipotent force." (Morell's *Psychology*, p. 184.)

Words are, in fact, the final expression of that mental process, as well as the depository of its final results, consummated through the instrumentality of the faculty of language, by which knowledge becomes definite, exact, and communicable; and they enable us, through our reasoning and reflecting faculties, not only to judge explicitly, but also to frame a method by which our judgments may be articulately expressed.

For the constructive faculty of language, from its power of combining words together, enables us, as I have said, to express the mutual relations of objects, the relations of our thoughts to objects, and the order and relations of our thoughts to themselves; and thus, on the one hand, continuous speech becomes moulded step by step into a complete organ of thought; and on the other, a sentence or proposition in language becomes equivalent to a complete thought in psychology, meaning of course by this formal thought, in its logical acceptance, that is: "a distinct act of comparison between two terms, in which we apprehend the relationship that exists between them." In the development of the intellectual consciousness, the reasoning and reflecting faculties are the latest to be evolved, and the last to reach their maturity; they are the most distinguishing attributes of humanity, of "the being that looks before and after"; for, while the moral and religious intuitions are the sole prerogatives of man, and constitute an immutable distinction between him and the whole animal creation, it is through his reasoning and reflecting faculties that he sees clearly the bases upon which moral obligation rests, and that religion becomes to him "a reasonable service," and that his is an intelligent, voluntary, and cheerful dependence upon an all-perfect Being, infinite in wisdom, power, and goodness.

When the exalted, pure, and holy moral and religious intuitions and feelings are directed, guided, and strengthened by the dominating influence of the reasoning and reflecting faculties, then it is, that the true greatness of the human character is manifested and felt by others.

From observation and experiment, from the joint operation of the perceptive faculties and the reasoning and reflecting powers, result the creation of science, and the achievements of science. Mr. Morell has well observed, "The proper function of reason is to create knowledge or science. The understanding alone can never do this; it can analyse, distinguish, form concepts, construct propositions, weave them into arguments, perform, in a word, any formal process within the data furnished to it, but it can never go beyond the barriers of its own definitions. When, however, we grasp a truth by the power of reason, on the other hand, it implies far more than the attainment of a bare definition of it. It implies that we have penetrated to the centre; that we can trace its pedigree in the world both of matter and form; that we can regard it as one link in a connected chain, of which we are able to tell the antecedents, and to foretell the consequents; that we can recognise it, in fine, as a particular manifestation of some great and universal law, the operations of which we have learned to comprehend and apply." (Morell's *Psychology*.)

But, in the progress of science, we must not overlook the importance of the imaginative or inventive faculty; and I shall close this imperfect and brief survey of the leading phenomena of the mental states, by reiterating what I have elsewhere said on the relations of the imaginative and reasoning powers. "Out of the fanciful combinations and groupings of external nature, new conceptions are formed; and by the imaginative faculty,

we are placed in scenes, circumstances, and relations, in which our actual experience has never placed us, and from which, in consequence, as new sources of thought, new conceptions arise. But, while these new creations may bear strongly the impress of the æsthetic and emotional character and tendencies of our minds, the highest efforts of the creative faculty involve equally the agency of the intellectual powers, of collocation, analysis, and comparison, to achieve their loftiest triumphs. And thus, while, on the one hand, ideality is dependent upon the intellectual powers for the development of its highest and sublimest flights; so, on the other, is the understanding indebted to the imaginative faculty for those ideal combinations and conceptions, which, independently of their artistic value and importance, are seen to be so operative in the common affairs of human life, suggesting those pictures of the future which are ever before our eyes, and are our animating springs of action, with those visions of enjoyment, never perhaps to be realised, and their prospects of anticipated evil, that often prove to be an exaggeration of the reality, prompting the investigations of science, that are gradually unfolding the sublime plan on which the universe is governed, and leading to a continual aspiration after those higher forms of moral and intellectual beauty, which are inseparably connected with purity and love."

"Every system of philosophy," to conclude in the words of Morell, "rests in God, as its highest idea and its final aim. To see the Divinity as the beginning, the middle, and the end of all things, is the culminating point of all human thought. Thus it is the goal, not only of providence, not only of redemption, but also of the no less divine laws of reason itself, that God should be all in all."

BENEFICIAL EFFECTS OF BELLADONNA AS A SEDATIVE IN EPILEPSY.

By WILLIAM SANKEY, Esq., F.R.C.S., Dover.

CATHARINE P. M'KENZIE, aged 5 years, came under treatment September 26th, 1860, suffering from epilepsy. The account given by her mother was, that from her birth she had been a remarkably healthy child till two years ago, when she was attacked with diarrhoea, which was allowed to go on for four or five weeks, producing great weakness. Soon after this, the first fit occurred; and for nearly three months she had two or three daily. These soon ceased, without medical assistance; and she got well, and continued so till the summer of 1860, when she was suddenly again seized with the fits, accompanied with loss of power on the right side. The fits continued increasing in spite of various modes of treatment, and became almost incessant day and night, with total loss of power in the limbs and muscles of the neck; but she still retained a degree of consciousness. The treatment consisted in purgatives and counterirritation by blisters behind the ears and nape of the neck, succeeded by various tonics and cod-liver oil; the bowels being kept regular by small doses of castor oil. The state of the poor little sufferer at this time appeared hopeless.

On December 27th, I prescribed one-twelfth of a grain of the extract of belladonna to be given three times a day, gradually increasing the frequency of the doses to every six and four hours. The effect was most decided; the fits, instead of recurring every hour or two, on the 1st of January only occurred once in twenty-four hours. The appetite was improved, and the digestion was good. As the beneficial effect of the remedy was now established, and the pupils were rather dilated, it was deemed proper gradually to lessen the frequency of the doses, which was done till only one dose was given in twenty-four hours. During this time,