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ANIMALS ARE AUTOMATA.

One of the most interesting features of the recent meeting of the British Association was the address of Professor Huxley on "The Hypothesis that the Animals are Automata, and its History." This title at once arouses a lively interest, since, among other things, it holds out the promise of a solution of those curious phenomena of sagacity or instinct in the lower animals, which sometimes lead us to question seriously whether the reasoning faculty be totally absent.

And this is susceptible of apparent experimental verification. Professor Huxley mentions the case of a frog in which the anterior portion of the brain is destroyed. The animal may live for years, and yet it is certain that it neither sees nor hears. It will sit forever in the same spot; and yet when urged against obstacles, it will turn to avoid them. It will swim in water or balance itself on the hand, as that member is slowly revolved. Something evidently passes through the sensory nerve, acts upon the frog's machinery and the nervous system, and causes it to adapt itself to the proper position.

A still more curious instance cited is that of a French soldier wounded in the left parietal bone. Although he recovered from the lesion, the man leads two distinct lives. For two days in the month he neither sees nor smells, and, in fact, is destitute of every sense except that of touch. Yet he avoids obstacles, eats (though he is utterly destitute of any discrimination in point of taste), performs a large number of actions on mere suggestions, and, stranger still, shows a totally different moral nature; as, while at other times he is inflexibly honest, when affected he becomes an inveterate thief.

With this brief reference to his illustrations we may at once come to Professor Huxley's conclusion, in which, however, he fails to concur wholly with Descartes. He says: "Taking into account the incontrovertible fact that the lower animals which possess brains at all possess (at any rate, in rudiments) a part of the brain, which we have every reason to believe is the organ of consciousness in ourselves; then it seems vastly more probable that the lower animals, although they may not possess that sort of consciousness which we have ourselves, yet have it in a form proportional to the comparative development of the organ of that consciousness, and foreshadow, more or less dimly, those feelings which we possess ourselves." In other words, an animal is, according to Professor Huxley, a sensitive, conscious automaton; its sensations, its volitions, and its thoughts are but the products and consequences of mechanical arrangements. A certain molecular change in the nervous system determines a sensation; the emotions thereby excited leave in the brain, in turn, molecular changes which constitute the physical foundation of memory. These changes give rise to volitions, which, in the animal, will be simply states of emotion which precede its actions; it is a conscious machine. And this, Professor Huxley says, "applies in its fullness and entirety to man;" and he expresses no fear of the logical consequences. Yet he does not—indeed, we fail to see how he could—avoid the admission that these very logical consequences of his doctrine, rather than the theory per se, will excite controversy and the imputation that he is speeding toward fatalism, atheism, and materialism.

It strikes us as a remarkable fact that Professor Huxley, by an entirely different road—a tunneling through the depths, as it were—brings us face to face with one result which Dr. Hammond, in his discussion of morbid impulse, reached by a surface path. A man, for example, commits a murder. If we turn to the morbid impulse theory, we may defend him on the ground that there is a flaw in his brain organism, which leaves him in a state when "he is impelled, consciously, to commit an act which is contrary to his natural reason and to his normal inclinations." This is "conscious mechanism," pure and simple. There is no will employed in the matter. Huxley's doctrine, however, carries us further, and allows the accused to plead the broader defence of "unconscious cerebration." He was injured, he may say, he struck, he killed; the power which impelled him to strike was the same which caused him to raise his arm to guard himself, a purely involuntary action. Practically, of course, no such defence would be admitted; but it leads us, from both the doctrines above referred to, to a closer investigation of how far man is responsible for his own actions.

PROFESSOR TYNDALL'S ADDRESS.

There are utterances which mark epochs in human history: not because they give voice to anything new, not because they suggest any original line of thought or investigation, but because they strike, so to speak, the intellectual key note of the age, announcing from some high position the irrepressible conflict of the coming years.

Of such a nature is Professor Tyndall's address before the assembled scientists of Great Britain. It contains no new thought, it announces no new truth; yet in asserting the irresistible sweep of Science upon the remaining strongholds of religious dogma, it is calculated to stir up a grand commotion, not merely in the class so neatly described by the senior Draper as the only example, in the fauna of the world, of that non-development which they so loudly affirm, but among progressive scientists themselves. The timid can no longer blink the fact that the drift of scientific thought, certainly in the minds of its highest representatives, is toward the complete subversion of the fundamental doctrines taught by the ecclesiastical world. It is no longer a question of the earth's form, or position, or age which marks the conflict of Science and religion; no more is it a question of man's place in Nature, his relation to other forms of life, or the origin of his physical frame; these outposts have been carried, and the citadel itself is entered; the distinction between mind and matter, or matter and spirit, is denied, and with it the personal immortality of man, the personal dominion of the universe, and all that these involve.

In the words of this spokesman of British Science, we may see the workings of British thought: "Trace the line of life backward, and see it approaching more and more to what we call the purely physical condition. We reach at length those organisms which I have compared to drops of oil suspended in a mixture of alcohol and water. We reach the protogenes of Haeckel, in which we have 'a type distinguishable from a fragment of albumen only by its finely granular character.' Can we pause here? We break a magnet and find two poles in each of its fragments. We continue breaking; but however small the parts, each carries with it, though enfeebled, the polarity of the whole. And when we can break no longer, we prolong the intellectual vision to the polar molecules. Are we not urged to do something similar in the case of life? Is there not a temptation to close, to some extent, with Lucretius, when he affirms that 'Nature is seen to do all things spontaneously of herself, without the help of the gods?' or with Bruno, when he declares that 'matter is not that mere empty capacity which philosophers have pictured her to be, but the universal mother who brings forth all things as the fruit of her own womb?'"

In its unexpected frankness, Professor Tyndall's answer to these questions reminds one of the reply given by a canny Scotchman, on being asked by a tourist if he did not sometimes feel sorely tempted to forget the "sawbath day" and go salmon fishing in the river that flashed by his cabin door.

"Na, na," gravely responded Sawney, "I's no temptit; I joost gang!"

So with Professor Tyndall. Where men of less resolution pause and shut their eyes to the inevitable, he "joost gangs." "Abandoning all disguises," he says, with a fearless honesty that will command respect if it fails to command assent, "the confession that I feel bound to make before you is that I prolong the vision backward across the boundary of the experimental evidence, and discern in that Matter which we, in our ignorance, and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium, the promise and potency of every form and quality of life." In other words, we are what we are, all things are what they are: not because it has been the pleasure of an artificer, "fashioned after a human model and acting by broken efforts, as man is seen to act," to so create us, but because of the potency of what we are wont to call lifeless matter, whose nature it is to evolve all that we see around us or feel within us, all things that have been or will be, through the play of molecular force. We live because matter lives. We think and feel because it is the function of material combinations such as compose us to think and feel, all the phenomena which we distinguish as physical or mental having their unsearchable roots in what he ventures to call a cosmical life.

To those familiar with the history of human thought, there is nothing startling in this confession. Precisely the same view of the potency of matter has been widely accepted in Germany. "Consciousness itself is nothing but an attribute of matter," says Moleschott, and others are equally outspoken. But for a philosophically conservative body like the British Association to listen to such assertions from its president is something altogether unexpected, something which will not end with the hearing.

VIVISECTION.

The question of how far we have the moral right to torture and mutilate the lower animals in the course of scientific investigation is again brought to public attention through a letter addressed by Mr. Henry Bergh, President of the Society for the Prevention of Cruelty to Animals, to Dr. Austin Flint, of the Bellevue Medical College of this city. This subject has been in controversy for nearly two centuries, and through its recent agitation in England has elicited the published opinions of many of the ablest British physiologists of the present day; so that we have abundant authority to guide us in drawing the line between that sacrifice of brutes which is both justifiable and proper through the magnitude of the ends which are secured thereby, and the wanton cruelty which impels the destruction of life uselessly.

We have so great an admiration for the philanthropy of Mr. Bergh, and so high an appreciation of the results of his efforts in behalf of the long-suffering animals, that it is with difficulty that we can bring ourselves to the task of pointing out the errors into which he falls through a laudable zeal in his self-imposed labors. But we cannot admit his assertions that "the most eminent physiologists have pronounced vivisection a scientific failure," or that "lifeless bodies furnish all necessary evidence."

Harvey owed the demonstration of the truth of the circulation of the blood to experiments upon living animals—experiments which he details with great minuteness in his famous work. John Hunter studied the terrible disease of aneurism, and perfected the surgical operation for its cure upon brutes. Sir Charles Bell gave us our knowledge of the nature of the sensory and voluntary nerves, and their double origin in the spinal cord; and Marshall Hall demonstrated the equally important discovery of the excitatory action of the nervous system, through the same means. In both of these last instances, it was impossible to use anesthetics, and the agonies of the animals were doubtless terrible; but they sink into utter insignificance beside the weapons which they placed in the hands of the physician wherewith to combat the pain and suffering of millions for ages hereafter. We might continue and adduce scores of cases similar to the above. Majendie's investigations, and the new remedies which they gave to Science; Blake's studies on saline matter in the blood; Gadden's localization of the cerebral function; the labors of Ferrier, Goltz, Michael Foster, Lewis, Hitzig, Fritz, Brown-Séquard, Bert, Dalton, and the recipient of Mr. Bergh's letter, Dr. Flint, are well-known examples which occur as we write.

But while Mr Bergh is, perhaps, as we have endeavored to show, too sweeping in his wholesale condemnation of vivisection, he is undoubtedly right in inveighing against the infliction of unnecessary torture on the unfortunate brutes; and in this respect we earnestly endorse the ground which he takes. It is a common practice in many medical colleges to sacrifice scores of animals yearly for the repetition of experiments which have proved well settled and thoroughly understood facts. The insertion of a canula into a dog's stomach, in order to submit a bit of meat to the prolonged action of the gastric juice, or the placing of bullets in a pig's leg to show the growth of the bone, are common examples, which, since they are useless, are certainly cruel. Nor is there any necessity of following the practice of a distinguished physiological lecturer in this city, of interrupting the thread of his explanations to seize a wretched cat, cut its throat, and composedly hand the reeking viscera about his class for examination. For such unnecessary torture there is no excuse.

A committee of the British Association, in 1870, considered this subject quite fully, and produced the following report, which we would recommend to faculties of medical colleges throughout the country, and incidentally to the notice of Mr. Bergh.