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TORCH OF REASON.

"TRUTH BEARS THE TORCH IN THE SEARCH FOR TRUTH."—*Lucretius*.

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Hail! Truth.

BY M. J. SAVAGE.

NO power on earth shall sever
My soul from Truth forever—

In what-e'er path she wander,
I'll follow my Commander.
All hail! all hail! beloved Truth.

Whate'er the foe before me,
Where-e'er her flag flies o'er me,
I'll stand and never falter,
No bribe my faith shall alter.
Lead on! lead on, thou mighty Truth!

And when the fight is over,
Look down upon thy lover;
He asks for well done duty,
To see thy heavenly beauty.
Reveal thy face, celestial Truth.

Consciousness.

BY ERNST HAECKEL.

NO phenomenon of the life of the soul is so wondrously and so variously interpreted as consciousness. The most contradictory views are current today, as they were two thousand years ago, not only with regard to the nature of this psychic function and its relation to the body, but even as to its diffusion in the organic world and its origin and its development. It is more responsible than any other psychic faculty for the erroneous idea of an "immaterial soul" and the belief in "personal immortality"; many of the gravest errors that still dominate even our modern civilization may be traced to it. Hence it is that I have entitled consciousness "the central mystery of psychology"; it is the strong citadel of all mystic and dualistic errors, before whose ramparts the best equipped efforts of reason threaten to miscarry. This fact would suffice of itself to induce us to make a special critical study of consciousness from our monistic point of view. We shall see that consciousness is simply a natural phenomenon like any other psychic quality, and that it is subject to the law of substance like all other natural phenomena.

Even as to the elementary idea of consciousness, its contents and extension, the views of the most distinguished philosophers and scientists are widely divergent. Perhaps the meaning of consciousness is best conceived as an internal perception, and compared with the action of a mirror. As its two chief departments we distinguish objective and subjective consciousness—consciousness of the world, the non-ego, and of the ego. By far the greater part of our conscious activity, as Schopenhauer justly remarked, belongs to the conscious-

ness of the outer world which are in any sense accessible to our minds. Much more contracted is the sphere of self-consciousness, the internal mirror of all of our own psychic activity, all our presentations, sensations, and volitions.

The only source of our knowledge of consciousness is that faculty itself; that is the chief cause of the extraordinary difficulty of subjecting it to scientific research. Subject and object are one and the same in it: the perceptive subject mirrors itself in its own inner nature which is to be the object of our inquiry. Thus we can never have a complete objective certainty of the consciousness of others; we can only proceed by a comparison of their psychic condition with our own. As long as this comparison is restricted to normal people we are justified in drawing certain conclusions as to their consciousness, the validity of which is unchallenged. But when we pass on to consider abnormal individuals (the genius, the eccentric, the stupid, or the insane) our conclusions from analogy are either unsafe or entirely erroneous. The same must be said with even greater truth when we attempt to compare human consciousness with that of the animals (even the higher, but especially the lower). In that case such grave difficulties arise that the views of physiologists and philosophers diverge as widely as the poles on the subject. We shall briefly enumerate the most important of these views.

1. The Anthropistic theory of consciousness.—That it is peculiar to man. To Descartes we must trace the wide spread notion that consciousness and thought are man's exclusive prerogative, and that he alone is blessed with an "immortal soul."

The great influence which Descartes had on subsequent philosophy was very remarkable, and entirely in harmony with his "book-keeping by double entry." The Materialists of the seventeenth and eighteenth centuries appealed to the Cartesian theory of the animal soul and its purely mechanical activity in support of their monistic psychology. The Spiritualists on the other hand, asserted that their dogma of the immortality of the soul and its independence of the body was firmly established by Descartes' theory of the human soul. This view is still prevalent in the camp of the theologians and dualistic metaphysicians. The scien-

tific conception of nature, however, which has been built up in the nineteenth century, has, with the aid of empirical progress, in physiological and comparative psychology, completely falsified it.

2. Neurological theory of consciousness.—That it is present only in man and higher animals which have a centralized nervous system and organs of sense. The conviction that a large number of animals—at least the higher mammals—are not less endowed than man with a thinking soul and consciousness prevails in modern zoology, exact physiology, and the monistic psychology. The immense progress we have made in the various branches of biology has contributed to bring about a recognition of this important truth.

Comparative physiology teaches us that the various states of consciousness are just the same in these highest placentals as in man; and we learn by experiment that there is the same reaction to external stimuli. The higher animals can be narcotized by alcohol, chloroform, ether, etc., and may be hypnotized by the usual methods, just as in the case of man.

It is, however, impossible to determine mathematically at what stage of animal life consciousness is to be first recognized as such. Some zoologists draw the line very high in the scale, others very low. Darwin, who most accurately distinguishes the various stages of consciousness, intelligence, and emotion in the higher animals, and explains them by progressive evolution points out how difficult, or even impossible, it is to determine the first beginning of this supreme psychic faculty in the lower animals. Personally, out of the many contradictory theories, I take that to be most probable which holds the centralization of the nervous system to be a condition of consciousness; and that is wanting in the lower classes of animals. The presence of a central nervous organ, of highly developed sense-organs, and an elaborate association of groups of presentations, seem to me to be required before the unity of consciousness is possible.

3. Cellular theory of consciousness.—That it is a vital property of every cell. The application of the cellular theory to every branch of biology involved its extension to psychology. Just as we take the living cell to be the "elementary organism" in anatomy and physiology, and derive the whole system

of the multicellular animal or plant from it, so, with equal right, we may consider the "cell-soul" to be the psychological unit, and the complex psychic activity of the higher organism to be the result of the combination of the psychic activity of the cells which compose it.

However, I repeat that, in my opinion, consciousness is only part of the psychic phenomena which we find in man and the higher animals; the great majority of them are unconscious.

However divergent are the different views as to the nature and origin of consciousness, they may, nevertheless, on a clear and logical examination, all be reduced to two fundamental theories—the transcendental (or dualistic) and the physiological (or monistic). I have myself always held the latter view, in the light of my evolutionary principles, and it is now shared by a great number of distinguished scientists, though it is by no means generally accepted.

The peculiar phenomenon of consciousness is not, as Du Bois-Reymond and the dualistic school would have us believe, a completely "transcendental" problem; it is, as I showed thirty-three years ago, a physiological problem, and, as such, must be reduced to the phenomena of physics and chemistry. I subsequently gave it the more definite title of a neurological problem, as I share the view that true consciousness (thought and reason) is only present in those higher animals which have a centralized nervous system and organs of sense of a certain degree of development. Those conditions are certainly found in the higher vertebrates, especially in the placental mammals, the class from which man has sprung. The consciousness of the highest apes, dogs, elephants, etc., differs from that of man in degree only, not in kind, and the graduated interval between the consciousness of these "rational" placentals and that of the lowest races of men [the Veddahs, etc.] is less than the corresponding interval between these uncivilized races and the highest specimens of thoughtful humanity [Spinoza, Goethe, Lamarck, Darwin, etc.]. Consciousness is but a part of the higher activity of the soul, and as such it is dependent on the normal structure of the corresponding psychic organ, the brain.

Physiological observation and experiment determined twenty years ago that the particular por-