TORCH OF REASON.

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

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Make Heaven Here.

BY PERRY MARSHALL.

LET sunshine chase the wrath of gloom away,
Strew flowers in the pathway of today;
Why wait our journey's end ere beauty be?
Make heaven here, my friend, for you and me.

Let self and ill be banished from the mind;
The thought of hell doth famish with the kind;
The bloom of love comes on the cheek to stay;
The smile of joy plays on the lips of May.

Here love-clad virtue will your coming wait;
And morn-robed goodness still sits by the gate;
Let peace and joy in twilight robes adorned,
Reward the heart that highest hate hath scorned.

Hope bears her bow above her queenly head,
No mists may veil what loving truth hath said,
And mercy melts to mirth the caloused eye,
And heaven for love of earth hath left the sky.

—[Launching and Landing.

The Biological Soul.

BY DR. ERNST HAECKEL.

JUST as the natural doctrine of development on a monistic basis has cleared up and elucidated the whole field of natural phenomena in their physical aspect, it has also modified that of the phenomena of mind, which is inseparably connected with the other. Our human body has been built up slowly and by degrees from a long series of vertebrate ancestors, and this is also true of our soul; as a function of our brain it has gradually been developed in reciprocal action and re-action with its bodily organ. What we briefly designate as the "human soul," is only the sum of our feeling, willing and thinking—the sum of those physiological functions whose elementary organs are constituted by the microscopic ganglion-cells of our brain. Comparative anatomy and ontogeny show us how the wonderful structure of this last, the organ of our human soul, has in the course of millions of years been gradually built up from the brains of higher and lower vertebrates. Comparative psychology teaches us how, hand in hand therewith, the soul itself, as function of the brain, has been developed. The last-named science teaches us also that a primitive form of soul-activity is already present even in the lowest animals, the single-celled primitive animals, Infusoria and Rhizopoda. Every scientific man who has long observed the life-activity of these single-celled Protista, is positively convinced that they also possess a soul; that this "cell-soul" also consists of a sum of sensations, perceptions, and volitions; the feeling, thinking and willing of our human soul differ from these only in degree. In like manner there is present in the egg-cell (as potential energy) a hereditary cell-soul, out of which man, like every other animal, is developed.

The first task of a truly scientific psychology will therefore be, not, as hitherto, idle speculation about an independent immaterial soul-existence and its puzzling temporary connection with the animal body, but rather the comparative investigation of the organs of the soul and the experimental examination of their psychical functions. For scientific psychology is a part of physiology, the doctrine of the functions and the life-activities of organisms. The psychology and psychiatry of the future, like the physiology and pathology of today, must take the form of a cellular study, and in the first instance investigate the soul-functions of the cells. It has but lately been shown what important disclosures such a cellular psychology can make, even in dealing with the lowest grades of organic life, in the single-celled Protista (especially Rhizopoda and Infusoria.)

These same main divisions of soul-activity, which are to be met with in the single-celled organism —the phenomena of irritability, sensation and motion — can be shown to exist in all multicellular organisms as functions of the cells of which their bodies are composed. In the lowest Metazoa, the invertebrate sponges and polyps, there are, just as in plants, no special soul-organs developed, and all the cells of the body participate more or less in the "soul-life." It is only in the higher animals that the soul-life is found to be localised and connected with special organs. As a consequence of division of labor, there have here been developed various sense-organs as organs of specific sensibility, muscles as organs of motion and volition, nerve-centres or ganglia as central co-ordinating and regulating organs. In the most highly developed families of the animal kingdom, these last come more and more into the foreground as independent soul-organs. In correspondence with the extraordinarily complicated structure of their central nervous system (the brain with its wonderful complex of ganglion-cells and nerve-fibres), the many-sided activity of such animals attains a wonderful degree of development.

It is only in these most highly-developed groups of the animal kingdom that we can with certainty establish the existence of those most perfect operations of the central nervous system, which we designate as consciousness. As we know, it is precisely this highest brain-function that still continues to be looked upon as a completely enigmatical phenomenon, and as the best proof for the immaterial existence of an immortal soul. And that now we will proceed to consider.

An Address to Students.

BY JOHN TYNDALL.

Self-reverence, self-knowledge, self-control,
These three alone lead life to sovereign power,
Yet not for power (power of herself
Would come uncalled for), but to live by law,
Acting the law we live by without fear;
And, because right is right, to follow right
Were wisdom in the scorn of consequence.

—Tennyson.

THERE is an idea regarding the nature of man which philosophy has sought, and is still seeking, to raise the clearness; the idea, namely, of secular growth. Man is not a thing of yesterday; nor do I imagine that the slightest controversial tinge is impaired into this address when I say that he is not a thing of six thousand years ago. Whether he came originally from stocks or stones, from nebulous gas or solar fire, I know not; if he had any such origin the process of his transformation is as inscrutable to you and me as that of the grand old legend, according to which "the Lord God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul." But however obscure man's origin may be, his growth is not to be denied. Here a little and there a little added through the ages have slowly transformed him from what he was into what he is. The doctrine has been held that the mind of the child is like a sheet of white paper, on which by education we can write what characters we please. This doctrine assuredly needs qualification and correction. In physics, when an external force is applied to a body with a view of affecting its inner texture, if we wish to predict the result, we must know whether the external force conspires with or opposes the internal forces of the body itself; and in bringing the influence of education to bear upon the new-born man his inner powers also must be taken into account. He comes to us as a bundle of inherited capacities and tendencies, labeled "from the indefinite past to the indefinite future;" and he makes his transit from the one to the other through the education of the present time. The object of that education is, or ought to be, to provide wise exercise for his capacities, wise direction for his tendencies, and through this exercise and this direction to furnish his mind with such knowledge as may contribute to the usefulness, the beauty, and the nobleness of his life.

How is this discipline to be secured, this knowledge imparted? Two rival methods now solicit attention—the one organized and equipped, the labor of centuries having been expended in bringing it to its present state of perfction; the other, more or less chaotic, but becoming daily less so, and giving signs of enormous power, both as a source of knowledge and as a means of discipline. These two methods are the classical and the scientific method. I wish they were not rivals; it is only bigotry and short-sightedness that make them so; for assuredly it is possible to give both of them fair play. Though hardly authorized to express an opinion upon the subject, I nevertheless hold the opinion that the proper study of a language is an intellectual discipline of the highest kind. If I except discussions on the comparative merits of Popery and Protestanism, English grammar was the most important discipline of my boyhood. The piercing through the involved and inverted sentences of "Paradise Lost;" the linking of the verb to its often distant nominative, of the relative to its distant antecedent, of the agent to the object of the transitive verb, of the preposition to the noun or pronoun which it governed, the study of variations in mood and tense, the transpositions often necessary to bring out the true grammatical structure of a sentence—all this was to my young mind a discipline of the highest value, and a source of unflagging delight. How I rejoiced when I found a great author tripping, and was fairly able to pin him to a corner from which there

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