

not merely justified in drawing up the fundamental law that "Ontogenesis [individual development] is a brief and rapid recapitulation of Phylogenesis [development of species], determined by the physiological functions of heredity (transmission) and adaptation (nourishment)," but we are bound to do so. Recently, in 1894, a fossil form of peculiar significance came to light. It is probably a "missing link" between man and his simian cousins: half-man and half-ape, it is a representative of the extinct species through which man ascended, like the anthropoid apes, from catarrhine, or old-world monkeys.

THE PSYCHOLOGICAL QUESTION.

So vast is the accumulation of facts in support of the thesis thus far—it may be truly said that *every* fact of anatomy, zoology, embryology, and paleontology supports it—that very few informed thinkers further oppose it. But the long-continued practice of dividing man into *body* and *soul* has inspired another obstructive theory. There are some eminent Christian zoologists who hold that though the human body was certainly developed, the soul was directly created. This is an aspect of the evolutionary question which has not received adequate attention. Obviously, however, it is a scientific question, and lends itself to the same treatment, in a general way, as the question of the origin of the body. A zoologist with a complete survey of the whole animal kingdom can tell us whether the mental or psychic functions which make up the "soul" of man have arisen on our planet by the same secular process of evolution as the structural parts which make up his body. No living zoologist is more competent to answer the question than Prof. Haeckel.

THE NATURE OF THE "SOUL."

We have left far behind in the history of thought the idea that the soul is, as Plato taught, an entity quite complete and operative in itself, or even that, as Descartes conceived, it sat like a telegraph girl in a minute structure in the centre of the brain. The brain is the organ of thought, sensation, and volition. Yet psychology is still obsessed by this fatal difficulty, that few of its students have a perfect knowledge of the brain. Hence it is that the science is still haunted by so much mysticism and enfeebled by so much vacillation—as the author shows in the cases of Kant, Virchow, and Du Bois-Raymond. The psychologist must be equipped with a thorough knowledge of the organ of thought. Dr. Haeckel, however, is too well-balanced a thinker to reject the introspective method in psychology, as Comtists do. Moreover, he reasserts the leading principle of his method—we must call philosophical speculation to our aid as well as experience. We must seek, too, all the collateral aid which the allied branches of science can give—comparative animal psychology, comparative human psychology (the psychology of races and ethnography), ontogenetic psychology (the study of infant and child), and phylogenetic psychology (the historical development of mind).

STAGES OF MENTAL LIFE.

The most important outcome of all this activity is the discovery of the "psychological unity of the whole organic world." The life of all living things is a development of sensation and motion, and is indissolubly connected with certain material antecedents in the living substance of the body—the plasma or protoplasm; the "soul" is but a collective title for "all the psychic functions of the plasma." The real task of the psychologist, therefore, is to determine the stages by which the human soul—the mental functions it covers—has arisen from a long

series of animal ancestors. Taking the actual powers of the mind in the order of their complexity, we find that they correspond to the grouping of the animal world, just as the nerve-structures do which they involve. We are presented with a vast picture of the organic species arranged in psychological order. In the earliest stage the whole psychoplasm is sensitive and reacts to stimuli. In the next stage, hairs and pigment spots, the crude beginnings of sense-organs, begin to appear on the surface of the organism. In the third stage, a specific differentiation of sense-organs sets in; and this is followed, in the fourth stage, by a centralization of the nervous system. Finally, a high development of the central part of the nervous system takes place, and conscious sensation begins. These are not merely the hypothetical, they are the historical stages in the development of the nervous system and of sensibility. Each function is similarly traced through the actual hierarchy of the animal world, and through the "natural history of creation," until even man's highest powers—reason, volition, and emotion (freedom of the will is rejected as an illusion)—are brought into the unity of the organic world. This tracing of the growth of the soul, illustrated by myriads of zoological facts, forms a most valuable and interesting chapter.

EMBRYONIC AND CHILD PSYCHOLOGY.

On the psychic as well as on the bodily side, embryology gives full confirmation to the Monistic theory. The old myths of a transmigration, or a transplantation, or a direct creation of souls rested on a basis of ignorance. There is no higher soul in the human germ than in any other unicellular organism. But, unlike the "soul" of the protista, the soul of the impregnated ovule has inherited a type, with the accidental disturbances arising from a duality of parentage. This leads the author into the thorny problems of heredity, which attract so much attention at the present day. On the broad question, however, the evidence leads to the same conclusion as in the preceding section: "the history of the germ is an epitome of the history of the species," bearing in mind, of course, the circumstance that the embryo is cut off from the influence of the environment by its amniotic protection. In confirmation of this "law," the author devotes the next chapter to tracing the historical development of mind. We can but briefly indicate the line of development, which Dr. Haeckel works out with abundant empirical illustration: 1, Unicellular protozoa with a simple cell-soul—as in the infusoria; 2, multicellular protozoa with a "cenobitic" soul—infusoria and rhizopods; 3, the oldest metazoa with an epithelial soul—plants and nerveless animal forms; 4, invertebrate forms with simple nervous apparatus—as the vermalia; 5, vertebrates with rudimentary spinal chord, without skull or brain—the acrania; 6, animals with skull and brain; 7, mammals with a preponderating development of the brain-cortex; 8, anthropoid apes and man.

CONSCIOUSNESS AND IMMORTALITY.

Each of these important problems claims a long and interesting chapter. After reviewing the principal theories of the range of consciousness—the Cartesian (that it is peculiar to man), the Darwinian (that it is present only in man and the higher animals), the theory of Schopenhauer (that it is found in all animals, and these only), the biological (that it is a common feature of all organisms), the cellular theory (that each cellule has its consciousness), and the atomistic (that it is a property of every atom)—the author subscribes rather to the Darwinian, or neurological: consciousness seems to dawn with the gradual