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978-1-108-00089-5 - The Riddle of the Universe at the Close of the Nineteenth Century

Ernst Heinrich Philipp August Haeckel

Excerpt

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THE RIDDLE OF THE UNIVERSE.

CHAPTER I.

THE NATURE OF THE PROBLEM.

The condition of civilization and of thought at the close of the nineteenth century. Progress of our knowledge of nature—of the organic and inorganic sciences. The Law of Substance and the Law of Evolution. Progress of technical science and of applied chemistry. Stagnancy in other departments of life: legal and political administration, education, and the Church. Conflict of reason and dogma. Anthropism. Cosmological perspective. Cosmological theorems. Refutation of the delusion of man's importance. Number of "world-riddles." Criticism of the "seven" enigmas. The way to solve them. Function of the senses and of the brain. Induction and deduction. Reason, sentiment, and revelation. Philosophy and science. Experience and speculation. Dualism and monism.

THE close of the nineteenth century offers one of the most remarkable spectacles to the thoughtful observer. All educated people are agreed that it has in many respects immeasurably outstripped its predecessors, and has achieved tasks that were deemed impracticable at its commencement. An entirely new character has been given to the whole of our modern civilization, not only by our astounding theoretical progress in sound knowledge of nature, but also by the remarkably fertile practical application of that knowledge in technical science, industry, commerce, and so forth.

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On the other hand, however, we have made little or no progress in moral and social life, in comparison with earlier centuries; at times there has been serious reaction. And from this obvious conflict there have arisen, not only an uneasy sense of dismemberment and falseness, but even the danger of grave catastrophes in the political and social world. It is, then, not merely the right, but the sacred duty, of every honourable and humanitarian thinker to devote himself conscientiously to the settlement of that conflict, and to warding off the dangers that it brings in its train. In our conviction this can only be done by a courageous effort to attain the truth, and by the formation of a clear view of the world—a view that shall be based on truth and conformity to reality.

If we recall to mind the imperfect condition of science at the beginning of the century, and compare this with the magnificent structure of its closing years, we are compelled to admit that marvellous progress has been made during its course. Every single branch of science can boast that it has, especially during the latter half of the century, made numerous acquisitions of the utmost value. Both in our microscopic knowledge of the little and in our telescopic investigation of the great, we have attained an invaluable insight that seemed inconceivable a hundred years ago. Improved methods of microscopic and biological research have not only revealed to us an invisible world of living things in the kingdom of the protists, full of an infinite wealth of forms, but they have taught us to recognize in the tiny cell the all-pervading “elementary organism” of whose social communities—the tissues—the body of every multicellular plant and animal, even that of man, is

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composed. This anatomical knowledge is of extreme importance; and it is supplemented by the embryological discovery that each of the higher multicellular organisms is developed out of one simple cell, the impregnated ovum. The "Cellular theory," which has been founded on that discovery, has given us the first true interpretation of the physical, chemical, and even the psychological, processes of life—those mysterious phenomena for whose explanation it had been customary to postulate a supernatural "vital force" or "immortal soul." Moreover, the true character of disease has been made clear and intelligible to the physician for the first time by the cognate science of Cellular Pathology.

The discoveries of the nineteenth century in the inorganic world are no less important. Physics has made astounding progress in every section of its province—in optics and acoustics, in magnetism and electricity, in mechanics and thermo-dynamics; and, what is still more important, it has proved the unity of the forces of the entire universe. The mechanical theory of heat has shown how intimately they are connected, and how each can, in certain conditions, transform itself directly into another. Spectral analysis has taught us that the same matter which enters into the composition of all bodies on earth, including its living inhabitants, builds up the rest of the planets, the sun, and the most distant stars. Astro-physics has considerably enlarged our cosmic perspective in revealing to us, in the immeasurable depths of space, millions of circling spheres, larger than our earth, and, like it, in endless transformation, in an eternal rhythm of life and death. Chemistry has introduced us to a multitude of new substances, all of

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which arise from the combination of a few (about seventy) elements that are incapable of further analysis; some of them play a most important part in every branch of life. It has been shown that one of these elements—carbon—is the remarkable substance that effects the endless variety of organic syntheses, and thus may be considered “the chemical basis of life.” All the particular advances, however, of physics and chemistry yield in theoretical importance to the discovery of the great law which brings them all to one common focus, the “Law of Substance.” As this fundamental cosmic law establishes the eternal persistence of matter and force, their unvarying constancy throughout the entire universe, it has become the pole-star that guides our Monistic Philosophy through the mighty labyrinth to a solution of the world-problem.

Since we intend to make a general survey of the actual condition of our knowledge of nature and its progress during the present century in the following chapters, we shall delay no longer with the review of its particular branches. We would only mention one important advance, which was contemporary with the discovery of the law of substance, and which supplements it—the establishment of the theory of evolution. It is true that there were philosophers who spoke of the evolution of things a thousand years ago; but the recognition that such a law dominates the entire universe, and that the world is nothing else than an eternal “evolution of substance,” is a fruit of the nineteenth century. It was not until the second half of this century that it attained to perfect clearness and a universal application. The immortal merit of establishing the doctrine on an empirical basis, and

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pointing out its world-wide application, belongs to the great scientist, Charles Darwin; he it was who, in 1859, supplied a solid foundation for the theory of descent, which the able French naturalist, Jean Lamarck, had already sketched in its broad outlines in 1809, and the fundamental idea of which had been almost prophetically enunciated in 1799 by Germany's greatest poet and thinker, Wolfgang Goethe. In that theory we have the key to "the question of all questions," to the great enigma of "the place of man in nature," and of his natural development. If we are in a position to-day to recognize the sovereignty of the law of evolution—and, indeed, of a monistic evolution—in every province of nature, and to use it, in conjunction with the law of substance, for a simple interpretation of all natural phenomena, we owe it chiefly to those three distinguished naturalists; they shine as three stars of the first magnitude amid all the great men of the century.

This marvellous progress in a theoretical knowledge of nature has been followed by a manifold practical application in every branch of civilized life. If we are to-day in the "age of commerce," if international trade and communication have attained dimensions beyond the conception of any previous age, if we have transcended the limits of space and time by our telegraph and telephone, we owe it, in the first place, to the technical advancement of physics, especially in the application of steam and electricity. If, in photography, we can, with the utmost ease, compel the sunbeam to create for us in a moment's time a correct picture of any object we like; if we have made enormous progress in agriculture, and in a variety of other pursuits; if, in surgery, we have

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brought an infinite relief to human pain by our chloroform and morphia, our antiseptics and serous therapeutics, we owe it all to applied chemistry. But it is so well known how much we have surpassed all earlier centuries through these and other scientific discoveries that we need linger over the question no longer.

While we look back with a just pride on the immense progress of the nineteenth century in a knowledge of nature and in its practical application, we find, unfortunately, a very different and far from agreeable picture when we turn to another and not less important province of modern life. To our great regret we must endorse the words of Alfred Wallace : “ Compared with our astounding progress in physical science and its practical application, our system of government, of administrative justice, and of national education, and our entire social and moral organization, remain in a state of barbarism.” To convince ourselves of the truth of this grave indictment we need only cast an unprejudiced glance at our public life, or look into the mirror that is daily offered to us by the press, the organ of public sentiment.

We begin our review with justice, the *fundamentum regnorum*. No one can maintain that its condition to-day is in harmony with our advanced knowledge of man and the world. Not a week passes in which we do not read of judicial decisions over which every thoughtful man shakes his head in despair ; many of the decisions of our higher and lower courts are simply unintelligible. We are not referring in the treatment of this particular “ world-problem ” to the fact that many modern States, in spite of their paper constitution, are really governed with absolute despotism, and that many who occupy the bench give

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judgment less in accordance with their sincere conviction than with wishes expressed in higher quarters. We readily admit that the majority of judges and counsel decide conscientiously, and err simply from human frailty. Most of their errors, indeed, are due to defective preparation. It is popularly supposed that these are just the men of highest education, and that on that very account they have the preference in nominations to different offices. However, this famed "legal education" is for the most part rather of a formal and technical character. They have but a superficial acquaintance with that chief and peculiar object of their activity, the human organism, and its most important function, the mind. That is evident from the curious views as to the liberty of the will, responsibility, etc., which we encounter daily. I once told an eminent jurist that the tiny spherical ovum from which every man is developed is as truly endowed with life as the embryo of two, or seven, or even nine months: he laughed incredulously. Most of the students of jurisprudence have no acquaintance with anthropology, psychology, and the doctrine of evolution—the very first requisites for a correct estimate of human nature. They have "no time" for it; their time is already too largely bespoken for an exhaustive study of beer and wine and for the noble art of fencing. The rest of their valuable study-time is required for the purpose of learning some hundreds of paragraphs of law books, a knowledge of which is supposed to qualify the jurist for any position whatever in our modern civilized community.

We shall touch but lightly on the unfortunate province of politics, for the unsatisfactory condition of the modern political world is only too familiar. In a great

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measure its evils are due to the fact that most of our officials are jurists—that is, men of a high technical education, but utterly devoid of that thorough knowledge of human nature which is only obtained by the study of comparative anthropology and the monistic psychology—men without an acquaintance with those social relations of which we find the earlier types in comparative zoology and the theory of evolution, in the cellular theory and the study of the protists. We can only arrive at a correct knowledge of the structure and life of the social body, the State, through a scientific knowledge of the structure and life of the individuals who compose it, and the cells of which they are in turn composed. If our political rulers and our “representatives of the people” possessed this invaluable biological and anthropological knowledge, we should not find our journals so full of the sociological blunders and political nonsense which at present are far from adorning our Parliamentary reports, and even many of our official documents. Worst of all is it when the modern State flings itself into the arms of the reactionary Church, and when the narrow-minded self-interest of parties and the infatuation of short-sighted party-leaders lend their support to the hierarchy. Then are witnessed such sad scenes as the German Reichstag puts before our eyes even at the close of the nineteenth century. We have the spectacle of the educated German people in the power of the ultramontane Centre, under the rule of the Roman papacy, which is its bitterest and most dangerous enemy. Then superstition and stupidity reign instead of right and reason. Never will our Government improve until it casts off the fetters of the Church

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and raises the views of the citizens on man and the world to a higher level by a general scientific education. That does not raise the question of any special form of constitution. Whether a Monarchy or a Republic be preferable, whether the constitution should be aristocratic or democratic, are subordinate questions in comparison with the supreme question: Shall the modern civilized State be spiritual or secular? Shall it be *theocratic*—ruled by the irrational formulæ of faith and by clerical despotism—or *nomocratic*—under the sovereignty of rational laws and civic right? The first task is to kindle a rational interest in our youth, and to uplift our citizens and free them from superstition. That can only be achieved by a timely reform of our schools.

Our education of the young is no more in harmony with modern scientific progress than our legal and political world. Physical science, which is so much more important than all other sciences, and which, properly understood, really embraces all the so-called moral sciences, is still regarded as a mere accessory in our schools, if not treated as the Cinderella of the curriculum. Most of our teachers still give the most prominent place to that dead learning which has come down from the cloistral schools of the Middle Ages. In the front rank we have grammatical gymnastics and an immense waste of time over a “thorough knowledge” of classics and of the history of foreign nations. Ethics, the most important object of practical philosophy, is entirely neglected, and its place is usurped by the ecclesiastical creed. Faith must take precedence over knowledge—not that scientific faith which leads to a monistic religion,

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but the irrational superstition that lays the foundation of a perverted Christianity. The valuable teaching of modern cosmology and anthropology, of biology and evolution, is most inadequately imparted, if not entirely unknown, in our higher schools; while the memory is burdened with a mass of philological and historical facts which are utterly useless, either from the point of view of theoretical education or for the practical purposes of life. Moreover, the antiquated arrangements and the distribution of faculties in the universities are just as little in harmony with the point we have reached in monistic science as the curriculum of the primary and secondary schools.

The climax of the opposition to modern education and its foundation, advanced natural philosophy, is reached, of course, in the Church. We are not speaking here of Ultramontane Papistry, nor of the orthodox Evangelical tendencies, which do not fall far short of it in ignorance and in the crass superstition of their dogmas. We are imagining ourselves for the moment to be in the church of a liberal Protestant minister, who has a good average education, and who finds room for "the rights of reason" by the side of his faith. There, besides excellent moral teaching, which is in perfect harmony with our own monistic ethics, and humanitarian discussion of which we cordially approve, we hear ideas on the nature of God, of the world, of man, and of life, which are directly opposed to all scientific experience. It is no wonder that physicists and chemists, doctors and philosophers, who have made a thorough study of nature, refuse a hearing to such preachers. Our theologians and our politicians are just as ignorant as our