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SCIENCE AND PHILOSOPHY*

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SOME have doubted that the modern scientist possesses the idealism and faith necessary to the true philosophy. The scientist has been accused not only of not having any ideals of his own, but of being bent upon destroying the ideals of others. It may be incumbent upon the man of science to proclaim his philosophic conclusions as well as to announce the spectacular conquests of nature.

Existence is a struggle, and we are urged on by a hope of comfort and gratification and of a life of happiness. Every contemplative person, in the beginning, expects to formulate a philosophy of life which will indicate the ends to be striven for, and such that it will stimulate the motives of action and lead to the satisfaction of attainment. The term of existence is so short and incomplete that in this struggle the happiness acquired by an individual varies greatly and in a manner that often seems unjust. In order that life may be worth living for an intelligently thoughtful being, there must be something more than the momentary results of action, whether these be rewards or punishments; there must be a goal towards which integrated human accomplishment advances. In mathematical language, existence is an infinite series of individual lives, some positive, some negative, some of the first power and some of higher powers, but the sum of the series must approach a limit which is an ultimate good far transcending in importance any

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single term of the series, and the nature of which may be quite independent of that of any single term. This final sum of the series may be called an "ideal" which extends beyond the experiences of this life, which becomes an eternal verity, and constitutes reality, and our philosophy wishes to describe and even to explain it.

At Princeton University, forty-nine years ago, being determined to find a metaphysical basis for experimental science, I joined a group of perhaps ten seriously minded students who went once a week to the library of President James McCosh. We literally sat at the feet of this great Scotch-American philosopher while he expounded a philosophy of realism, opposed to idealism on the one hand and to agnosticism and materialism on the other. Those of my teachers who have impressed me above all other men are Dr. McCosh, Charles A. Young, the Princeton astronomer, and Cleveland's own Edward W. Morley, a triumvirate of profound and scientific philosophers.

Realism holds that there are real things and real "values". We cannot by pure reasoning prove the existence of either mind or matter. If we are ever to get hold of reality, we must seize it at once, and having whole-heartedly accepted it, we are to proceed to develop a system of philosophy which will be fundamentally scientific. I am prepared to adopt as the realities which constitute the universe three manifestations of absolute value: things which are eternally true—*science*; things which are intrinsically good—*ethics*; and things which are inherently beautiful—*esthetics*. There are not three different worlds of values; there is one universe of reality, a unity of the good, the true and the beautiful. And more, we must believe in the inherent and everlasting ability of mankind to progress towards an ultimate ideal or destiny, which requires that one's life be so ordered as to be in harmony with these eternal virtues. Such a life brings the greatest happiness and satisfaction.

It is not our observation or induction of these things that makes them realities; rather, we are sure we know them, we seek them, we cling to them, we are not satisfied with anything less nor indeed with anything else. This realistic philosophy is accepted in accordance with what the scientific man calls a "postulate"; others may well say it is accepted as a matter of "faith". Such

a system of philosophy is not new, in fact, it is one of the oldest systems.

The aim of life should be to secure the greatest development and manifestation of these qualities, and a life based upon such an ideal should bring the greatest happiness and satisfaction. Mere physical pleasure is a part of the reality of nature, and its pursuit is not only allowable but is laudable. However, the foolish man often overlooks the fact that nature is scientific and ethical in its very essence, as well as esthetic and epicurean, and that sooner or later he must submit to the inevitable consequences of his actions; the wise man knows that the most exquisite and satisfying pleasure comes to him who practices his enjoyments with regard to the unity and solidarity of nature. The universe does not keep its ethics in one compartment and its beauty in another, to be sampled as one selects; it is true throughout, it is beautiful throughout, and it is ethical throughout.

There is no conflict between science and real religion. It is not within the province of religion to circumscribe science nor to limit beauty. It is no part of the work of science to prove or to define religion. Ethics is just as real and just as fundamental as science, but not more so. The study of science should and usually does increase one's appreciation of the principles of ethics. The study of the laws of physics gives one an enhanced appreciation of the beauties of music, the subtlest of all the arts. The contemplation of any part of the universe of reality enlarges one's understanding of the whole.

I would quote from the writings of several physicists, with each of whom it has been my great privilege to be personally acquainted.

Henry A. Rowland, the first professor of physics of Johns Hopkins University, became the leading physicist of America. His love of truth held him in supreme control. He describes a scientific observer in the following words:

> I value in a scientific mind, most of all, that love of truth, that care in its pursuit, and that humility of mind which makes the possibility of error always present more than any other quality.

Lord Kelvin, England's greatest physicist, said:

> I believe that the more thoroughly science is studied the further does it take us from anything comparable to atheism.

The late Lord Rayleigh has said:

It is a strange world, and perhaps the strangest thing of all is that we are here to discuss it. I may say that in my opinion true science and true religion neither are nor could be opposed.

The late Michael Pupin, of Columbia University, upheld upon every occasion the high ideals of science, and said:

The worship of eternal truth and the burning desire to seek an ever-broadening revelation of it constitute the mental attitude which I call "idealism in science."

The late Dr. John A. Brashear, of Pittsburg, with whom I became acquainted in my college days, has always been a source of inspiration. In the making of astronomical instruments of precision he was the peer of any man of his time. Much as he loved and revered the science of astronomy—and surely no man ever loved it more—he said:

The science most worth while in this world is that of extracting sunlight from behind the clouds and scattering it over the shadowed pathways of our fellow travelers.

His ashes, together with those of his life-long help-mate in good deeds, lie in the crypt under the great telescope of his own construction in Pittsburgh. The marble plate bears the inscription:

We have loved the stars too fondly
To be fearful of the night.