

# EVOLUTION IN SCIENCE AND RELIGION

BY

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The Terry Lectures



*Evolution in Science  
and Religion*

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IN THE LIGHT OF  
SCIENCE AND PHILOSOPHY



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*The  
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Terry  
Foundation*

*At the Printing-Office of the Yale University Press.*



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**THE EVOLUTION OF TWENTIETH  
CENTURY PHYSICS**



# EVOLUTION IN SCIENCE AND RELIGION

## I.

### THE EVOLUTION OF TWENTIETH CENTURY PHYSICS

**I**T is with very great hesitation that I have accepted the invitation to give the Terry lectures this year for I am fully conscious of the fact that I can speak with no sort of knowledge or authority in matters of either religion or philosophy. If there be any appropriateness whatever in my joining in the discussion of the relations of religion to science and philosophy it arises from two facts.

First, my life has been wholly devoted to the most fundamental of the natural sciences, physics. I have therefore had intimate contact with the spirit and with the progress of that one science and can speak with a certain amount of knowledge of its point of view. Further, I have had the good fortune to come into fairly broad contacts with the other sciences; so that I should be able to understand at least the angle of approach of scientists as such, if

there be anything typical in their angle of approach, to the rest of life's problems.

Second, I have had much more intimate association as a student and teacher in three different institutions—all of which have outstanding theological departments—with the best of our religious thinkers than have most of my fellow scientists, and am therefore perhaps a little less likely to misunderstand and hence to misrepresent their point of view than some scientists might be.

In spite of these facts, my viewpoints are to be regarded as essentially individual. However incompetent any one of us may be to handle the relations of these great fields, every one of us must of necessity attempt to do so for himself if he is a reflectively moral being; for every such person must integrate his experiences into some sort of philosophy and some sort of religion. Further, as he gropes his own way—and the best of us are only gropers—he cannot possibly refuse to tell a fellow inquiring groper what he sees or thinks he sees with such light as is available to him. This is all I am trying to do in these lec-

tures; they make no claim to authoritativeness of any sort; they represent merely my individual experience and point of view.

So far, however, as my observation goes, scientists do not differ as a class from other educated people in their attitude toward the problems of religion. This indicates, I think, not that the growth of science has not influenced religious thought, but rather that its influences are recognized in much the same way by religious leaders and by thoughtful people generally as by scientists themselves. The fact that the most outstanding scientists have frequently been men who were closely identified with religious organizations constitutes at least presumptive evidence that there is no essential conflict between the two fields; indeed, it is definite proof that there is no conflict, *as these scientists themselves* have understood and interpreted religion, for I take it that even those who are wont to make the amusing assumption that in general men who possess convictions of any sort are dishonest—that the way to become honest is to drop

your principles—would hesitate to impute hypocrisy to a Maxwell or a Lord Rayleigh. I shall therefore in these lectures not focus attention upon supposed antagonisms but rather endeavor to indicate how the growth of science seems to me to have contributed to the evolution of religion in the past and what sort of influences it appears to be exerting upon its further evolution today.

In the first lecture I shall endeavor to create a background for those that follow by sketching the extraordinarily interesting and significant evolution of my own subject, physics, during the period from about 1893 when I myself first began to study it intensively up to the present. In other words, the first lecture will be pure physics. The second lecture will deal with the relations between new truth and old as it is revealed definitely in the history of physics and inferentially in other fields. This trenches somewhat at least upon the domain of philosophy. The last lecture will deal with what seems to me to have been the process of the evolution of religion under the influence of our continually

expanding knowledge of the world in which we live, *i.e.*, under the influence of science.

My own period of activity in the intensive pursuit of physics happens to be almost exactly coincident with the period of development of what we may call modern physics as distinct from nineteenth century physics; so that I am in the rather unusual position of being able to relate, from my own experiences and entirely without reference to books, when and how the changes occurred, how some of the actors felt and thought and acted in the presence of each new development, and what stupendous shifts in viewpoint have been brought about. This is my excuse for making the first lecture to some extent a personal narrative.

The transition from the old to the new mode of thought in physics was probably made as dramatically in my case as in that of anyone in the world; for I was in the fortunate position of having entered the field just three years before the end of the complete dominance of nineteenth century modes of thought. In those three years I



had the privilege of personally meeting and hearing lectures by the most outstanding creators of nineteenth century physics—Kelvin, Helmholtz, Boltzman, Poincaré, Rayleigh, Van't Hoff, Michelson, Ostwald, Lorentz—every one of whom I met and heard between 1892 and 1896. In one of these lectures I listened with rapt attention to the expression of a point of view which was undoubtedly held by most of them—indeed, by practically all physicists of that epoch; for it had been given expression more than once by the most distinguished men of the nineteenth century.

The speaker had reviewed, first, the establishment and definite proof of the principles of mechanics during the seventeenth and eighteenth centuries culminating in La Place's great *Mécanique Céleste*; then he had turned to the wonderfully complete verification of the wave theory of light by Young and Fresnel, between 1800 and 1830, experiments which laid secure foundations for the later structure known as the physics of the ether, one of the most beautiful