tirely safe, in Presbyterian or other schools, under such an instruction as that. But Mr. Bryan wished to go further. He proposed to consign a man named Darwin, who never had anything to do with the doctrine or practice of the church, who was a man of science and who merely went through life trying to find out what was true, to ignominy. The resolution which he offered and eloquently advocated declared

> that no part of the Educational Fund of the Presbyterian Church of the United States of America shall be paid to any school, college, university or theological seminary that teaches, or permits to be taught as a proven fact, either Darwinism or any other evolutionary hypothesis that links men in blood relationship with any other form of life.

The difference between the two resolutions is significant and fundamental and the decision of the Presbyterian General Assembly is highly important, because by implication it recognizes the fact that perhaps teachers who are as much devoted to the Christian faith as any other may not exclude consideration of the evolutionary philosophy from their teaching; in other words, that an evolutionary philosophy need not by them be regarded as altogether materialistic in its bearings. The Bryan resolution approaches, with a bludgeon merely, a subject which may well engage the attention and summon up the wisdom of the most devout. Manifestly the Presbyterian Church is not prepared to take that attitude.

The Presbyterian Church, in short, avoids the imputation of assuming infallibility. It rests upon the Christian doctrine and proposes to continue to rest upon it, but does not bind the conscience of believers with bands of theological steel. But this is precisely what it would have done if it had adopted the remarkable resolution offered by the Rev. Edward H. Pence of Portland, Oregon, which made this declaration:

> That man was evolved with all his mental, moral, spiritual content to his consciousness of self and God by the operation of laws inherently within a form from which he came, and the acknowledgment of possibilities, or even probabilities, that a physical organism may have been evolved by forces and processes implanted by God, sacred, because so chosen and used by Him, and that his organism did not and could not have become human until, by creative fiat of God, he breathed into it the inherent parts which constituted man as the potential son of God.

The defeat of this resolution and Mr. Bryan's, taken together with the temperate declaration which was actually adopted, indicates that the day is past when the right of ecumenical conclusiveness is likely to be assumed by American Protestant bodies.—*The Boston Evening Transcript.*

SCIENTIFIC BOOKS

The Meaning of Relativity. By ALBERT EINSTEIN. (Princeton lectures translated into English by E. P. Adams.) Princeton University Press. 1922.

The present state of the remarkable theory of relativity of Albert Einstein, the degree of maturity which the investigation has reached, the extensive and varied development of the subject which has been set forth in so large a literature, the doubts and difficulties which the theory has encountered, the enthusiasms which it has engendered, the antagonisms which it has aroused, the difficult form which much of the exposition of it has taken, its intimate relations with the deepest realities accessible to investigation—all these render imperative such an exposition of the subject as will make it accessible to a large body of persons interested in the more profound consequences of physical theory. The preliminary announcement of the publication of "The meaning of relativity" by Albert Einstein raised the hope that this book would serve just that purpose.

In a small volume of 123 pages we have here four lectures by Einstein: the first is on "Space and time in pre-relativity physics"; the second is on "the theory of special relativity"; both the third and the fourth bear the title "The general theory of relativity." The lectures open with a brief investigation of the origin of our ideas of space and time and a discussion of the object of science as a means of coordinating our experiences and of bringing them into a logical system. Subjective time is not measurable; we can assign numerical measures to time only by means of some objective phenomena which are recurrent. Simul-

taneity at different places is a notion of which we do not have immediate awareness. We require some convention or agreement before we can say whether distantly separated events are simultaneous or not. In following up this idea one cannot avoid an intimate association of space and time. A realization of this brings him towards one of the fundamental notions of the theory of relativity, namely, that measured space and time are so intimately connected and entangled that we can not deal with either apart from the other. We are forced to think of space and time as indissolubly conjoined into a four-dimensional continuum of space-and-time. This intimate junction of two things previously separated, a junction necessary at least in the measurements of physics, is one of the basic conceptions on which the whole theory of relativity rests. In his first lecture Einstein shows how this comes about and gives something of the mathematical means by which this conjoined space-and-time is to be investigated.

The second lecture is devoted to the milder form of the theory of relativity as Einstein presented it in 1905. This special relativity can be treated without any very complicated mathematical machinery, though even here a full understanding of its detailed development is impossible without considerable mathematics. Einstein here develops the main part of this theory in intimate connection with the various general ideas to which it is related. The exposition is suited to the needs of a serious student of the subject who has already acquired some of the simpler ideas.

Now this special relativity is not comprehensive enough to embrace the phenomena of nature beyond a certain rather narrow range. A more general theory is necessary to bring about agreement with cosmic phenomena. Einstein's construction of this more general theory was set forth in a memoir of 1915. The third and fourth lectures of the present volume are devoted to an exposition of that more general theory. An attempt is made to show the nature of its details and to explain its connections with the famous phenomena of astronomy which have afforded so remarkable a verification of the theory. Full details can not be given in so short an exposition. But the author can and does succeed in making clear the general ideas and in setting before the reader the spirit and trend of the argument and in leading him to see much of the detail of the whole theory. The exposition is thus a very useful one.

A review of such a brief book on relativity should not be ended without indicating the place which it should have with a learner who is working himself into a knowledge of the theory. It is obvious that the book must be authoritative. But it cannot serve as a single volume to lead the reader into a fair introductory knowledge of the whole theory; indeed this was not the purpose of the book. (The reader who desires a single short volume suited to lead him to a fair preliminary conception of the whole subject will find such a book in the second edition of my "Theory of relativity" published by Wiley & Sons, New York.) But the book can be made to serve an important purpose for the learner who wants a fairly rapid and yet comprehensive introduction to the whole theory. He might well begin with Einstein's more elementary book (translated by Lawson, published by Holt & Co. in 1921) entitled "Relativity—the special and general theory." This will lead him readily into the simpler aspects of the theory. This might be followed with the book named at the head of this article. He could then proceed to Weyl's comprehensive "Space—time—matter" (translation by Brose published by Dutton in 1922). Or, he might precede Weyl's book by Eddington's "Space, time and gravitation." By means of these four or five books, all of them available in English, it is possible for one to get a rapid and comprehensive introduction to the whole theory of relativity. They are recommended only to the serious student of the subject. None of the volumes constitutes "light reading."

R. D. CARMICHAEL

TUBEUF'S MONOGRAPH OF THE MISTLETOE

ONE of the most encouraging signs of surviving intellectual life in Mid-Europe is the occasional appearance of masterly publications like the MONOGRAPHIE DER MISTEL (The Oldenbourg Verlag, Munich) by Professor Tubeuf of the University of Munich. For many years