down scientific news to the merest fraction of the present amount, or to print only such things as the multiplication table.

Dr. Millikan's own definition is that an opinion becomes established in physics "when nine-tenths of the informed and competent workers in the field are in agreement upon it," and adds that there will always be a certain percentage of people who will vote "no," and that "for no reason whatever except that they are built that way." The newspaper, however, can hardly be expected to stop to take a census before it publishes anything about a scientific theory or discovery. If it did so it would not only abandon its primary function of informing the world—including the scientists themselves—of the discovery, but it would be shutting off the views of the dissenting 10 per cent., and the history of science certainly does not show that this dissenting 10 per cent. has always been wrong.

The function of the newspaper is primarily to report what the leading scientists do and say. If they contradict each other, and there is confusion, the newspapers merely picture the confusion and do not create it. To the extent, however, that newspaper reports emphasize the contradictions among scientific theories, they increase the pressure on the scientists to eliminate these contradictions.—*The New York Times.*

SCIENTIFIC BOOKS

THE ARCHITECTURE OF THE UNIVERSE

The Architecture of the Universe. By W. F. G. SWANN. ix + 428 pp. The Macmillan Company, 1934. $3.75.

ALTHOUGH "The Architecture of the Universe" is somewhat similar in subject-matter to several other books that have appeared in recent years, it is a refreshing and original work. Its twelve chapters are devoted to such subjects as the nature of matter, modern atomic theories, space and time, dimensions, the restricted and general theories of relativity, vital processes and science and theology. The author does not presuppose extensive scientific training on the part of his readers, and consequently refrains from using the technical language of the specialist, yet he goes deeply into the fundamentals of each of the subjects he treats. Indeed, I have read no other semi-popular discussion of these subjects that presents them so adequately and satisfactorily.

In style, the book of Dr. Swann is quite different from others in its field. There is in it no striving for the sensational, no parading of the paradoxical, no mixing in of the mystical. Instead, with refreshing balance and candor, the author presents science as a sane, orderly body of doctrine developed for interpreting experience. Science as he presents it has the fine spirit we associate with the names of Archimedes, Galileo, Newton and Darwin. I can not easily overemphasize the excellence of these praiseworthy qualities of his exposition. But in mentioning them I am likely to convey the impression that the book may be dull and monotonous. As a matter of fact, it is sparkling with wit and humor, extraordinarily rich in figures of speech and extended comparisons, and livened with many fine passages. The extended comparisons or parables are not only apt but often very interesting. If they have a fault, it is that in some cases they are so long and so entertaining that the reader is likely to forget that they are only illustrations of an important and difficult scientific principle or conclusion. An example is the parable used in discussing the second law of thermodynamics.

The author has attained exceptional sparkle and variety of exposition by a remarkably successful use of an interesting device. He often sets up a discussion between himself and the reader, all expressed in direct quotations. Under this method he does not limit himself to stating his own conclusions; the reader, too, expresses his opinions, his misconceptions, doubts and antagonisms, and the author answers him. This method, of course, is not new, for it was employed by Plato and Galileo and many other writers. But Dr. Swann has used it with rare skill, being eminently fair in permitting the reader to have his say and equally fair in his replies, and illuminating all with wit and apt figures of speech.

It is not possible within the limits of space available for a review of the book to outline comprehensibly any of the particular discussions Dr. Swann has given. I must content myself with saying that his remarks upon the second law of thermodynamics, the principle of indetermination, vital processes and even the relationship between science and theology are particularly penetrating, balanced and convincing. If any of these subjects were to be omitted, I should choose the last, partly because from its nature it does not lend itself to very definite conclusions. The author does not, however, indulge in any such amateurish attempts to rest theology on science as have frequently appeared in recent years.

"The Architecture of the Universe" is a splendid book which I strongly recommend to those who desire to get a real understanding of the heart of science to-day and who are willing to devote considerable careful thought to attaining that goal.

F. R. MOULTON