EXPERIMENTAL SCIENCE AND
WORLD GEOMETRY

The major advances in science are many-sided. Though led by men of exceptional genius they have always been natural outgrowths of the concepts and problems met with in preceding systems of ideas. They have had natural setting not only in the main current of science in the narrower sense but even in the general thought of mankind. They need to be viewed in varied ways, interpreted by persons of varied outlook and equipment, in order that both their powers and their limitations may be understood.

For my part in the present group of papers I have chosen a point of view indicated by the title and best described in the body of the paper. Some reasons for this choice are found in the flavor of recent discussions concerning the bearing of particular experiments on the future of the relativity theory, in particular on the oft-heard question whether it is true or false. Now it is apparent that some of the diversities of judgment and expectation on these matters are to be ascribed to differences of opinion as to the nature and possibilities of scientific theories altogether. We may never reach unanimity on this point. It is perhaps even probable that there will always remain ways of thinking so contrasted that according to one’s philosophy any particular theory can be justly called either true or false. Since one main motive of a genuine relativity scheme of thought is the explicit recognition of a variety of points of view or “frames of reference,” it would be consonant with the spirit of such a theory to welcome a variety of modes of judgment even as to its own truth and virtue. But it is important to remember that part of the discrepancies of judgment are due to double meanings in the language used, not easy to avoid and therefore needful to be noticed.

We ask whether an ether exists, whether space is actually curved, whether time is truly a fourth dimension, whether a body is really flattened when it moves. The meaning of the questions needs some explanation.

Clearly we do not show that an ether exists in all the senses in which we show that a gas exists. We pump gas out of a vessel and stop the passage of sound. No one claims yet to have pumped the ether out of a portion of space and stopped the passage

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