1

Nature's Unseen World

There are innumerable niceties concerning notions, relations, instants, formalities, quiddities and haecceities, which no one can pry into, unless he has eyes that can penetrate the thickest darkness, and there can see things that have no existence whatever.

ERASMUS, *Moriae Encomium*, 1509

Erasmus preceded Galileo, Descartes and Newton, men who founded new disciplines leading us to classical physics, the physics of an era of unquestioned belief in the existence of an aether. This era passed at the beginning of the twentieth century. The ideas of Einstein, Heisenberg and Pauli have changed our physics. We have reverted to principles, concepts which to Erasmus would be notions, relations and formalities. Our physics are now founded upon abstract philosophical dogma, whereas physical phenomena are still governed by an all-pervading environmental influence which, as it must have a source, signifies the existence of an aether. Because his eyes cannot penetrate the thickest darkness, the scientist of today cannot see what exists in apparently empty space, but he feels its effect and should be ever-conscious of its existence. The cosmos is linked by space and so space must be examined to find the links between the phenomena of our universe.

Understanding the cosmos provides an exacting challenge. But it is easy to find a starting point. Let us review some words quoted from the book by Lincoln Barnett entitled *The Universe and Dr. Einstein*:*

Today most newspaper readers know vaguely that Einstein had something to do with the atomic bomb; beyond that his name is simply a synonym for the abstruse. While his theories form part of

* Page 12 of second revised edition, Harper and Row, New York, 1957.

the body of modern science, many of them are not yet part of the modern curriculum. It is not surprising therefore that many a college graduate still thinks of Einstein as a kind of mathematical surrealist rather than as the discoverer of certain cosmic laws of immense importance in man's slow struggle to understand physical reality. He may not realise that Relativity, over and above its scientific import, comprises a major philosophical system which augments and illumines the reflections of the great epistemologists—Locke, Berkeley, and Hume. Consequently he has very little notion of the vast, arcane, and mysteriously ordered universe in which he dwells.

Clearly, we must start with Einstein's Relativity. Yet, where will this lead us? Will we follow like sheep into the complexity of a philosophical system and be hopelessly lost in a world of confusion? Let us avoid indoctrination which may cause us to make our scientific evaluations on the basis of aesthetic appreciation. It is not uncommon for scientists to describe Relativity by the use of the term 'elegant', but the truths of Nature are all too often inelegant and if we are to be objective we should favour simplicity rather than complexity. Disorder may come from order. Complexity may come from simplicity. The fundamental structure from which we are formed may therefore be simple, and should be assumed so in our initial enquiries. The world we experience is one of three dimensions. It is, in its structural geometrical concept, rather simple. It can be visualized. It is experienced and, in this sense, it must be real. Yet, Relativity would have us believe in a different world, a world of four space dimensions interlinked by time. Relativity concerns 'notions, relations, instants . . . which no one can pry into, unless he . . . can see things that have no existence whatever.' These may seem to be words of a heretic but, in the spirit of Erasmus, we will forge ahead with this assertion as a challenge to the existing disorder of things.

Do we have any allies in this pursuit? A recently published book by Harald Nordenson has critized the fundamental foundations of Einstein's theory.* In the final reflections in this work Nordenson writes:

As I have criticized Einstein very heavily in this book I am anxious to point out that my criticism applies to his philosophical reasonings

* *Relativity Time and Reality*, Allen and Unwin, London, 1969.

and especially those of epistemological character. On the other hand I have the greatest respect for his eminent contributions in other domains of mathematics and physics.

I have often met persons, especially outside Sweden, who have expressed their astonishment that Einstein was not awarded the Nobel Prize for his Theory of Relativity, which many people consider as one of the most outstanding achievements of this century. As a member of the Swedish Academy of Science which distributes the Nobel Prizes of physics I am on the other hand very glad that this was not done, since the Theory of Relativity is not physics but philosophy and in my opinion poor philosophy.

Nordenson has attacked the logical foundations of Einstein's theory. He has presented persuasive reasons, which we need not review here. Our object is to portray reality and replace the abstract, a point which is singularly pertinent if we look at the review which Nordenson's book attracted from the *British Journal for the Philosophy of Science* (August 1970):

The author of the book under review is led to the drastic conclusion that Relativity Theory is logically incoherent, contains inconsistencies and must be rejected, even though he admits we have nothing to put in its place.

It seems appropriate to mention that in September 1970 the Review Editor of this very journal wrote to the publishers of the present writer's book *Physics without Einstein* explaining the difficulty of finding a reviewer. About the book he wrote:

We noted its unusual interest and decided that we should like to review it in our columns. Unfortunately we cannot do this if we cannot find a reviewer, and so far all the five persons approached have been unable to review the book for us.

It would seem that the modern physicist is so specialized in the physics of today that he has lost the aptitude to adapt to new ideas. Perhaps, however, we should be referring only to the philosophers of science. Unable to adapt to new concepts but unwilling to reject the old unless we have something to substitute, the philosophers appears locked in a state of mental stagnation. Relativity is sacrosanct.

The relativistic method is so entrenched that few writers are able to secure publication for their alternative ideas. Few readers

can assimilate what is presented to them in texts on Relativity, but the establishment has ordained that Relativity shall be the accepted doctrine. To quote from a publisher's summary of a recent work on gravitation:

This book is a review of recent research developments pertaining to the theory of gravitation. After consultation with many scientists throughout the world working in relativity theory, the most important topics being worked on today were selected for inclusion in the book.*

Someone has decided, it seems, that only Relativity can lead us to understanding gravitation.

Our challenge, therefore, is not merely presented by the cosmos. Mankind has inertia just as does mass. The challenge in the quest for ultimate truths is to confront this barrier presented by man himself. Later in this work we will consider the nature of gravitation. Leading professors have expressed themselves on this subject. Hoyle (1964) wrote:†

There is no such thing as gravitation apart from geometry . . . the geometrical relationship between different localities is the phenomenon of gravitation.

On the same subject, Bondi (1963) wrote:‡

Gravity is a peculiar force and thus rightly described in a very special way.

Our starting point could be Relativity, but what prospect of lasting success? Perhaps that path will lead us to dispose of the cosmos as some mathematical concept devoid of real form and essentially peculiar. It seems better to retrace some of the ideas of antiquity and examine how our basic ideas of the cosmos developed. We must look at the problem of the void in which we are immersed. Either there is some physical substance filling all space or there is not. If there is, then it must yield its secrets if we pry into this unseen world with enough

* *Gravitation: An Introduction to Current Research*, Wiley.

† 'A New Theory of Gravitation' by Hoyle, pp. 19–26 in 1964 BBC Publication entitled *A New Kind of Physics*.

‡ 'Acceleration and Gravity' by Bondi, pp. 5–12 in 1963 BBC Publication entitled *Relativity Today*.

imagination and conviction. Eventually, we must discover the elements of its structure and have enough verification from the methods of physical science. If the void has no substance, it has no existence. It can provide no links, no metric structure, nothing by which the coherent properties of physical science can be related. We are left to philosophize. Mathematical formulations are the creation of our minds. They cannot provide an aether in themselves. They can describe an aether if one exists in Nature. In this work, therefore, our starting point must be a firm belief in the existence of a medium filling the heavenly void. The aether has to be real. If we fail to succeed then we leave the task to others in the future who may have more luck in fathoming this vital secret of Nature. We can pacify ourselves by diverting to philosophy. We can embark on the Relativity journey and eventually be drugged by notions which cause us to lose all sense of time. But let us see where we arrive in this pursuit.

Modern science has presented many facts to us which we can understand in terms of our physics, but many of the problems with which the ancients wrestled are unsolved to this day. It is these problems which are important in any effort to understand the cosmic world.