

### *The Tacit Component*

The answer to the first is that experience is an indispensable clue to the understanding of nature, even though it does not determine its understanding. Einstein speaks of 'ein intuitives Heranfühlen an die Tatsachen', which I should call a groping for the meaning of the facts. In this empirical guidance of our groping lies all the difference—elusive and yet utterly decisive—between a merely formal advance and a new insight into the nature of things. Whence this elusiveness? It is a reflection on the canvas of the highest scientific achievement of the fact that we can never tell exactly what we mean, or even whether we mean anything at all. Indeterminacy of meaning is not eliminated, but only restricted, when we eventually decide to accept a theory as a true statement of something new about nature. For, while we heavily commit ourselves thereby to a belief concerning certain things, such a belief can have no bearing on reality unless its scope is still left indeterminate.

The answer to the second question, why we should prefer science to astrology, cannot be given briefly. In the next section I shall approach it by one step and a fairly conclusive reply will be reached at the end of Part Three; but the whole of this book is but a quest for a substantial reply to a question of this kind. In the end I should be able to say as a statement that will appear neither dogmatic nor trivial: 'I do not entertain explanations in terms of astrology, for I do not believe them to be true.'

### 5. SCIENTIFIC CONTROVERSY

Heuristic passion seeks no personal possession. It sets out not to conquer, but to enrich the world. Yet such a move is also an attack. It raises a claim and makes a tremendous demand on other men; for it asks that its gift to humanity be accepted by all. In order to be satisfied, our intellectual passions must find response. This universal intent creates a tension: we suffer when a vision of reality to which we have committed ourselves is contemptuously ignored by others. For a general unbelief imperils our own convictions by evoking an echo in us. Our vision must conquer or die.

Like the heuristic passion from which it flows, the *persuasive passion* too finds itself facing a logical gap. To the extent to which a discoverer has committed himself to a new vision of reality, he has separated himself from others who still think on the old lines. His persuasive passion spurs him now to cross this gap by converting everybody to his way of seeing things, even as his heuristic passion has spurred him to cross the heuristic gap which separated him from discovery.

We can see, therefore, why scientific controversies never lie altogether within science. For when a new system of thought concerning a whole class of alleged facts is at issue, the question will be whether it should be accepted or rejected in principle, and those who reject it on such comprehensive grounds will inevitably regard it as altogether incompetent and

unsound. Take, for example, four contemporary issues: Freud's psychoanalysis, Eddington's *a priori* system of physics, Rhine's 'Reach of the Mind', or Lysenko's environmental genetics. Each of the four authors mentioned here has his own conceptual framework, by which he identifies his facts and within which he conducts his arguments, and each expresses his conceptions in his own distinctive terminology. Any such framework is relatively stable, for it can account for most of the evidence which it accepts as well established, and it is sufficiently coherent in itself to justify to the satisfaction of its followers the neglect for the time being of facts, or alleged facts, which it cannot interpret. It is correspondingly segregated from any knowledge or alleged knowledge rooted in different conceptions of experience. The two conflicting systems of thought are separated by a logical gap, in the same sense as a problem is separated from the discovery which solves the problem. Formal operations relying on *one* framework of interpretation cannot demonstrate a proposition to persons who rely on *another* framework. Its advocates may not even succeed in getting a hearing from these, since they must first teach them a new language, and no one can learn a new language unless he first trusts that it means something. A hostile audience may in fact deliberately refuse to entertain novel conceptions such as those of Freud, Eddington, Rhine or Lysenko, precisely because its members fear that once they have accepted this framework they will be led to conclusions which they—rightly or wrongly—abhor. Proponents of a new system can convince their audience only by first winning their intellectual sympathy for a doctrine they have not yet grasped. Those who listen sympathetically will discover for themselves what they would otherwise never have understood. Such an acceptance is a heuristic process, a self-modifying act, and to this extent a conversion. It produces disciples forming a school, the members of which are separated for the time being by a logical gap from those outside it. They think differently, speak a different language, live in a different world, and at least one of the two schools is excluded to this extent for the time being (whether rightly or wrongly) from the community of science.

We can now see, also, the great difficulty that may arise in the attempt to persuade others to accept a new idea in science. We have seen that to the extent to which it represents a new way of reasoning, we cannot convince others of it by formal argument, for so long as we argue within their framework, we can never induce them to abandon it. Demonstration must be supplemented, therefore, by forms of persuasion which can induce a conversion. The refusal to enter on the opponent's way of arguing must be justified by making it appear altogether unreasonable.

Such comprehensive rejection cannot fail to discredit the opponent. He will be made to appear as thoroughly deluded, which in the heat of the battle will easily come to imply that he was a fool, a crank or a fraud. And once we are out to establish such charges we shall readily go on to expose our opponent as a 'metaphysician', a 'Jesuit', a 'Jew', or a 'Bolshevik', as