SCIENTIFIC OBSERVATION AND PERCEPTION
IN GENERAL [1935]*

LUDWIK FLECK

Until quite lately the following conviction prevailed among scientists, ex- pressed in Poincaré’s sentence: “if a research worker had infinite time at his disposal, it would suffice to tell him: Look, but look well”. Our entire knowledge would allegedly emerge out of the description of his observations of all events.

This conviction includes a number of foundations which are impossible even today. Can observation indeed be only either ‘good’ or ‘bad’ (or, ‘better’ or ‘worse’) and does every ‘good’ observation lead to the same results? Is it sensible to talk of the ‘descriptions of all events’, just as if these descriptions were always fundamentally additive, and necessarily did yield, all of them, a certain whole representing some sense? Does the concept of ‘the whole of science’, ‘one general science’ have any sense at all? Is an isolated research worker at all possible, even if he had an infinite time at his disposal?

In matters of this kind the theorists rely mainly on the experience of the past century, predominantly on the experience of physicists. The problem of observation appeared at that time to be much more simple than it does at present. It was believed that, e.g., observation does not in principle affect the state of the observed object. Today, it follows from the quantum theory that every observation of atomic phenomena does influence their course. However, the complex nature of the problem of observation comes to the fore only in the biological sciences which are less deductive and less abstract.

My own profession makes me carry out daily observations of things which are very simple from a certain standpoint: of microscopic preparations. When I look at the microscopic preparation of, e.g., a diphtheria culture, then, to use common parlance, I see only a certain number of lines having a certain specific structure (or colour), a certain form and a certain arrangement. However, it would be futile on my part to try to describe these three

* Przegląd Filozoficzny 38 (Warsaw, 1935).

59

elements of the image so as to render in words, univocally for the layman, the image of the characteristic form which is seen by the trained observer, but which the layman is simply unable to see at the beginning. Nevertheless, after a short period of time, almost all of the pupils acquire the ability to perceive it, and reach results which are consistent (at least to a large extent). Thus one has first to learn to look in order to be able to see that which forms the basis of the given discipline. One has to acquire a certain experience, a certain knack, which cannot be replaced with verbal formulae. Hence a completely axiomatic edifice of science is not possible, because no words or sentences suffice to render their complete contents. Such an edifice is understandable only for a specialist, and for a layman it is not the equivalent of the given branch of knowledge. The indispensability of distinguishing the specialist from the layman, the necessity of a certain experience and of the acquisition of a certain knowhow introduce a certain alogical factor into science.

Still more vivid is the necessity of a specific training to acquire the ability to perceive certain forms, e.g. in dermatology. In this field, a layman who is capable of carrying out good observations in other fields, say, a specialist in bacteriology, does not differentiate and recognize dermatological changes. At first he listens to the descriptions of dermatologists as if they were fairy tales, much as he has the object described lying in front of him.

Thus there exists a necessity of separate training in the perception of specific forms from various fields of science, and it is not possible to render these forms univocally by describing them with the aid of words of a certain general language. Hence one cannot talk in general about good and bad observation, but only about an observation which is consistent with a certain branch of science or an observation which is not consistent with it.

The art of observation is not a general one; it does not include all fields of science at the same time. On the contrary, it is always limited to one field only. I knew an eminent surgeon, specializing in the abdominal cavity, who needed only just a few looks and a few touches of the abdomen to diagnose the clinical state of the appendix vermiformis almost infallibly, sometimes in cases when other medical men 'did not see anything'. The same specialist could never learn how to distinguish under a microscope mucus strips from the hyaline cast. I also knew a bacteriologist who was an assistant lecturer in a large university; he perceived and recognized ever so minute morbid changes in inoculated animals, but was unable to tell a male mouse from a female one.

An observer who lacks training in a certain field is unable to provide a useful description. He will at best provide a longish description containing