barometer that the spot is beneath the bottom of a depression. Now the proper mental attitude on this question, before somewhat recent investigations had been carried to a successful issue, would have been for each person to recognise that his knowledge of the immediate cause of the variations of the barometer—that is, his knowledge of the existence of variations in the weight of the superincumbent column of air—was something quite different from his supposition that the latter variations were entirely dependent upon changes in the density or weight of the air itself. When men of science have closely observed a phenomenon, or have succeeded in establishing a fact, their next care is to endeavour to find out the explanation of it; and experience has shown that the best method of doing this is to bring into play what is known as the scientific exercise of the imagination, and to think out some conjecture as to the causes which are in operation. This conjecture will be more or less probable, according to the knowledge and the sagacity of the person by whom it is formed. In relation to the inquiry, it is properly called a hypothesis, or supposition, and is accepted only provisionally, in order that it may serve as a standard to which new facts may be brought, either to confirm or to weaken it, and in order that it may suggest experiments of such a nature that certain results must follow if the hypothesis be true. If the results do not follow, if the new facts are in opposition to the hypothesis, it must be abandoned, and a new one advanced in its stead; but, if it be tried by every test and is confirmed by all, it ceases to be a hypothesis, and becomes a theory—that is, a generalised expression of facts, or, in other words, a truth. When the nature of light was doubtful, when some people thought it might consist of fine particles, the suggestion that it was an appearance produced by wave movement in an universally diffused medium finer than the atmosphere was called the undulatory hypothesis. The hypothesis was ultimately found to satisfy all the conditions of the problem, and hence we now speak of the undulatory theory.

The process which I have thus briefly described, the conduct of which may sometimes tax all the skill and all the resources of the most advanced mathematician, or of the most learned physical philosopher, is equally applicable to many of the common things of life, and may be carried out by people of very humble attainments. In one of the great London hospitals, before the science and art of nursing had been brought to their present perfection, two students were once competing for a clinical prize. They were required to examine the same patient, in immediate succession to one another, and to write an account of his symptoms and condition. It was necessary to undress him in order to examine his heart and lungs; and the first student, who was a keen observer, but only very slightly gifted with scientific imagination, noticed a curious patch of discolouration on the front surface of the patient's chest. He measured this patch in all its dimensions, wrote down the peculiarities of its aspect, and drew a plan of its irregular outline in his report. The second student also noticed the patch; but he, being gifted with imagination, conjectured that it might possibly be due to the presence of dirt. In order to bring this provisional hypothesis to the test of experiment, he asked for a sponge, with soap and hot water, and established the truth of his conjecture by washing the patch away. I cannot be sure whether he realised that he was illustrating an entire system of philosophy; and must admit that, very possibly, he was like Molière's hero, who had talked prose all his life without knowing it.

Unfortunately, perhaps, many provisional hypotheses find their way into text-books and manuals, and are copied without due precaution from one into another, until it is often made to appear that the hypothesis, and the facts which it is postulated in order to explain, stand upon the same level and are certainties of the same order. Those who thus receive them will probably discover, sooner or later, that the hypothesis has been exploded, or projected into space; and, if they are persons of inferior mental culture, the discovery, instead of only leading them to distrust hypotheses until they are proven, will be likely to render them distrustful also of facts. That the atmosphere varied in density at different times was once, perhaps, the best provisional hypothesis which could be framed in order to account for the barometric variations; but it was never more than a hypothesis, was never elevated by crucial experiment into the position of a truth. And, as soon as it was ascertained that, when gases of unequal density are in contact, their commingling, so that the mixture becomes of uniform density, is governed by a definite law, it became apparent that different atmospheric densities could not be maintained, in neighbouring localities, long enough to satisfy the demands of the old barometric hypothesis, and that this must be abandoned as an inadequate explanation of the facts. After a while, the multiplication of telegraph stations enabled observers to compare the different heights of the barometer over wide areas at the same moment of time; and then it became known that every point of maximum elevation of the mercury is surrounded by zones of lower elevation, which, in their turn, pass into areas of depression; and that this arrangement, as a whole, travels from one

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