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OBJECTIVE AND HUMAN PHYSICS

The twofold view of nature is as old as theoretical physics. The picture in which nature presents itself to the observer is complicated; but Democritus, the great Greek thinker, had already recognized that this complication is only apparent, and the result of the peculiarities and limitations of the human senses. It was the idea of Democritus that the picture of nature to which true thinking leads must be of much greater simplicity than that which man receives through his senses. The necessary condition for the simplification of physics had therefore to consist in the liberation of physics from all human, from all subjective, points of view.

Democritus also recognized that the objects of the simplest physical events must be much smaller than any object amenable to sense-perception. The exploration of hidden atomic events thus became the essential aim of objective physics.

As soon as the true size of atoms was evaluated by exact methods, the primarily speculative hypothesis became exact scientific knowledge. To-day we can determine the mass of atoms with comparatively greater accuracy than the mass of the earth. Not only through one but through the most varied and independent methods the characteristic constants of atoms can be determined in the most accurate manner; and all these methods, independently of each other, have led to the same values. If it can be regarded as an argument for the existence of our external world that the sensations of sight, hearing and touch all lead us to infer the existence of the same objects, then theoretical physics has certain proof of the real existence of atoms in the fact that their characteristic constants, as obtained by fundamentally different methods, have nevertheless always the same values.

Modern physics, based on the exploration of atomic processes, has revealed to us a picture of nature of great simplicity. It has clearly shown that it is not nature that is complicated, but only the path leading to a knowledge of it, and that this path consists in the gradual transformation of the subjective world-picture into an objective one.

But if the objective picture be the true one, then it should also be possible inversely to construct the subjective human picture from the objective one. We can then raise the question of how, under given powers and limitations of the human senses, nature may reappear in a picture produced by these senses. We



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