Kant's Ideas of Space

Philosophy

IMMANUEL KANT, in his essay on "Regions in Space," quoted in Kant's *Inaugural Dissertation,* translated by John Handyside (Open Court):

When a body is perfectly equal and similar to another, and yet cannot be included within the same boundaries, I entitle it the incongruent counterpart of that other. To show its possibility, take a body which is not composed of two halves symmetrically disposed to a single intersecting surface, say a human hand. From all points of its surface draw perpendiculars to a plane set over against it, and produce them just as far behind the plane as these points lie in front of it; the extremities of the lines so produced, if connected, then compose the surface and shape of a physical body which is the incongruent counterpart of the first; i. e., if the given hand is the right, its counterpart is the left. The image of an object in a mirror rests upon the same principle; for it always appears just as far behind the mirror as the object lies in front of its surface, and so the mirrored image of a right hand is always a left. If the object itself consists of two incongruent counterparts, as does the human body when divided by a vertical section from front to back, its image is congruent with it, as can easily be seen by allowing it in thought to make a half turn; for the counterpart of the counterpart of an object is necessarily congruent with the object.

The above considerations may suffice for understanding the possibility of spaces which are completely equal and similar and yet incongruent. We now proceed to the philosophical application of these concepts. From the common example of the two hands, it is already clear that the shape of one body can be completely similar to that of another, and the magnitude of their extension exactly the same, while yet there remains an inner difference, namely that the surface which bounds the one cannot possibly bound the other. Since this surface bounds the physical space of the one but cannot serve as boundary to the other, however one may turn and twist it, this difference must be such as rests upon an inner ground. This inner ground cannot, however, depend on any difference in the mode of connection of the parts of the body relatively to one another; for, as can be seen from the examples adduced, in this respect everything may be completely identical in the two cases. . . .

Should we, then, adopt the conception held by many modern philosophers, especially in Germany, that space consists only in the outer relations of the parts of matter existing alongside one another, in the case before us all actual space would be that which this hand occupies. But since, whether it be right or left, there is no difference in the relations of its parts to one another, the hand would in respect of this characteristic be absolutely indeterminate, i. e., it would fit either side of the human body, which is impossible.

Thus it is evident that instead of the determinations of space following from the positions of the parts of matter relatively to one another, these latter follow from the former. It is also clear that in the constitution of bodies differences are to be found which are real differences, and which are grounded solely in their relation to absolute, primary space. For, only through this relation is the relation of bodily things possible. Since absolute space is not an object of an outer sensation, but a fundamental concept which first makes all such sensations possible, it further follows that whatsoever in the outline of a body exclusively concerns its reference to pure space, can be apprehended only through comparison with other bodies.

A reflective reader will accordingly regard as no mere fiction that concept of space which the geometer has thought out and which clear-thinking philosophers have incorporated into the system of natural philosophy. There is, indeed, no lack of difficulties surrounding this concept, if we attempt to comprehend its reality—a reality which is sufficiently intuitable to inner sense—through ideas of reason. This difficulty always arises when we attempt to philosophise on the first data of our knowledge. But it reaches its maximum when, as in this case, the consequences of an assumed concept [that of spatial relations as subsequent to and dependent on the relations of bodies to one another] contradict the most obvious experience.

Science News-Letter, February 9, 1929

A stalagmite in Carlsbad Cavern, in New Mexico, is 62 feet high and resembles the Leaning Tower of Pisa.