

GENERAL SCIENCE

Faults of Science Application Lie in Lack of Morality

Skill in the Use of What We Discover Is Not Acquired in a Day, But This Skill Can Be Learned

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Sir William Bragg, Nobelist in physics, President of Britain's famous Royal Society and director of the Royal Institution, made this significant statement on "The Growth of Science", speaking as guest scientist on Science Service's Adventures in Science radio program over the nation wide network of the Columbia Broadcasting System.

THE WORD Science has come to mean a knowledge of nature, of the heavens and the stars, of the earth and all that it holds living and not living, and of all the forces that govern the constant changes that are to be observed in heaven and earth.

Science does not include the uses that we make of this knowledge, ships and steamengines and aeroplanes, X-rays and wireless and so forth. These are the applications of science which may be wise or unwise, charitable or selfish. The right use of science is a matter of morality and religion: science itself is knowledge only. The distinction is most important, because it is otherwise possible to blame science where the fault lies not in an excess of knowledge but in a lack of morality.

Science grows all the time. This is partly due to the natural curiosity of man, who loves to explore the unknown. It is a very great pleasure to unravel some mystery or to find some new thing in nature which has never been observed before. Another cause is the constant demand for more knowledge.

Specific Needs

The doctor wants to know the inner nature of some disease, or to solve some question in connection with the health of the community.

The manufacturer wants the explanation of some unexpected defect, or better still to explore the possibilities of new constructions.

The engineer wants better materials wherewith to build, the agriculturist wants to grow stronger and fuller crops, to fight against pests and the conditions of weather and soil, and so on, and so

on. Thousands of new items of knowledge are added to the world's store every day. There is no stopping the continuous increase.

It is to be remembered that each item can probably be used for many purposes, quite different, it may be, from anything in the mind of the discoverer or from any purpose he had, if he had one at all. The poison gases of modern warfare were not invented as such: they have long been known and used, and if they could be and were abolished there would be a serious interruption in the world's work.

It is cheerful and indeed helpful to look at the bright side. We observe the increasing health of the community, the gradual lessening of pain and want and distress, the increase in the opportunities for wonder and admiration as the marvels of the world are unfolded. The more we understand and appreciate the power that knowledge gives us, and the good that we can do with it, the stronger and more ready we are to oppose its degradation by mistaken or evil usage.

Let me mention one or two important and interesting directions in which science is advancing at the present time.

Study of Living Cell

I am inclined to head the list with the work that is proceeding in the region where biology and chemistry and physics meet, that is to say in the study of the living cell and tissues. Here strange discoveries are being made which will surely add to our understanding of the mechanical aspect of the living body, and enable us to improve our treatment of it.

Again, there are new methods by which it is possible to look down into the depths of the structure of metals and alloys, and to learn the origin of their very diverse properties. Of late years the science of metallurgy has been completely revised: and the novelty of its achievements is to be seen in the marvels of construction with which we are becoming familiar.

Of course, the wonders of electricity

never cease. In quite a different direction it is most interesting to observe the increase in the knowledge respecting the preservation of food: and naturally this is of first importance to the community. Is there anything more curious and interesting than the gas-storage of fruit? Or the preservation of food by choice of temperature? I need not give more illustrations.

Now comes the really important point. How are we to behave in the face of this growing knowledge of the world in its material aspects? I believe that most will trust to the observance of the fundamental rules of Christianity. I do not argue the question as to whether these rules are to be found in Christianity alone: that is outside my province today. Here is to be found the incitement to right action. After that comes wisdom, based on an understanding of the influence which natural knowledge has had and will have upon our lives. We have to acquire skill in the use of what we discover, and skill is not acquired in a day.

Must Learn Quickly

I believe that it is a mistake to lament that our troubles arise because morality is not growing fast enough to keep up with science. Morality cannot grow at such a rate. But if we give our minds to it we can acquire the skill which is wanted to make the right use of the growth of science: only, we have to learn quickly because science is growing so fast.

Science puts into our hands vast opportunities for improving the conditions that govern our lives. There is also good will in the world; far more I think than we might gather from what we read and hear; we should rather trust our everyday experiences with our neighbours. But wisdom and understanding are sorely lacking, and one of the greatest needs of the day is to learn how to make use of the knowledge we have gained.

It is to be remembered that speculation is not knowledge; speculation is necessary but must be kept strictly in its place. It is good when we use it to suggest the next step to be made: it is right also to remind ourselves that what we know is a drop in the ocean compared to what we do not know. There is a mysticism which is a confession of ignorance and is healthy: there is also a mysticism founded on uncontrolled imagination which may be dangerous.

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Mice age so rapidly that a two-year-old mouse is comparable to a man of 70.