

# Scientific Developments and Ethical Values

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**Abstract:** *After sharing some of his ideas on the nature and role of science, the author points out that in recent times the horizons of science have expanded considerably to extend beyond the traditional confines of pure science. This development, though most welcome, has serious unhealthy consequences, which calls for a greater sensitivity to the impact of science on society and a wider responsibility from the part of scientists. Rejecting the claim that science is value-free, the author emphasizes the need for developing an ethics of responsibility, and presents several helpful practical suggestions.*

- Editor

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## Introduction

The classical understanding of science is that it is a way of obtaining error-free knowledge about nature and natural phenomena. The classical understanding also claims that it has a distinct methodology, called the scientific method. As a human activity it springs from human's innate urge to know, to ask questions, to seek explanations, and to systematize knowledge in general patterns. The enormous success of organized scientific research of the last couple of centuries has given science a mystique and a distinct culture, with its own set of norms and values. This culture has been nurtured and shaped by a line of scholars who have been called the philosophers of science. The scientific attitude is the dominant hallmark of the intellectual temper of modern times.

## **The Expanding Role of Science and Its Implications**

However, science is not merely a body of knowledge or an academic discipline. Much more than that. It is a dominant controlling force shaping social arrangements and a way of life in modern society. This is mainly because of the close alliance between science and technology. Science is no longer a disinterested philosophical inquiry about the general laws of nature. Most of the scientific research is pursued today with technological and commercial applications in mind. In a large number of research projects scientists and engineers work together. The dividing line between scientific research and technology development is getting blurred. Therefore in the present context of exploring the ethical issues related to scientific developments we will make no distinction between science and technology.

The benefits of science and technology come to society through the process of industrial production and market mechanism. These are governed by the economic powers of the society. The guiding motivation of these powers is to maximize their profit. Science and technology become merely means to that end. Any benefit, which accrues to society in the process, becomes secondary to the primary object of profit making. This servitude of science and technology to the economic powers is one of the main causes of the serious problems of ethics and other human values created by them. Although their avowed aim is to serve the society, science and technology have become mere accomplices to the various manipulative, exploitative and unethical practices adopted by industry, trade and commerce. These include promotion of crass consumerism, creation of false needs, despoliation of nature, and dangerous degradation of the environment. Even in basic areas of human needs like agriculture, food production, health care, etc., science seems to be serving more the interests of the rich classes and the rich nations rather than those of the poor, the downtrodden and the underprivileged.

The second Master of Science and technology is the political power of the state. It controls the directions of scientific development through its regulatory policies and through direct funding of the scientific establishments and scientific research. What is to be researched, how and by whom, and how the outcomes of research are to be utilized, are

largely dependent on governmental action. The highest priority of the state is strategic defence research. The term is an euphemistic phrase for developing ever more lethal weapons of mass destruction. A whopping 80% of the world-wide research funding is expended for this purpose. Three fourths of it comes from the world's biggest military power. Such defence research is sought to be justified on the grounds of national security. Appeal is made to the patriotic sentiments of the scientists. To an extent these arguments may be accepted as valid. But it will be difficult to justify morally the competitive arms race provoked by despotic political rulers, and encouraged by peddlers and merchants of arms. Much worse is the mindless stockpiling of over-kill nuclear weapons, even at the risk of a nuclear holocaust.

An important factor inhibiting proper questioning of modern scientific developments on ethical grounds is the somewhat insular attitude of scientists towards the larger social, ethical and human dimensions of their profession. One reason for this is that the pursuit of science is a highly specialised activity. The areas of specialisation and super-specialisation are getting narrower and narrower. It is very much like Bernard Shaw's description of a specialist as one 'who knows more and more about less and less until finally he knows everything about nothing'!

### **Scientists and Social Responsibility**

As individuals most scientists are quite competent and devoted persons. They love their work and want to be left alone to pursue their researches. They hold science in high esteem and consider advancement of scientific knowledge as their sacred duty. Similar is the temper of those who develop technology and apply it for social and economic development. They are happy to provide the best technological solution to a given problem. Although commendable in itself, this inward looking attitude prevents scientists from examining the social and ethical problems created by their professional pursuits. In particular, they shake off any responsibility for the negative and harmful consequences of their work. When confronted with such issues they become defensive and indignantly point out that they have no control over the way their labours are used. It is up to the 'society' to check the misuses and misapplications of science and technology. In this way, they disengage themselves from

the society. One consequence of this disengagement is the prevalent attitude of moral neutrality towards the ends which their scientific discoveries and technological innovations are made to serve. To put it rather bluntly, scientists and engineers are ready to sell their knowledge and talents to the highest bidder, without asking any questions about the social and moral worth of their master's enterprise. This less than responsible, almost mercenary, attitude of the highly respected and admired community of scientists and technologists augurs ill for human wellbeing. It is perhaps because of this that Gandhiji described "science without humanity" as one of the seven deadly sins of modern times.

This does not mean that science and scientists should be made the whipping boys for all the ills of modern society. Certainly there are equally powerful economic, political and social forces controlling the course of human civilization. Ethical values play a minimal role in their ideologies and pursuits of powers. They ought to share a greater part of the blame for the monstrous problems facing contemporary technological age. But that does not mean that scientists can be absolved of their share of the responsibility. The existence of other factors only delimits the extent of scientists' responsibility. It is also not true that all scientists are insensitive to the distressing problems created by modern science and technology. Many of them have cautioned against indiscriminate and inappropriate ways of using science and technology. Some researchers have refused funding for weapons research. They have imposed voluntary ban on certain types of researches on human genetics. These are indicative of the growing concern amongst the scientific community about the harmful consequences of science and technology. However, as yet these are episodic voices from the fringes. They have not become strong enough to affect the course of scientific developments. Most of the ethical and human critiques of science and technology are externalist, i.e., from thoughtful persons outside the scientific community.

The important point, however, is not to apportion blame between different parties, but to seek effective ways to check the harmful impact of science on society. The first ethical canon of 'do no harm' applies much more forcefully in the case of scientific pursuit, as it has the potential to do harm on a much wider scale. Equally important is to channelise scientific research in those areas which contribute positively and directly

to human wellbeing. Scientists should be individually and collectively more sensitive to human needs and to human wellbeing than what they have been in the past. This human sensitivity should be reflected in their choice and conduct of research projects. It may mean working in those areas which are less prestigious, or which have lesser potentials for winning awards and recognition. The second ethical canon of 'do good' demands this kind of sensitivity and initiative from scientists. It means the social and human consequences of any proposed research work should be carefully examined before scientists commit their knowledge and skills to its success. Scientific and technological knowledge is power. This power ought to be exercised in a responsible manner for the benefit of humanity. This is the key concept of 'the ethics of responsibility' for the guidance of modern scientific and technological pursuits.

## **The Ethics of Responsibility**

The ethics of responsibility is the ethics of care and concern. It demands that scientists and technologists investigate all possible consequences of their professional work on different segments of society. This examination should be not only of consequences here and now but also of those which are likely to occur in distant lands and in the future. Many of the present day activities are causing irreversible damage to ecology. This would endanger the safety and wellbeing of future generations. Similarly, in exhausting non-renewable resources we deprive future generations of the chance to use them for their own benefit. Such issues call for the development of new ethical principles for reconciling the conflicting demands of the present generation with those of the coming generations.

The ethics of responsibility, care and concern should not be limited only to the human society, but it should also include all other living species, as well as the whole of the natural order. Science and technology have so far treated nature as a 'standing reserve' at our beck and call. It is looked upon merely as the source of raw material for industrial production, and as the ultimate dumping ground for all the wastes produced by the modern technological society. It is only when faced with serious environmental crisis that this callous attitude towards nature began changing. But the basic moral questions such as, "Do we have an absolute

right to use the nature the way we like?”, “What are our duties towards nature?” and “Why?” have not been adequately addressed. The emerging sub-discipline of environmental ethics should explore these questions in greater depth.

A newer area of scientific research, particularly in the life sciences, is throwing up a number of difficult ethical problems. For example, is it ethically right to tinker with, and even alter, the biological process whose long-term consequences cannot be known with any degree of certainty? What ethical norms should govern the use of animals in scientific research? How to reconcile the conflicting needs of advancing scientific developments and safeguarding the rights and dignity of the patients in medical science research? Some argue that life is created by God, and so we should not try to take over His role through genetic manipulations. Others reply that genetic research can give great relief to those suffering from genetic disorders and diseases. Is it right to deny them these advantages? Such issues cannot be settled on the basis of the old ethical concepts. The exploration of such issues has led to the emergence of another branch of applied ethics, bio-ethics. It needs to be pursued much more vigorously to refine ethical principles for the guidance of scientists.

The significance of examining ethical values related to scientific and technological developments has been realized only recently. It has prompted the growth of newer sub-disciplines of ethics like bio-ethics, environmental ethics, medical ethics, engineering ethics, etc. They are collectively termed as applied ethics. Contribution to these new areas are being made by philosophers as well as by scholars from professional disciplines. However, the ideas being advanced have yet to make a significant impact on working scientists, engineers, doctors and other practicing professionals. Their attitude towards their profession, as well as their value temper, is not yet being affected by the ethical norms and restraints being proposed by the new ethical thoughts.

To bring about the desired qualitative improvements, it is very much necessary that teaching of ethics and values be made an essential part of the education of scientists, engineers and other professionals. The objective of such courses should be to awaken the moral consciousness of the individual scientists, and to inform them about the larger social, ethical and human implications of their work. More

importantly, the studies should help scientists and professionals to acquire a conceptual framework for examining the ethical issues connected with their work and the capacity to make moral judgments on those issues.

The development of social and moral consciousness of individual scientists through education is a necessary step for promoting ethics in science. In addition, there are several other steps which need to be taken, one of them being the activism of collective bodies of scientists. For example, the recent initiative taken by the International Council for Science for evolving a code of ethics for scientists is a welcome move in the right direction. Ethical issues connected with science and technology should be regularly discussed and debated in scientific journals, and in all other fora of scientists. Furthermore, scientists should consider it a part of their duty to inform the public of both the potentialities and possible dangers of scientific developments. The collective bodies should also act as watchdogs and exert pressure on industrial corporations, policy makers and governmental bodies to prevent harmful application of science and technology. Scientists have a much better understanding of such matters than the general public and their voice on such issues will carry greater weight. The ethics of responsibility demands such activism from scientists.

Ethical issues are being raised and debated more vigorously in the western countries than in our own. This is quite understandable because they are facing the challenges of science and technology more acutely, and over a longer period of time. And also because it is they who have created most of these problems. The current debate on ethical values in science is of great significance to us now when science and technology are poised to play a much stronger and wider role in our socio-economic development. We can learn from the mistakes of the West and avoid the ethical pitfalls in the process of scientific and technological developments. Furthermore, we can seek better guidance from our own distinct worldview, its social and ecological wisdom, and its greater respect for nature and life, to make science a real boon for humanity.

## **Conclusion**

In conclusion we can say that the modern critiques of science demonstrate the falsity of the classical view that science is value free.

Science has become a powerful social force, and to advance human wellbeing it has become necessary to examine the social, human and ethical implications of modern scientific developments. Scientists cannot disengage themselves from such examinations. In fact, it ought to be their moral responsibility to do so, as they are best suited for the purpose. What is needed is to seek a change in the value-temper of scientists and technologists; to equip them with the capability for making value-analysis and value judgement about scientific matters; and to demand greater accountability for the consequences of their scientific pursuits.

**Note**

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