

THE NECESSITY FOR REVISING THE PROBLEM OF TECHNOLOGY TRANSFORMATION

Discussions made on the transfer of science and technology may be divided into three categories. First, the papers, and articles written by experts and specialists. Second, the articles that report the views and researches of philosophers as well as sociologists. And third, what exists as a plain combination of the materials of the first two categories, which is sometimes mingled with ideological interests. The contents of these articles are usually of general nature, the accepted ideas and thoughts. Still one may not say that the authors of the materials of the third category have not any impact on the process of the transfer of science and technology although the complete dominance of these authors over a society indicates the difficulty of recognising the importance of science and technology and also the inability of developing countries in the process of its acquisition.

If the articles of experts are actually reports on the experience of transfer, they will be informative and useful for those concerned with the transfer of science and technology. They can also be used as substance for research and speculation by researchers and thinkers. Those who give an account of their success and failure in their reports, show the people, who are looking for a way to improve their methods. They also make it easier to understand the problems.

People have always required experience and now need it more than ever. But the point that is usually ignored is the conditions of learning from experience. If we look at the history of science and technology and contemplate their problems, we may ask how and why two countries have begun learning and adapting science and technology at the same time are not now at the same level. It is wrong to import the technology and to use it without absorbing the knowledge that has been used for its production. In other words, the scientific aspect of a technology that is transferred into a country should be established, and with that aspect new technologies can be created and developed. That is to say that technology together with Science should be produced and exchanged among countries.

In our country the first college, namely Dar-Al-Fonun (Polytechnique), was established about 150 years ago. The aim of its great founder, Amirkabir, was to train students in applied sciences. This operated for some time but did not develop much and no step was taken for its development or the establishment of similar colleges. The problem was

PROBLEMS OF ADAPTATION OF MODERN TECHNOLOGIES ■ 71

the lack of a suitable approach to the science. Although the modern science is a performative and applied science and some authorities maintain that it has got all its legitimacy from its performative aspect. When science is viewed as a means, and where it is taken for consumption, it does not grow roots and neither does it fruit. That is, science is not a commodity to be bought from a market and to be used in any possible way.

The transfer of science and technology began in the early 19th century. Nevertheless, it was not until the mid 20th century that people asked how it was possible to do so, why it was not done in the way it was expected, and what were the preconditions for the easy transfer of science. Today, different answers are proposed for these questions. In principle, one cannot give clear and definite answer to such questions. Researchers normally list all cultural, social, and economic conditions existing in a country where science and technology have been successfully absorbed or adapted as appropriate conditions. We already know that in the early twentieth century, Max Weber found a relation between the advent of Capitalism and the Protestant reform. Nowadays religious believes are also considered as a precondition of technologic development in certain East Asian countries. The emphasis of Max Weber on the correlation between the advent of Capitalism and religious reform was justifiable. The Protestant reform did not create Capitalism. Instead, the moral, mental, and scientific revolution in Europe was realised in the form of Capitalism, new science and politics, human rights and the reform of religion.

These sort of misunderstandings are due to the belief that they consider science and technology as a collection of statements, methods, and instructions that can be thoroughly taught. They suppose that all people and countries have the same relation with science and technology, and that they can go through all the levels whenever they wish to do so. But those critics just see the teachable appearance of science and technology, and ignore its essence that should be established in the spirits of people, and so they consider easy the process of transferring science and technology. They also consider learning and using others' information as a deficiency and equal to mere imitation. Third, they are unaware of the fact that if science were imitative, it could not have any connections with technology; and if science were co-ordinated with other aspects of development, it would not be imitative, because imitation is a personal psychological characteristic. The

imitative science is based on individuals' psychology. The imitating society is the-one in which the link among people is weak or torn. The science that is effective in de-velopment is not only independent of people's psychology but is also one of the pillars of development.

If technology were attainable by granting licenses, purchasing certain technical facilities, and the results of a few researches, every developing country would then be able to have access to technology to some extent. We can hardly find a country that has not taken measures for buying technology. But as we know the degree of success has not been the same in all countries concerned.

Most societies and cultures are not equally sensitive towards technology i.e. all societies and cultures do not absorb technology to the same extent. In other words, apparently in the process of the transfer of science and technology, the receiving society is taken as a fix matter; and it is thought that technology can be brought into any society from the out-

72 • REZA DAVARI ARDAKANI

side and be implemented. Actually, if the receiving society is not prepared to absorb technology, whatever is brought in from the outside will be baseless, and may be wasted.

All countries use scientific information and communication technologies whether they wish to do so or not. Although, there is not much scientific and economic benefit in the use of information and communication technologies. No condition is needed for such a use of technology, or in case some minimum conditions are required. Certainly, this type of consumption changes people's lifestyle. It is not clear whether this change is in the direction of preparing the ground for the development of technology. Even if we are optimistic, we cannot ignore this strong possibility that the trend toward globalisation will result in the increase of unemployment and helplessness in the developing countries. In this respect, the main points are as follows:

The transfer of technology in the present world is a necessity, because no nation can restart the path of science and technology development which has taken 400 years. The modern Science and technology have never been separated from each other. And the reason why the relationship of research with technology had not been discussed until the early 20th century is that these two were proceeding together in a balanced and parallel manner. In the 20th century, and particularly within the World War I, the use of science for the invention of new technologies enhanced. Ever since, science and technology have been inclusively and clearly forming the world. The transfer of technology can facilitate development provided that there is a ground for them in the receiving country. Science and technology can not be transferred to everywhere. If the motive of the transfer is a mere economic one and the spiritual, scientific and official conditions are not prepared, the result will not be suitable. Usually the transfer of technology is accomplished on the basis of a plan, similar to a socio-economic development plan. Each plan should consider a balance. Designing such an order and balance is a difficult task, and its realisation is still more difficult. The characteristic feature of science is unity and unification. Wherever there is science, there must be room for the development of all types of science. Sciences need one another, and if the ideal of Descartes, that is the unity of all sciences, has not been achieved, at least one may say that there are apparent and hidden correlation and connection among sciences. If planning for development is done outside the atmosphere of correlation, or people do not feel this atmosphere, planning will not succeed. The transfer of technology usually begins with purchasing the license and through contracts made between countries and economic organisations. Governments and organisations of developing countries rarely consider the status of science and technology and the attitudes and views of their scientists while preparing the contracts.

Now that science has been changed into the information that is sold in the market, the transfer of technology seems easy. But the weak customers purchase things which satisfy their immediate needs. But the appropriate and successful transfer of technology is possible wherever there are scientific training and technical abilities at a desirable level. In many cases, the transfer of technology is done through foreign investment. If this investment is not absorbed within the production system of the country that receives the technology, and the investors control every affair of the foreign investment, the solitary island of technology will not be efficient in development. Hence, the transfer of technology is