

## **Lecture 28**

### **Science in Post-Independence India**

When the World War II ended in 1945, Germany, Italy and Japan lost and France was badly shaken. Even Britain had suffered tremendous losses and its economy was almost ruined. Thus, the colonial powers which had ruled the world and spread poverty, hunger and disease everywhere, were in no position to suppress people anywhere any more. The constant struggle for freedom in the colonial countries had also reached a high pitch. The result was that, one after another, more than a hundred countries of Asia, Africa and South America became free. The world was then gasping after being ravaged by the horrendous crimes and casualties perpetrated by the World War II. National economies of most of the countries were in shatters. International trade touched the lowest ebb. The War had shattered the old system, and a new world had been born, with an entirely different set of opportunities and problems.

The countries which had become newly independent had the tremendous problem of reconstructing their economy so that tolerable conditions of living could first be created for all their people. The old ruling countries, on the other hand, had to think of ways and means of continuing to drain the wealth of their erstwhile colonies. This was necessary to enable their business enterprise to continue making high profits so that they could maintain relatively high standards of living to which their own people had become accustomed.

Science and technology had to be deliberately employed by both sets of countries. The only difference was that the developing countries had to make a start from scratch-with hardly any institutions or people who could engage in competitive science and technology, whereas the advanced or developed countries now had a stronger base of science and technology than ever before. During the War great sums of money had been spent on developing nuclear science and the atomic bomb, on electronics as applied to radar and communication, and on advanced designs of aircrafts, submarines and other means of waging war. All other sciences were also in a much better position than before. This base of science and technology was to be used to the advantage of developed countries to regain the old glory and power. In other words, our struggle for “development” and their struggle for supremacy are two sides of the same coin. Science and technology played a pivotal role in this international competition.

The Indian freedom movement had been conscious that political independence was only a stepping stone to economic independence. Our leaders had realised that our decisions about industry and trade would have to be taken by us alone without compulsion of foreign governments or their business counterparts. And that our economic development

would have to serve the people and meet the minimum needs of their food, health, shelter, education, culture etc For this, we could not leave economic development to chance, or to the purely profit motive on which private industry and trade operate, their natural tendency being to produce what can sell, rather than what is needed in our social context. Therefore, an essential part of our approach to development was to plan our economy to bring about maximum human satisfaction combined with growth.

The role of science and technology was crucial for this endeavour and this was clearly expressed in the "Scientific Policy Resolution" adopted by the Parliament in 1958. This resolution was drafted and piloted through the Parliament by our first Prime Minister, Jawaharlal Nehru. In the words of this Resolution:

The key to national prosperity, apart from the spirit of the people, lies, in the modern age, in the effective combination of three factors, technology, raw materials and capital, of which the first is, perhaps, the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources, and reduce the demands on capital. But technology can only grow out of the study of science and its applications.

Since Independence, and particularly after the passage of the Resolution, a great expansion of science and technology in both education and research has taken place. The situation today is far different from what it was in 1947. We have now about 200 universities including 6 Indian Institutes of Technology, over 800 engineering colleges and 110 medical colleges, a few hundred scientific research laboratories under the Central and State governments, as also R&D units in private industry. Research is king done in almost all areas of modern science. The conspicuous success of our scientists in atomic energy, space research and agriculture is well known.

The funds allocated to research have also vastly increased over what they used to be 60 years ago. But in the modern world, it is not enough to be in the forefront of creative science or innovative technology. Out of the total world expenditure on research, excluding the socialist countries, 98% is spent by the developed countries, the old imperial powers. Only 2% is spent by all the developing countries taken together. In this, India's share may be half a per cent. Moreover, since the developed countries have better facilities, better opportunities for scientific work and higher standards of living, a fairly high proportion of our talented young people migrate to those countries. They are, thus, unable to contribute towards national development by solving our problems through science and technology. New discoveries and new inventions, therefore, still come from the advanced or developed countries. p i s position does not seem likely to change in the near future.

A new feature of the world since the Second World War is the armaments race. It started with the Americans dropping the radically different weapon, the atom bomb, on Hiroshima and Nagasaki in Japan. Since then, modern bombs, each equivalent to a million tons of the old explosive, were developed both by the US, the then Soviet Union and other nuclear powers. Nuclear powers have missiles which can carry the bombs to targets half way round the globe. Each offensive weapon has led to a new defensive system. There has also been a race to obtain bases in other countries. A dangerous aspect about nuclear weapons is that these could be triggered off even by mistake. and could destroy all civilisation. Thus, we can see that the security of neither of these countries has improved. In fact, many other countries are drawn into the race because weapons of one country have to be matched by another. It is calculated that the world is spending more than Rs. 1,00,000 crore per year on armament and the developing countries are spending about 20% of this amount, much of which goes to buy weapons from firms in the developed countries.

Imagine such a lot of money, representing human labour, being wasted year after year. Naturally resources for development are diverted to "security". On the other hand, people in underdeveloped countries are still largely illiterate and deficiently served in basic requirements of life, such as food, drinking water, medicine etc. Interestingly, it is said that the arms race has led to huge profits being made by a small number of firms, and it is designed to suck away the resources of developing countries so that their dependence on foreign loans, technologies and strategic policies is increased. The more sophisticated the weapons are, the more is our dependence on the advanced countries.

Surely, this is neither a happy situation nor a stable one. The power of science has reached such a pitch that international relations have to be readjusted, and national effort has to be recast so as to bring about the benefits of science to the lives of common people.