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It is an honour and a pleasure to visit the Shivaji University and to participate in the Annual Convocation. The University was founded in 1962. It is located in a city of great historic fame and charm, and it bears a name which is one of the greatest in our history. It is no easy thing to set up and organise a new university. It makes great demands on the resourcefulness, initiative, imagination and energy of the Vice-Chancellor, and of the teachers and students. In a university we all are 'Students'-a teacher is a life-long student. The University has been fortunate in its Vice-Chancellor who brings to bear on his challenging task, wide experience and understanding, and, above all, a spirit of dedication. The University has made commendable and encouraging progress in academic as in other fields. The system of "gram shibirs" organised by the University is a project which has immense possibilities, and this is equally true of the Shivaji Vidyapeeth Vidyarthi Kalyan Mandal. The results achieved by the Shivaji University will be of great interest and value to other universities in the country. May I express the confident hope that the University which has made such an auspicious and encouraging beginning will, in the years to come with the devoted effort of its teachers and students, make a notable contribution to higher education and research and to the progress of our country generally, and come to occupy a leading place in the community of universities.

To the young men and women who have received today their *degrees* and academic distinctions, I offer my warm felicitations. I wish them a happy and purposeful life, and faith and courage in the pursuit of great ideals. I trust they will make a worthy contribution towards the progress, prosperity and security of our country. Education does not end with graduation. It has and ought to continue throughout life. Says an old proverb, "a man who has lost the inner urge for knowledge is just one mere stone standing on another."

India in ancient and medieval times had great centres of learning held in the highest esteem throughout the known world. It is a curious fact of history

that these celebrated institutions fell into decadence at about the same time as universities started to emerge in Europe, particularly in Italy, in the 11th century. There was a gap in our country of some six centuries separating the ancient indigenous universities which faded away about the end of the 12th century and the setting up by the British Government, in 1857, of the universities at Calcutta, Bombay and Madras. I may mention incidentally that the medieval term 'university' derived from the Latin word '*universitas*' meant a corporation of persons engaged in the pursuit of studies. It did not imply, as is wrongly assumed sometimes, that a university aimed at universality as regards the range of subjects studied. "The notion that a university means a *universitas facultatum*- a school in which all the faculties or branches of knowledge are represented-has indeed, long since disappeared from the pages of professional historians. "But it still lingers on as one of the popular errors about the academic world. To cover within the compass of a single university all possible subjects of higher learning was as impossible then as it is today. It is essential for the success of a university to concentrate its effort on a few carefully selected areas of study in relation to the interests of its teachers and the needs of its students.

I mentioned about the ancient universities in India. The world famous universities at Taxila, Nalanda, Vikramasila, Kashi, Ujjain and Ajanta, to name a few, flourished over many centuries and maintained a continuity of great scholarly tradition. Taxila was distinguished specially in medicine, Ajanta in practising arts, Ujjain in astronomy and Nalanda in Buddhist studies. A somewhat detailed description of the Nalanda University is available, based on the writings of Chinese pilgrims. The University, in the days of its glory, Had some 10000 students, 1,500 teachers, 100 lecture rooms and large blocks of dormitories, big observatory buildings, and great libraries. The procedure of selecting students for entry to the university was rigorous and elaborate, and only some two or three out of every ten succeeded in securing admission. Students were given free tuition, board and lodging. The majority of students stayed for 12 years, but some stayed for much longer periods. Discipline was strictly enforced and observed. It is said that "a student found guilty of any serious breach of discipline had to wear for a whole year the skin of an ass, with the tail turned upward and had to go about

begging and declaring his sin.” A motto of the Nalanda University proclaimed : “ Con-quer anger by pardon, conquer a bad man by good deeds, con-quer a miser by giving him more, and conquer a liar by truth.”

The universities in our country established over the last 150 years, in spite of their being alien implantations (even the gowns and hoods proclaim that) and originally set up to trans-mit western science and culture, have played a notable role in the country’s history. Yet, a role far greater and more crucial lies in the future. And, if the universities are to fulfil their vital role in the life of the nation, they must be close to the people, close to their needs and to their aspirations. We have to make a serious and sustained effort to raise the quality of education. Much greater attention than hitherto has to be devoted to science and technology, and also to the study of Indian langua-ges and literature, Indian thought, philosophy and culture. Ramendra Sunder Trivedi, a distinguished and percipient scholar, said in his memorandum to the Sadler Commission (1917-19) : “Western education has given us much, we have been great gainers : but there has been a cost, a cost as regards culture, a cost as regards respect for self and reverence for oth-ers, a cost as regards the nobility and dignity of life.”

Knowledge in the modern world is growing and expanding at a terrific pace. It is well recognised that the doubling period of world science and technology is ten years or so. This means that ten years from now the new knowledge gathered over the next decade would be comparable to what has been accumulated over the preceding several centuries. Once a country has reushed a “take off” stale insaience, things, Ihihgs directly linked with science and technology-such as the number of scien- tists and engineers, the number of scientific publications, output of electricity-grow with a doubling period of about ten years. We do not quite understand why the doubling period should have this value. A doubling period of ten years corresponds to a compound growth rate of seven per cent per year. A country which joins the scientific race late, like India, could, with determined effort and dedication, achieve a faster rate of growth.

A -consequence of the science-technology-based world is that for the first time in man’s history the world has got divided into a poor part and a rich part. In the rich countries the average span of human life is about twice that in the

underdeveloped world.

The economic gap between the rich and the poor countries is not only dismally large, but is growing wider with the passage of time. As an instance of the frightening gap between rich and poor countries, we may notice that in India today the expenditure on all levels of education and research is about two dollars per capita per year; the corresponding figure for the U. S. A. is \$300. By the end of the century the Indian figure may go up to \$20 per person per year, whereas the U. S. A. figure will certainly rise to δ 1,000 per person per year. The wide gap would be wider still.

Japan provides an illuminating example of what can be done if a country has the determination and discipline to harness science and technology for its development and welfare. During the post-world-war-II period, Japan has achieved an extremely high rate of economic growth of nearly ten per cent yearly rise in its GNP. (The yearly growth rate after allowing for price inflation was 12.8 per cent in 1963, 9.9 per cent in 1964 and 4.3 per cent in 1965; the average for the 10 years, 1956-65, being 11.5 per cent.) This is a near miracle. Within a generation Japan has transformed its economy from an 'under-developed' to a 'developed' level. It has increased its per capita GNP from less than δ 100 to above δ 600, a sevenfold increase in 15 years. The special attention paid by Japan to technical and general education has been a very significant factor in this 'transformation. Japan ranks third as regards the number of students in higher education per unit of population, though in terms of per capita income, it does not fall within the top twenty countries. Uchida (*Scientific American*, November 1966) has observed that China with its stress on technology and industrialisation, and with luck, may in 10 to 15 years attain a per capita income equal to Japan's present figure (5620). The Chinese explosion of a thermo-nuclear device is a technological feat of a very high order; and the synthesis of insulin provides example of a superb piece of fundamental work.

Science and technology are universal, and in the development of a country, borrowing of advanced technology from developed countries can play a major role in hastening the process of indigenous development. It is interesting to observe that in 1965 Japan paid to other countries \$1 66 million in licence fees; as against this, the export of its own technology earned δ 13 million from other

countries. In the case of the U. S. A., the receipts for 1961 were δ 577 million and payments to other countries \$ 63 million.

Incidentally, in advanced countries (and India is on the way, a long way, to become an 'advanced country') crime also gets linked to science and technology, and shows a growth rate comparable to the growth rate of science. Thus, so reports James Barrenbarg, Executive Director of U. S. President's Commission on Law and the Enforcement and Administration and Justice (*Machine Design* April 13, 1967), that in the U. S. A. almost half of all males living today will be arrested in their life-time. Another authority points out that at the rate the crime is increasing "every person born by 1970 could expect to be the victim of a serious crime-could expect to be murdered, robbed or suffered an aggravated assault by the time he or she reaches the age of 60". No doubt, long before this could happen, the growth rate of crime is certain to slow down, and I fervently hope that this will happen before there is a decline in the growth rate of science.

So rapid is the progress of science that a young man receiving a Master's degree in a modern subject is nearly obsolete on the day of his graduation. A degree like a passport would need to be revalidated every five or ten years. A research paper, if a good one, is often out-of-date on the day of its publication. An expensive research tool is out of fashion by the time it is procured.

The great philosopher A. N. Whitehead said : "in the conditions of modern life the rule is absolute : the race which does not value trained intelligence is doomed." We are now passing from the stage when university education was confined to a few the elite to a situation where an appreciable proportion of the population goes in for it. This is necessary to meet the increasing needs of industry, and industrialisation of agriculture, and welfare services, and demands of security and defence. Though expenditure on education now constitutes a few per cent of the national income, very little is known about the efficiency of the educational process. There has not been much serious study of the process of learning and teaching, of the utilisation of educational facilities, admissions, examinations, and so on. Take the question of university admissions. The assumption is often made that with enough care and effort it should be possible to select the "right" students. Yet, as Sir Eric Ashby observed in his recent Presidential Address to the

British Association for the Advancement of Science : “ There is no right way and it is vain to seek one.” Another matter of great interest and importance, whose real educational significance needs serious study, is the pupil-to-teacher ratio in the universities and colleges. It is about 17 in India. The corresponding figure (for 1960) for U. K. is 8, for France 30, Germany (F. R.) 35, Sweden 12, USA 13 and USSR 12.

We should make more effective use of laboratories and libraries and classroom space than is generally the case in most universities and colleges. All these and related questions need careful study and examination. Discussion of educational problems is often vitiated by our expressing the same old prejudices and preconceived notions but in new terms and at times giving them a pseudo-scientific gloss.

In dealing with any proposed change or reform in education, it is important to be clear about the aims and goals which it is proposed to achieve. If the purpose of an educational reform is to raise the quality of education, to increase educational opportunities open to children, then the success of the reform should be judged by what it achieves in relation to the criteria laid down. The evaluation has to be done as objectively as possible, and ruthlessly. Education in the modern world is so vital to economic development, cultural progress and national security, *so vital to survival itself*, that in dealing with education one has to be extremely careful and realistic; and to endeavour relentlessly to obtain the maximum yield from the available resources. When tests of progress or success are not carefully formulated in advance, a proposed reform may be no more than a waste of resources.

Knowledge is vitally important; but if it is to transform society from a state of relative stagnation to one of dynamism and progress, there must be a general willingness and determination to make use of it in the service of the community. In a developing country it is most important to strengthen the universities. We need strong and progressive universities. These should be not only vigorous centres for imparting and advancing knowledge, but should also promote in their members a sense of social responsibility and identification with the community. *Knowledge and commitment must go together.* In this context, what

Sir Eric Ashby, one of the most eminent of contemporary educationists, says with regard to the new African Universities is of much more than passing interest in relation to our own situation. He says (*African Universities & Western Tradition*, Harvard University Press, 1964) : “For an African the impact of a University education is something inconceivable to a Euro-pean. It separates him from his family and his village (though lie will, with intense feeling and loyalty, return regularly to his home and accept what are often crushing family responsibilities). It obliges him to live in a Western way, whether he likes to or not. It stretches his nerve between two spiritual worlds, two systems of ethics, two horizons of thought. In his hands he holds the terrifying instrument of Western civilisation: the instrument which created Jefferson’s speeches, the philosophy of Marx, the mathematics and chemistry of atomic destruction. His problem is how to apply this instrument to the welfare of his own people. But he has no opportunity to reflect on this problem. For one thing, the gap between himself ‘and his-people is very great.....’ in our time,’ Dr. Nkrumah once said, ‘ the universities are looked upon almost as if they were the heart of the nation, essential to its life and progress. ‘ Yet, although they are “ the heart of the nation,” the universities and their graduates are isolated from the life of the common people in a way which has had no parallel in England since the middle ages. This is the peculiar dilemma of the African university.” These are wise and powerful words, and they apply to us no less.

A university is a society of teachers and students dedicated to the pursuit of learning. It is, above all, a dwelling place of ideas and idealism. And the contribution that the universities and colleges in our country will or can make to meet the great challenge of our times will be in direct proportion to their being and becoming, in pursuit of their true ideals, places where there is freedom to inquire boldly and readiness to doubt courageously, where knowledge and understanding and true humility go together and grow more and more, and where the highest standards of scholarship, integrity and conduct are expected, respected and cultivated.

