

THE ITALIAN UNIVERSITY IN THE 90's

This is a particularly opportune time to conduct a discussion about Italian universities and the objectives of university education. There are at least two reasons for it, one external and one internal. The last two years have seen unprecedented changes in the world. Communism both as an ideology and as an instrument of government has essentially collapsed. The Soviet Union has disintegrated in front of our eyes. We painfully understand that the liberation of Eastern Europe is only a very preliminary and short step towards democracy and economic stability and a rigidly centralized economy cannot be transformed into a market economy overnight without causing extraordinary social dislocations. There is an equally profound change taking place in the so-called developed world. Briefly put, this change has to do with technological change and the resulting transformation in the processes of production. This change is being fuelled by extraordinary progress in materials science which makes possession of natural resources somewhat less important, semiconductor electronics and the information revolution brought about by the coupling of networks of computers and telecommunications, which in its turn permits the formation of a global communications network for the transmission, processing and control of information without regard to geographical boundaries. A company like IBM may have its headquarters in New York, carry out its research and development in Tokyo and have its production facilities in Thailand. The economic fortunes of one country is inexorably linked to the economic conditions of the rest of the world.

In this new economic world order, competitive advantage comes primarily not from the control of natural resources or even capital but from control of knowledge and the control of sources of knowledge. In the first instance, this is scientific and engineering knowledge, both fundamental and applied, because each stage in the processes of production will become crucially dependent on this type of knowledge. Operating these processes of production will require people in possession of this knowledge in varying degrees of detail and sophistication. In effect the concept of labour, be it capitalistic, social democratic or marxian will change radically. Many fewer people will contribute to the dominant "value-added" portion of the economy and the dangers of creating a large

underclass, the signs of which we already see in the western world, are very great. To manage this transformation without destroying the social progress that has been made in this century will require knowledge that derives from the humanities and the social sciences and from their rapprochement with science and engineering. If this scenario is even partially correct, the causal link between education and economic and social progress becomes very direct. In particular universities, which have as their primary function the creation, fostering and transfer of knowledge through education and research assume a pivotal position in this scheme of things.

Let me now consider the other major reason for a discussion about the university at this time. After years of deliberation some sort of reform of the organization and structure of the Italian university system is taking place. This reform is about things like financial autonomy, organization of the faculty and instituting a three year undergraduate degree. They are necessary but the reforms should not and cannot stop here because these reforms by themselves cannot deal with the fundamental changes in the world that I have tried to describe in the previous paragraph. The important discussion about the role of the university in a modern technological world and the education it will have to provide in the nineties and beyond has yet to take place in Italy. Such a discussion is taking place in the United States where it is now recognized that there is a crisis in education at the school level and that universities are not immune from its effects. Furthermore the explosive growth of knowledge in the scientific and technological disciplines and the increasingly intimate relationship between science and technology and economic development necessitates a rethinking about the nature and scope of undergraduate education both in the scientific and humanitarian disciplines. Rarely does one see a discussion of these issues in the Italian press. It is doubtful that newspaper articles providing superficial comparisons about the relative superiority or inferiority of American university education vis a vis Italian university education serves any useful purpose. These comparisons ignore facts, such as that not every university in America is of the quality of Harvard or MIT (my own institution), do not discuss the different societal and economic frameworks in which American and Italian universities operate and do not make precise whether the comparison is based on an examination of undergraduate education or graduate education and research. The reality of the Italian university system is complex and a simplistic examination of this institution is likely to lead to erroneous conclusions.

Any discussion of the university and the objectives of university education can only be based on an agreement, at least in broad terms, as to what the definition of a well-

educated person is. I would like to suggest that for a person to be called well-educated, at the end of four years of university education he should have, firstly, enough knowledge of his cultural heritage and tradition so that he can situate himself in society and understand how his culture got to be what it is today. This means understanding the historical, literary, social and political foundations underlying this culture. Secondly, he must have enough knowledge of the natural sciences so that he can understand the physical world in which he lives. This requires a certain knowledge of physics, chemistry and biology. Thirdly, he must have some understanding of the economic and social forces directly shaping his life. This means that he must have knowledge about the fundamentals of economics. Fourthly, and most importantly, he must be able to think critically and logically. The discipline that provides the foundations of logical thinking is undoubtedly mathematics. The mathematization of technology and even daily life through the presence of computers in many aspects of modern life makes mathematics an even more critical element in education. Finally, to unify and make sense of all these disciplines is the task of philosophy. The student should have some understanding of the main currents of philosophy mainly to get an appreciation of how philosophers throughout history have tried to deal with this question.

What I have described in the previous paragraph might constitute a blue print for a liberal undergraduate education in a first-rank American University. In the Italian context the student will receive part of this education in a pre-university setting. Thus university education in Italy is more discipline-oriented and specialized and not strictly comparable with undergraduate university education in America. The situation is somewhat different in the professional schools such as engineering and law, where a direct comparison is much more valid. At the risk of oversimplification, one can make the statement that an Italian student at the end of four years of university education is a better educated person than his American counterpart, primarily because of the superiority of the Italian school system. Whether an Italian engineer graduating from a top Italian university is better educated in engineering than a student graduating from MIT, say, is much more debatable.

The modern university in addition to providing basic undergraduate education has the additional function of creating and disseminating new knowledge through research. Four years of education no longer provides a student adequate preparation for doing this. The necessary additional preparation is provided through graduate education. The integration of graduate education and research is very much an American creation and there is nothing comparable to this in quality anywhere else in the world (I qualify this statement

by adding that I am referring to graduate education and research in the best American universities). It is graduate education and research and their connections to undergraduate education that needs significant strengthening in Italy. The American model should be carefully studied but it will have to be adapted to Italian conditions. While thinking this through the role and function of CNR and how national laboratories and universities are going to meaningfully cooperate needs a complete rethinking

I have tried to argue in this article that in the new world economic order in which countries have to function, the primary resources are people and knowledge and a country which does not recognize this and does not invest in education is unlikely to prosper materially and spiritually. But investment in terms of money is not a sufficient condition for success. Looking at Italian universities, their problems of infrastructure, bureaucratization and professorial appointments on the basis of an outmoded system of national competition are well documented and certainly action at the ministerial level in Rome is needed if this situation is to improve. The important question here is why, in spite of adequate recognition of these problems, significant change does not seem to come about. The standard argument which lays all the blame for inaction on the Italian political system cannot withstand rigorous scrutiny. I believe that the Italian professorial class must take its fair share of responsibility in perpetuating the status quo, and must recognize that significant change can only come from "within" the university. I want to emphasize that local initiatives which lead to a substantial discussion of the points raised in this article are essential for creating the necessary dynamics for change at the national level. New institutional structures which permit supporting and encouraging young Italian researchers working in subjects which cross the boundaries of traditional disciplines are needed. Individual universities should move quickly (the economics of time is not something that is always appreciated in Italy) to form these new institutional structures. Finally, Italy should move by recognizing its major strength - the existence of one of the most well-educated populations in the world.