Similarities and Disparities in Europe

In the past ten years, most industrialized and semi-industrialized countries have evolved their own national science policies. But attempts to compare policies or even to compare the levels of resources devoted to science and technology in different countries are hampered by lack of data and by the lack of internationally accepted definitions of terms. The latest in the series of UNESCO science policy studies (*National Science Policies in Europe*, UNESCO, £2·85), however, represents one of the boldest attempts so far to put national science policies into a form in which international comparisons can be made. Twenty-six different European countries, including the USSR, provided descriptions of their own science policy machinery, in a standardized form and using the same terms.

The first conclusion to be drawn is that the chief argument used by most countries for developing a national science policy is that scientific and technological research should be geared more effectively to national goals, but that these goals are often ill-defined. There also seems to be a trend, at least in the more highly developed countries, away from regarding economic growth as the only goal to aim for, and towards using science and technology to solve social problems.

Perhaps the most striking difference in the scientific activities of European countries lies simply in the level of expenditure on science and technology and in the human resources which are engaged on research and development. Table 1 shows the total manpower engaged on research and development, together with the expenditure on research and development as a percentage of gross national product, of a few European countries.

Table 1. EXPENDITURE AND MANPOWER ENGAGED ON RESEARCH AND DEVELOPMENT (1967)

Country	Total manpower in R&D	Scientists and engineers per 10,000 inhabitants	Expenditure on R&D as per cent GNP	Expenditure on R&D per head of population ($US)
Belgium	20,957	21·9	0·93	18·96
Bulgaria	37,360	45·3	1·36	6·40
Czechoslovakia	130,874	91·5	3·59	38·46
France	184,519	37·2	2·17	47·81
Germany	207,384	35·9	1·91	40·00
Greece	2,729	3·2	0·17	1·31
Hungary	31,378	30·7	1·43	9·50
Italy	49,939	9·5	0·67	8·54
Netherlands	50,200	39·8	2·26	40·88
Norway	8,063	21·3	1·07	23·67
Poland	145,903	45·7	1·79	10·58
Spain	12,988	4·0	0·22	1·89
Sweden	25,049	31·8	1·37	41·56
Yugoslavia	29,862	15·1	0·74	2·98

There are clearly wide disparities in the level of activity in science and technology in Europe, but the most striking discrepancy is the level of expenditure per scientist engaged on research. This varies from $5,300 a year in Greece, to about $44,000 a year in Czechoslovakia, and it throws into relief the considerable differences that exist between the working conditions offered to research workers in different countries of Europe.

Considering the haphazard way in which most national science policies have evolved, the UNESCO report brings out a surprising similarity in the way that many European countries plan their science and technology. In most countries, for example, there is an inter-ministerial committee for science and technology which usually meets rather infrequently to consider budgets for research and development and to decide on priorities for research programmes. The annual budget is also usually the chief regulator of the scientific effort. But it is in the coordination of science policy at the national level and in the nature of the advisory bodies for science policy that many European countries differ.

The chief difference is that some countries prefer to entrust all the functions of policy planning and co-ordination to a single body—usually called the National Council for Scientific Policy—while other countries prefer to spread these responsibilities out among several national bodies. The argument for the former arrangement is that it gives greater homogeneity to the science policy and also increases both the speed and the effectiveness of the activities. On the other hand, countries which spread the responsibilities among several agencies maintain that science policy is an integral part of national policy as a whole, and it should be formulated and carried out by the bodies which are concerned with other aspects of national policy.

As far as advisory bodies for science policy are concerned, the UNESCO report suggests that there are again two chief categories. Some countries, such as Hungary, Italy and the USSR, prefer their science policy advice to originate from committees of the central science policy body, and it therefore forms part of the overall machinery for preparing the various projects to be considered by the government. The chief alternative is the system adopted by, for example, France, Spain, Belgium and the UK, in which policy advice is submitted directly to the government by independent advisory bodies.

Nearly all the countries which sent in descriptions and remarks about their national policies at least paid lip service to the benefits of international cooperation in science. The USSR, for example, said that it regards international cooperation as "an essential condition of scientific progress and one of the most important ways of improving international relations", and the UK report emphasized that international projects "can lead to important economies in research expenditure in the sense of getting better value from available resources". But there are clearly several constraints on the level of international cooperation. Among these are the difficulties of decision-making at national level—individual countries often seem to have difficulty in deciding on the best areas in which to participate at European level. There is also the problem of finding the best form of management and decision-making at European level for a joint project.

Several countries, including the UK, also point out that there should be no increase in the number of international institutions because the expenditure entailed in this form of cooperation is often too heavy, and it does not usually yield good results.