

STUDY OF ENVIRONMENTAL SCIENCE AT BRITISH UNIVERSITIES*

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Dr. Vlavianos-Arvanitis rightly comments that one of the key ways forward in the problem of bio-education is through curriculum revision at all levels in education. In this I am convinced that she has taken us to the nub of the problem: the time for generalities is over and we all need to look at the day-to-day problems and at how biopolitics can contribute practically to the future.

In looking at the way forward, it is often constructive and instructive to look at past achievements for guidance on how best to approach the difficulties we face now or even what mistakes we should avoid in solving the problems of today. With this in mind, I thought it might be useful to look at the way the study of the environment has developed in British universities and in particular at the contents of undergraduate courses leading to a degree in Environmental Science.

There are currently 12 universities in Britain offering Environmental Science degree courses, nine in England and one each in Scotland, Wales and Northern Ireland. The location of each university offers its own unique opportunities for specialisation deriving from the immediate surroundings ranging from urban pollution to coastal management, land use conflicts, moorland conservation and water resource planning. The various courses provide a diversity of options over and above the broad basic training provided by all the courses. A number of these degree courses were established between 1964 and 1985, the first was at the University of Lancaster in 1964, but most were created during the 1970's.

Three main factors contributed to the establishment of these courses over the past two decades. Firstly, there was some reaction in academic circles against the long established tradition for intensive specialisation at university within one selected subject or field. This intense specialisation endangered communication between major subject areas and even within subjects. Even with subjects such as physics or chemistry this is serious enough but in the study of the environment, specialisation and compartmentalisation is simply unacceptable. Secondly, it was becoming obvious that the acceleration of environmental and cultural change in modern urbanised industrial societies and agricultural intensification in rural areas were creating new environmental problems which demanded new solutions. These were best found in inter-disciplinary training courses, lying diametrically across the earth sciences, the physical sciences, the biological sciences and the social sciences. Thirdly, and particularly important and relevant to Britain was the creation in the 1960s of new universities. In addition to the creation of new universities, the established universities were also being encouraged to expand and the time was clearly right for innovation. The academic response was spontaneous and swift, almost as though 'invisible colleges' of environmental scientists pre-existed. This sponsored a wave of new developments. Student response was equally enthusiastic and discerning and nowadays the Environmental Science courses are well established in British universities with associated courses at the M.Sc. and Ph.D. level.

It is appropriate and in tune with these factors which encouraged the creation of the courses that the established methods of teaching science at the universities were not considered appropriate. Instead the Environmental Science courses are taught by regular student participation in project work and problem-solving exercises, both individual and team-based. This style is in tune with current trends in education from school level upwards and also with present and future trends and teaching priorities within the British university system. Real-world local debates or conflicts on environmental issues can be the subject of workshops which can seek out the scientific evidence for and against alternative solutions.

An important feature of the planning of higher education in Britain is the link with a student's vocation afterwards. As we cannot teach environmental studies in isolation, so we must recognise that for the student, this study equally needs to be integrated with the world outside. The motivation to study environmental problems in vocational terms expresses twin objectives. Firstly, there is the wish on personal and aesthetic grounds to improve appearance, state and management of environments, promoting beneficial policies and removing sources of degradation. Secondly, there is the desire to become professionally and technically qualified to achieve the first objective either by involvement in environmental management or by developing the environmental aspects of conventional employment, as for example in environmental health, or through educational means, for example teaching or by carrying out research in aspects of environmental science. Greater environmental awareness and greater employability are the rewards of these university courses and both aspects are equally important.

This approach naturally leads on to liaison with outside organisations and here there is frequent contact between the undergraduates and government departments, industry, local authorities and water and conservation bodies. In addition, liaison also occurs with research institutes such as the Institute of Oceanographic Sciences and the Forestry Commission. Indeed, environmental science students are encouraged to take a year out from their undergraduate course and to spend this year in suitable employment. Most students spend their third year in this way and

gain valuable experience and maturity, inevitably expressed as a better degree and quicker access to the right job. This policy is in tune with the current trend for the universities and industry to achieve higher levels of cooperation in training and financing the managers, technologists and planners of the future. The most successful people in the future will be those who can switch from one job to another without excessive training and the broad inter-related environmental science course is an ideal base for these managers.

The two major ingredients of environmental expertise and environmental management are both essential and complementary in the environmental science course. Both are represented in all the university courses with varying emphasis not only between but also within them. The various courses at different universities give different emphasis to different aspects of environmental study and it is important that students look closely at the best course suitable for their particular qualification, interests and career intentions.

The aim is to provide a unified course to comprehend the rural environment, especially that of rural Wales including its origins, resources, development and management.

The course at Bradford differs in that it aims to understand how human activity both affects and is affected by environmental processes. The aim is to present a synthesis of the biological, chemical and cultural processes in the environment, together with earth science. Human ecology occupies a major proportion of the final two years, together with a study of industry, environment and planning.

The third University, that of Coleraine in Northern Ireland, focuses its environmental science course on a study of the earth's natural resources and leads to a focus on the environment and resources of the biosphere and the earth's crust.

King's College in London has two courses: one in human environmental science and the other in applied environmental science. This concentration on the aquatic and atmospheric systems of the earth together with applied earth sciences is also the main theme at the University of Lancaster and at Queen Mary College in London, whereas the course at Sheffield related to the range of habitat and land uses around Sheffield itself. At Southampton, a major port, the emphasis is on water in the environment and allied topics such as sedimentary environment, while further in the North at Stirling attention is focused on the face and near-surface environments of the earth.

These courses are steadily becoming more popular, both with the growing awareness of environmental problems and with the increasing opportunities within government and industry for those with such training and background. The scope of employment opportunities for those who have studied environmental science is a clear demonstration of the value of these courses. Those who take up posts in the government, or in land agencies for example, contribute immediately and positively to the problems we face; those who remain in teaching either at university or at secondary level contribute equally positively but on a longer-term basis. The support of biopolitics for education is support above all for the teachers who are laying the foundation now for those who will contribute to conservation in the future.

Education in all its aspects is not a peripheral subject, it is at the very heart of biopolitics, and it is appropriate and right that we should be devoting our attention to this important subject today.

Dr. **Robert T. Taylor** is the British Council representative in Greece. He holds a B.A., M.A. and D.Phil. from Oxford University. He has been a research associate and Fulbright Scholar at the University of Michigan, and ICI Research Fellow at the University of Liverpool. He has travelled to India, Spain and Mexico as the British Council representative, has contributed to Chambers Encyclopaedia and has published many papers in scientific journals.