Recent Developments in Environmental Education in Britain

Monica Hale
Senior Education Officer, (Schools & Colleges)
Council for Environmental Education
Reading, England

Abstract

Over the past decade concern for the environment and, as a consequence, interest in environmental education have undergone a revival in Britain. Interest generated in the late Sixties and early Seventies was followed by a quiescent period during which few significant developments occurred. The publication of the World Conservation Strategy and the UK Response in the early Eighties, coupled with the general realisation that environmental degradation was occurring on a global scale, has caused a substantial increase in environmental interest. Recent developments in the formulation of a National Curriculum in England and Wales have provided a real opportunity to incorporate environmental education into the programs of study for every pupil between the ages of 5 to 16.

The following paper concentrates on the formal education system but important developments are currently taking place in the youth sector. As the National Curriculum proceeds and becomes fully implemented it will further affect higher and further education and environmental education in industry.

Introduction

Twenty years or so ago the 'European Conservation Year' was launched upon a British public almost entirely ignorant of problems of environmental degradation. In contrast its 1987 successor 'The European Year of the Environment' was received by a public which Rogers (1987) describes as "in danger of satiety on matters of pollution, the loss of wildlife species and the destruction of treasured landscapes". Undoubtedly, in the intervening period between these two events, there has been a massive re-education and shift in the public's perception and appreciation of their environment. The formal education system has played a significant part in this process by contributing to the realisation of the objective stated in the Gilbert Report (SED 1974) that:

https://doi.org/10.1017/S0814062600002007 Published online by Cambridge University Press

> "The ultimate aims of environmental education are the creation of responsible attitudes and the development of an environmental ethic".

In the 1960's environmental education evolved into a recognised component of the curriculum as a development of the rural studies discipline. The Council for Europe's 'Countryside in the Seventies' project and the 'European Year of the Environment' (1987-1988) gave further impetus to the environmental movement and the integration of environmental education into the curriculum.

The publication of the World Conservation Strategy in 1980 (IUCN 1980), acted as a catalyst which caused a number of organisations (mostly voluntary) to initiate environmental projects. For example, the World Wide Fund for Nature (WWF-UK) has provided substantial funding for environmental education in schools which has included the development of over 30 curriculum projects across subject and age ranges. The WWF-UK has also supported numerous conferences and workshops for teachers and organised primary school musicals with environmental themes throughout the UK.

Our Common Future (1987), the Report of the World Commission on Environment and Development set up by the United Nations as an independent body under Gro Harlem Brundtland, strengthened the links between environmentalists and those concerned with economics and sustainable development. It also provided added backing for initiatives which were being instigated in education.

The Brundtland Report urges "new norms of behaviour at all levels and in the interests of all" and states that "changes in attitudes, values and aspirations" will depend on vast campaigns of education, debate and public participation". Clearly the role of school education is central to this process.

Environmental education is increasingly being aimed at wider audiences through the media. The publication of popular magazines on environmental topics has risen over the past couple of years and the coverage on the environment has greatly increased through television and the 'quality' newspapers. Professional subject associations now give considerable time and consideration in their conferences and publications to environmental matters rather than just on academic debates.

Against a background of increasing public concern for the quality of the environment and resolutions passed by the European Parliament which will affect all member states, environmental education has rapidly gained a new level of respectability as an area of knowledge about which individuals should possess at least a basic understanding.

Many environmental and other organisations are now concerning themselves with environmental education as part of their programs of work, such as the Friends of the Earth, while others are entirely devoted to it, for example, the Council for Environmental Education (CEE).[1]

Numerous events, conferences, reports, initiatives and other developments both nationally and on a Europe-wide basis have shaped the environmental dimension in education in the UK. It would be impossible to report on and describe all of these in the space of a short article. However, a number of events and developments stand out as being of particular importance to the evolution of environmental education in Britain, some of which are detailed below.

RECENT DEVELOPMENTS

The European Year of the Environment

Twenty years after the Council for Europe's 'Countryside in 1970' initiative during the 1960's, the 'European Year of the Environment' (EYE) (March 1987-March 1988) was launched by the European Commission. In the UK alone the 'Year' inspired 3,500 events, 1,000 practical schemes, and a substantial number of exhibitions and campaigns. There were 500 entries for the Eyecatcher awards for highly commended environmental projects (Baines, 1988).

The enhanced status of environmental education and activity associated with EYE, particularly at local education authority level, led to the production of local resource guides, funding for events and practical projects (for example, tree planting, land reclamation, pond clearance, etc.), the setting aside of additional resources, and the development of curriculum statements.

At national level support, was given to a number of environmental initiatives, including: a research project to assess the use of school grounds as a learning resource (See 'Learning Through Landscapes', section below) funded by the Department of Education and Science and some Local Authorities, and a pilot project on introducing environmental education into youth work based in Birmingham and Staffordshire (developed by CEE). Additional funding was also provided by various statutory government bodies (such as the Nature Conservancy Council) to support environmental education.

The activities of teachers, education advisers and the voluntary sector, funded by Government Agencies and, increasingly, from industry, made a substantial contribution to the national effort during EYE.

Resources for Environmental Learning

As well as learning 'about' and 'for' the environment, environmental education is seen as education 'in' the environment. Therefore, school grounds provide an important educational resource in the formal curriculum where many environmental aspects my be studied. In addition, it has been shown that school grounds play a significant part in the informal curriculum outside lesson time (Adams, 1988).

In Britain over 80 percent of children go to school in urban areas. Access to open land and countryside is not available for many children. Worse, many schools in inner city and suburban areas have very limited and unsuitable grounds; in some of the older inner city areas schools may only have a strip of

perimeter asphalt for access and play. However, it has been shown that under the imaginative leadership of committed members of school staff many of these areas (and accessible undeveloped sites) can be transformed from lifeless wastelands to havens of wildlife and environmental opportunity.

Another government initiated change affecting the environment of schools is a modification in the method of maintenance and development of school grounds. New regulations in local government organisation and required competitive tendering for contracts for school grounds maintenance has led to increased opportunities for more varied approaches to the design and appearance of school grounds. Other government legislation which gives schools greater control of their budgets and the management of their resources ('Local Management of Schools' legislation) may well lead to fundamental changes in the way schools perceive and use their grounds.

One of the most common expressions of the increased interest in the environment and wildlife is school nature gardens.

School Nature Areas

Traditionally school grounds have comprised hard surfaces (playgrounds and games courts) and soft surfaces (playing fields and marginal access and circulation areas). Legislation requiring recreational facilities in the outdoor environment was indicated by the 1981 Education (School Premises) Regulations and has influenced the design of school premises (Adams, 1990).

The importance of school grounds as a resource for education has considerably increased over the past decade due to the greater emphasis now being placed on active learning and practical engagement both in the primary and secondary sectors. Additionally, the rising costs of outside school visits and the ever increasing demands of the school time-table (particularly in secondary schools) mean that on-site facilities for all areas of the curriculum are now often seen as a basic requirement.

Schools have adopted a range of approaches to the development of their grounds. Many have undertaken various alterations themselves by using voluntary help of teachers, pupils, and parents in creating ponds or wildlife areas, etc. Some schools have worked with community agencies such as community arts and design groups; also agencies such as the British Trust for Nature Conservation Volunteers and Manpower Services Commission schemes have assisted in various developments in school grounds. In some instances, local authorities have assisted to carry out specific developments.

One of the main problems has been (and continues to be) that of financing these initiatives, as local authorities are generally reluctant to commit themselves to such developments. Schools usually have to raise the necessary funds themselves (by sponsored events or through application to trust funds, etc.). Unfortunately this is not always possible, particularly in inner city areas, and some schemes have to be abandoned.

Experience has shown that the creation of environmental study areas should not be undertaken lightly, as there is a requirement for an ongoing commitment to their upkeep and maintenance by teachers, pupils and parents.

Manpower Services Commission–Community Program (1982-86)

The 'Community Program' (CP) was a Government training and work program operating from 1982 to 1988 during a period of high national unemployment. It was run by the 'Manpower Services Commission' (MSC), which has since been disbanded.

The objective of the scheme was to help the long-term unemployed prepare for permanent work through work experience and training on projects of benefit to the community (Hale, 1987a). Institutions, organisations and companies could apply to the MSC to obtain the necessary funding to run a project and to pay the salaries of personnel. Organisations such as wildlife trusts, educational charities and institutes of further and higher education took advantage of this means of employing additional workers (Hale, 1989).

A number of schemes specialised in employing graduates in environmental and natural sciences to undertake tasks in practical conservation and environmental education. An example of such a project was the Urban Spaces Scheme, based at the Polytechnic of North London, which employed 75 graduates to provide environmental and curriculum development expertise to schools and education authorities in five North London boroughs.

Essentially, the functions of the scheme were to:

* provide on-site and in-school assistance to teachers to support jointly developed projects;
* produce teacher resource materials and booklets on a variety of environmental topics;
* provide an advisory and referral service to research specific topics for schools and to offer advice on sites which may be used for local field-work;
* organise and run workshops and courses for teachers in cooperation with the Local Education Authority, and others;
* the Project also established its own urban field studies resource centre in an inner city area.

It has been estimated that of the Community Program's total expenditure, £10 million was directed to creating 2,300 jobs in environmental and conservation work, of which approximately 11 percent were related to environmental education (Brown, 1988). Without the financial support from such a government sponsored scheme it would have been impossible to establish such a service on an independent financial footing. When the Manpower Services Commission was

disbanded and the Community Program replaced by an entirely different form of government training scheme this valuable support service was unfortunately lost to schools.

However, some lasting effects resulted from this work such as:

- many schools now have environmental education facilities which they might otherwise never have obtained;
- education authorities are more aware of the tangible educational benefits resulting from a more environmental approach;
- many teachers now have the confidence to undertake work in the environment;
- permanent environmental education posts were created in local authorities subsequent to the demise of the MSC.

Learning through Landscapes Project

One of the most significant developments during the latter half of the 1980s was the 'official' recognition of the need for school grounds to be developed as an educational resource. A research project initiated and funded by the Department of Education and Science, the Countryside Commission[2] and three local education authorities was established in 1986.

This three year study was established to investigate the use, design, management and development of school grounds. Publications resulting from the final report will provide advice on how to extend educational opportunity and improve the environmental quality of school grounds.

This guidance is certainly needed at a time when the curriculum, resources and management of schools are undergoing considerable change (primarily due to the implementation of a standard National Curriculum throughout the UK). The approach adopted to the project is essentially to highlight existing good practice rather than to provide a design guide as plenty of instructional material (for example,. recommended species of trees and shrubs, pond construction methods, management methodologies, etc.) already exists. The project has sought to reveal some of the thinking behind the efforts of designers, managers and teachers to create an outdoor learning environment suitable for the varied needs of pupils of different ages and abilities in schools (Adams, 1990).

Subsequent to the 3 year research phase a development program is planned. This is expected to have three main functions:

- the provision of information and advice on the use, design, management and development of school grounds;
- the documentation and dissemination of examples of good practice;
- the development of training materials for the personnel involved in such schemes.

The Learning through Landscapes project revealed that schools can do much for themselves in developing their grounds, but there is a lack of access to design advice. The current system is not responsive or supportive in helping schools manage change to enable them to undertake grounds developments. There is limited finance and a lack of manpower in local authorities and thus overstretched maintenance budgets have not been able to cope with increased demands from schools for help. A recommendation of the report is that a development program needs to find ways of bringing together educationalists, designers and managers to create more effective means of tackling change in school grounds (Adams, 1990).

External Teacher Support

During the past decade, increasing numbers of groups and organisations with an interest in the environment have flourished. Naturally, such groups aim to promote their own particular sphere of interest, but there is now an infrastructure of organisations promoting environmental concern through education.

A number of organisations exist to provide a forum for teachers in environmental and related areas of education, such as the National Association for Environmental Education, and the Schools Natural History Society. Other organisations supply educational support resources such as written resource materials and personnel to work in schools (for example, the Royal Society for the Protection of Birds, the Tidy Britain Group and the Royal Society for Nature Conservation). Smaller locally-based centres with their own education officers, such as those run by county wildlife trusts and conservation volunteers, also provide a useful resource for schools.

While this additional support in environmental education is valuable it is carried out on an *ad hoc* basis. This has led to disparities in the accessibility of such resources and not all schools have been able to benefit from them.

The experiences of the MSC funded Community Program scheme served to highlight the needs of teachers and demonstrated the work which could be achieved given sufficient on-site and in-school support. Unfortunately, alternative funding has not been forthcoming since the demise of CP and this has resulted in an overall loss of support for environmental education initiatives. There is now a gap in educational support provision which needs to be filled, unfortunately in the current economic climate it is unlikely that it will be.

The National Curriculum

Over the past three years a number of government led initiatives and legislation have resulted in fundamental changes in the school curriculum. The government has effectively set the educational agenda for what is to be taught and, by a highly structured assessment and monitoring regime, the mechanism to secure a uniformity of coverage and approach to subjects identified as Core and Foundation. The Education Reform Act (1988) legislation such as Local

Management of Schools and Charging for Out of School Visits, coupled with the introduction of new examinations and schemes aimed at vocational training (for example the Technical and Vocational Education Initiative) have been the vehicles for these changes.

It is a requirement of the Education Reform Act (ERA, 1988) that the curriculum "promotes the spiritual, moral, cultural, mental and physical development of pupils at the school and of society" and "prepares pupils for the opportunities and experiences of adult life".

The move towards a British National Curriculum as a way of raising standards has generally been welcomed. When the Department of Education and Science first issued its intentions in 1987 (DES, 1987) its goals were to clarify objectives, prevent duplication in syllabuses at different stages and narrow the range of pupils' attainments. It does not seem that these objectives will be immediately met as the standards expected under the national curriculum in essential skills remain too low and the expected spread of attainment targets in each subject is too wide.

The provisions and requirements for the National Curriculum are still in the process of being drawn up. Certain of the reforms are currently being implemented on a rolling program towards full implementation by 1997. The Curriculum is based on ten core and foundation subjects which include: English, Mathematics, Science (which constitute the three 'core' subjects); technology, geography, history, modern foreign languages, art and design, music, physical education, with religious education.

Each subject has its own specified Attainment Targets which are statements of knowledge, skills and understanding which pupils are expected to achieve at specific age/ability related levels (Fig. 1). Programs of Study which children should follow are also described in the subject Orders. It should be emphasised that while the National Curriculum lays down a *minimum* statutory entitlement which schools are obliged to provide their pupils, there is nothing to prevent teachers including other areas or developing one part of the curriculum to a greater extent than required in the Orders. In practice, however, it is unlikely that there will be sufficient time or inclination on the part of most teachers to go further in most subject areas.

For each of the subjects a working group has been established by the National Curriculum Council[3] (NCC) to make recommendations to the Secretary of State for Education and Science as to the curriculum content for the subject. From this Statutory Orders are passed by Parliament which lay down the Attainment Targets and Programs of Study to be followed by each child as they reach a certain level (these are usually age-related) (Fig. 2).

A major element of the new curriculum is the testing of children at age 11 years (in the 3 core subjects) and subsequent testing at 14 and 16 years in all other subjects. Specialist working groups have been established to devise Standard

Assessment Tasks (SATs) to ensure uniformity of testing. These subject-based committees are due to report in 1990.

At the time of writing, Statutory Orders have been issued and partially implemented for English, Mathematics, Science and Technology. During 1990 Geography, History and Modern Foreign Languages Orders will take effect. Trial (not reported) testing will also be carried out for specified levels during 1990 before full implementation.

The Development of Cross-Curricular Issues

In 1987 the 'National Curriculum 5-16 Consultation Document' was published by the DES. It was a great disappointment at the time that environmental education was not included as a foundation subject and no direct reference was made to it. Much hope was pinned on a small number of statements which were relevant to environmental education such as:

> "In addition, there are a number of subjects on themes such as health education ... which can be taught through other subjects ... It is proposed that such subjects or themes should be taught through the foundation subjects."

Since the publication of this initial document, a number of timely external factors (described below) served to influence the content of the curriculum. Thus, environmental education has been elevated to an integral part of the new curriculum as one of the five cross-curricular themes.

These and other events are thought to have acted to influence the Secretary of State for Education to make a formal request to the NCC in 1988 to give early and urgent consideration to the nature and place of cross-curricular issues in the National Curriculum. This has been carried out by the Interim Whole Curriculum Committee (IWCC). The most significant of these influences has been the resolution of the European Ministers of Education on Environmental Education; the publication of the Curriculum Matters (No.13) booklet on Environmental Education by the Department of Education and Science; and the Prime Minister's first 'green speech' delivered to the Royal Society in London in September 1988.

i) Resolution of the European Council of Education Ministers

In May 1988 a major resolution was passed by the Council of European Communities Ministers of Education in which they agreed the need to take positive action to promote environmental education throughout the Community. *All* Member States committed themselves to:

- the promotion of environmental education in all sectors of education;
- publication of current policy on environmental education in a document for schools;

https://doi.org/10.1017/S0814062600002007 Published online by Cambridge University Press

- consideration of the aims of environmental education when drawing up curricular and interdisciplinary courses;
- sufficient provision for the development of teachers' knowledge of environmental matters in initial and in- service training;
- to provide teachers and pupils with appropriate teaching materials. (Resolution 88/C 177/03)

The UK Government has invited the National Curriculum Council (NCC) and Secondary Examinations and Assessment Council (SEAC) to take account of this resolution. The European Community requires a UK policy statement to be formulated by May 1990. The Government invited advice to be submitted by November 1989.

ii) Curriculum Series No 13 – Environmental Education

In 1989 the Department of Education and Science published its long awaited guidelines on the place of Environmental Education in the Curriculum and how it may be integrated across traditional subject boundaries, these were embodied in the HMI Curriculum Matters Series booklet, 'Environmental Education 5-16'. The fact of its publication is more significant than its content as the document has nothing new to offer those already well versed in environmental education, and provides no specific help for those who are not.

Its contents were viewed with some disappointment, as it does not go far enough in formalising the inclusion of environmental education in the curriculum and it generally lacks detail as to how environmental education contributes to individual subjects. However, despite its many shortfalls, this document is an important landmark.

iii) The Prime Minister's Speech to the Royal Society

The Prime Minister's speech in September 1988 has been regarded as significant as it established a government commitment to the environment and focussed attention on the links between health, jobs, industry, the economy and the environment.

The Interim Whole Curriculum Committee (IWCC)

The IWCC concluded that in order to provide a balanced and broadly based curriculum, a range of cross-curricular issues should be addressed through the core and foundation subjects; these included health education, environmental education, economic and industrial awareness, citizenship and careers education. These have strong components of knowledge and understanding as well as promoting related skills. These are part of every pupil's entitlement and whilst environmental education is not a statutory subject in its own right, it must be viewed as being complementary to and permeating the core and foundation subjects.

Distinctions are thus made between:

- *cross-curricular dimensions* - personal and social education, multicultural education and equal opportunities;
- *cross-curricular skills* - oracy, numeracy, study skills, graphical skills;
- *cross-curricular themes* - health education, environmental education, economic and industrial awareness, citizenship and careers education. These have strong components of knowledge and understanding as well as skills.

Early in 1989, the IWCC established a national Task Group to report on each Theme in detail, how each will fit and be part of a pupil's basic Entitlement and how they will be part of the Core and Foundation subjects. Complementary studies have been undertaken in each of the cross-curricular themes. The Council for Environmental Education co-ordinated the Task Group on Environmental Education drawing on the expertise of individuals with a wide range of experience in all areas of environmental work in education.

The Task Groups were required to identify:

- where the studies should be located; that is, within the attainment targets and programs of study of core and foundation subjects;
- the most appropriate key stages (allowing for progression);
- whether essential elements should be taught together or separately.

The cross-curricular themes are "less pervasive" than the cross-curricular dimensions and tend to have a more definite component of knowledge and understanding. They also tend to involve basic questions of values and beliefs. Thus, the themes all contribute to personal and social education (Palmer, 1989).

The Environmental Education Task Group presented its report to the NCC in June and the final report detailing its recommendations for all the cross-curricular themes was sent to the Secretary of State in July 1989. An outline of cross-curricular themes has been published, and a series of leaflets on each of the cross-curricular themes are scheduled to be made available during 1990.

These reports by the Task Group consider how environmental education can be integrated across the mainstream of the curriculum and the evaluation of learning outcomes of this theme has served to establish the educational credentials of this part of the curriculum.

While the knowledge and understanding content of environmental education is expected to be primarily, although not exclusively, delivered through Science and Geography, if environmental education is to live up to its full potential as a cross-curricular theme it needs to be an element of all core and

foundation subjects. Thus, aesthetic and historic dimensions, etc., are equally important in a balanced environmental education.

Teacher Education

Notwithstanding the reforms and the new demands being placed on teachers as a result of the new education legislation, shortfalls in teacher education in environmental education were previously identified both at initial training and in-service levels. The recent changes in the school curriculum now demand a far higher level of first-hand experience by pupils based on practical work in the local environment. Most teachers, whether they qualified some time ago, or have recently entered the teaching profession, are insufficiently prepared or confident to implement field-based studies (particularly using local resources). Exacerbating the inherent shortfalls in teacher education is the lack of provision of local education authority (LEA) teacher support services which teachers may call upon. This could be remedied by the supply of additional LEA specialist support units and a higher level of liaison and cooperation with outside organisations who can provide assistance (Hale, 1987b).

To some extent the problems of teacher training are being addressed by organisations such as the Council for Environmental Education, which has been overseeing a project funded by the Central Electricity Generating Board (CEGB) to develop materials for in-service teacher education in environmental education. The training modules adopt a novel approach to the introduction of environmental education across the curriculum for teachers at all levels and different subject specialisms. The approach adopted is to encourage discussion between teachers on ways in which environmental education can be introduced into their school, rather than to 'tell' teachers how to teach. It is expected that the first modules will be published towards the end of 1990.

Local Education Authority Environmental Education Policies

Many local government authorities and their education departments have formulated statements and policies for the development and implementation of environmental education within schools and other of their institutions.

The Council for Environmental Education is currently undertaking research into the contents and form of these policy documents with the aim of producing guidelines on how these statements should be drawn up and their implementation.

Many schools now include environmental policy statements as part of their institutional development plan. This move should be encouraged as a basic requirement by education authorities as a means of ensuring that sufficient time and resources are allocated to this area of school activity.

Conclusion

There is now a real opportunity within the framework of the National Curriculum to promote a sound and well researched Entitlement to environmental education, and to integrate this within the statutory guidelines of the National Curriculum.

The development of environmental education in the curriculum is an essential element of a basic education, as it is at school that the foundations of knowledge, interest and understanding are nurtured leading to a caring and concerned attitude for the environment.

It has been shown that environmental education can provide the basis of knowledge and understanding about the environment and can help people to participate more in the debates surrounding the issues. Numerous opinion polls show that the quality of the environment is a key concern of many people, but environmental education still needs to broaden its appeal (Baines, 1988).

Recently the Minister for Education, Mrs Angela Rumbold said at the Environmental Education Advisers Association (April, 1990) that, "children should develop an awareness of our environment and a solid grasp of the principles underlying environmental processes and patterns", and "no opportunity is lost to develop knowledge, understanding and concern for the environment through school education".

Increasingly, over the past five years environmental education has prompted the verbal support of politicians, industrialists and secular bodies. The level of general debate on environmental matters is generally high and the mechanism to mobilise intellectual resources exists. A major challenge for the immediate future is to use these resources to widen the appeal of environmental education to all sectors of society and demonstrate the relevance of environmental education to all concerns and interests.

Environmental education ranks with numeracy and literacy as a fundamental component of education which cannot be left to whim. Thus it must be part of the planned curriculum for all pupils. It seems that for the first time in Britain this objective may be realised with the introduction of the new curriculum.

Notes

1. The Council for Environmental Education (CEE) is the national organisation for the promotion and co-ordination of environmental education in the UK. CEE publishes a yearly journal, the *Annual Review of Environmental Education.*

2. The Countryside Commission is the UK statutory agency responsible for the conservation of the natural beauty of the countryside of England and Wales (Scotland has its own Countryside Commission), and encouraging the provision and improvement of facilities for enjoyment and access to it for open air recreation.

3. The National Curriculum Council (NCC) oversees the work of the subject Working Groups established for each of the Core and Foundation subjects. The culmination of the Working Groups consultations and deliberations are recommendations which, if accepted by the Secretary of State, are then incorporated in the Statutory Orders for each subject.

References

Adams, E. "Learning through landscapes", *AREE* No.3, CEE, 1990, pp.12-14.

Adams, E. "School grounds and the local area", *A Common Purpose: Environmental Education and the School Curriculum*, WWF UK, 1988, p. 57.

Baines, J. "Eye on the future", *Times Educational Supplement*, 24 June, 1988, p. 55.

Brown, D. "Trust's manpower crisis", *Natural World*, 1988.

Department of Education and Science, *Environmental Education From 5 -16, HMI Curriculum Matters, No. 13*, HMSO, 1989.

Department of Education and Science, *National Curriculum 5-16, A Discussion Document*, DES, 1987.

Department of Education and Science, *Science in the National Curriculum*, HMSO, London, 1989.

Hale, M. "Employment of ecologists and the effects of MSC schemes", *Biologist*, 34(5), 1987a, pp. 241-243.

Hale, M. "Environmental education in the National Curriculum", *Journal of Biological Education*, 23(4), 1989b, pp. 257-9.

Hale, M. "Environmental education, CP and ET", *AREE*, No.2, 1989a pp. 26-28.

Hale, M. "The role of external organisations in providing teacher support for field-work in the local environment", *PLET*, 24(1), 1987b, pp. 32-36.

International Union for Conservation of Nature and Natural Resources (IUCN), with the United Nations Environment Program (UNEP), and the World Wildlife Fund (WWF) *The World Conservation Strategy*, 1980.

Rogers, A. "The allure of a rural degree", *Times Educational Supplement* 26 June 1987, p. 55.

Scottish Education Department (SED) *Environmental Education: a Report by HM Inspectors of Schools. (The Gilbert Report)*. HMSO, Edinburgh, 1974.

The World Commission on Environment and Development, *Our Common Future (The Brundtland Report)*, Oxford University Press, 1987.

UK Conservation Development Program *The Conservation and Development Program for the UK: A Response to the World Conservation Strategy*, London, Kogan Page, 1983.

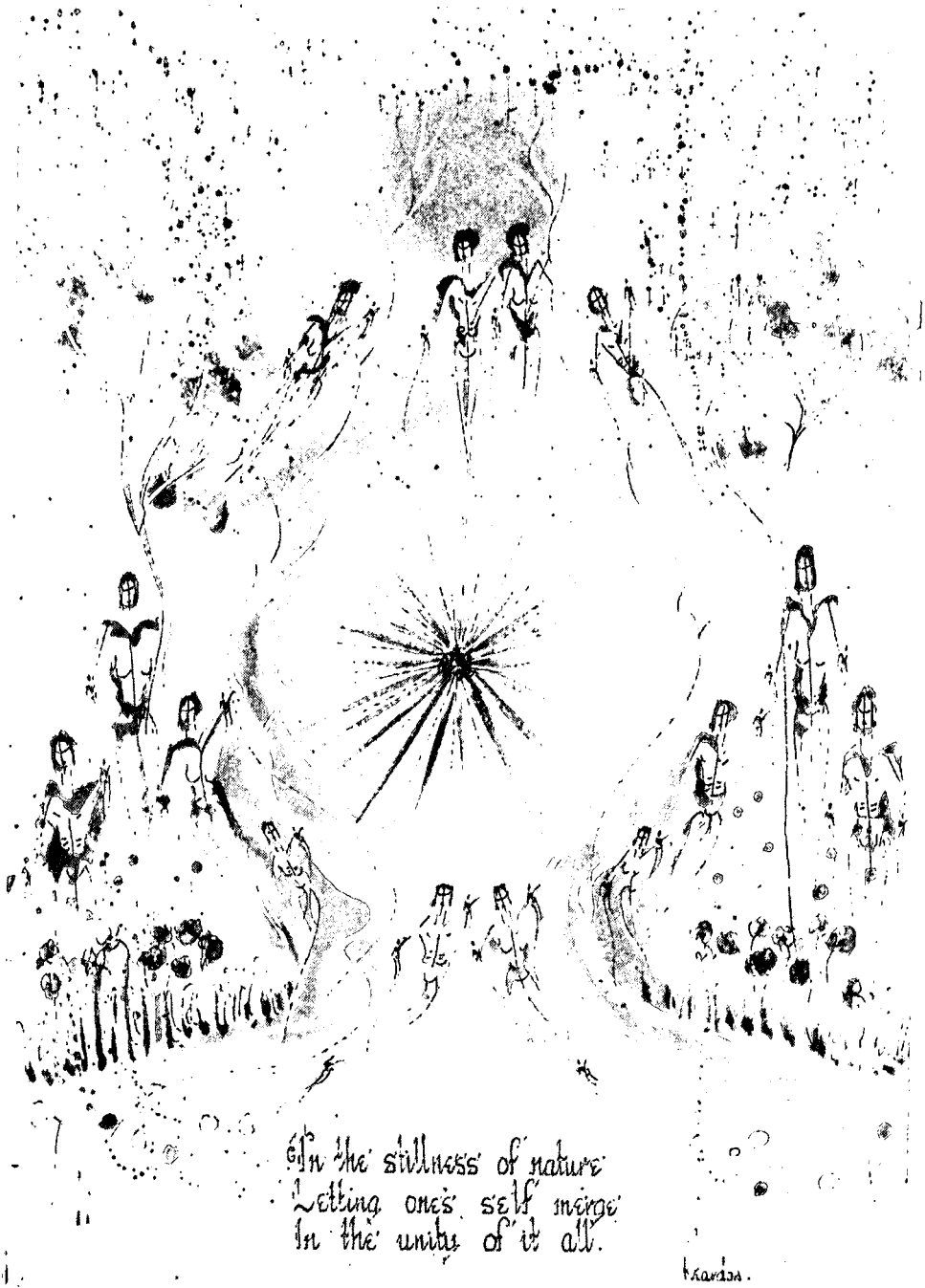
Figure 1: Attainment Targets for Science
(from Science in the National Curriculum, DES 1989)

AT1	Exploration of Science Knowledge and understanding of science, communication, and the applications and implications of science
AT2	The variety of life
AT3	Processes of life
AT4	Genetics and evolution
AT5	Human influences on the Earth
AT6	Types and uses of materials
AT7	Making new materials
AT8	Explaining how materials behave
AT9	Earth and atmosphere
AT10	Forces
AT11	Electricity and magnetism
AT12	The scientific aspects of information technology including microelectronics
AT13	Energy
AT14	Sound and music
AT15	Using light and electromagnetic radiation
AT16	The Earth in space
AT17	The nature of science

Figure 2: The Levels of Attainment for each age-related 'Key Stage' for Science
(from Science in the National Curriculum, DES 1989)

Key Stage	**1**	**2**	**3**	**4**
Age	5-7	7-11	11-14	14-16
Levels	1-3	2-5	3-7	4-10
Attainment Targets	1-6 9-16	1-6 9-16	1-17	GCSE
Average (Expected) Levels				
Age	7	11	14	16
Av. Level	2	4	5/6	6/7

https://doi.org/10.1017/S0814062600002007 Published online by Cambridge University Press



https://doi.org/10.1017/S0814062600002007 Published online by Cambridge University Press