

ENVIRONMENTALISM AND ITS IMPLICATIONS
FOR EDUCATION: A STUDY OF PRIVATE SCHOOLS IN THE
EASTERN CAPE.

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ABSTRACT

This study explores the extent to which the ethos and the basic approach to education taken by three Eastern Cape private schools influences the practice of environmental education within these schools. Their environmental education programmes are evaluated in terms of the guiding principles adopted by the international community in the 'Tbilisi Principles of Environmental Education'.

An ethnographic approach was adopted for this research and findings are essentially descriptive and qualitative, with special regard to social structures and the attitudes of individuals within these structures.

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PREFACE

The writer would like to acknowledge the help given by many people during the course of this study. Firstly thanks go to Professor P.R.Irwin of the Department of Education, Rhodes University who supervised the study. The researcher greatly appreciates the constructive and non - prescriptive way in which the supervision was conducted.

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The study represents original work by the researcher and has not been submitted in any form to another university. Where use was made of the work of others it has been duly acknowledged in the text.

CHAPTER ONE

INTRODUCTION

1.1 THE ENVIRONMENTAL CRISIS. AN HISTORICAL PERSPECTIVE

During the seventeenth century the dominant worldview of Europeans changed dramatically. Berman (1981) describes the worldview of the Middle Ages as having been inter-alia; geocentric, teleological, continuous, cyclical and understood via the concrete and the qualitative. Nature was considered to be alive, and organic, observed in order to make deductions from general principles.

The worldview which has dominated since the seventeenth century has been heliocentric (the earth having no special status). Explanations are atomistic, time has come to be seen as linear and progressive and nature is understood via the abstract and quantitative.

Capra (1983) states that the notion of an organic, living and spiritual universe was replaced by that of the world as a machine. This development was brought about by the achievements and ideas of Copernicus, Galileo, Newton, Bacon and Descartes. When Francis Bacon formulated the first clear theory of inductive procedure it profoundly changed the nature and purpose of scientific quest:

The terms in which Bacon advocated his new empirical method of investigation were not only passionate but often outright vicious. Nature, in his view, had to be hounded in her wanderings, bound into service, and made the slave. She was to be put in constraint and the aim of the scientist was to torture nature's secrets from her.

(Capra, 1983, p.40.)

Devall and Sessions (1985) have, drawing from several sources, compiled a selection of what they regard as the basic assumptions of the modern Western worldview *viz.*

- * People are fundamentally different from all other creatures on earth, over which they have dominion.
- * People are masters of their own destiny; they choose their goals and learn to do whatever is necessary to achieve them.
- * The world is vast and thus provides unlimited opportunities for humans.

Ehrenfeld (1978) too contends that the Western worldview is characterised by a faith in human systems and technologies, the belief that when the chips are down, we will apply ourselves and work together for a solution before it is too late.

The extent to which this human-centred worldview has become dominant, in the social sciences too, is illustrated by Catton (1980) who notes that;

- * Since humans have a cultural kind of heritage in addition to and distinct from their genetic inheritance, they are quite unlike the earth's other creatures.
- * Cultural accumulation means that technological and social progress can continue without limit, making all social problems ultimately soluble.

The writings of Teilhard de Chardin provide further evidence of the depth to which anthropocentrism pervades Western thinking. Combining Christian spirituality with evolutionary ideas he consistently rejects the mechanistic worldview in favour of a

more spiritual one, but paradoxically, continues to fully support the technological exploitation of the earth and the tradition of human control over the natural world.

In - Towards the future Teilhard de Chardin (1973) expresses unwavering faith in the future of man. The following propositions sum up his fundamental vision;

a. The essential phenomenon in the material world is life (because life is interiorised).

b. The essential phenomenon in the living world is man (because man is reflective)

A third step has still to be taken if we are to follow the curve of cosmic involution we have thus sketched in, and carry it through to its end; and this is to make up our minds, as we have solid reason for doing, to accept the third proposition;

c. The essential phenomenon in the world of man is the gradual totalization of mankind (in which individuals superreflect upon themselves).

(Teilhard de Chardin, 1973, p.175)

In the view of the writer it is this mechanistic, Cartesian-Newtonian worldview which provides the philosophical justification for the massive and ruthless exploitation of resources which was made possible by the discovery of fossil fuels and the rise of the industrial era.

1.2 CALLS FOR A NEW WORLDVIEW:

By the mid 20th century many writers had started to express their concern at the excesses of the industrial era and to predict or call for a major shift in human attitudes and lifestyles. The following are some of the writings which the researcher regards as significant:

The publication of Aldo Leopold's A Sand County Almanac (1949) marked an important milestone in creating public awareness of the impact that development was having on the natural environment. This sensitively written book reveals the author's sense of wonder and love for nature, but more importantly, is a powerful statement about people's ethical responsibility towards the land.

We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect. There is no other way for land to survive the impact of mechanised man, nor for us to reap from it the aesthetic harvest it is capable, under science, of contributing to culture.

That land is a community is the basic concept of ecology, but that the land is to be loved and respected is an extension of ethics. That land yields a cultural harvest is a fact long known, but latterly often forgotten.

(Leopold, 1949, p.viii)

Another important protest against the ravages of modern man was Rachel Carson's Silent Spring (1963). This controversial book revealed the extent to which the use of toxic chemicals by farmers was causing the widespread destruction of wildlife.

At a time when there was great optimism as to humanity's ability to bring about a 'green revolution' and to assert total control over agricultural production, Carson sounded a warning about the dangers and high cost inherent in such a war on life. She made a persuasive case for human beings to appreciate the fact that they are a part of life on earth, that interdependence is absolute and that the destruction of any one part will have consequences for the whole.

Referring to the need for a Land Ethic, Leopold (1949) states;

One basic weakness in a conservation system based wholly on economic motives is that most members of the land community have no economic value....The evidence has to be economic in order to be valid.

(Leopold, 1949, p.210)

This argument is taken up again strongly by Schumacher in his book Small is Beautiful. (1974) He argues that the current pursuit of profit and progress, which promotes giant organisations (state owned and private) has resulted in gross economic inefficiency and environmental degradation. Schumacher challenges the doctrine of economic, technological and scientific specialisation which has pulled man out of equilibrium with the earth. What is needed he argues is a new ethic; we can no longer afford to apply only one test (profit) to everything we do. We have got to consider also, the cost in human terms, the cost to the environment and the cost to future generations of actions we take today.

During the early 1980's two significant works were published; Toffler's The Third Wave (1980) and Capra's The Turning Point. (1983) Both argue that humanity has reached a turning point in its evolutionary development, precipitated by the excesses of the industrial era, an era in which development has increasingly alienated people from each other and from their environment.

Capra (1983) for example states:

What we need then is a new 'paradigm'- a new vision of reality : a fundamental change in our thoughts, perceptions and values. The beginnings of this change, of the shift from the mechanistic to the holistic conception of reality are already visible in all fields, and are likely to dominate the present decade.

(Capra, 1983 p.xviii)

Significantly, these writers both believe that the shift to a new paradigm is already taking place and that the move constitutes a natural evolutionary progression brought about by changes in the environment.

In Gaia: A New Look at Life on Earth, Lovelock (1979) expands on the concept of man as an integral part of nature by proposing that the earth itself is a living organism of which man is only a small part. The Gaia hypothesis suggests that the atmosphere, the oceans, the climate and the crust of the earth are regulated at a state comfortable for life because of the behaviour of living organisms. Consequently the health of the earth is most threatened by major changes in natural ecosystems. Hence the need for a holistic perspective when considering the activities of industrialised man.

Sagan's Cosmos (1981) (which also became a popular television series) greatly increased public awareness of the earth as a fragile, delicately balanced organism. He looks at the earth from an extraterrestrial vantage point and emphasises its uniqueness and vulnerability, as well as the common heritage of all life on earth:

All life on earth is closely related. We have a common organic chemistry and a common evolutionary heritage. As a result our biologists are profoundly limited. They study only a single kind of biology, one lonely theme in the music of life.

(Sagan, 1981, p.24.)

Similarly, Attenborough (1980) in the book and television series Life on Earth made a significant contribution towards increasing awareness of our responsibility towards the planet.

The fact is that no species has ever had such wholesale control over everything on earth, living or dead, as we now have. That lays upon us, whether we like it or not, an awesome responsibility. In our hands now lies not only our own future, but that of all other living creatures with whom we share the earth.

(Attenborough, 1980 p.361)

1.3 ENVIRONMENTAL EDUCATION

Over the past twenty years considerable effort has been expended internationally to clarify and delineate the concept of environmental education. Many definitions have been put forward, but today the one that is by far the most widely accepted is known as the ICUN (International Union for the Conservation of Nature and Natural Resources) definition.

It reads as follows:

Environmental education is the process of recognising values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental education also entails practise in decision-making and self-formulation of a code of behaviour about issues concerning environmental quality.

(IUCN 1971: 17)

Two major international meetings on environmental education, The Belgrade Workshop in 1975, and the Tbilisi Inter-Governmental Conference in 1977 further developed these ideas and provided useful guidelines for the practice of environmental education. *The Tbilisi Principles of Environmental Education* today form the

foundation for the practise of environmental education on a global, national and regional scale.

The application of the 12 Guiding Principles listed in the Tbilisi Declaration (see Appendix 1.) can therefore be regarded an important yardstick when evaluating aspects of environmental education. The primary aim of this research was to investigate the extent to which environmental education at private schools in the Eastern Cape, corresponds to these guiding principles adopted by the international community.

Environmental education is not a school 'subject' in the normal sense, it is also not an 'activity' distinct from other activities within a school curriculum. It is an alternative approach to education, a sophisticated concept born out of the perceived need for fundamental change in the dominant value structures within modern society.

As an approach, environmental education has its roots in child centred humanism, and the need to give education an intrinsic value appropriate to the needs of an increasingly threatened planet. Following Irwin (1990) it entails practice in decision making and the self formulation of a code of behaviour about issues concerning environmental quality.

Ideally, environmental education is interdisciplinary, and is about hands on experience in the environment. Gough (1989) defines the role of the teacher as facilitating rather than

didactic. Pupils should work in active investigative groups, even if not on group tasks. Topics may be open ended, flowing in directions determined by childrens' interests rather than by predetermined schemes of work.

Because environmental education is initiated by factors in the changing world of the learner,

....it is not a static phenomenon, but a dynamic concept and, in a sense, a response to a perceived need. it is a concept which is under constant scrutiny and subject to continual modification and change as new needs or emphases arise or are perceived to arise

(Irwin,1990,p.5.)

W'Dkot-Uma and Wereko-Brobby,(1985) also see environmental education as an integrated course cutting across traditional subject areas and aimed at enhancing the learner's awareness, understanding and concern for the environment. This is achieved through the development of skills and attitudes and the inculcation of a commitment to act within the local environment.

As an approach environmental education is strongly committed to a learning process which starts with the needs and interests of the learner. As such it is diametrically opposed to the prescriptive, epistemological model which dominates much of education today.

The materialistic and atomistic worldview which dominates formal education in Western society is at the same time the product and

the perpetuator of the Cartesian value structure, a structure which has increasingly divorced the learning process from the realities of life, resulting ultimately in an 'educated' population which is incapable of recognising the interrelatedness between itself and its cultural or biophysical surroundings.

1.3.1 An alternative paradigm for education

For the purposes of this research it is important to establish some clear differences between the environmental approach to education and the more traditional approach to education.

Gough (1989) provides a useful table comparing what he calls the 'epistemological' with the 'ecopolitical' paradigms for education. (Overleaf)

Table 1.1. Comparison between epistemological and ecopolitical paradigms of education.

	Epistemological	Ecopolitical
View of learning	Practice in cognition	Practice in perception
Purposes of learning	Transmission of existing knowledge Abstraction of generic concepts	Perception of variants and discovery of serial concepts and generic concepts in learners' environments
Control of learning	Asymmetrical dependence (of learners on teachers) Competition between learners	Symmetrical dependence (all participants are co-learners) Co-operation between learners
Co-ordination of learning settings timing	Schools/classrooms Age-grading, school calendar and class timetable	Community settings Synchronized to, and negotiated with, community settings
View of knowledge	Socially structured (theoretic, technical)	Individually structured (practical, personal)
Learning materials	Paying attention Rote performance Memorizing	Discrimination Differentiation Searching Creating
Teaching activities	Distribution of structured knowledge Lecturing and demonstrating	Creating and re-creating learning settings and tools which sustain learners perceptual work

Source: Gough (1989) p.283

1.3.2 Assumptions upon which this research is based.

This research is based upon three broad assumptions:

- a. That the basic problem facing humanity at the close of the twentieth century is an environmental one.
- b. That the values, attitudes and technologies which have characterised the industrial era are no longer appropriate to the needs of a threatened planet.
- c. That education has an important role to play in equipping people to deal with the demands of a rapidly changing world.

The rationale behind adopting an environmental approach to education is the assumption that learning based on intimate contact with the environment will inter-alia:

- Make the learning process more relevant and therefore more valuable to the learner.
- Create opportunities for learning by discovery.
- Develop a sense of belonging and interdependence through contact with the living world.
- Encourage aesthetic and spiritual values appropriate to a caring individual and society.

1.3.3 The Hypotheses stated

Based on the assumptions outlined above, the following hypotheses are postulated for acceptance or rejection.

- a. That the interests, and environmental perceptions held by individual teachers and headmasters are the most

important variables determining the nature and extent of environmental education practice within schools.

- b. That active participation and learning by discovery within the environment is a more effective means of achieving environmental awareness than is the abstract epistemological approach.

- c. That there is a close relationship between the prevailing ethos within a school and the environmental sensitivity displayed by the children. Where schools are characterised by a gentle and supportive ethos, pupils are more likely to be aware of, and concerned about, their environment.

It is the researcher's view that no amount of knowledge about the environment is likely to influence behaviour if it exists in a moral or spiritual vacuum. The ethos surrounding the learning experience will necessarily influence the outcome.

Gough (1989) argues that moral and spiritual growth, which may lead to environmental empathy is unlikely to be effective unless it is based on perception gained through participation and discovery. An analysis of Table 1.1. indicates that much of the rhetoric around curriculum reform (both internationally and in South Africa) suggests a move towards practices more consistent with the ecopolitical paradigm. However, it may also be argued by those familiar with the South African school system, that elements of the epistemological paradigm are still very much in

evidence in our schools, even the most progressive.

Because the researcher has been strongly influenced by Gough and regards his model as a useful instrument for the evaluation of environmental education in schools it has served as a constant reference point throughout this study.

1.4 THEMES WITHIN THE STUDY

A thematic approach has been adopted for the presentation of these research findings, with the themes corresponding to the three hypotheses postulated. The themes are as follows:

i. **Environmental Perceptions (chapter 4)** in which the perceptions of environmental education held by headmasters and the influence which these perceptions have on those of the children in their care are explored. Also the extent to which teachers perceptions may influence the knowledge and awareness of pupils.

ii. **The Practice of environmental education in schools (chapter 5)** in which some of the activities relating environmental education within schools are highlighted and evaluated in terms of the Tbilisi principles and the ideas of Gough.

iii. **Attitudes and Values (chapter 6)** in which the focus is essentially on environmental attitudes and values held by the children. Attempts are made to relate these specifically to the nature of education they have received at their schools.

CHAPTER TWO

LITERATURE REVIEW

The review of literature relevant to this study has been divided into two main areas:

- * Writings which place the concept of environmentalism and the perceived need for a new paradigm into an educational context.
- * Material directly related to the practice of environmental education in schools.

2.1 THE QUEST FOR A MORE RELEVANT EDUCATION:

According to Emery (1981), much of the education that takes place in formal settings is today still geared to the materialistic, deterministic, atomistic and reductionist vision of the universe that has dominated Western perceptions of knowledge since the eighteenth century. Empiricist theorists have postulated that 'real knowledge' is locked up in the storehouses of knowledge which are so jealously guarded by scholars and scientists and that the best way to gain access to this knowledge is through years of schooling in the disciplines that have been our means of organising the contents of these storehouses.

Ecological theories of perception, on the other hand, suggest that limitless information is present in our personal, social and physical environments and that with an 'education of attention' we can access as much of it as we need. The 'education of attention' means guiding learners in the many and various ways

of enhancing their capabilities for extracting information from their environments, Gough (1989) contrasts these educational practices and provides a useful comparison between what he calls the epistemological and the ecopolitical paradigms as shown in table 1.1. Broadly speaking the epistemological paradigm is behaviourist in character and indicates a transmission model of teaching/learning while the ecopolitical is humanistic. The essential differences between these two philosophies are also well expressed by Maslow (1973) in his reference to Huxley's 1962 novel, Island.

If we look at education in our society, we see two sharply different factors. First of all there is the overwhelming majority of teachers, principals, curriculum planners, school superintendents who are devoted to passing on knowledge that children need in order to live in our industrialised society. They are not especially imaginative or creative, nor do they often question why they are teaching the things they are teaching. Their chief concern is with efficiency, that is with emplanting the greatest number of facts into the greatest possible number of children, with the minimum of time expense and effort. On the other hand, there is the minority of humanistically orientated educators who have as their goal the creation of better human beings, or in psychological terms, self actualization and self transcendence.

(Maslow,1973,p.159.)

Popkewitz (1984) distinguishes between a product orientated and a process orientated approach to education. The former is typified by the centre-to-periphery RDDA (Research, Development, Dissemination and Adoption) model and the latter by the problem-solving DAE (Dialogue, Action and Evaluation) model.

Because, in the view of the researcher, environmental education entails collaborative decision making it is particularly suited to the DAE model. O'Donoghue (1990) and Mc Naught (1990) concur with this view:

If centre-to-periphery communications and innovation management ideologies persist, change is likely to be no more than apparent motion, with the potential for meaningful reconstruction being subverted by the deterministic ideologies of management and control that have brought about much of the environmental crisis.

(O'Donoghue, 1990, p.17.)

Referring to developing countries, Vulliamy (1987) points out that environmental education has often failed to achieve its aims because it has been presented in a formalistic, didactic style:

Most of the case-studies of environmental education discussed at the Bangalore Conference require that teachers operate at what Beeby has called 'the stage of meaning'. They incorporate elements of 'progressive' teaching styles adopted in the West, such as student-centred learning strategies, project work, discussion groups, drama, games and simulations, and so on.

(Vulliamy, 1987, p.14)

He further argues that, many teachers in developing countries are locked into the formalistic mould by either their traditional cultures or their colonial heritage, also in some cases, by a lack of confidence due to their own limited education and training.

W'O Okot-Uma and Wereko-Brobby (1985) identify a similar problem in Africa. Stating that much of African education has been burdened by a legacy of alien contexts, they see the environment as a natural starting point for any kind of education in society, because it provides a context, a perspective and scope for a variety of learning experiences. However, it is only when it meets the needs of the learner and those of the society, that environmental education is likely to be effective.

Agarwal (1986) expands on this concept, arguing that cultural diversity is no historical accident, but is the direct result of the world's biological diversity. He sees the spread of multi-national technology and the creation of a multinational culture as one of the main causes of global environmental destruction. Sustainable development, he believes, requires environmental education which is sensitive to the peculiarities within the local community and which is not prescriptive, but aims to solve problems negotiated with the community. This emphasis on the unique requirements of each community within its environment, implies the need for a collaborative, problem solving approach.

Environmental education is also, according to Forbes (1987), a move away from an often alien and deterministic curriculum towards a more relevant, participatory approach. He sees it as a process of using the local environment in order to develop confidence and capability.

.....locally based study can use the locality as a laboratory in which to 'learn how to learn' using familiar things.

(Forbes, 1987 p.136.)

Opie (1989) defined an environmentally based approach to education as:.....Education ABOUT the environment
THROUGH the environment
FOR the environment.

(Opie, 1989 p.17.)

The environment is defined in broad terms to include the full spectrum of environments familiar to the learner.

Irwin (1990) expands on this, stating that an emphasis on the activities of people within their environments has become the dominant feature of modern environmental thinking. This emphasis

is also reflected clearly in environmental education, which

.... has developed into a sophisticated concept embracing ecological knowledge and understanding, total people-environment relationships, ethics, politics, sociology and public participation in decision making.

(Irwin, 1990 p.5.)

It is a sophisticated, creative, environmentally based educational philosophy, designed to enable people to deal effectively and sensitively with their changing world. It is also a deliberate attempt to break with those practices in education which are believed to foster environmentally damaging behaviour.

A number of writers identify entrenched cultural norms within society as powerful factors inhibiting the adoption of environmental education. Bowers and Flinders (1990) for example warn us that in developed industrialised societies the legacy of the Cartesian paradigm seriously hampers the introduction of an environmental approach to education.

Ironically, responding to the ecological crisis by continuing the cultural practices that contributed to it may be most visible in the knowledge-producing and legitimating institutions, such as universities, where the Cartesian-liberal paradigm, in all its mutations, is associated with the higher values of Enlightenment thinking.

(Bowers and Flinders, 1990, p.248)

Di Chiro (1987) introduces the question of gender into the environmental debate, arguing that the adoption of a feminist perspective is an appropriate response to the perceived environmental crises, which she sees as an essentially socio-political problem.

A feminist perspective of environmental education, integrating gender with class, offers a social critique that sheds light on the causes and definitions of environmental problems and the educational forms that

would appropriately respond to them.

(Di Chiro, 1987 p.42)

She examines how power relationships (for example, gender, class and race) shape the world in which we live and strongly influence our attitudes towards the environment and towards each other.

The ideas of de Bono (1970) and (1979) closely resemble the intellectual processes advocated in the ecological theories of perception, suggesting that change will only be brought about by the introduction of a new approach to thinking.

Lateral thinking is also concerned with breaking out of the concept prisons of old ideas. This leads to changes in approach; to looking in a different way at things which have always been looked at in the same way. Liberation from the old ideas and the stimulation of new ones are twin aspects of lateral thinking.

(deBono, 1970, p.11.)

2.2 MATERIAL OF PRACTICAL VALUE:

A number of journals relating to environmental education were used extensively in this research. Because of their immediacy in this relatively new field, these proved to be valuable sources of information. The most useful of these have been:

The Journal of Environmental Education [USA], The Environmentalist [UK], The International Journal of Environmental Education and Information [UK], and the IUCN Bulletin.

Ecological groups and the Green movement in the developed countries publish a great deal of literature, much of it aimed at young people. A number of these books were useful to this research, particularly when compiling the questionnaire (Appendix 2). These are listed in the references. The importance

of these publications is that they often highlight issues which have not traditionally received much attention in South African environmental education, such as urban and industrial problems and also economic and political concerns.

Organisations such as the Worldwide Fund for Nature produce a large range of excellent materials, particularly the 'Global Environmental Education Project', a series of curriculum modules designed for British schools and intended to place environmental issues into global context. Similarly, books by the Earth Works Group (1990) Willis (1990) and Elkington and Hailes (1990) provide important insights into the scope and potential for environmental education amongst younger children, placing the concept into the real world of the learner.

Randle (1989) is an outspoken and somewhat radical advocate of a new approach to education. Teaching Green provides an excellent synopsis of ideas and techniques already being used in schools, placing particular emphasis on ways of developing new technologies, lifestyles and political practices.

In the context of South African environmental education there are two particularly important sources of information. Both of these proved invaluable to the researcher throughout this study. These are:

- a) Publications emanating from the Wildlife Society of Southern Africa's Umgeni Valley Project which distributes a wide variety of field guides, news letters and research data through its 'Share-Net'scheme. This is an informal

collaborative structure through which individuals, projects and agencies can both contribute to and benefit from current environmental education resource development activities in Southern Africa.

b) The Environmental Association of Southern Africa (EEASA) which publishes the Southern African Journal of Environmental Education.

The stated aims of EEASA are:

To act as a responsible body for the purpose of consultation and coordination on matters of public and professional interest concerning environmental education in Southern Africa.

To promote interdisciplinary as well as multi-disciplinary environmental education.

To promote, organise and sponsor activities associated with and research in environmental education.

To provide opportunities for the exchange of ideas and opinions *inter alia* by means of the publication of a journal.

(EEASA Bulletin No.3 (1990) inside cover.)

Other publications emanating from Southern Africa which also provided a great deal of information relating to current developments within the field of environmental education included the Matlhasedi Education Bulletin, Action: The Environmental Health Magazine, New Ground: The Journal of Development and Environment, Our Living World and Conserva.

CHAPTER THREE

RESEARCH METHODOLOGY

In keeping with the nature of the hypotheses stated in chapter 1 the researcher chose a qualitative rather than a quantitative approach to the research, this incorporated elements of both observation and of close interaction with persons in order to arrive at what are inevitably tentative conclusions.

3.1. THE METHODOLOGICAL APPROACH.

Educationally speaking, environmental education is a holistic approach involving all three domains of human development; the cognitive, the affective and the psychomotor.

(Irwin, 1991, p.15.)

Environmental education developed as a response to perceived inadequacies within the existing school system and advocates the vigorous promotion of a holistic and non - reductionist view of the environment and ecological processes. (Irwin, 1991). Because environmental education encompasses such a broad spectrum of human activity, much of which does not easily lend itself to measurement and calculation, it was decided that a non-positivist approach to research was appropriate for this study of environmental education.

One of the principal tenets of logical positivism is that the meaning of a statement is given by the method of its verification. This means therefore that unverifiable statements are held to be meaningless. (Cohen and Manion, 1980). The acceptance of natural science as the paradigm of human knowledge, implies also that the methodological procedures of natural

science are appropriate to the social sciences. According to Giddens (1975) this also implies a particular stance concerning the social scientist as an observer of social reality:

...that the end-product of investigations by the social scientist can be formulated in terms parallel to those of natural science. This means that his analysis must be expressed in 'laws' or 'law-like' generalisations of the same kind that have been established in relation to natural phenomena. Positivism here involves a definite view of the social scientist as analyst or interpreter of his subject matter.

(Giddens, A. 1975; quoted in Cohen and Manion 1980 p.12)

Cohen and Manion (1980) assert that the selection of a research methodology is principally determined by the researcher's conception of social reality. His assumptions about society, human nature and the relationship between human beings and their environment will influence the choice of a research methodology.

Burrell and Morgan (1979) identify two perspectives: In the first, people are portrayed as responding mechanically to their environment, while in the second they initiate their own actions. Investigators adopting the first, objectivist or positivist approach to the social world and who treat it like the world of natural phenomena, (hard, real and external to the individual) may choose from a range of traditional research options. On the other hand, those that adopt a more subjective approach,

..... who view the social world as being of a much softer, personal and man created kind will select from a comparable range of recent and emerging techniques - accounts, participant observation and personal constructs, for example.

(Burrell and Morgan, 1979;
quoted in Cohen and Manion, 1980 p.8.)

Reason and Rowan (1981) argue that when applied to the study of human behaviour, positivism and the scientific method become problematic because of the complexity of human nature and social phenomena. The tendency towards reductionism and compartmentalisation, which are inherent in positivism, may result in knowledge being taken out of context and the study of people being isolated from their social context. This may lead to distortion and reduced relevance.

According to Taft, (1985) ethnographic research consists essentially of a description of events that occur within the life of a group, with special regard to the social structures and the behaviour of individuals within those structures. It is a naturalistic and qualitative rather than a controlled and quantitative method.

Goetz and Lecompte (1984) contend that the ethnographic approach admits the subjective experiences of both investigator and participants into the research frame, thus providing a depth of understanding often lacking in other approaches to research. As such it is well suited to qualitative evaluation. Because Environmental Education fundamentally deals with human behaviour and the ethics upon which this behaviour is based (Irwin 1990), it seems appropriate to evaluate its implementation using a research method which is both descriptive and generative.

Heron (1981) states that most orthodox research takes absolute determinism as the general model of explanation and that despite obvious difficulties in practice, human behaviour is regarded as

part of the deterministic order. Traditionally therefore researchers in the social sciences have not fully informed their subjects about research propositions, the formulation of hypotheses and the conclusions reached.

By contrast, 'New paradigm' research is based on cooperative inquiry whereby the researcher interacts with the subjects so that both parties contribute to hypotheses making and the formulation of final conclusions. This contribution may be strong, in the sense that the subject becomes a co-researcher at every stage. Or it may be weak in the sense that the subject is fully informed throughout the research, is invited to assent or dissent, but does not necessarily contribute to the hypothesis formulation or the drawing of conclusions (Heron 1981).

Qualitative research in the schools is not possible without the cooperation of the Headmaster and his staff and for this reason the 'New paradigm' identified by Heron seemed a practical and ethically acceptable philosophical basis on which to conduct ethnographic research. Because much of the study focused on the interactions between teachers and pupils the researcher felt that the above approach was essential to gain the confidence and cooperation of both pupils and teachers, but in particular the latter. It was felt that;

- i. They had a right to be fully informed as to the nature and intent of the research.
- ii. Insight would allay any fears or suspicions which might exist.

- iii. Collaboration would elicit intelligent and constructive input from them based on an understanding of research aims.

3.2 THE RESEARCH SAMPLE

The research was undertaken at three non-racial private schools in the Eastern Cape and at the Thomas Baines Environmental Education Centre near Grahamstown. The investigation focused on the senior primary level, but also included certain relevant activities within the secondary schools.

The schools chosen for this research were selected because they are private schools, claiming to provide a child-centred, individually structured education consistent with many of Gough's ecopolitical ideals. In addition, the principals all stated that it was school policy to facilitate wherever possible, opportunities for the children's education to include exposure to the real world.

Prior investigation had also revealed that these schools were receptive to innovation and willing to become actively involved in educational research. This commitment to active participation in curriculum reform is expressed in the following extract from the mission statement issued by the Independent Schools Council of South Africa during the 1991 Headmasters conference:

It believes that, along side the political and social changes current or imminent in South Africa, there will inevitably be fundamental change in education, both in structure and practice. Member schools will no doubt take different routes to meet these challenges, but it will be a prime function of the ISC to facilitate

change, by the interchange of ideas, by its network of information, by the ongoing training of its teachers and administrators, by participation in curriculum reform, and by all other forms of encouragement, so that its schools can position themselves as leaders in the field of South African education.

(ISC.,1990 p.1.)

The above statement, coupled with the generally excellent facilities available in these schools, the favourable pupil-teacher ratios, the excellent transport facilities, and the curricular flexibility inherent in private schools, made it seem to the researcher that they could represent what was best in South African environmental education and perhaps serve as models for the rest of the country.

The decision to focus the study on the senior primary level was made because it is felt that this level in particular lends itself to an environmental approach. The reasons are as follows:

- a) The children have usually achieved a level of literacy which enables independent work.
- b) Examination pressure need not yet have become an inhibiting factor.
- c) At senior primary level classes tend to spend much of their time with the same teacher, which enables the integration of subjects and effective time management.
- d) There is a widely held assumption at the primary level that knowledge should not be compartmentalised into separate subjects (Kerry and Egglestone, 1988) The writer would like to suggest however, that fairly rigid compartmentalisation is probably still the norm in South African primary education.

e) An examination of the Cape senior primary syllabuses, used in the three private schools, clearly indicates in the view of the researcher, that direct knowledge transfer is only part of what children are expected to experience at this stage of their education.

In support of (e) above Opie (1987) provides the following synopsis of objectives in the primary school General Science course.

1. To guide pupils to respect and appreciate the wonders and beauty of nature.....
2. To inculcate in pupils a love of and interest in nature...
3. To stimulate eagerness to learn.... through independent investigation...
4. ... to learn and use correct scientific terminology.
5. To inculcate the desired attitude towards research by encouraging them to perform investigations of their own...
6. To provide pupils with those basic concepts and with that factual knowledge that is essential...

(Opie,1987,p.38.)

Campbell (1989) argues that primary school syllabuses in the Cape Province, offer suggestions rather than impose requirements, and that they allow the creative teacher ample opportunity for innovative education both in the classroom and in the wider environment. The researcher, who first taught in the senior primary school twenty years ago, has also noticed an increasing willingness on the part of superintendents of education to accept and even encourage innovative interpretation of the syllabus by teachers.

3.3 DATA COLLECTION

The prime aim of this research was to determine the extent to which the schools involved conform to principles expressed in the Tbilisi Declaration, specifically with regard to the stated objectives of, awareness, knowledge, attitudes, skills and participation, as expressed in appendix 3.

Data relating to these objectives was collected in three ways broadly corresponding to the themes detailed in 1.4. i.e:

- * Informal interviews and conversations with headmasters and teachers.
- * Observation of and participation in group activities including informal interviews with children.
- * Administration of 'My World questionnaire (Appendix 2) to one standard five class from each of the schools.

3.3.1 Informal interviews.

Cohen and Manion (1980) define the informal interview as being one in which the interviewer may have a number of key issues which he raises in conversational style instead of having a set questionnaire.

Informal (tape recorded) interviews were conducted with the heads of the schools prior to the start of group observations. An interview guide (Appendix 4) was used during these interviews to remind the researcher to raise certain important issues. It was not intended to be a detailed guide of the sort used in more

structured interviews, but merely to insure that key issues were not overlooked.

The aims of the interviews were:

- a) To explain the proposed research and plan a mutually convenient programme for participation and observation.
- b) To determine the principal's understanding of the concept environmental education.
- c) To gauge the extent to which an ecopolitical paradigm for education (Gough 1989) manifests itself in the curriculum of the school.

Referring to ethnographic research, Taft (1985) points out that the reliability and accuracy of observations can be enhanced by the use of modern audiovisual methods, because recorded data can be examined and analysed at leisure. For this reason all interviews were recorded on tape, a careful analysis of the conversations was made, and data transcribed onto prepared 'researcher guide' forms. (Appendix 3)

3.3.2 Observation and participation.

In case studies, multiple research techniques, including participant observation, are often needed for investigators to get sufficient data about different aspects of an object (Zeisel 1984). Because the aim of this research was to evaluate the practice of environmental education in a selected group of schools, it was important for the researcher to interact with pupils and teachers in as many 'natural settings' (normal school

activities) as possible. 'Natural settings' offer the researcher the opportunity to observe people engaged in activities a contrived setting could not recreate. According to Ziesel (1984) natural settings are particularly appropriate for diagnostic studies in which investigators want to find out what is actually going on - what elements, relationships and dynamics are salient.

The cross - curricular nature of environmental education made it difficult to decide on appropriate activities for observation. Because the presence of a third party in the formal classroom situation tends to have an inhibiting effect on the normal teacher pupil interaction and is often not welcome, it was decided, in consultation with the headmasters to keep this aspect to a minimum.

Although classroom observation was excluded from this research for the reasons given above, it was felt that the research would be incomplete if it did not include class work specifically related to environmental education. A number of classroom projects, mostly extensions of field-work, were evaluated and the findings have been incorporated in the overall research.

Since principals and teachers tended to associate environmental education with 'nature conservation' and 'outdoor education' they usually suggested that the observation and participation components of the research be concentrated on such activities. Careful consideration by the researcher brought him to the conclusion that these activities did in fact provide a particularly good opportunity for such observation. The reasons

were as follows:

- The relatively informal nature of activities outside the classroom made interaction with the children easier and less inhibited.
- Opportunities to study people-environment relationships and attitudes often arise during outdoor activities.
- Opportunities to observe inter-personal relationships and to draw some conclusions as to the prevailing 'ethos' within the group are more likely to occur in an informal setting.
- The outside environment provided excellent opportunities to gauge pupils level of ecological knowledge and understanding.

School groups were accompanied and interviews conducted with staff at the following places:

Andries Vosloo Kudu Reserve.
 Grahamstown 'Sun City' project.
 Hobbiton - on - Hogsback.
 Tharfield Nature Reserve.
 Pilanesberg National Park.
 Thomas Baines Nature Reserve.
 Umgeni Valley Project.
 Van Staden's Pass.
 Woodridge Nature Reserve.

Most of the above are nature reserves or wilderness areas situated throughout Southern Africa at which children are able to experience those things which are unique to such environments. The exception is the 'Sun City' project in Grahamstown which brings pupils from privileged backgrounds into contact with life in a squatter community (refer to 6.1.1).

3.3.3 The questionnaire:

The 'My World' questionnaire (Appendix 3.) was designed by the researcher to serve the following purposes;

1. To gain some insight into the values, attitudes and lifestyles of 'private school' pupils, on matters affecting the environment.
2. To measure in empirical terms the pupils comprehension of some important environmental concerns.
3. To allow the pupils an opportunity to demonstrate their knowledge about the natural world.

The questionnaire was administered to three standard five classes, one from each school. The total number of pupils involved was 42, of which 8 were girls. (Because gender was not considered an important variable in the context of this research no attempt was made to correct the imbalance in this ratio.) The sample size was considered to be an adequate representation of the senior primary classes at the three schools, which number a total of about 300 pupils. For the purpose of comparison, all responses have been converted to percentages on the basis of $n = \% \text{ of } N \text{ where } N = 42$.

Throughout this study the yardstick was compliance with the Tbilisi Principles (Appendix 1.) and the 'objectives' cited in the Tbilisi Declaration. Similarly, the questionnaire addressed these areas and questions were divided into three groupings derived from the above objectives; Knowledge and Awareness, Skills and Participation and Values and Attitudes.

Because of the 'general' nature of the information sought and the age of respondents, this questionnaire was designed to be enjoyable and well within the ability of the pupils. An important criterion for the distribution of questions was variety and the need to sustain interest. For this reason, questions relating to each of the Tbilisi objectives were not necessarily grouped together, but were distributed throughout the questionnaire. The researcher was at pains to stress that it was not a test and that the children were entitled to express their opinions honestly. Anonymity was guaranteed, it was also made clear that participation was voluntary and that it was not compulsory to answer all questions.

Following a pilot study and subsequent modification, the questionnaire was personally administered by the researcher who led pupils through it on a pre-determined time schedule.

The time allocated was 75 minutes, but in all the groups slower pupils requested and were granted additional time for certain questions (most notably, Question 2.) Without exception the children were cooperative and appeared to enjoy completing the questionnaire.

In retrospect however, the researcher believes that for standard five pupils the questionnaire should have been administered in two 60 minute sessions, possibly over two days. This would have provided the children with more time to consider some of the answers and would have made available a period for discussion immediately after completion of the questionnaire. A number of the respondents wanted to discuss issues after each session.

CHAPTER 4

PERCEPTIONS OF ENVIRONMENTAL EDUCATION

The character of any school and the curricular emphasis within that school can be and often are strongly influenced by the headmaster or headmistress. For this reason, the researcher hypothesised that perceptions of environmental education held by heads would significantly influence the nature of environmental education programmes where these existed. (Refer to 1.3.3).

4.1. KNOWLEDGE OF THE TBILISI PRINCIPLES:

Because the Tbilisi Declaration of 1977 is generally regarded as the definitive statement of the principles for effective environmental education, it was important from the outset to establish the extent to which the heads of the schools involved in this research were familiar with this document; and with the 1989 South African White Paper on Environmental Education, which is based on the Tbilisi Principles and was widely circulated to schools in this country.

Despite its importance and international recognition, only one of the school principals interviewed had heard of the Tbilisi Declaration. The same person was the only one familiar with the White Paper. This interview indicated that knowledge of the Tbilisi principles significantly influenced understanding of the concept 'environmental education'.

In the case of principals who had no knowledge of the Tbilisi document or the White Paper environmental education was exclusively associated with either 'Outdoor Education' or 'Nature Conservation'. It was seen as an activity in it's own right, somehow divorced from other school activities and typically practised in nature reserves or wilderness areas. One headmaster described his schools 'environmental education' programme as follows:

.....Yes, we have a set programme, we go to Hobbiton every year and do all the environmental things.

Another stated;

.....I think this whole environment nature thing is overdone by some teachers, there is more to life than bush.....I don't interfere because they are amongst my best teachers.

It is interesting to note that in later discussions the above headmaster was particularly enthusiastic about the concept of an ecopolitical paradigm for education and found that he shared many of the values expounded by Gough (1989). This suggests that the narrow interpretation of environmental education results largely from a lack of information. Despite the narrow interpretation taken by some of the heads it is important to note that they were positively disposed towards what they saw as environmental education. These activities were encouraged by them for two main reasons:

1. They saw field work as an effective way to study natural phenomena relating to the syllabus.
2. They considered that outdoor education provided a valuable opportunity for the development of leadership qualities and the exercising of initiative by pupils.

One of the headmasters said that he believed contact with wilderness would, "... through enjoyment, develop a love for nature and a caring attitude about the outdoors", which he saw as a " good thing " .

The following opening paragraph from a letter informing parents about a three day excursion to the Outdoor Education Centre at Hobbiton-on-Hogsback indicates the sort of benefit schools hope to derive from such experiences .

The purpose of the outdoor education trip is to make the children more aware of nature and their environment. In this way we hope to enrich the pupils knowledge and make their learning experience more enjoyable .

4.1.1. The influence of The Tbilisi Principles

The headmaster who was familiar with the Tbilisi Principles made the following statements indicating a sophisticated understanding of what is meant by environmental education:

While we do associate environmental education with our outdoor education programme, we recognise that there are many different environments, the sea, the urban or the Andries Vosloo Reserve for example.

This statement was significant, firstly because it indicated a recognition that environmental education went beyond outdoor education programmes and secondly because it constituted the first and only unsolicited reference to the urban environment in the context of environmental education.

The following statements by the same head provide further evidence of this holistic perspective.

At each level, Standard 3,4,5 and 6 our pupils are exposed to different environments with no predetermined agenda. They deal with issues as they arise or as they discover them.

In Standard 3 and again in Standard 4 pupils are involved in extended cross curricular projects involving the local environment....The Standard 3's play the 'Environment Game' and the 4's play the 'Game of Life', in both, children actively investigate and become involved in local environmental and social affairs. Issues might include things like packaging, ozone friendly products, waste and costs.... Visits might include insurance companies, the town council or the sewage works.

We built a 'Litter Monster' on the street last year to bring this problem to the attention of the public.

We encourage problem solving in a real life context.... an attempt is made to develop life skills.

We have a nature club at the school...and I am lucky to have on my staff people who are personally very interested in wild life and conservation. This filters through and much of the art and drama in the school reflects an environmental theme, probably because of the teachers interest.

The Tbilisi Declaration suggests that educators"introduce into each subject the essential environmental dimension" and makes the following recommendations specifically for primary schools:

In primary school, for instance, a few useful directions in which to promote environmental education would be programmes of visits, the use of free time for activities in close contact with the environment, the development of a critical faculty and ability to see things in the round, and the transcending of the cultural and scientific levels so as to gain an awareness of relations with the community and move towards solutions.

(UNESCO-UNEP, 1978, p.5.)

The above evidence suggests that this particular school has been

influenced by the Tbilisi Principles and was making a conscious effort to apply them. The researcher however recognises that there are also important elements of the Tbilisi Principles being applied at the other schools studied, despite their not being aware of the document itself.

4.1.2 Practices reflecting the principles of environmental education

Analysing the interviews, the researcher was able to identify five curricular aims which were also common to all the schools, and reflected what seemed to be core ideals in the private schools under study. All of these aims include elements consistent with the recommendations of the Tbilisi Declaration, and with Gough's ecopolitical paradigm:

- * To encourage an interdisciplinary approach to education in order to demonstrate relationships and give relevance to all aspects of the learning experience.
- * To encourage expression and provide opportunities for decision making by the pupils, both as individuals and within groups.
- * To adopt a learner centred approach to education with an emphasis on individual realization.
- * To recognise problem-solving and debate as important components of the school experience.
- * To utilise diverse learning environments and encourage firsthand experiences wherever possible.

Although not recognised as such by the majority of headmasters

these approaches were particularly significant from an environmental education perspective. This is because environmental education is in the first place an approach to education; it is not concerned only with the imparting of ecological knowledge.

Environmental educators have largely been content to see ecology as a subject matter - something to be transferred to learners. While it has been recognised that environmental education ought not to be merely education in or about environments....

(Gough, 1987, p. 50.)

Gough argues that to have a profoundly ecological understanding of education we must pay less attention to the objects within the environment and concentrate on interrelationships. Attention must be paid to the interactions between people and environments that he calls 'learning' and those between people and other people that he calls 'teaching'. The five curricular aims above, are essentially concerned with relationships within the learning situation, as such they may be regarded as potentially important elements in the environmental education at these schools.

'Environmental Education' is an educational response to wider social, technological and environmental changes. As such, it must not be seen as merely another addition to the school curriculum. It represents a total paradigm shift, a revolutionary approach to education which sees the existing paradigm as one of the root causes of environmental insensitivity. Only by fundamentally changing attitudes to a more gentle, humane and caring approach are we likely to reverse the environmental damage caused by the materialistic, atomistic worldview which dominates education today. Ecological knowledge alone, or even close contact with

environments will make little difference if it is not accompanied by a spiritual transformation.

4.2 CHILDRENS UNDERSTANDING OF ENVIRONMENTAL PHENOMENA:

Agarwal (1986 p.166.) writes that "The environmental is an idea whose time has come...." and there is today abundant evidence to support this contention. Environmental matters receive prominence in the mass media, they have become the subject of advertising campaigns, and concerned organisations both state-run and private make considerable efforts to increase public awareness.

Schools also, are inundated with glossy posters, pamphlets and environmentally related competitions. The senior primary classrooms visited during the course of this research, all, to varying extents reflected this emphasis. Posters and projects on wildlife and environmental themes were prominent on the walls. It would indeed be a most unobservant standard five pupil at one of these schools, who was not at least aware of the more popular environmental issues.

It is the view of the researcher that while these efforts to convey the environmental message are laudable, the display and use of such material, no matter how sophisticated, will not necessarily change attitudes or foster sensitivity towards the environment. There is, it seems to the researcher, a very real danger that such material can lead to complacency on the part of teachers and serve to entrench the idea that environmental problems are somehow abstract and removed from reality. Glossy

material on its own, may at best create only superficial or passive awareness.

Environmental awareness and the acquisition of skills for identifying and solving environmental problems, do not belong in the realms of theory; they are real issues in the lives of people. Materials relating to urban problems, consumer education and environmental matters pertinent to the everyday lives of the children were conspicuous by their absence in most of the classrooms. For the most part teachers seemed content to limit environmental education to the study of nature and of global issues in the abstract.

Implicit in the first hypothesis on which this research is based is the assumption that teachers and headmasters/mistresses perceptions of environmental education will also be reflected in the knowledge and awareness of pupils.

The data which follows is based on the 'My World' questionnaire and is an analysis of questions which were intended to gauge the nature of childrens environmental knowledge and their awareness of different environments (refer to section 3.3.3).

4.2.1. The 'Natural Environment'

'Natural environment' here refers to wilderness and rural areas as opposed to urban or highly developed areas and is different to the interpretation used by Ziesel (1984), (see 3.3.2)

Question 6. (refer to Appendix 2.) which asked respondents to identify photographs depicting 'an environment' was designed to establish their understanding of the term environment. It was motivated by the belief that there is a strong tendency for people to associate the word environment exclusively with nature or wildlife.

The findings strongly support this belief; 26% of respondents identified photograph 1. 98% chose photograph 2, 42% photograph 3. and 29% photograph 4. Only 17% of respondents recognised that all four photographs depicted environments.

There was also strong evidence of this emphasis in the classrooms, where the researcher was struck by the large number of pictures depicting wild animals and birds. Because of this overt interest, (presumably on the part of the teachers as well as the pupils) it was decided to include **Questions 26.** and **27.** in order to gauge the level of wildlife awareness at these schools. In these questions children were asked to identify from colour photographs, some of the better known African animals.

Three interesting findings emerged from **Questions 26** and **27**:

- i That there is a remarkably high level of recognition, the average score being 70%. Almost half the respondents scored 75% or more.

- ii. Pupils scoring over 75% tended also to have had more game reserve visits and wilderness experiences than those scoring lower (refer to Question 23 below).

- iii. There was no apparent relationship between the interests of parents (revealed by Question 25), and the childrens ability to recognise animals which may suggest that the schools and visits to wilderness areas are important factors in developing an interest in this aspect of the environment.

Question 23, intended to establish how many local (Eastern Cape) wilderness areas had been visited, revealed that standard five pupils at these schools had each on average visited 6 different Reserves, hiking trails or wilderness areas. This can be attributed in part to the personal interest of many teachers, who over the years have organised numerous field trips to these areas. Such trips have now become an integral part of the curriculum at all the schools researched.

4.2.2. The Built and the Technological Environments:

Although many people seem to take them for granted, and do not associate them with the term 'environment' the built and technological environments are in fact the ones in which most people live and work. Awareness and knowledge about these environments is in many respects more pertinent to lives of twentieth century children than knowledge of the so called 'natural environment'. In order therefore to gauge the level of awareness about matters closer to their everyday lives, it was

decided to include the following questions:

In Question 7. 'Where does the water in your tap come from?' and... 'What do you think happens to the sewage (dirty water) from your home?' the intention was twofold. It was firstly to establish the extent to which pupils understood the cyclic nature of water in the environment and secondly, to determine the childrens perception of where tap water originates, and where it goes to after use.

Responding to the first question, 76% of respondents answered, 'dam' or 'borehole', while 12 % said they did not know and the other 12% said from the sewage works. It is interesting to note that not one of the respondents mentioned rain as a source of water. This response was probably reasonable considering the wording of the question, which gave no indication that the cycle could be traced as far back as they liked.

Regarding the second part of this question, the researcher acknowledges that the word sewage may have been leading, but it remains interesting that 67% of respondents identified the sewage works as the final destination of dirty water. Only 19% mentioned rivers or the sea and the remainder did not know.

Although in retrospect the question could have been worded better, the important finding was that the majority of these children **may** think of their water supply as coming from one man made installation and ending up at another, in a linear rather than a cyclic fashion. It suggests to the researcher the

possibility that similar limited perceptions may exist with regard to other services and products commonly used by urban children.

Questions 8,9 and 10. dealt with energy and electricity and revealed an interesting contradiction. Most of the children, (93%) identified winter as the season when more electricity was used and were able to give reasons for their answers. However, responding to Question 10. the same children scored very poorly when asked to suggest ways to save electricity, only 21% giving satisfactory responses. This may suggest that the children have difficulty in relating theoretical knowledge to practical problem solving, a skill which forms a vital part of environmental education.

Because both coal mining and electricity were syllabus options in previous standards it was surprising to find that only 43% of the respondents were able to name coal as the fuel used to produce most of South Africa's electricity (Question 9).

Of these however, 94% demonstrated that they understood the environmental consequences of burning coal on a massive scale. Other sources of energy suggested were Nuclear 12% and a surprising 29% who said that hydro-electricity was the country's main source of power. The remaining 17% did not offer any answers.

4.2.3 Identifying environmental issues

An analysis of the response to **Question 28**. confirmed that the stereotypes referred to in 4.1 persist and that even relatively sophisticated pupils are not always able to appreciate the all-embracing extent of environmental issues. The popular and well publicised issues were easily recognised by most of the children, these being; population increase, hunting and fishing, farming methods and violence and war. (The surprising recognition by the majority of children that violence and war can be environmental issues is probably attributable to the television coverage being given to the environmental consequences of the 'Gulf War' at the time they completed the questionnaire.)

Issues about which there was considerable doubt were, play grounds, housing, traffic in cities, buildings, vehicles on beaches and waste in wealthy societies. Ironically most of these are issues closer to the daily lives of the pupils. This response in the view of the researcher illustrates the tendency for schools to regard the 'environment' as something removed from the daily lives of the children (refer to section 4.1).

4.2.4 Soil and Soil Conservation

The response to **Question 12**. in which pupils were asked to suggest ways in which soil erosion could be prevented, revealed a considerable level of awareness. 68% of the respondents gave satisfactory answers including grass and tree planting, stock control and management techniques. The remaining 32% either did

not respond or gave unclear answers. Because only 24% of the respondents come from farming families, it is reasonable to assume that some of this knowledge may have been gained through the childrens formal education.

When asked in **Question 13**. what they would expect to find in good topsoil, the response was disappointing, possibly because the question was not explicit enough. Although the researcher did explain that he wanted them to describe what they would expect to see in a handful of good soil, only 55% were able to answer. What makes the above result particularly puzzling is that 69% were able to respond well to **Question 14**. indicating that they had learned, (possibly without understanding) the concept of death, decay and growth in the food chain.

Question 17. 'What do you think people mean when they say that living things depend on each other?' confirmed that the pupils have in general considerable knowledge about the concept of food webs, nutrient cycles and dependency. However, the relatively poor response to **Question 13**. suggests that much of this knowledge is theoretical and that the children have not had sufficient 'hands - on' experience with soil.

4.2.5. Environmental Terminology:

Questions 16,18, and 19. were intended to gauge the pupils understanding of some of the commonly used terms in environmental discussion. For convenience the response to each term will be discussed below without further reference to the questions:

Endangered Animals: This concept was well understood by the children, possibly because of media coverage in recent years, but it might also be a reflection of the previously mentioned bias towards wildlife related topics in these schools.

46% of respondents identified human greed, hunting and poaching as reasons why animals might be endangered, while 11% suggested habitat destruction. Other responses included poison, disease and fire. However 31% of the pupils were unable to offer any reason.

Biodegradable: Only 41% of the pupils indicated that they understood the meaning of this word, and the quality of the responses indicated that understanding was limited. This seems to the researcher to be a further manifestation of the anomaly identified when comparing **Question 13**.and **Question 14**.in section 4.2.4.

Pollution: Although the pupils had little difficulty in giving examples of pollution, they did experience difficulty with explaining the meaning of the term in a more general sense. The example most commonly cited for pollution was factory smoke, 59% of respondents giving this example. The word 'plastic' (without any qualification) accounted for 21%, while 12% cited litter and dumping. Noise, spray cans and dirty water accounted for the remaining answers.

The multiple choice questions requiring the children to select the sentences which best described the terms; acid rain, recycling, and deforestation received an aggregate correct answer of 88%, indicating that most pupils were quite familiar with

these terms. The multiple choice format which required recognition rather than recall, probably made these terms easier to identify.

In general the responses to these questions reflect the wildlife conservation orientation within the schools, with children demonstrating an impressive ability to identify African wildlife. On the other hand their knowledge and understanding about matters closer to home was not nearly as complete, which suggests the need for a more holistic approach on the part of educators.

CHAPTER FIVE

CHILDRENS INTERACTIONS WITH THE ENVIRONMENT

5.1 PARTICIPATION IN THE SCHOOL CONTEXT:

In terms of the Tbilisi Declaration, the role of participation is;

To provide social groups and individuals with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

(UNESCO-UNEP, 1978, p.3)

In reality however, primary school children are somewhat limited in their ability to initiate active participation in environmental improvement and protection. For this reason it was decided not to interpret 'participation in the strict sense of the Tbilisi Declaration. The researcher sought instead to gauge the nature and extent of the childrens contact with different environments.

In the context of this research therefore, 'participation' refers specifically to educational and other formal activities which have enabled the children to gain firsthand experience of their environment.

At the schools where this research was conducted there is a general recognition that education should be extended beyond the confines of the classroom and the syllabus. Consequently, 'field trips' and 'outdoor education' are recognised as an important part of the curriculum. Headmasters and teachers closely associate environmental education with these activities and at all the schools they were cited as examples of environmental education practice.

Because environmental education is concerned with people-environment relationships, activities which bring pupils in contact with their environment, that move away from the abstract and towards a process of learning by discovery within their surroundings are important. This does not imply however, that lessons which take place outside the classroom are always synonymous with effective environmental education. As indicated in Chapters 1 and 2 environmental education is more than merely a process of learning in or about environments. If the experience is little more than an outdoor version of the didactical classroom experience then it can hardly be called environmental education.

5.1.1. Guidelines for Field-work

In South Africa today there are a number of sources providing teachers with guidelines and material for effective field-work; These include; The Wildlife Society of Southern Africa through its Umgeni Valley Project, The Environmental Education Association of Southern Africa (EEASA), The South African Department of Environmental Affairs, and the writings of individuals such as Opie. (see references)

In addition to the 1989 White paper on Environmental Education the South African Department of Environment Affairs has published a guide for teachers titled, Teaching for Environmental Conservation. Item 6.1.2. of this publication, Techniques for primary education provides a useful synopsis of the sort of

activities which might form a part of what are called 'environmental studies', while item 6.2.3. **Field-work and practical work**, provides evidence that official perceptions of environmental education are starting to change.

Field-work and practical work are essential parts of the environmental experience. Such experience should develop skills of observation and note taking, and should encourage positive environmental attitudes and behaviour in pupils.

One of the guiding principles for effective environmental education (listed in section 5.2) is that pupils should be involved in problem solving situations. Whether you teach Biology or Geography History or English, encourage your students to look at environmental issues objectively, to analyse problems and seek ways and means of achieving solutions.

(Teaching for Environmental Conservation, p. 9.)

The inclusion of concepts such as skills development, problem solving and the encouragement of positive attitudes indicates a recognition of the need for a wider, more holistic and less prescriptive approach to environmental education in South Africa.

An analysis of the above document and the White Paper indicates the important influence that the Tbilisi Declaration has had on South African thinking in recent years. Many organisations directly involved in environmental education today, recognise that the concept is not limited to the natural environment, that it embraces far more than structured field-work and scientific analysis, and that outdoor activities should not stop at observations alone but should include a wide range of experiences designed to bring the learner into contact with the total environment on the physical, intellectual and the spiritual level.

Developments within official departments such as the Department of Environment Affairs and specifically, the Chief Directorate Nature and Environmental Conservation (CDNEC) of the Cape Provincial Administration were important to this research. This is because of the extent to which the schools involved utilise the Thomas Baines Environmental Education Centre near Grahamstown.

5.2 THE ROLE OF AGENCIES EXTRANEIOUS TO THE SCHOOLS :

Where headmasters hold a narrow perspective they may be content to leave the 'environmental education' of their pupils to 'specialists' at institutions such as the Thomas Baines Environmental Education Centre, in the belief that this experience constitutes most of what environmental education is about. This does not imply that the contribution of such centres is unimportant. In fact their importance is magnified precisely because so much is left up to them.

Field-trips formed the cornerstone of 'participation' in the primary schools where this research was conducted, and these can be divided into two distinctive categories;

1. Those conducted under the auspices of the school and forming an integral part of school activities.
2. Those conducted by outside agencies, separate from normal school activities.

5.2.1 Thomas Baines Environmental Education Centre:

The Thomas Baines Gold Fields Environmental Education Centre, which operates under the auspices of the CDNEC is typical of a

number of such centres situated in nature reserves around the country.

As the name suggests, these centres were established in order to provide 'environmental education' to groups of children from schools in the area. The teaching staff at the centre recognise that they provide only a specific type of experience and that they are not able to do full justice to the concept of environmental education. Unfortunately, many of the schools are unaware of these limitations, and regard an annual visit to Thomas Baines as an adequate gesture towards environmental education.

In the specific case of Thomas Baines, the officer in charge of education is fully cognisant of the unrealistic expectations of many schools and is also soundly versed in the holistic principles on which modern environmental education is based. As a result, every effort is made to leave the children with lasting impressions and a level of awareness which it is hoped will permeate other aspects of their lives and schooling. The emphasis is on the experiential rather than on the formal transmission of knowledge, in the belief that enquiry and sensory interaction will provide more meaningful experiences and are more likely in the long term, to change attitudes and behaviour than will structured study guides and other techniques based on the scientific method.

The following quotations from a tape recorded meeting with the head and his staff, give some insight into the educational

philosophy and contribution of the Thomas Baines Centre:

The highest priority in this country as we see it, is to allow people to experience nature, who have never before had the opportunity..... in the hope that they will come to love and care for it.

We are moving in an experiential direction...the emphasis is on things like night activities, listening, feeling and solitaire. These activities are usually followed by a long 'summary session' in an open forum where the whole thing is placed in an ecological perspective.

The value of informal interaction is that it leads to the child asking questions, to a learner driven learning experience.....we want the person to have a direct experience that makes him ask questions.

We have to sell the idea that people need the natural areas, not only for conservation but also for their own spiritual needs.

We know that we provide for only one aspect of environmental education, but then much of environmental education can be done in town.....Syllabus related field-work should preferably be done around the school.....in our experience if nothing is happening in the child's life, in his school or home, then an outing like this is purely of recreational value.

There must be an element of preparation there is no way you can run an environmental education programme based on field-trips and outward-bound type activities alone.

When a school like St. Andrews Prep. comes here, the field-trips are completely in context. The children are ready, they are on the same wave length, so they get full benefit from the various studies.....The ideal is for us to supplement a good school programme.

Centres like Thomas Baines can make an important contribution to environmental education within a region, and can effectively supplement programmes within schools. In the opinion of the researcher however, the existence of these centres does present the following problems:

- i. By virtue of their location in nature reserves, the familiar 'game ranger' uniforms worn by the staff and strong emphasis on conservation, these centres tend to reinforce the widely held perception that Environmental Education is mainly about nature conservation.
- ii. Schools (even those positively disposed towards environmental education) tend to regard sending groups of pupils to an 'Environmental Education Centre' as a sufficient contribution to the subject in their schools.
- iii. The excellent facilities at the centres are limited and relatively remote. At best therefore they can only service a small proportion of the pupils in a given area which tends to favour the more affluent schools who use the centre to further enrich an already bounteous curriculum.

5.2.2 Outdoor Education:

Two of the schools at which the research was conducted place a strong emphasis on the 'Outward Bound' philosophy and in both cases this is closely associated with their conception of 'environmental education'.

Outdoor Education programmes, whether practised as an integral part of the school curriculum or at outdoor education centres such as Hobbiton-on-Hogsback, tend to have similar, well defined characteristics. In his book about Treverton College, Solomon (1988) identifies the following typical aims:

- personal confidence
- an increased level of agility and physical co-ordination
- an increased joy in ones physical self and in being with others
- an increased familiarity with God's creation in the natural environment
- an awareness of one's spiritual need for the outdoors

These are modelled on the aims of such organisations as Outward Bound and the Veld and Vlei Adventure Trust which believe that young people benefit from outdoor experience and therefore make the following assumptions:

1. People are more capable and have more resources than they think possible.
2. A small close group can successfully cope with any physical or mental challenge.
3. More can be achieved by presenting problems than by providing solutions.
4. A period of extended solitude contributes to one's physical, mental and spiritual well-being.
5. Stress and shared adventure are important catalysts in the self-discovery process.
6. One of the most important determinants of a person's future is self concept.
7. Everyone is capable of critical decision-making and responsibility.
8. Significant long-lasting learning can be achieved through an intensive short term experience.

(Solomon, 1988 p.4.)

Clearly many of these goals are compatible with those for Environmental Education and echo important concepts found in the Tbilisi Principles and the writings of Gough (1989). Concepts such as increased familiarity with the natural environment, awareness of a spiritual need for the outdoors, resourcefulness, critical decision-making and problem solving are common to both environmental education and outdoor education as expressed by the philosophy. It is however important not to confuse these concepts

and to remember that Outdoor Education is at best, only a small part of the more holistic, Environmental Education.

5.3 INTEGRATED PARTICIPATION

Sending the children away from school to get 'environmental education' is therefore a misconception. Because it is a holistic approach to education, environmental education should remain an integral and continuing part of the learning process at school. The ideal is to incorporate environmental education wherever possible in the everyday experience of the child and continuously to relate field experiences to those in the classroom and to the social milieu.

Field-work should therefore be routinely undertaken, (where possible, in the context of the syllabus) and ideally, at primary level, under the guidance of the class teacher who is in the best position to incorporate this work in the total development of the child.

5.3.1 The Tharfield excursion:

The Tbilisi document identifies five categories of objectives for environmental education; **Awareness, Knowledge, Attitudes, Skills and Participation**. These categories can form a useful basis for the evaluation of field-work and have been used for the following description of a particularly successful field-trip undertaken by a standard three group from one of the schools.

The three day outing took place at the Tharfield Private Nature Reserve, situated on the coast between the Riet and Kleinemonde River mouths, the aim being to study the ecology of the coastal zone. The average age of the children was ten years.

Awareness: Within the context of the beach environment and at a level appropriate to their age the children were encouraged to observe and discover the different zones, subtidal, intertidal, primary dunes, transverse dunes and coastal thicket. The emphasis was on the use of the senses for observation, based on which children were expected to formulate their own answers to questions posed on comprehensive worksheets.

Appropriately at this age, the focus was on awareness and sensitivity, with aesthetic aspects playing an important part. Children were encouraged to describe feelings, textures, smells and visual observations including the use of magnifying glasses.

Knowledge: The main aim of the outing was to give the children some insight into the complex interactions and dynamic nature of the coastal zone and to demonstrate that dunes and beaches are not barren wastelands but sensitive and vulnerable ecosystems. Before the excursion each child was given a plastic folder which contained the following:

- * A procedure list.
- * A programme of events for the three days, which included instructions, questions, activities and worksheets covering each aspect of the field-trip. See Appendix 5.
- * Handouts containing relevant reference material.

The children were told that the excursion would be followed by individual projects to be completed at school. For this purpose they were encouraged to make close observations and collect appropriate samples. The project and other follow up exercises formed an important part of the field-trip. See Appendix 6.

Much of the knowledge component was however built around questions posed by the children in the field. Significantly, the teacher in charge made it clear at the outset that he did not have all the answers and that they would all be learning together. Throughout the exercise children were encouraged to arrive at their own conclusions based on observation and discussion.

Attitudes: The human impact was investigated and examples of insensitive or destructive behaviour were discussed. Issues included litter, beach cottages, graffiti on rocks and the driving of vehicles on the beach. All these issues were raised by the children as a result of their own observations. Possible solutions to the problems were suggested and debated.

Attention was drawn to the question of litter by means of a game in which children were asked to collect 'foreign' items of interest on the beach and then to make up a story of how they got there. This activity not only drew attention to the problems of litter and waste but also provided an element of fun and an opportunity for creativity.

Skills: Experiential learning and problem solving formed an important part of the teaching methodology used on this field-trip. Symmetrical dependence was strongly in evidence despite the relative youth of the pupils.

Participation: Field-trips as a rule take place over short periods and are confined to limited, often pristine environments. Their value from an environmental education point of view therefore, lies chiefly in the fact that they expose the learner to issues or experiences which may increase awareness, change attitudes or even influence behaviour.

The field-trip itself will not necessarily provide opportunities for active involvement in solving environmental problems. However, it will always provide the good teacher with opportunities to develop problem solving skills which in another context could be used to resolve actual environmental problems.

The researcher believes that the Tharfield excursion was effective for the following reasons:

1. It adequately addressed all the objectives identified in the Tbilisi Declaration thereby giving the children an integrated and holistic perspective on that particular environment, as well as the opportunity discover generic concepts for themselves.
2. The learning process was characterised by co-operation between learners and symmetrical dependence of learners on teachers.
3. There was a strong emphasis on the experiential, which meant that much of the discussion and study was learner motivated.
4. The programme was thoroughly planned and demanded of the children careful observation, the rigorous recording of data and a great deal of creativity. See Appendix 5 and 6.

5.4 PARTICIPATION (QUESTIONNAIRE ANALYSIS)

Two aspects of the 'My World' questionnaire have been included in this chapter. The first gives some indication of the nature of participation by the children and the second is an analysis of their ability to respond intelligently to current environmental problems.

5.4.1 Voluntary participation

For reasons noted earlier (see section 5.1), the term 'participation' will for the purposes of this research refer specifically to education and other formal activities which have enabled the children to gain firsthand experience of their environment. Participation in field-trips has formed the core of the 'environmental education' programmes at all the schools. Because of the narrow interpretation which predominates however, such field-trips have mainly, but not exclusively, concentrated on nature reserves and wilderness areas.

As indicated in section 4.2.1. most of these children have participated in a significant number of encounters with the natural environment. Consequently many of them demonstrate a high level of knowledge about this aspect of the environment.

Question 25. which deals with affiliation to conservation or scouting movements, revealed that 48% of the respondents have in the past, or currently, belong to a 'wildlife society' of some sort and that a further 29% have been or are affiliated to a

scouting movement. These relatively high percentages are significant, because voluntary participation in the activities of such organisations indicates that many of the children are sufficiently motivated to initiate their own active involvement.

The second part of Question 25. asked respondents, in the first place to name any interesting clubs or societies to which they belonged and secondly those to which their parents belonged. The intention was to establish whether there was any obvious correlation between the interests of children and those of their parents. The following findings emerged:

- i. A common interest in sport was immediately apparent, participation in sporting activities clearly playing a prominent part in the lives of both pupils and parents. 57% of parents belong to sports clubs and 90% of the pupils mentioned sporting activities amongst their interests. The sporting tradition is clearly well entrenched in both groups, possibly the result of generations brought up in a sporting school tradition.
- ii. Only 7% of parents belong to societies concerned with the natural environment or conservation, compared to 76% in the case of the children. This makes it apparent that the schools can and do motivate children to adopt new attitudes and participate in activities appropriate to the changing circumstances of their world.

5.4.2 Insight and problem solving

One of the objectives for environmental education cited in the Tbilisi declaration was to help groups and individuals acquire the skills for identifying and solving environmental problems. **Question 29** was intended to provide pupils with an opportunity to demonstrate their ability to evaluate the environmental impact of a given technology and to argue in support of their position.

Five inventions, motor vehicles, telephones, printing press, television, and plastics were listed, and pupils were asked to select any one which they believed could have a detrimental effect on the environment and to give reasons for their answers.

The majority, 52%, of respondents selected 'plastics' as being harmful, but few were able to justify their choice credibly or to demonstrate any real insight into the potential environmental consequences of their choice. A further 33% of the pupils selected 'motor vehicles' and again were not able to explain their choice adequately. Interestingly the 14% which selected the less obvious 'printing' or 'television' were, in the estimation of the researcher better able to justify their choices. This is possibly because their conclusions were the result of original thought rather than popular wisdom which is not really understood.

When asked to select one of the above inventions which was environmentally benign or could even have a positive effect on the environment, two namely 'telephones' and 'television' shared 94% of the responses. The selection of these two by so many of

the children does indicate an ability to identify the more obviously benign inventions, but, once again they had difficulty with providing reasons for their selections.

Responding to **Question 30**: 'Can you think of any reason why large numbers of poor people all over the world are moving to the towns and cities?' 76% of the pupils cited 'pull' factors such as the desire for money, food or work as reasons for the rapid urbanisation of the rural poor. A further 12% stated that they came in order to beg from the rich and only 9% cited 'push' factors such as diminishing land and fuel resources. The answers given indicate that these relatively affluent children have only limited insight into the plight of the rural poor and the environmental consequences of a problem which is today endemic in the Eastern Cape and other parts of South Africa.

In both **Questions 29** and **30**. the pupils revealed only superficial insight into these pertinent environmental issues and this in the opinion of the researcher, limited their ability to present coherent arguments in support of their opinions.

CHAPTER SIX

VALUES AND ATTITUDES

6.1 THE PHILOSOPHICAL DIMENSION OF ENVIRONMENTALISM:

Environmentalism, according to O'Riordan (1981)

... is as much a social movement as a political activity. It exists to change peoples outlook on the world, their beliefs and behaviour, not just to shift public policies and redirect particular decisions. Like all good social movements it espouses a reformist philosophy."

(O'Riordan, 1981, p.3.)

He suggests that Western society is in the process of moving from a Technocentric to an Ecocentric philosophical base, and that at the cutting edge of this movement are the 'Deep ecologists' who represent the ultimate goal of the environmental movement.

Modern environmental/ecological social movements have arisen out of the perceived need for a new ecological philosophy. The ecological crisis, according to Devall and Sessions (1985) is increasingly coming to be understood as primarily a crisis of character and of culture. If environmental education is to be effective therefore, it must go beyond the factual scientific level and must cultivate ecological consciousness, ethics and values.

Deep ecology goes beyond a limited piecemeal shallow approach to environmental problems and attempts to articulate a comprehensive religious and philosophical worldview. The foundations of deep ecology are the basic intuitions and experiencing of ourselves and Nature which comprise ecological consciousness. Certain outlooks on politics and public policy flow naturally from this consciousness."

(Devall and Sessions, 1985, p.65.)

Following this line of argument and in the context of the hypothesis stated in Chapter 1, the researcher felt that it was important to consider those aspects of school life which in his opinion influence the social, political and ultimately the environmental sensitivity of the pupils.

6.1.1 The Social Environment

The Tbilisi Principles state that environmental education should consider the environment in its totality, natural and built, technological and social and that special attention should be paid to understanding the complex relations between psycho-economic development and the improvement of the environment. This is a clear directive that environmental education should link the education process with real life, building its activities around the environmental problems that are faced by communities. Encouraging an awareness of the needs of others is therefore an important aspect of environmental education.

In the Tbilisi document terms such as concern, values, attitudes, sensitivity and feelings are often used which in the view of the researcher indicates a recognition that environmental education is essentially aimed at changing the ethos within society to a more caring one. For this reason, community service and social awareness can constitute an important part of environmental education.

Where children are involved in community service or are made aware of conditions within their social environment, this constitutes an essential part of their environmental education.

Projects which bring pupils into direct contact with the often harsh realities of life in their communities or demand of them some sacrifice, may serve to sensitise them to the needs of others and to demonstrate that action can make a difference.

The researcher believes too that a person who is not in the first place sensitive to the needs of other people, is less likely to be sensitive to the needs of a living environment.

The private schools that were the subject of this research all have ongoing community service projects. These include surf life-saving commitments, the clearing of exotic bush from public land, running a soup kitchen for under-privileged children, assisting with the maintenance of a nursery school in a squatter community, fund-raising for charity and anti-litter campaigns. In most instances teachers at the schools did not regard these activities as having any environmental significance. They were seen rather as opportunities to increase awareness of the needs of others and as providing a tangible means of expressing the responsibility of members of a community for one another.

The researcher however, regards this involvement in the affairs of the community as an important manifestation of a move towards relevant, environmentally based education. Direct participation is perhaps the most effective way to enable children to recognise, understand and begin to look for solutions to problems within their environment.

6.1.2 The Liberal Tradition

Traditions dating back in some cases to the middle of the last century are strongly entrenched in the schools studied and the researcher was struck throughout by the unwavering faith expressed in the Liberal and Christian traditions on which these schools were founded. These, along with concepts such as 'fair play' and 'teamwork' were often cited as important values on which children could build for the future.

The following extract from the Mission Statement issued by the Independent Schools Council in 1991 illustrate this:

At the same time it (ISC) recognises that the past educational traditions and practices which its schools have inherited (which are very far from what is generally practised in South Africa) represent a human achievement of the first order, incorporating a vast amount of wisdom and experience, and it is concerned to ensure that what is valuable in this tradition will be conserved and assimilated in whatever new systems arise in the future.

(ISC.Synopsis,1991, p.1.)

Although populists might argue that this statement is naive or irrelevant in the South Africa of the 1990's, representing as it does an essentially middle class perspective, the researcher believes that there is much in the liberal tradition of these schools which is conducive to environmental sensitivity and caring. Aspects such as non-racialism, religious tolerance, critical debate and the encouraging of free expression are all very much a part of the environmental paradigm for education as defined by writers such as Gough, Di Chiro, Irwin, and O'Donoghue (refer to references pp.93-97).

6.2 VALUES REVEALED BY THE QUESTIONNAIRE:

The way that people live, their priorities and consumer habits always have environmental consequences. The socio-economic status of a group directly influences the nature of its demands on the environment (Wilson and Ramphele, 1989). For this reason the questionnaire sought to investigate those values and attitudes which could influence the children's behaviour towards the environment. The researcher hoped that this might also provide some insight into the environmental educational needs of this particular group of children.

The middle class background of the majority of these children, particularly with regard to consumer habits and conceptions of beauty, was very much in evidence in their responses to the 'My World questionnaire', **Question 1**. 'Can your family do without any of the following things in their daily lives?' was designed to elicit two sets of information:

- Childrens ability to distinguish between necessities and luxuries
- Attitudes towards some environmentally contentious issues, namely, electricity, motor cars, plastics, tree utilisation.

Table 6.1. below indicates that the pupils were easily able to distinguish between essential and non-essential items.

Table 6.1. Number of pupils responding to Question 1.

	<u>YES</u>	<u>NO</u>	<u>NOT SURE</u>
Clean water	3	32	5
Electric blankets	42	0	0
Trees for building	30	4	8
Canned fizzy drinks	36	4	2
Air fresheners	30	4	8
Fresh vegetables	1	36	5
Trees for fruit	6	25	11
Warm clothing	5	31	6
Bubble bath	39	2	1
Trees for firewood	19	12	10
Exercise	4	32	6
Sweets	33	4	4
The latest clothing fashion	30	7	5
Fresh air	2	38	2
Electricity	10	25	7
Motor cars	14	23	4
Caravans	38	1	3
Trees for shade	11	21	8
Sports fields	22	11	8
Plastic	25	9	7

(N = 42)

Children responded as follows to the more environmentally contentious questions:

Electricity; 60% said that they could not do without electricity, while a surprising 21% believed that they could and the remainder were unsure. Clearly the majority of these pupils regard a supply of electricity as an essential in their lives and this has important environmental implications for South Africa in the years to come.

Motor cars; 55% regarded these as something their families could do without in their daily lives, while 33% regarded them as essential. The response to this question might reflect youthfulness of the respondents or possibly the affluent circumstances from which they derive, circumstances which have totally removed them from the realities of a life without private transportation. Nevertheless it remains significant that the majority are able to envisage a world in which the motor car plays less of a part.

Plastic; 60% of the children regarded plastic as something their families could do without. The researcher believes that this surprisingly high percentage reflects to some extent the previously mentioned (section 4.2.5.) negative connotation attached to the word 'plastic'.

Trees; Included in this list were four references to trees. Two of these, namely trees for fruit and trees for shade, were strongly supported, with the majority of children feeling that they could not do without these in their daily lives. By contrast, 71% did not regard trees for building as essential. The above finding which seems to the researcher to reflect a child's perspective on trees, might serve as a reminder to environmental educators that children often value things for very different reasons to adults and that these must be born in mind if effective communication is to take place.

On the question of trees for firewood there was an almost equal split between those who said they could do without them and those who claimed that they could not, or were unsure. It is worth noting that of the latter group 41% were farm children or came from either Botswana and Bophuthatswana, which seems to indicate that these children might be familiar with the realities of energy production in rural Southern Africa.

6.2.1 The Value Shield

The value shield (Appendix 2. No.2) was intended to give the children an opportunity to freely express their feelings and preferences both personal and in a wider social context. It was hoped that some trends of environmental significance might emerge. Because of the open nature of these questions and the wide variety of responses, it was decided to confine the analysis to those areas where definite and relevant trends emerged.

Although questions 1. and 2. of the were mainly intended to introduce the children to the 'Value Shield' and encourage them to be open and relaxed, they also revealed some interesting data.

When asked to name their favourite foods 88% of the responses included meat in one form or another, 24% specifically mentioned hamburgers, while other 'fast foods' were also prominent. This is consistent with similar trends in affluent societies and has important implications for the global environment. (Elkington and Hailes 1990)

A somewhat contradictory finding emerged from Question 2 of the Value Shield. When asked to write down things that they liked doing, relatively few, 31% of the respondents referred to school sport. This figure contrasts sharply with the responses to question 25 (refer to section 5.4.1) and may indicate that the strong emphasis on the 'traditional' sports in the schools is not actually appropriate to the needs of many children. Wilderness related activities, including hunting, fishing, bird watching, butterfly collecting, hiking and camping made up 29% of the responses.

When asked what scared them (question 3.) the children came up with a wide variety of responses and no clear pattern emerged. However, certain fears were expressed with some frequency and these included; snakes, the loss of parents, war and nuclear war, satan, death, motor accidents, environmental destruction and darkness. Although there are environmental implications to some of these, in no instance was the frequency of occurrence sufficient to warrant specific attention in the context of this research.

In question 4. the children were asked to cite the qualities that they liked about their best friends and in question 5. those they believed their friends liked about them. The most striking thing about the responses was the number of children who cited exactly the same qualities in both cases. Three qualities dominated the responses; Fun and humour was cited by 26% of the children,

Kindness and generosity by 23% and loyalty and friendship by 18%. Given the choice in question 6. of any one thing they would save from their burning homes the children responded as follows; 69% chose to save either family members or pets, while material items made up only 21 % of the responses. This may suggest a caring and considerate attitude in many of the children and has important implications for the concept of environmental education, which aims to engender a less materialistic and more gentle, caring approach to life.

Similarly in question 7. when asked what would make the world a better place, more than half of the children offered abstract concepts such as peace, friendship and an end to violence.

The elimination of environmental problems, specifically pollution and population growth accounted for most of the remaining responses, (27% of the total). This is particularly significant because the response came early in the questionnaire, before the pupils would have become aware of the environmental slant to the exercise.

Responding to question 8. in which they were asked to name any one thing they wanted, the children were almost equally divided between those who offered material items (54%) and those who offered abstract concepts such as friendship, peace, love or faith (46%). The researcher feels that the relatively high number of abstract responses reinforce the findings in 6. and 7. above.

With hindsight the researcher feels that the sort of information gleaned from the 'Value Shield' was extremely important from an environmental education point of view and that this approach to questioning should have made up a greater part of the questionnaire. Because of the researchers basic assumption that positive attitudes and values are a prerequisite for responsible and sensitive behaviour towards the environment, it was important that he gain some insight into the values and attitudes held by the children.

6.2.2. Perceptions of Beauty

Question 4. of the main questionnaire required pupils to name a beautiful place they had visited. It aimed to give the children an opportunity to communicate their perceptions of environmental beauty, while Question 5. provided them with a chance to describe what they regarded as an unpleasant environment.

In response to Question 4. the great majority of children regarded tranquil rural or pristine natural areas as the most beautiful and in the reasons given reference was usually made to peacefulness or to the beauty of the natural fauna and flora. The 20% of the respondents who saw beauty in the urban areas offered a wide variety of reasons, these included beautiful buildings, friendly people, recreational facilities, good hotels and general aesthetic appeal (particularly when referring to Cape Town)

Although the places named in **Question 5.** were diverse, including rubbish dumps, factories, black townships and cities in general, there was almost total agreement about what actually made these places ugly. Litter and smoke were repeatedly cited as the main offenders.

The clarity with which the children were able to pinpoint their ideal environments as well as to articulate their feelings about unpleasant environments could have important implications for environmental education in schools. Firstly, because the apparent consensus on these issues can serve to stimulate popular participation in remedial actions and secondly because dealing with some of the issues (such as litter) is well within the capabilities of even primary school children. As such they present ideal starting points for active participation in environmental concerns identified by the learners themselves.

CHAPTER SEVEN

CONCLUSIONS

7.1. EVALUATION OF THE RESEARCH:

7.1.1. The Ethnographic Approach:

The decision to opt for a subjective approach to this research stemmed in the first place from the researcher's conception of social reality. The researcher does not accept that the social world can be treated like the world of natural phenomena. Secondly, the researcher regards the environmental crisis as a primarily sociological problem having its origin in the aggressive, utilitarian and self-serving ethic which dominates modern society, an ethic which is no longer appropriate to an overcrowded world with diminishing resources.

The fact that environmental education is a multi-dimensional concept involving many aspects of school life, different relationships and subtleties, as well as ecological knowledge and understanding, made the ethnographic research approach, (described in Chapter 3) particularly suitable for much of this work. The researcher did however feel that there were three areas in which this approach became problematic:

- i. The presence of a second adult, (the researcher) in the primary school situation possibly distorted or inhibited the normal interactions within the group.

- ii. The logistics of accompanying groups or spending extended time at schools proved difficult because the schools are situated far from each other and from the researchers home. Most of the field-trips were also conducted in outlying areas. Ethnographic research is possibly therefore, better suited to subjects or situations more easily accessible to the researcher over an extended period.

- iii. The full timetables at these schools also made it difficult for them to accommodate the researcher at all times. It is important to note however that all the schools were extremely generous and co-operative throughout this research. Extended ethnographic research may therefore mean that the subject of the research is considerably inconvenienced, particularly in rigidly structured organisations such as schools.

The researcher believes that his many years of experience as a teacher enhanced the value of the ethnographic component of this research. Being familiar with the school situation made it possible to detect nuances which might otherwise have been lost.

7.1.2. Interviews:

Interviews with headmasters and teachers proved to be a valuable source of information. As previously indicated these were conducted in an informal manner and the researcher was impressed by the frankness which characterised these discussions. No attempt was made to withhold information and the researcher was

given every assistance and encouragement in his investigation.

7.1.3. The Questionnaire:

The inclusion of a questionnaire was not originally intended for this research, but, at an early stage it became apparent to the researcher that there was an over-emphasis on the activities and ideas of headmasters and teachers and that insufficient attention had been given to establishing the level of environmental knowledge amongst the children themselves. This resulted in the development of the 'My World' questionnaire which in its final form probed the childrens perspectives on aspects of the three themes within this study (refer to section 1.4.). The schools were again approached, and permission was granted to administer the questionnaire to one standard five class from each school.

Although the questionnaire proved to be long for standard five pupils and with hindsight some questions could have been worded differently, it succeeded in many of its aims and was able to make an important contribution specifically to chapters 4, 5 and 6.

7.2. ENVIRONMENTAL EDUCATION AND THE PRIVATE SCHOOL ETHOS:

One of the hypotheses postulated in the first chapter, is that there exists a close relationship between the prevailing ethos within a school and the environmental sensitivity displayed by the children. The researcher believed that the child-centred approach to education at the schools in question should bring them closer to the 'ecopolitical' model identified by Gough (see section 1.3.1 table 1.1.)

The Eastern Cape private schools were selected for this research, because they are well known for their vigorous outdoor education programmes which include the study of conservation, ecology and wildlife. In addition, they were willing to co-operate and were eager to be evaluated from an environmental education perspective.

As the research progressed it became increasingly apparent that the interest in environmental education at these schools was closely connected to the ethos in the schools and their general educational philosophy. The one seemed to be a natural extension of the other. An example of this is the 'Fideliter Scheme' which has been introduced at one of the schools. This scheme encourages self evaluation and assists pupils to cope with a gradually increasing responsibility, and can be seen as typical of the child centred approach to education at the three schools. Under the above scheme a pupil reaching the level of Councillor, should;

....be a sound leader in all spheres of school life and should show understanding and compassion to those in charge. As the name suggests, a councillor forms part of the pupils' governing body.

(Woodridge Brochure,1991.)

This emphasis on compassion, on service to both school and community and the rewarding of gentle, considerate behaviour was a characteristic which the researcher experienced at all the schools.

Although the schools themselves do not always recognise that the above characteristics have anything to do with environmental education, the researcher believes that it is precisely this

ethos which has brought these schools closer to the ecopolitical paradigm identified by Gough (1989). Sensitivity to the needs of individuals and those of the society will ultimately lead to what Leopold (1949) called a new ethic, one which would include morality in our dealing with all life on earth. De Beer (1991) expands on this concept arguing that;

The problem was, and frequently still is, that plants, animals species and ecosystems are not moral objects; do not feature as such in our moral lives.

(de Beer, 1991,p.14.)

He argues that moral development has evolved from an initial accent on the relationship with other individuals, to the relationship with society and is now poised to include all forms of life on earth.

Moral development has always been a function of education and it has been regarded a the legitimate role of schools to convey moral standards appropriate to the norms and needs of society. An appropriate moral response to a changing and threatened environment seems to the researcher thus to be entirely within the mandate of schools.

Pupils at the schools investigated undoubtedly have had a rich and varied exposure to their surroundings. Field-work and projects play an important part in the curriculum and as might be expected, the pupils have consequently accumulated a considerable amount of empirical knowledge about some aspects of their environment. To believe however, that the efficacy of environmental education can be measured in terms only of

accumulated facts, is to have misunderstood the philosophical basis underpinning the concept.

7.3. COUNTER CURRENTS;

The 20th century conflict theorists identified many areas of similarity between the structures of the wider society and those within the schools. Althusser (1980) for example makes an interesting comparison between the role of the church in precapitalist society and that of the education system in modern capitalist society. He sees both as 'ideological state apparatuses' for the transmission of ruling class ideology. Similarly, some environmental educators regard traditional schools as the handmaidens of an industrialised consumer society.

Even in progressive private schools there are structures and traditions which seem to the researcher to militate against the implementation of an environmental approach to education. These include deeply entrenched hierarchical disciplinary structures which tend to be authoritarian in character and academic programmes (at senior level) which concentrate on abstract theoretical knowledge and are strongly examination orientated. There is also a discernable aura of elitism and exclusivity which may negatively influence the sort of relationships necessary for social and environmental sensitivity. Finally, there is at these schools an overt emphasis on rivalry and competition both between schools and within the schools themselves.

The above aspects of the curriculum can have a subtle and powerful influence on the values held by the children. Because the element of rivalry manifests itself particularly strongly in sport, this aspect is briefly dealt with below.

7.3.1. Sport:

Sport forms an important part of the curriculum in all these schools and two in particular have a strong sporting orientation. For all its positive attributes, sport can introduce into schools an aggressive competitive ethos which is in some ways the antithesis of the one advocated for environmental education. Principals at three of the schools indicated that parents placed them under considerable pressure to succeed in sporting competition, with the result that sport tends to take precedence over many other activities and to become the dominant 'cultural' force in the school.

Irwin (1982) encountered a similar situation in Natal:

Where individual teachers are interested in environmental education or conservation, they frequently come up against the indifference or occasional antagonism of their principals many of whom are sport-orientated to the exclusion of most other activities.

(Irwin, 1982, p.47)

The principals of the more 'sport orientated' schools involved in this research are not antagonistic or even indifferent to environmental education, but there is a real danger that where sport becomes a high priority the aggressive and competitive spirit needed for success will increasingly pervade other aspects of school life. Where such values become dominant, they may have an adverse effect on the environmental ethic, and on the efficacy

of environmental education.

7.3.2. Education Theory and Teaching Method:

Compared to other schools in South Africa, the evidence suggests that these private schools are among the more 'ecopolitical' in orientation. They consciously attempt to avoid the determinism of the behaviourist approach. However, they exist and operate within the South African milieu and a number of their teachers are the products of a national system in which the behaviourist philosophy of Fundamental Pedagogics has dominated for decades (Gunter, 1985). Aspects of the behavioral approach to teaching are deeply ingrained at all levels of South African Education, including the most progressive.

The holistic emphasis which is so central to the environmental approach is rare in the South African context. Many of the modes of operation, even within the progressive schools that were the subject of this research, emphasise an atomistic world view. These include; age-graded study, separate subjects, programmes synchronised to timetables and a strong emphasis on theory. Gough (1989), contends that curricula which are 'too theoretic, or 'too compartmentalised' promote the atomistic world view which has,

...abstracted reality, nature and human nature into a world composed of separate entities such as atoms, individuals, academic departments, corporations, cities and nations.

(Gough, 1989, p.232.)

It is important to note however that there was evidence at all the schools involved in this research, of a shift away from

what Gough calls the 'epistemological paradigm' and towards his 'ecopolitical paradigm'. The inclusion in the curriculum of the aims described in chapter 4.1.2. and even of subjects such as computer studies, health education, outdoor education and traffic safety education indicate tentative moves away from the traditional academic disciplines and towards an education with more relevance to the pupils environment.

7.3.3. Outside Influences:

Although they are undoubtedly an important factor in the formulation of children's values and attitudes, schools are by no means the only, or even the most important influence on their behaviour. Both the children and the schools themselves operate in a wider social context and are strongly influenced by the norms and standards of the society in which they live. The values held by a community will always be reflected in its children.

Thus for example, a society which actively encourages consumerism and which has allowed its youth in particular to become the targets of carefully orchestrated advertising campaigns, unwittingly perpetuates wasteful and environmentally damaging practices. Equally, a society which institutionalises discrimination and the large scale exploitation of people should not be surprised if its citizens demonstrate little respect for the environment or rights and needs of other life forms.

While schools may therefore contribute towards environmental awareness and some extent change attitudes or behaviour, their

influence is often countered by the prevailing norms of society. Environmental education has a definite political component; it is essentially reformist in character and seeks to bring about fundamental change in society. For this reason it is important that the concept free itself from the narrow association with conservation and nature study and emphasise total people-environment relationships.

Greater emphasis on its ethical and its political aspects is necessary if environmental education is going to make a difference or have relevance. This is particularly true of South Africa where many people hold negative environmental perceptions and feel that environmentalists place the needs of animals above those of people. By concentrating on wildlife and wilderness to the exclusion of the human condition, Environmental Education runs the risk of being marginalised because it is perceived to be irrelevant to the "real" issues of the day. (Khan, 1990)

The danger of this marginalisation is not limited to the disaffected poor, it applies equally to the affluent, for as long as the 'Environment' is perceived to be something or some place apart, the concern of somebody else, it will not be recognised as an integral part of human culture.

7.3.4 The influence of socio-economic factors:

In the first hypothesis on which this research was based, the assumption was made that the interests and attitudes of educators were the most important variables determining the nature and extent of environmental education in schools. While there was

considerable evidence to support this assertion, the researcher detected what in his estimation was an equally, if not more important determinant, namely, the socio-economic background of the pupils and the influence this had on the attitudes of teachers as well as pupils, particularly at private schools.

Khan, (1990) points out that there is a world- wide tendency for the better educated and more affluent sectors of society to demonstrate an interest in environmental matters.

The class bias inherent in environmental concern has been clearly reflected by survey results in South Africa which have shown not only that South Africans in general are abysmally ignorant about the natural environment, but also that there is a strong correlation between environmental concern and socio-economic variables.

(Khan, 1990, p.36.)

This the researcher believes, partly explains the relatively high interest in the natural environment at these affluent private schools; an interest which has resulted in a lopsided perception of environmentalism. Compared to their sophistication about the natural world these children were relatively naive when it came to matters such as energy, consumerism, resource management and the problems associated with urbanisation. The lack of insight into such matters highlights what is probably the most important weakness in the application of an environmental education at these and many other schools. Throughout this research it was apparent that both pupils and staff at the schools investigated held misconceptions about the nature and scope of environmental education and that these had led to the bias referred to above.

On the positive side, there is encouraging evidence, particularly at one school, that an ecological ethos is starting to become a part of the curriculum and that the considerable resources of these schools are increasingly being used to bring pupils into contact with wider aspects of their environment, including in recent years the urban and social environments. This development is still in its infancy, but the researcher believes that it is wholly consistent with the political and ethical character of these progressive schools and is likely to increase as their understanding of environmental education becomes more sophisticated.

7.4. COMMENT ON THE HYPOTHESES

The first of the hypotheses in Chapter 1. postulated that the interests and attitudes of individual teachers were the most important variables determining the nature of environmental education in schools. The researcher found considerable evidence to substantiate this position, but came to the conclusion that in the case of private schools, the socio-economic background of the children also plays an important part in determining the focus of environmental education.

The second hypothesis, that active participation and learning by discovery are more effective means of achieving environmental awareness than are theoretical abstract methods, was in the opinion of the researcher, largely supported by the evidence. However the research did reveal that there is an urgent need to extend the scope of participation to include all aspects of the

childs environment.

In the final analysis the researcher remains convinced that the single most important aspect of environmental education is attitude. The primary schools at which this research was conducted consciously foster a caring ethos and this the researcher believes is the main reason for their positive attitude towards environmental education and the environment in general.

REFERENCES :

Agarwal,A.(1986) The Fifth World Conservation Lecture: Human-Nature Interactions in a Third World Country. The Environmentalist, Volume 6, No.3, pp.165-185.

Althusser,L.(1972) Quoted in Haralambos,M.(1980) Sociology Themes and Perspectives. p.180. Bell and Hyman, London.

Attenborough,D.(1980) Life on Earth: A Natural History. p.361. William Collins, London.

Berman,M.(1981) The Re-enchantment of the World. Cornell University Press, Ithaka, New York.

Bowers,C.and Flinders,D.(1990) Responsive Teaching: An Ecological Approach to Classroom Patterns of language, Culture and Thought. p.248. Teachers College Press, New York.

Burrell,G. and Morgan,G.(1979) Quoted in Cohen,L.and Manion,L. (1980) Research Methods in Education. p.12. Roulledge, New York.

Campbell,T.(1989) Integrating the Std.5 Science Syllabus into a Thematic Framework for Coastal Schools. Education Journal Vol.99, No.1 S.A.Teachers Association Cape Town.

Capra,F.(1983) The Turning Point: Science Society and the Rising Culture. p.40, xviii. Fontana, London.

Carson,R.(1963) Silent Spring. Hamish Hamilton, London.

Catton,W.(1980) Overshoot: The Ecological Basis of Revolutionary Change. Univ.of Illinois Press.

Catton,W.and Dunlap,R.(1980) 'New Ecological Paradigm for Post Exuberant Sociology,' American Behavioural Scientist 24 (September 1980), pp.15-48.

Cohen,L. and Manion,L.(1980) Research Methods in Education. Routledge, New York.

- De Beer, H. (1991) Whose World is this Anyway? Conserva, Vol. 6. No. 2: pp. 14-22.
- de Bono, E. (1970) Lateral Thinking: A Textbook of Creativity. p. 11. Penguin, New York.
- de Bono, E. (1979) Learning to Think. Penguin, London.
- Department of Environment Affairs, (Undated): Teaching for Environmental Conservation. A Guide for Teachers in all Phases of education.
- Devall, B. and Sessions, G. (1985) Deep Ecology. p. 65. Gibbs Smith, Utah.
- Di Chiro, G. (1987) Environmental education and the question of gender: A feminist critique. In Robottom, I. (edit.) (1987) Environmental Education Practice and Possibility p. 42. Deakin University Press, Victoria.
- Earth Works Group, (1990), Fifty Simple Things Kids Can do to Save the Earth, Sphere Books, London.
- Ehrenfeld, D. (1978) The Arrogance of Humanism. Oxford, New York.
- Elkington, J. and Hailes, J. (1990) The Young Green Consumer Guide. Victor Gollancz, London.
- Emery, F. (1981) Educational Paradigms. Human Futures. Spring.
- Forbes, J. (1987) 'Environmental Education - Implications for Public Policy.' The Environmentalist. Vol. 7 No. 2 pp. 131-142.
- Giddens, A. (1975) Quoted in Cohen, L. and Manion, L. (1980) Research Methods in Education. p. 12. Routledge, New York.
- Goetz, J. and Le Compte, M. (1984), Ethnography and Qualitative Design in Educational Research. Academic Press, London.
- Gough, N. (1987) Learning with environments: Towards an ecological paradigm for education. In Robottom, I. (ed) (1987) Environmental Education: Practice and Possibility. p. 50. Deakin University Press, Victoria.

Gough, N. (1989) From Epistemology to Ecopolitics: Renewing a Paradigm for Curriculum. Journal of Curriculum Studies. (Australia) Vol.21 No.3 pp.225-241.

Gunter, C. (1985), Aspects of Educational Theory. University Publishers, Stellenbosch.

Heron, J. (1981) Philosophical basis for a new paradigm. In, Reason, P. and Rowan, J. (eds.) Human Inquiry. A sourcebook of new paradigm research. John Wiley and Sons. New York.

Huntley, B. Siegfried, R. Sunter, C. (1989) South African Environments into the 21st Century. Human and Rousseau, Cape Town.

Huxley, A. (1962) Island. Chatto and Windus, London.

ISC (Independent Schools Council of South Africa) (1991) A Synopsis of the ISC Together with Details of Member and Associate Member Schools. p.1. Box 87430, Houghton.

Irwin, P. (1982) Conservation Awareness Amongst White Adolescents in South Africa: A Study of Senior Secondary Pupils in Natal. p.47. Unpublished, M.Ed. Thesis, University of Natal.

Irwin, P. (1990) What is Environmental Education ? Conserva, 5 (2): pp.4-5.

Irwin, P. (1991) Environmental Education a Quest for the Future. (Inaugural lecture), p.15. Rhodes University, Grahamstown.

International Union for the Conservation of Nature and Natural Resources, 1971. Education for the Environment. Papers of the Nevada Conference of 1970 and the Zurich Conference of December 1971. IUCN Publication New Series, Morges.

Kerry, T. and Eggleston, J. (1988) Topic Work in the Primary School. Chapman and Hall, London.

Khan, F. (1990) Involvement of the Masses in Environmental Politics. Veld and Flora, June: p.36.

- Leopold, A. (1949) A Sand County Almanac. p.viii, 210. Oxford, New York.
- Lovelock, J. (1979) Gaia: A New Look at Life on Earth Oxford, New York.
- Lovelock, J. (1988) The Ages of Gaia: A Biography of our Living Earth. Oxford, New York.
- Maslow, A. (1973) The Farther Reaches of Human Nature. Viking Press, New York.
- O'Donoghue, R. (1990) Environmental Education Curriculum Development. Unpublished M.Ed.Thesis, University of Natal.
- O'Riordan, T. (1981) Environmentalism and Education, Journal of Geography in Higher Education, Vol.5 No.1.
- Opie, F. (1987) Seeds of Hope. Veld and Flora, April: pp.36-40.
- Opie, F. (1989) The Outdoor Classroom: A Teachers Guide to Effective Fieldwork. p.17. Maskew Miller, Cape Town.
- Popkewitz, T. (1984) Paradigm and Ideology in Education Research: The Social Functions of the Intellectual. Falmer Press, New York.
- Randle, D. (1989) Teaching Green: A parent's guide to education for life on earth. Green Print, London.
- Reason, P. and Rowan, J. (Eds.) (1981) Human Enquiry. A Sourcebook of New Paradigm Research. John Wiley and Sons New York.
- Rowland, S. (1984) The Enquiring Classroom: An Approach to Understanding Childrens Learning. Falmer Press, London.
- Sagan, C. (1981) Cosmos p.24. MacDonald Futura, London.
- Schumacher, E. (1973) Small is Beautiful: A Study of Economics as if people Mattered. Penguin, London.

Solomon, N. (1988) Reach Beyond: A textbook for the Outdoor Pursuits Award Programme of Treverton College Mooi River. p.4. Teeanem, Pietermaritzburg.

Stenhouse, L. (1975) An Introduction to Curriculum Research and Development. Heinemann, London.

Taft, R. (1985) Ethnographic Research Methods. In: Husen, T. and Postlethwaite, T. (Eds.) (1985) The International Encyclopaedia of Education. Pergamon, Oxford, vol.3, pp.1729 - 33.

Teilhard de Chardin, P. (1959) The Phenomenon of Man. Fontana, London.

Teilhard de Chardin, P. (1973) Towards the Future. p.175. Collins, London.

Toffler, A. (1980) The Third Wave. William Collins, London.

UNESCO-UNEP, (1978) The Tbilisi Declaration. Connect. Vol.3 No.1. pp.1-7.

Vulliamy, G. (1987) 'Environmental Education in Third World Schools: Rhetoric or Realism?' The Environmentalist. Vol.7 No.1 pp.11-19.

Willis, W. (1990) Greendays. Arrow Books, London.

Wilson, F. and Ramphele, M. (1989) Uprooting Poverty: The South African Challenge. David Philip, Cape Town.

WLSSA (Wildlife Society of Southern Africa) (1988) Priorities for Conservation in South Africa: Conference Proceedings. Durban.

Woodridge Brochure, (1991) Fideliter. P.O. Thornhill, E.Cape.

W'O Okot-Uma, R. and Wereko-Brobby, C. (1985) 'Environmental Education: The African Dimension.' The Environmentalist. Vol.5 No.2 pp.137-142.

Zeisel, J. (1984) Inquiry by Design: Tools for Environmental Behaviour Research. Cambridge University Press, Cambridge.

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APPENDIX 1

THE TBILISI PRINCIPLES

GUIDING PRINCIPLES FOR EFFECTIVE ENVIRONMENTAL EDUCATION AS ADOPTED AT THE 1977 INTERGOVERNMENTAL CONFERENCE ON ENVIRONMENTAL EDUCATION HELD AT TBILISI, USSR.

Environmental education should:

- ⊗ consider the environment in its totality - natural and built, technological and social (economic, political, cultural-historical, moral, aesthetic);
- ⊗ be a continuous lifelong process, beginning at the pre-school level and continuing through all formal and nonformal stages;
- ⊗ be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balanced perspective;
- ⊗ examine major environmental issues from local, national, regional and international points of view so that students receive insights into environmental conditions in other geographical areas;
- ⊗ focus on current and potential environmental situations while taking into account the historical perspective;
- ⊗ promote the value and necessity of local, national and international cooperation in the prevention and solution of environmental problems;
- ⊗ explicitly consider environmental aspects in plans for development and growth;
- ⊗ enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;
- ⊗ relate environmental sensitivity, knowledge, problem-solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years;
- ⊗ help learners discover the symptoms and real causes of environmental problems;
- ⊗ emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem-solving skills;
- ⊗ utilize diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first-hand experience.

Source: UNESCO-UNEP, (1978) Vol.3, No.1.

APPENDIX 2

QUESTIONNAIRE AND ADMINISTRATION SCHEDULE

MY WORLD

CODE NAME: _____ GENDER: _____

SCHOOL: _____ STANDARD: _____

HOME DISTRICT: _____ TYPE: _____

HOBBIES AND INTERESTS: _____

WHAT THESE QUESTIONS ARE ABOUT:

- * To find out how you feel about things in your life.
- * To see how well you understand and know your world.

PLEASE REMEMBER THAT WE ARE ALL DIFFERENT AND THAT YOU ARE ENTITLED TO YOUR OPINION. SO, THINK CAREFULLY AND ANSWER AS HONESTLY AS YOU CAN.

^^^^^^^^^^^^^^^^^^^^

1. Can your family do without any of the following things their daily lives?

Place a tick (✓) in the appropriate box:

	YES	NO	NOT SURE
- Clean water.....			
- Electric Blankets.....			
- Trees for building.....			
- Canned fizzy drinks.....			
- Air fresheners.....			
- Fresh vegetables.....			
- Trees for fruit.....			
- Warm clothing.....			
- Bubble bath.....			
- Trees for firewood.....			
- Exercise.....			
- Sweets.....			
- The latest clothing fashions...			
- Fresh air.....			
- Electricity.....			
- Motor cars.....			
- Caravans.....			
- Trees for shade.....			
- Sports fields.....			
- Plastic.....			

^^^^^^^^^^^^^^^^^^^^

2.

A VALUE SHIELD

Please answer these questions in the spaces provided .
(Take care to match the numbers with those in the shield)

1. What are your favourite foods ?
2. Two things you like doing.
3. What scares you ?
4. What two things do you like about your best friend ?
5. What do you think he or she likes best about you ?
6. If your home was burning and you could only save one thing, what would it be ?
7. What two things would make the world a better place ?
8. If you could have any one thing you wanted, what would it be ?

{1}	{2}
{3}	{4}
{5}	{6}
{7}	{8}

3. Do you get driven when you could easily walk or cycle ?

often sometimes never

Does your family collect vegetable matter for composting ?

often sometimes never

4. Name a beautiful place you have visited.....

Why do you think it is beautiful ?

5. Name an ugly place you have seen.....

Why do you think it is ugly ?.....

6. Look at the four photographs then tick those you think depict an environment.

1.	2.	3.	4.
----	----	----	----

7. Where does the water in your tap come from ?

What do you think happens to the sewage (dirty water) from your home ?

8. Does your family use more electricity in winter or in summer

Winter Summer

Explain your answer.....

9. What fuel do you think is used to produce most of South Africa's electricity ?

Do you think this is good or bad for the environment ?

Good Bad Not sure

Explain your answer.

10. Suggest two things that we can do to save electricity.

i).....

ii).....

11. What is 'Public Transport' ?

.....
.....
.....

What forms of 'Public Transport' have you used ?.....

.....

12. Suggest two ways in which soil erosion can be prevented.

i).....

.....
.....

ii).....

.....
.....

13. Name any two things you would expect to find in good topsoil.

.....and.....

14. Try to explain if you can, how a fallen leaf could eventually become food for a cat. (Write or draw a diagram)

.....
.....
.....

15. Give one way in which spiders are useful to us.

.....
.....
.....

16. What do you think it means when people talk about 'endangered animals'

.....
.....

Can you suggest two reasons why an animal might become 'endangered'.

.....
.....
.....

17. What do you think people mean when they say that living things depend on each other ?

.....
.....
.....
.....

18. Try to explain in your own words what the term 'biodegradable' means.

.....
.....
.....
.....

19. Can you give an example of pollution ?.....

.....
.....
.....

Try to explain what the term 'pollution' means.

.....
.....
.....
.....
.....

SELECT AND TICK (✓) THE ANSWER WHICH BEST DESCRIBES THE UNDERLINED WORDS :

20. Which of the following best describes acid rain.

- Sulphur and nitrogen oxides in water droplets
- A pop group.....
- Badly polluted air.....
- A chemical compound in water.....

21. Which of the following best describes recycling.

- A way to save energy.....
- A type of sport.....
- The wise use of resources.....
- Using a material again and again.....

22. Which of the following best describes deforestation.

- A method of farming.....
- The destruction of natural forests....
- The harvesting of timber plantations..
- A new kind of tree disease.....

WILDERNESS AND CONSERVATION:

23. Have you ever been to:

- Alexandria Forest Nature Reserve
- Andries Vosloo Kudu Reserve
- Addo Elephant Park
- Thomas Bains Nature Reserve
- Port Elizabeth Oceanarium/Snake Park
- Karoo Nature reserve at Graaff-Reinet
- Bloukrans Nature Reserve
- Hobbiton - on - Hogsback
- Waters Meeting (Horseshoe) Nature Reserve
- Mountain Zebra National Park at Cradock

24. Name any other Reserves, Hiking trails or wild places you have visited.

.....
.....

25. Do you, or have you ever belonged to:

- A wildlife society
- Boy Scouts / Girl Guides

If you belong to any other clubs or societies please write them down.

.....
.....

25.(cont..)

Name any interesting clubs or societies that either of your parents belong to.

.....
.....

26. Look carefully at the birds in these pictures, then see how many of them you can name:

Write the names in the corresponding boxes below.

1.		2.	
3.		4.	
5.		6.	
7.		8.	

27. Look carefully at the mammals in these pictures, then see how many you can name.

1.		2.	
3.		4.	
5.		6.	
7.		8.	
9.		10.	
11.		12.	

28. Look at the list below then decide which of these is an environmental issue.

	YES	NO	NOT SURE
The condition of play grounds..			
The type of housing that people have..			
The rapid increase in population..			
The control of hunting and fishing..			
Methods of farming..			
The heavy traffic in cities..			
The construction of tall buildings..			
The driving of vehicles on beaches..			
The waste in wealthy societies..			
Violence and war..			

29. Think about the following inventions:

- | |
|----------------|
| Motor Vehicles |
| Telephones |
| Printing press |
| Television |
| Plastics |

Write down one of these which has had a negative (harmful) effect on our environment.

Why do you think so ?
.....
.....

Write down one of these which could have a positive (good) effect on our environment.

Why do you think so ?
.....
.....

30. Can you think of any reason why large numbers of poor people all over the world are moving to the Towns and Cities ?

.....
.....
.....

31. Where would you most like to live ?

.....

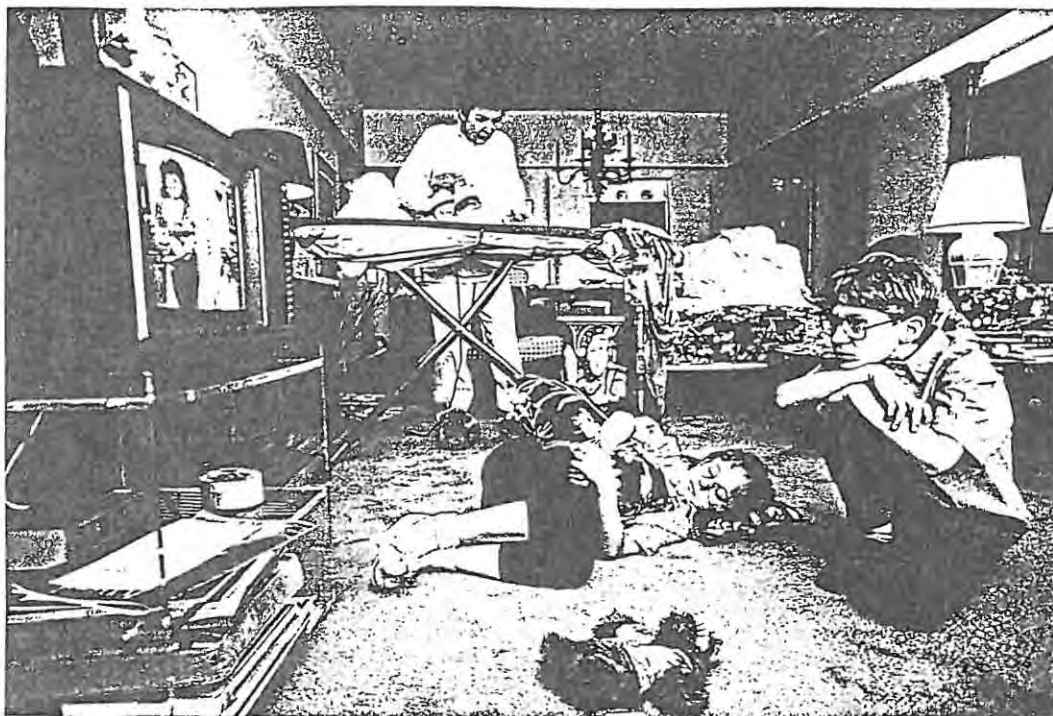
Why do you say so ?
.....
.....

32. Which of these groups of people most need to be taught about their environment ?

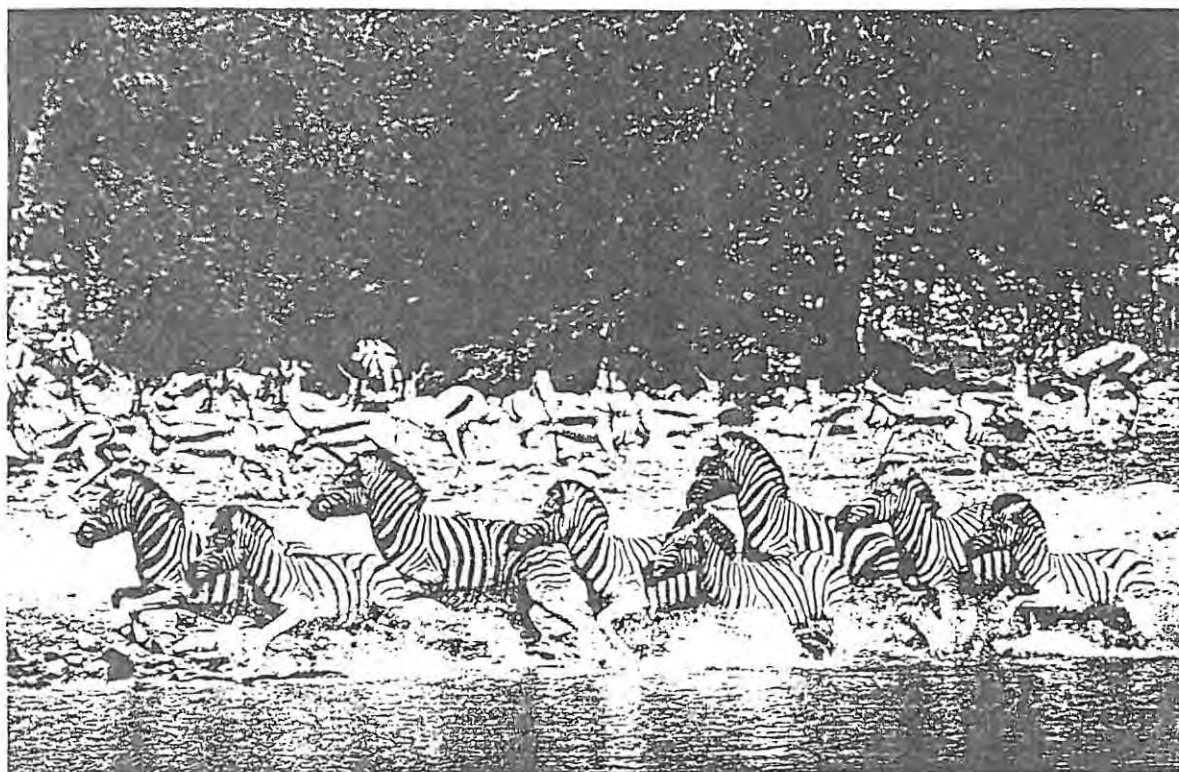
Children Adults Both Groups

Why do you say so ?
.....
.....

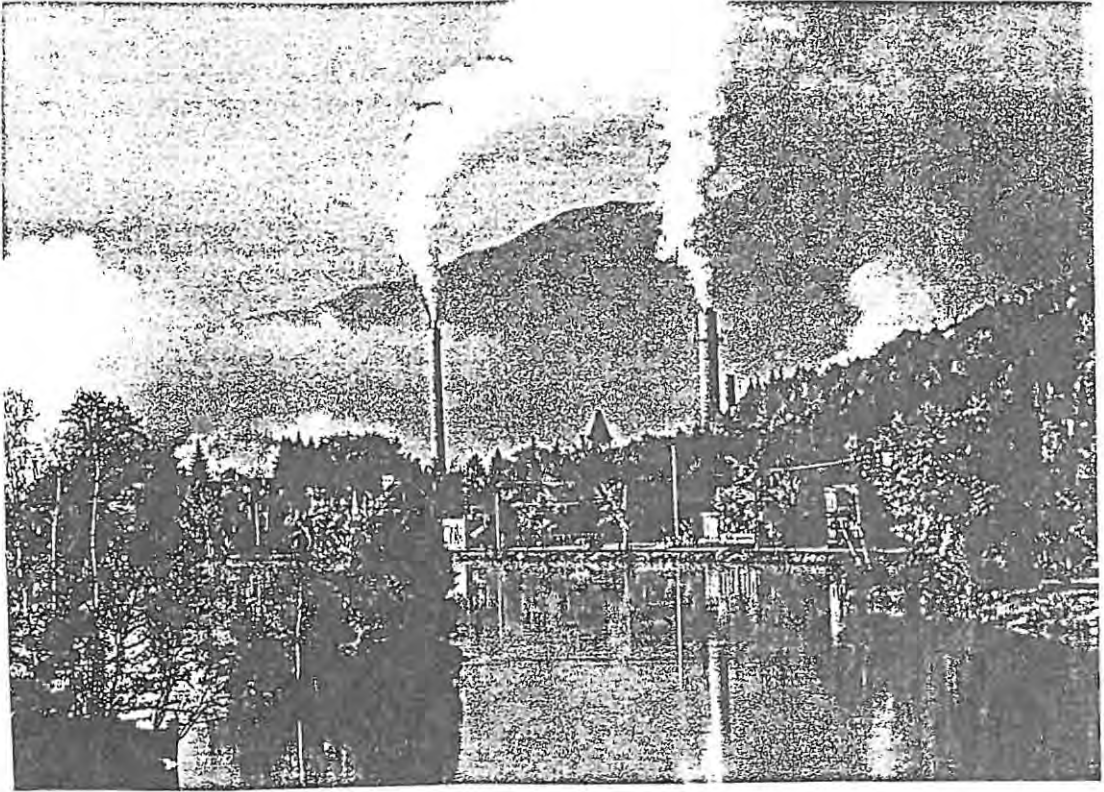
Photographs for Question 6.



1.



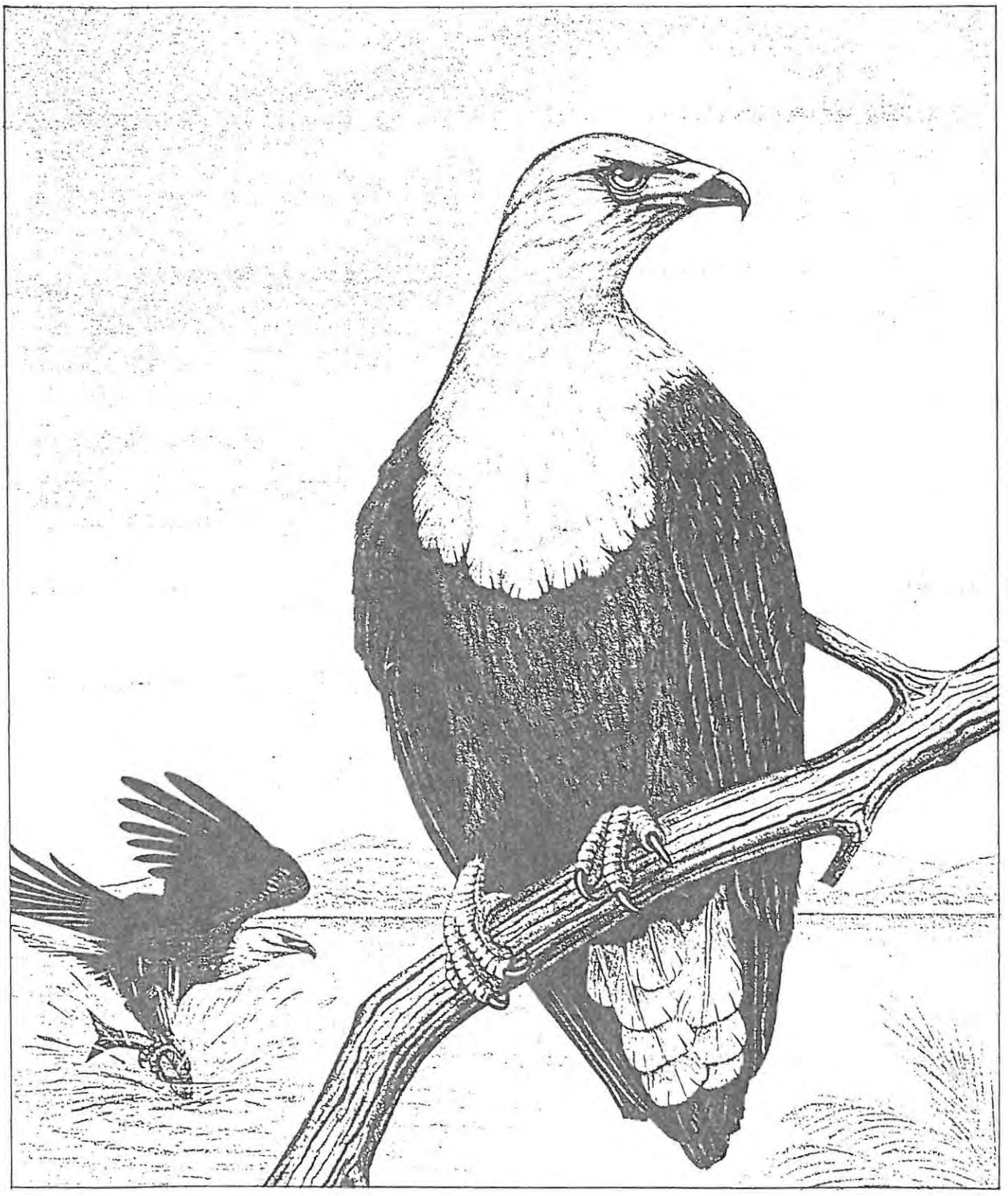
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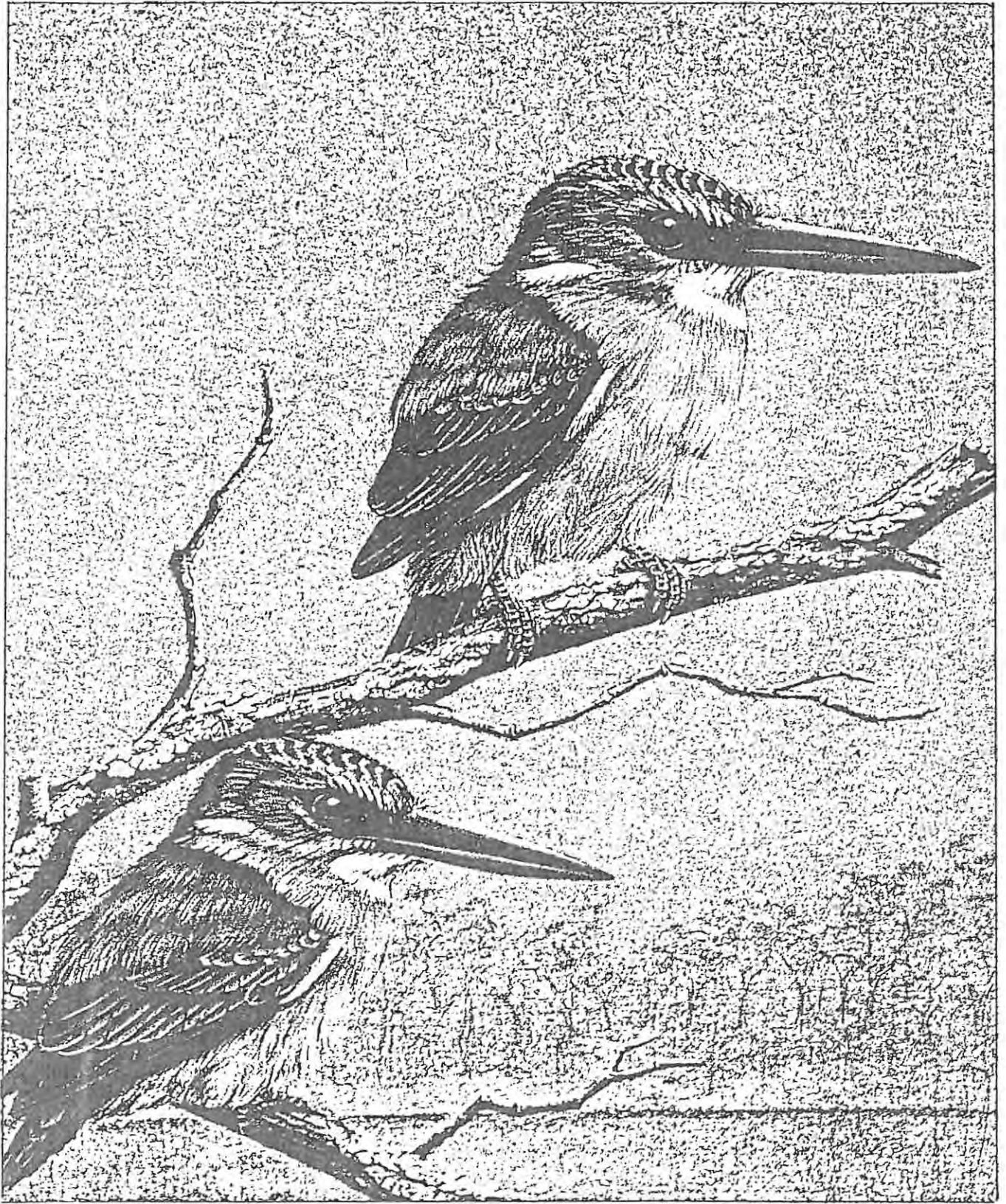


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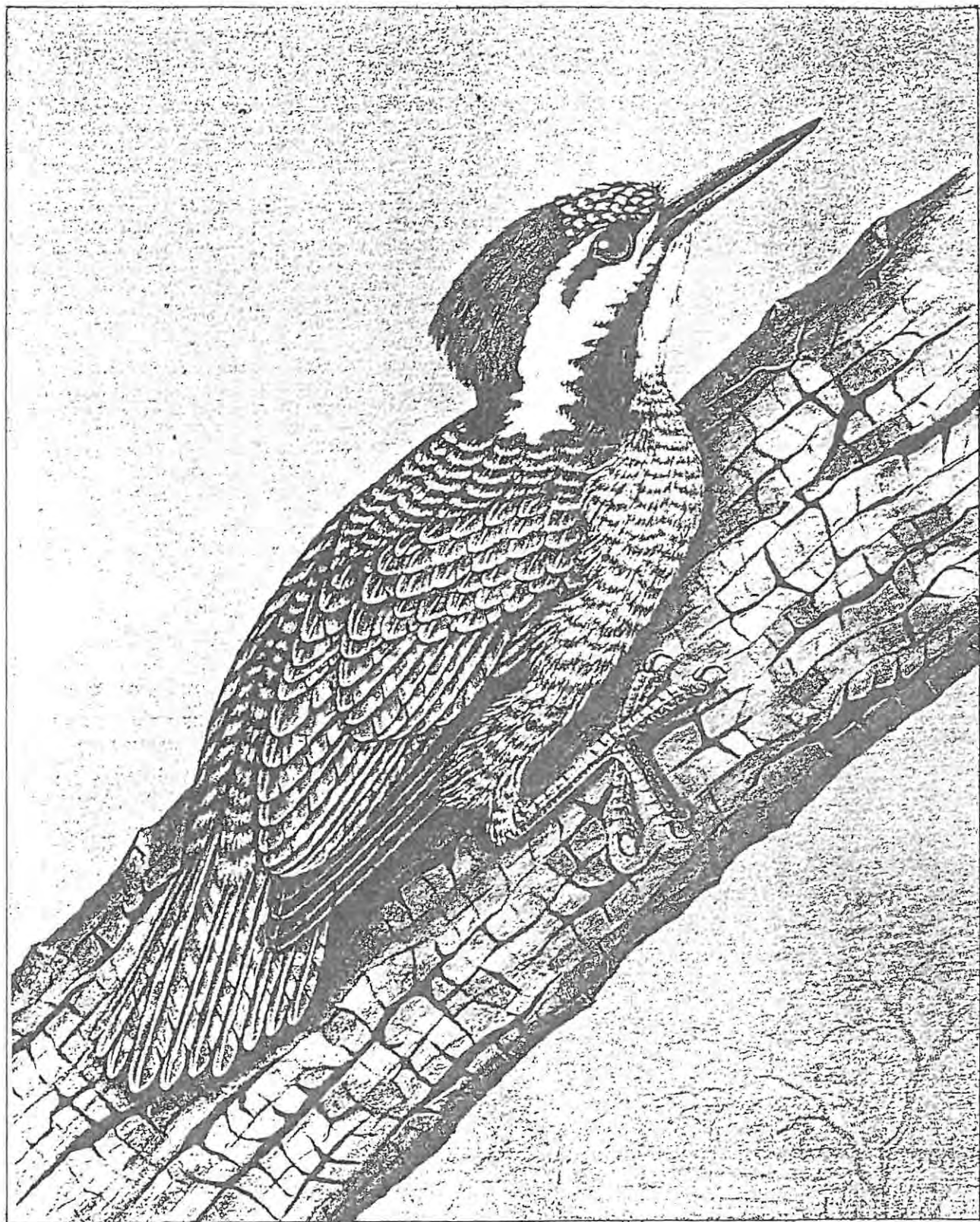


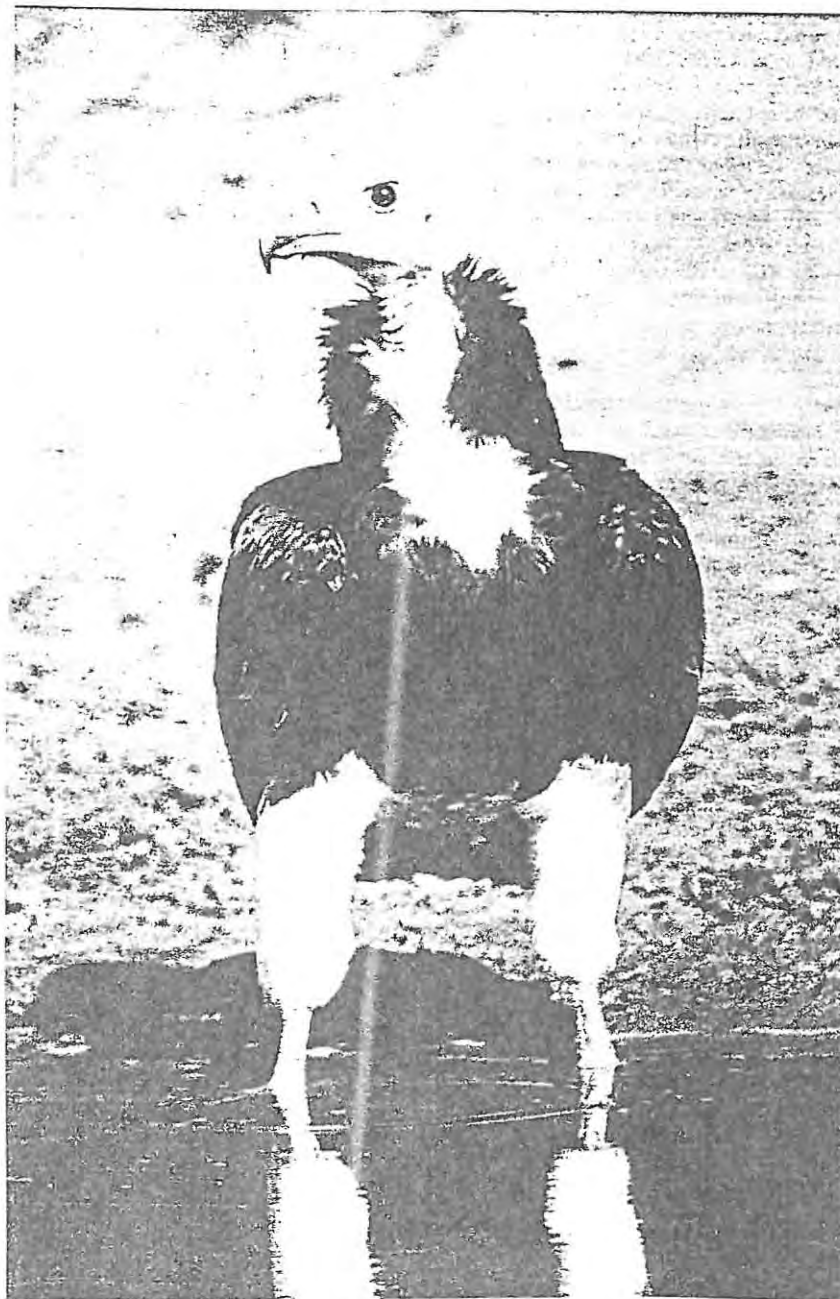
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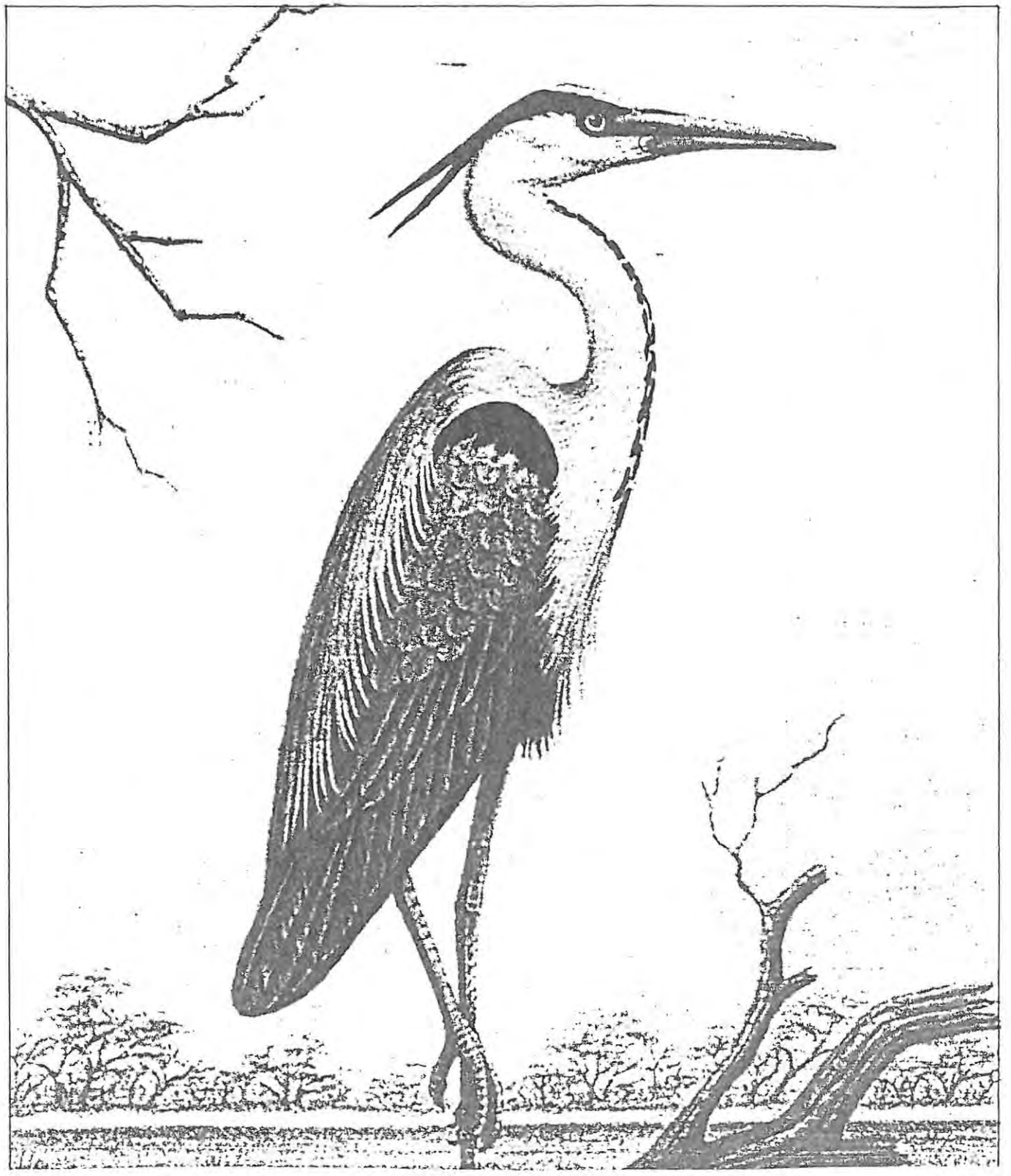


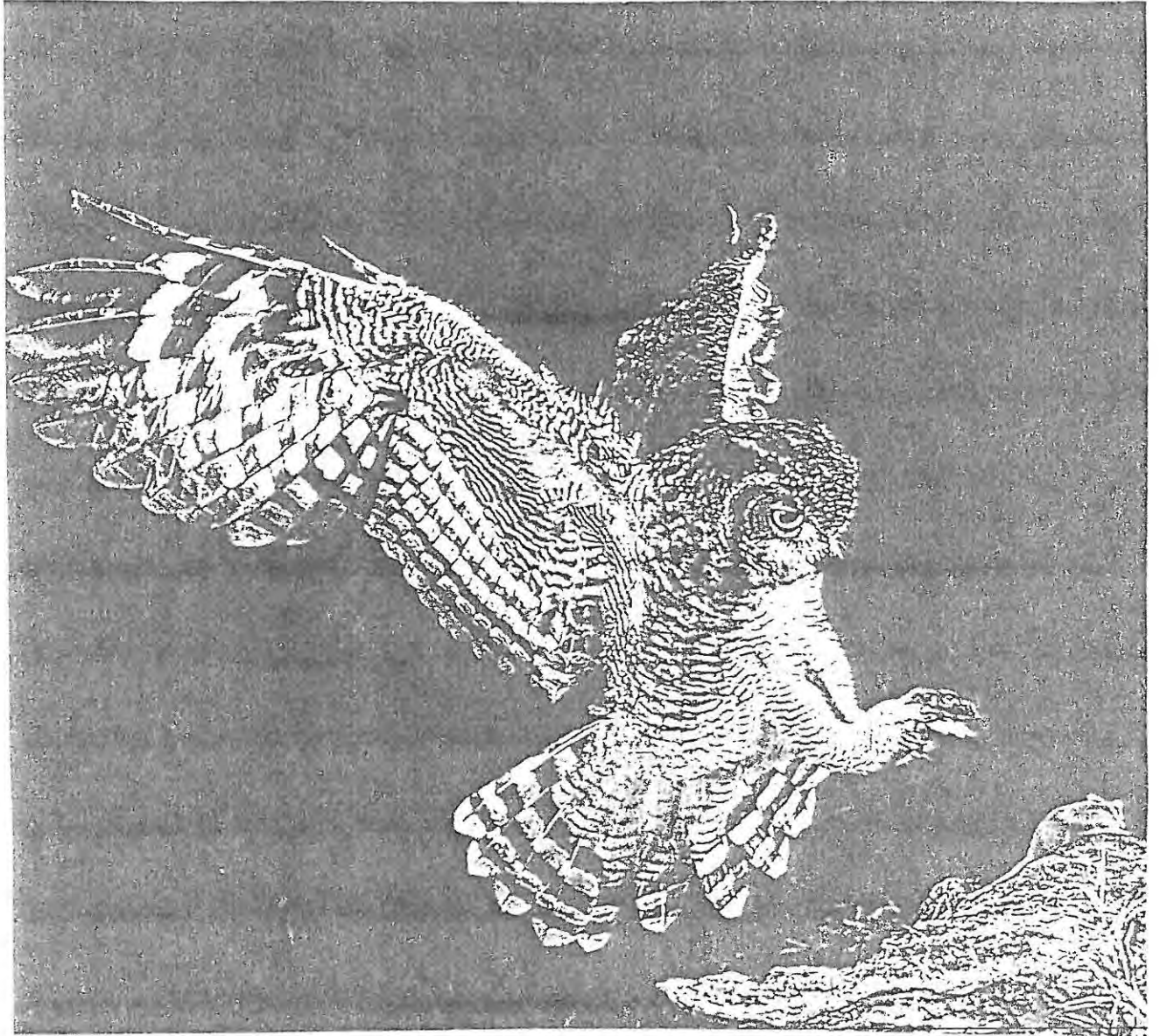




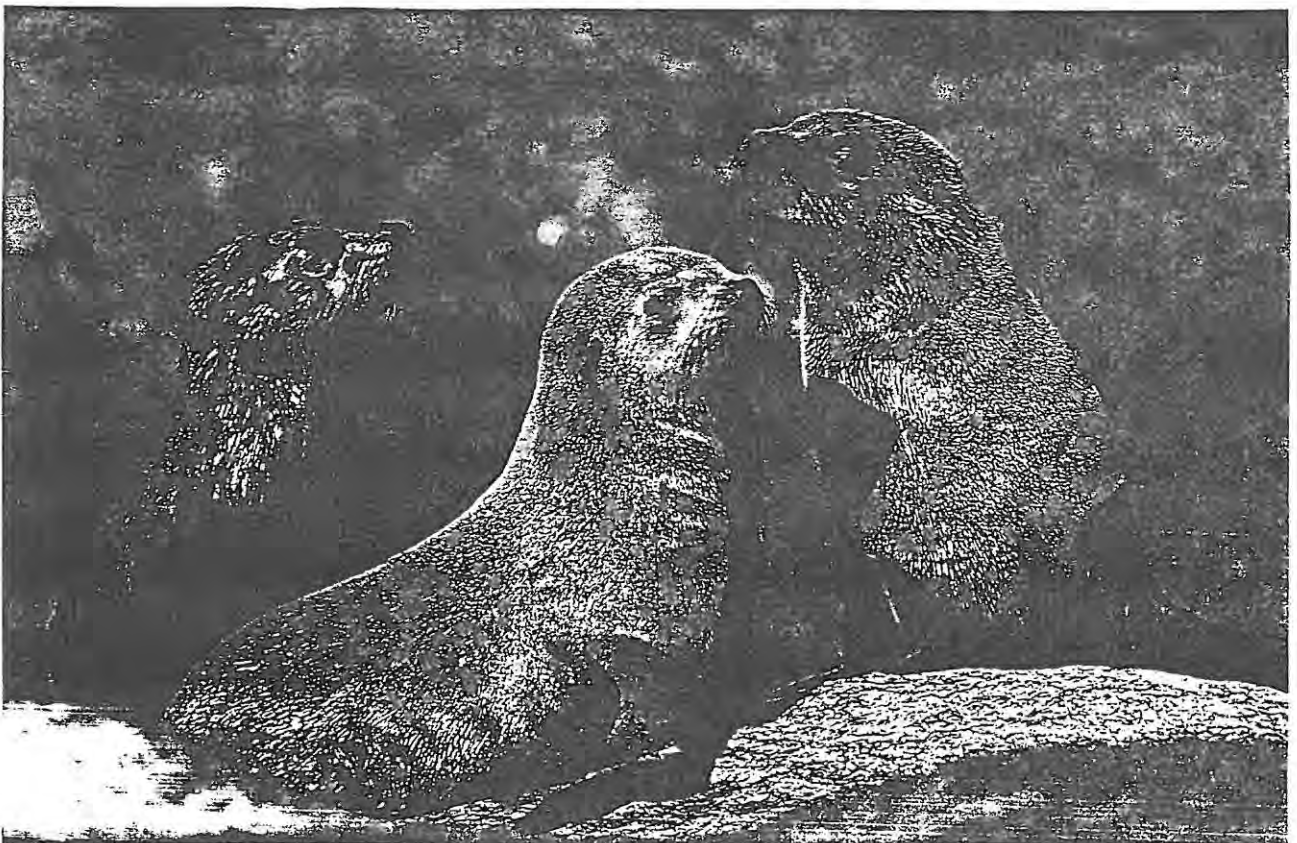


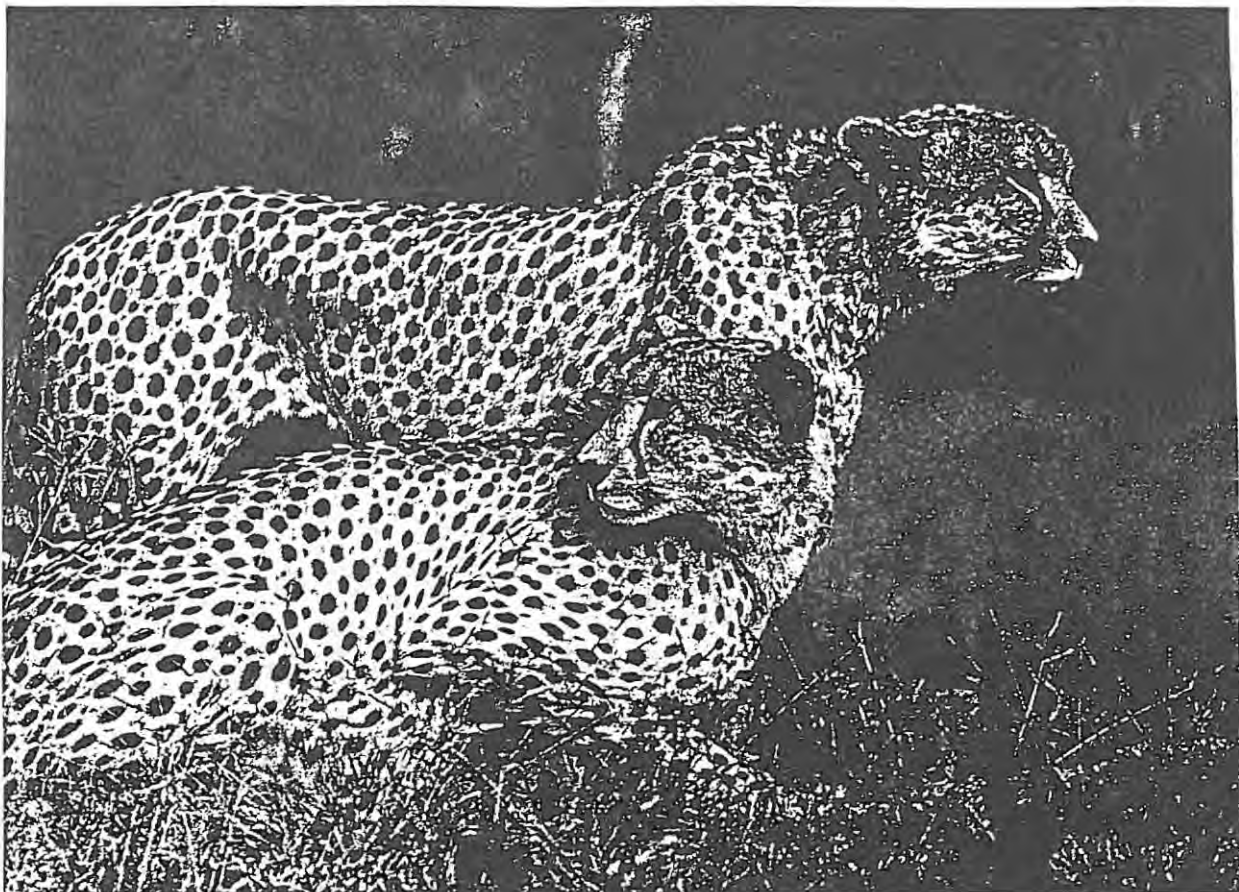




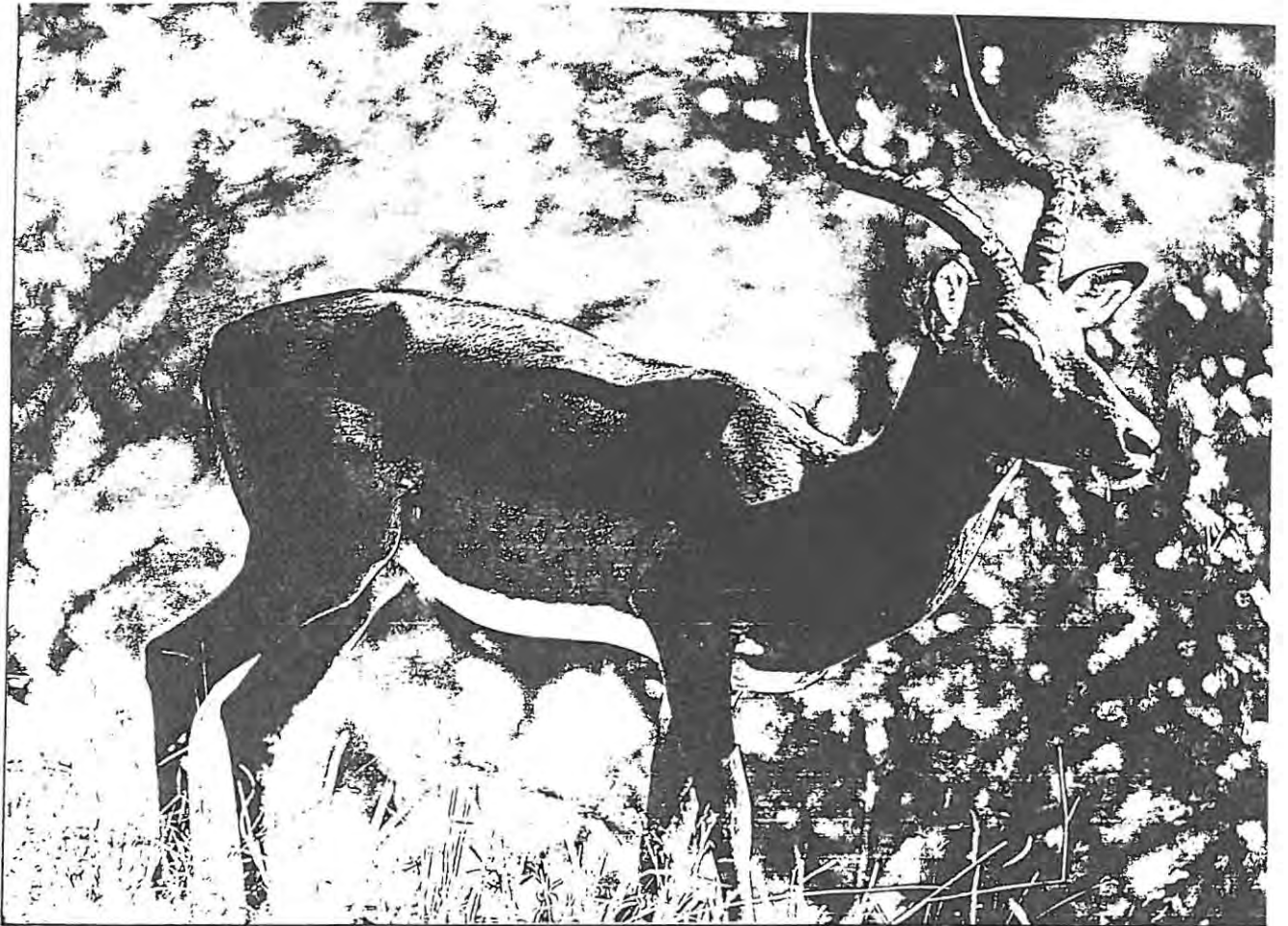
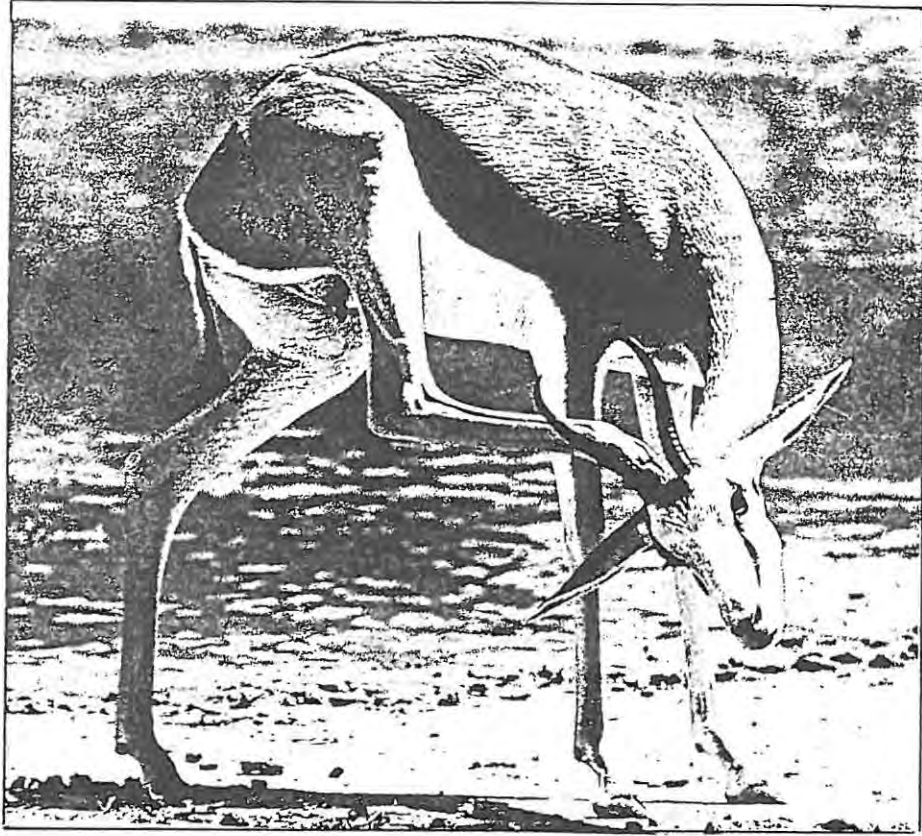


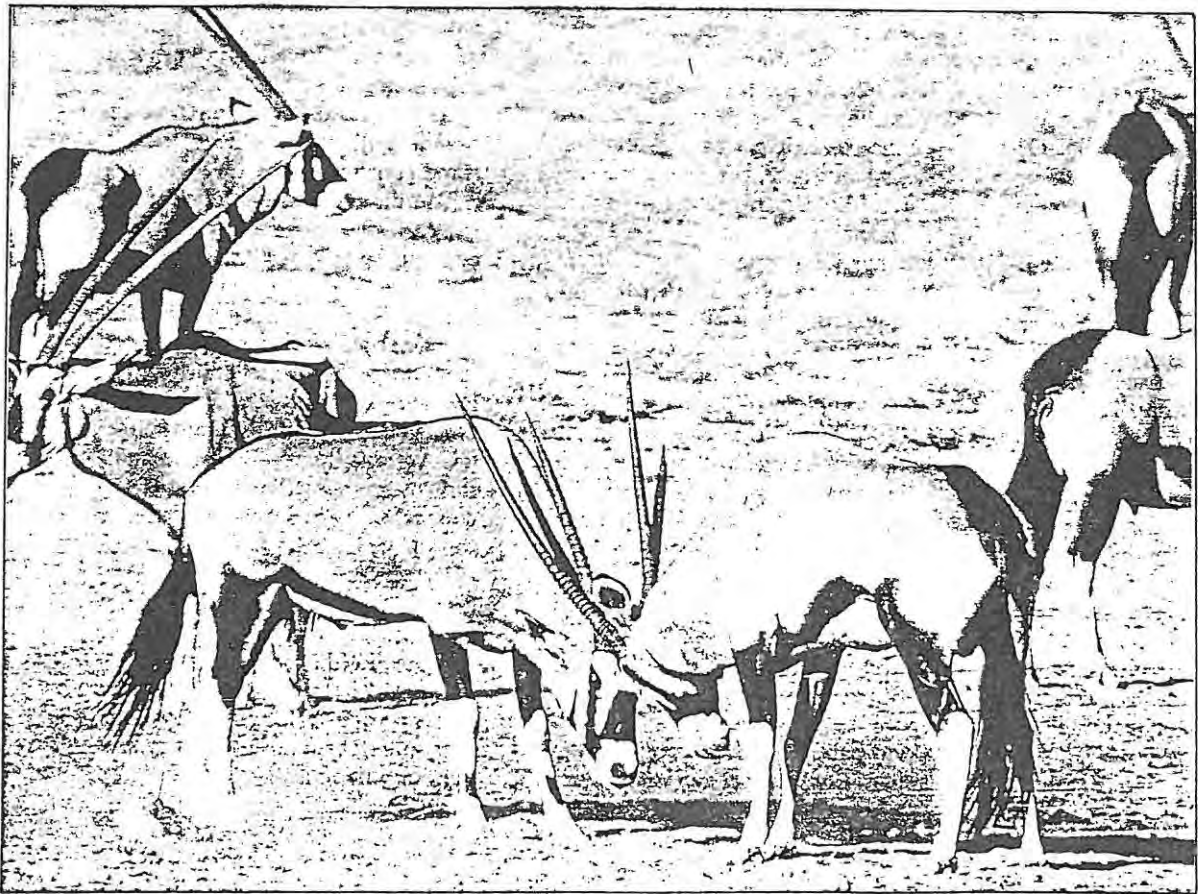
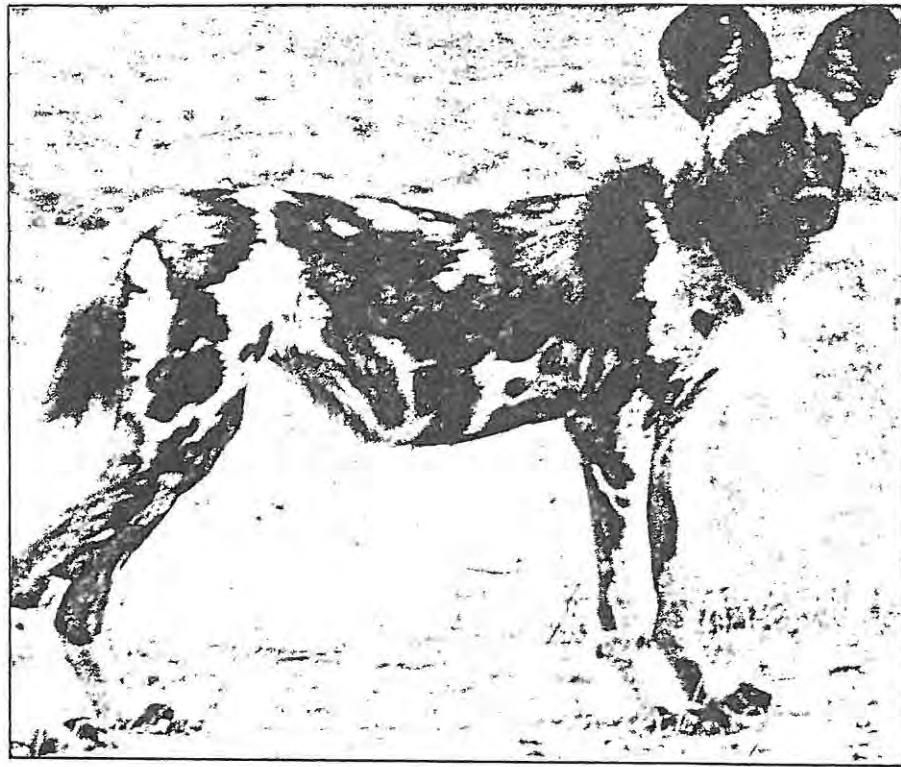


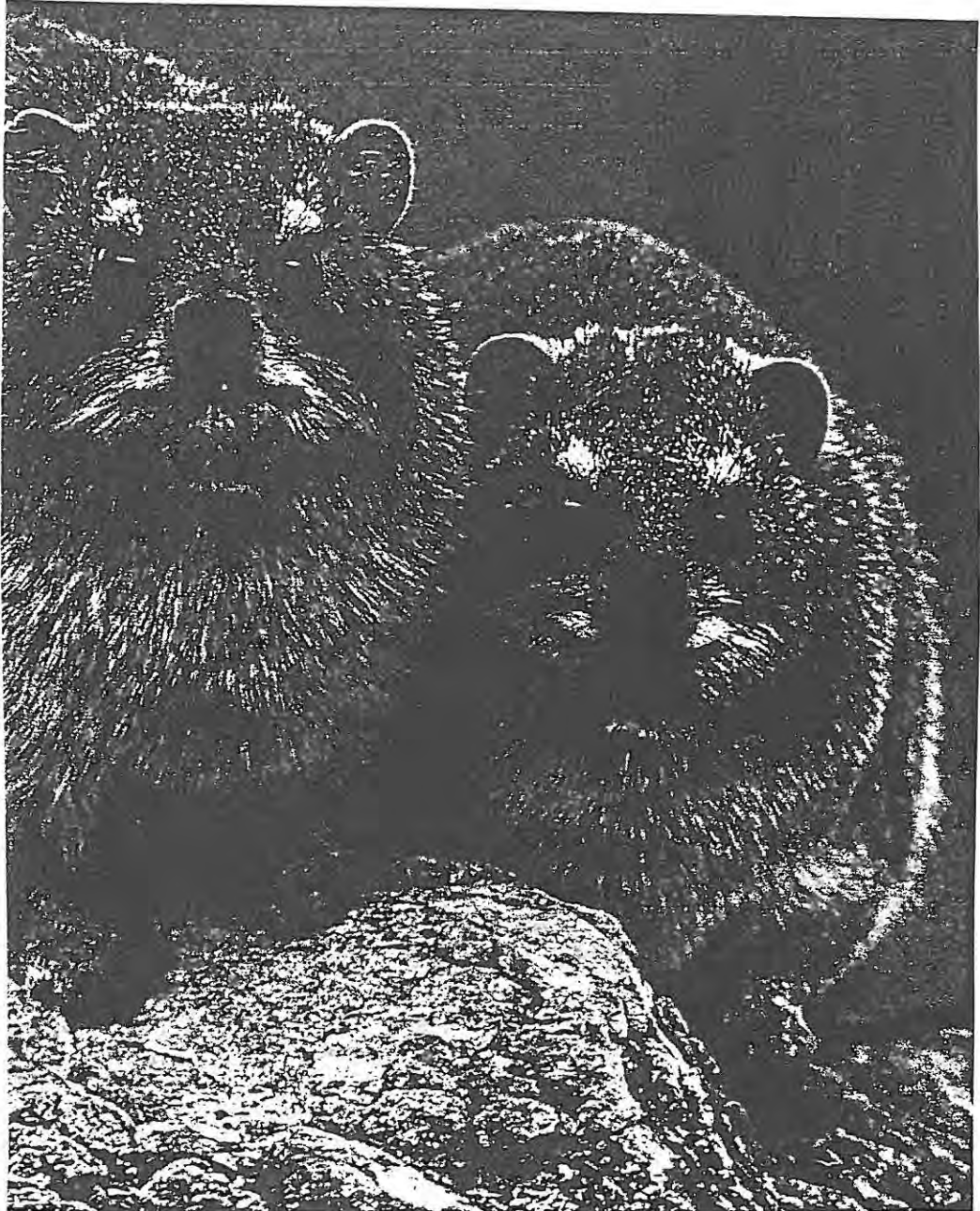














Appendix 2 (continued)

QUESTIONNAIRE - ADMINISTRATION SCHEDULE

(My World _ questionnaire)

- * Before we start, please make sure that you all have sharp pencils: _
- * Biographical detail:
 1. Stress anonymity and therefore the option of a code name.
 2. Home district refers to the area, eg. Reef, Ciskei.
 3. Type refers to dwelling, eg. Suburban house, farm, flat.
 4. Hobbies and interests, anything outside of school activities
- * Read What the questions are about. (page 1.)
Ask whether there are any further questions.
- * It is very important to me that you always state your opinion honestly and also that you try to answer all the questions, even if you are not completely sure of the answers. Remember that this is not a test !
- * Do not hesitate to ask questions if you are unsure what to do.

let me know if you are not able to keep up for any reason at all.

Follow me through the questions, do not turn to the next page until you are instructed to do so.

Wherever there is a box place a tick in the appropriate place.

Where there is no box, answer in a single word or short sentence.

Spelling will not count.

Lets look at question 1. Page 1

Time: Biographical detail = 2 min. / 1. = 4 min.

1. [Additional Instruction] Ask yourself in each case; can we do without ? then tick in the appropriate box.

Page 2.

Time: 2. = 6 min.

2. [Additional Instruction] Be brief. If you select money in No.8 you must say what you would use it for.

Do not worry about practicability in No.6 consider only the thing that you would most like to save.

Page 3.

Time: 3.4.5.= 2 min. / 6.= 2 min. / 7.8.9.=4 min.

6. [Additional Instruction] You may want to tick more than one.

Page 4.

Time: 10.11.12.13.14.= 8 min.

14. [Additional Instruction] Be brief, or if you prefer draw a rough diagram to illustrate your answer.

Page 5.

Time: 15.16.17.18.19.= 6 min.

Page 6.

Time: 20.21.22.23.24.25.= 4 min.

20. [Additional Instruction] Read all the options and think carefully before placing your tick.

Page 7.

Time: 25.(cont.) = 1 min. / 26.27.= 7 min. / 28.= 2 min.

25. [Additional Instruction] If you or your parents are particularly interested in an activity, but do not participate through a club or society, please include this interest. eg. Hunting, Fishing, Skate-boarding or Reading.

26. [Additional Instruction]

- * Keep your handwriting small.
- * Spelling does not matter.
- * Make sure the numbers correspond.
- * Stay with me, do not go ahead.
- * When naming these animals you may use any language or name that you know them by.
- * If you do not know one, cross out the box before you go on to the next one.

28. [Additional Instruction] Which of these subjects does influence the quality of our environment.

Page 8.

Time: 29.30.31.32.= 8min.

31. [Additional Instruction] Where in the world would you most like to live, or in what sort of place.

APPENDIX 3

ETHNOGRAPHIC RESEARCH - RESEARCHERS GUIDE

These sheets were used by the researcher during periods of observation and participation and were intended to ensure that all the relevant areas were covered.

The Tbilisi document identifies the following categories of environmental education 'objectives'.

AWARENESS KNOWLEDGE ATTITUDES SKILLS PARTICIPATION:

Details of School, (Personnel and Circumstances)

1. AWARENESS: (To foster concern, awareness and sensitivity to the total environment' Including ecological - interdependence, social and economic factors, urban and rural situations etc.)

Q 1.1 Is there an emphasis on the holistic perspective of environment? (vs. atomistic) _____

Q 1.2 Are learners encouraged to discover symptoms and real causes of environmental problems? _____

Q 1.3 Is attention given to aesthetic considerations? (feelings, sounds, visual experiences etc.) _____

2. KNOWLEDGE: (To help individuals and groups acquire a basic understanding of environmental and associated problems.)

Q 2.1 What teaching methods are used to enhance understanding? (positivist/behaviourist-or-interpretative/humanistic)

3. ATTITUDES: (To help people acquire feelings of concern and provide motivation for active participation in environmental improvement and protection.)

Q 3.1 Is Active participation in local environmental affairs encouraged? _____

Q 3.2 To what extent is dialogue, co-operation and positive interaction employed in learning process?

Q 3.3 Is attention given to the problems of; consumer attitudes, waste management, development needs etc. _____

4. SKILLS: (To help groups and individuals acquire skills in identifying and solving environmental problems.)

Q 4.1 Are problem solving skills and critical thinking consciously developed? _____

5. PARTICIPATION: (To provide groups and individuals with opportunities to become actively involved in resolving environmental problems)

Q 5.1 What is the extent of pupil involvement in the community?

6. GENERAL:

APPENDIX 4.
INTERVIEW GUIDE

The 'Interview Guide' below was intended to be used by the researcher as a checklist during interviews with heads of schools in order to insure that all the more important points were raised.

Introduction:

1. Introduce myself.[]
2. Explain the nature of the research
and the M.Ed. course at Rhodes.....[]
3. Explain the scope of the interview.....[]
4. Request permission to tape-record.....[]

Key issues:

1. Familiarity with the Tbilisi Declaration
and/or the 1989 S.A. White Paper.....[]
2. What efforts are made to bring pupils
into contact with their environment.....[]
3. EE. essentially a learner centred, discovery
based approach to education: This school ?.....[]
4. What do you regard as the most important
values that this school seeks to impart.....[]
5. MAKE ARRANGEMENTS FOR OBSERVATION:

(date / time) (venue) (teacher / std.) (phone)

a.

b.

c.

APPENDIX 5.

THARFIELD EXCURSION - PROGRAMME

'Programme of events' and 'activity guide' given to each pupil at the commencement of the St. Andrews Preparatory School standard three sea - excursion.

PROGRAMME OF EVENTS:

1. Rock pool study
2. Sand dune study
3. Bird study
4. Sea-weed study
5. Physical formations study
6. Fish study
7. Crab study
8. Sand castle building competition
9. Fishing competition
10. Climate study
11. Food chains
12. Tides and waves
13. Problem solving exercise
14. Can you think
15. Night walk

SEA-WEED STUDY:

- 1) You have a sheet with pictures of sea-weed on it.
See how many of the different types of sea-weed you and your partner can find.
- 2) Try to match them up with the pictures.
- 3) You may find some that are not on the sheet. Draw them on a piece of paper. Be careful to capture the most important details.
- 4) Observe where the different types of sea-weed are found. Can you see any pattern.
Are there any places where sea-weed isn't found ?
Why is this ?
- 5) Take any piece of sea-weed and give it the senses test.
taste it
look at it
smell it
feel it
listen to it !!

CLIMATE STUDY:

There is a work-sheet that you and your partner must complete. All the information that you need is on the sheet. You will need to have a thermometer.

BEACH STUDY:

- This is divided into three sections: a) The seashore zones
b) The sand-dunes
c) Sea solitaire
- 1) Find the sheet on the seashore zones. Working with your partner try to identify all the zones. Is it always easy to identify these regions? why/why not?
 - 2) There is a worksheet called the 'Sand dune study'. Work through this with your partner. Don't rush your answers.
 - 3) Scout around and see what interesting things you can see lying on the sand. Make a list of these things. Next to each one make a note of how you think it got there.
 - 4) Find a quiet spot. Spend about 30 minutes just recording your thoughts and feelings, what you can see and feel. What do your thoughts turn towards?
 - 5) There is a sheet on the problems that animals face on the beach. Read it!
One of the most common animals on the beach is the bulia. There is a sheet called, 'Things to do'. Follow the instructions. You will find it very interesting.
 - 6) There is another sheet called 'Beaches and storms'. It shows how a beach is effected by storms and shows you how to do an experiment to see this. Follow the directions carefully and try to record the results.

BIRD STUDY:

- 1) There are many birds to be seen in the area. Sometimes we don't really notice them, we take them for granted. These birds form an important part of the ecosystem.
- 2) Using the sheet on the bird-count:
Take careful note of the different birds you see and fill in the sections.
- 3) Can you think of other birds that might be found along the seashore, that you haven't seen?
- 4) Write a few sentences saying why you think the birds are important to the area.

FOOD CHAIN STUDY:

There is a lot of information on food chains. Use this to answer the following questions:

- 1) Some parts of the food chain can't be seen. Why is this?
- 2) Draw a simple food chain. Make up your own if you can. If you find it too difficult, use one of those you have been given, one you understand.
- 3) How do we fit into a food chain?
- 4) What is meiofauna?
Can you see it?
- 5) If you removed one part of the chain, what would happen?

ROCK POOL STUDY:

- 1) You have been given a number of sheets with squares on them. You must try and fill in the squares with the information required. Observe the animals in the rock pools carefully. Look at the labels on the top and fill in the proper squares.
 - 2) Find the sheet that is used for counting the different anenomes that you can see in the rock pool. Put the different colours that you can see down the side. Then make a tick for each one of the colours that you can see.
 - 3) Find a starfish. Gently place it upside down in a small pool. Watch how it turns itself over. Make some notes on how it does this. Repeat the experiment a few times.
 - 4) Get a sea-urchin. Examine it carefully. Can you see how it moves ? Draw it from the bottom.
Can you see how it eats ?
Place it next to a rock pool and watch what it does.
Record the results.
See if you can find a dead sea-urchin. Compare it to a living one. What are the differences ?
 - 5) There are three different types of barnacles. See if you can find one of each and draw it.
 - 6) See if you can find a barnacle shell with a hole in it. What made the hole ?
 - 7) On a clean piece of paper, list ALL the living things you can find in one rock pool.
 - 8) Find the pictures of the rock pool. How many of the things in the picture can you actually find ? List them. If you have time, colour in the picture.
-

APPENDIX 6

THARFIELD EXCURSION - GUIDES

(A guide, designed to assist children with the compilation of a personal record of their experiences and reflections.)

TASK THREE

Now let's think about each step. Here are some ideas to help you. Remember that the final choice of what you do is yours. If you are undecided then each step will be examined in detail.

REMEMBER - USE YOUR IMAGINATION.
DON'T BE SCARED TO EXPERIMENT.

a) INDEX

This will probably be the last thing you will do , but you must remember to leave space for it.

The index is where you list where each new area starts, on what page you can find it. If you are not sure then have a look at the index in a front of a book.

b) THE TRIP TO RIET RIVER

Record how we travelled, when we left , some interesting facts on the trip. If you like you can include a picture.

c) THE PLACE WE STAYED

A 'good' description of the cottage and its surroundings. What did you think of it when you first saw it? Where did you sleep? What did it make you think of ? Again it would be a good idea to draw a picture of some part of the cottage.

d) ROCK - POOL STUDY

You made a lot of notes about the plants and animals you saw in the rock pools. Write up what you observed. Use some sort of headings like; ' Sea anemones' ' Sea urchins' 'Other animals and plants'.

Write about what they look like (draw a picture).

What do they eat? How do they move? Any other information.

Stick in the 'count' sheet of anemones and urchins.

e) BARNACLES

We looked at three different kinds of barnacles, what they eat and what eats them. Write down what you can about them.

f) SAND DUNE STUDY

You did a lot of work on sand dunes, what are they made of, what lives on them, how they change shape.....

Try to tell me something about the sand dune your group observed.

Use your notes you made while on the dune. Try to draw a sand dune in your project book.

g) SEA-WEED STUDY

On the last day we were there we had a long walk and looked at all kinds of sea-weed. Stick the pictures of the different kinds of sea-weed into your project book. Write a description of at least two sea-weeds that you can remember.

h) CRABS STUDY

We are going to try to make up a complete crab from the little bits that you brought back. I will give you a handout on crabs. Stick or copy this into your project book.

i) BIRD STUDY

You have a record of at least five birds that you saw and recorded. Stick this into your project book. If it is not very neat and you would like to do it again then ask the teacher. Do you think that we saw many birds or only a few? Give reasons for your answer.

j) ROCK FEATURES WE SAW

We looked at a blow-hole, an arch, hard rock and soft rock. Say something about where we saw these things and how they were made. Try to draw them. Use the notes you were given in your file.

k) FOOD CHAINS

You have three pages with pictures of things on them. Cut these out and try to form food chains using these pictures. Write something about the different chains that you make. There is a page in your notes that will help you.

l) GROUP EXPERIMENTS

We dug a large hole and investigated what we found in it. List what you found and try to explain how it got there. Think about it the other holes that other groups dug. How was yours different from theirs?

Examine the specimens of sand and water that you brought back. List each one and say what you observe. Are there any differences? Can you account for these differences?

m) PROBLEM SOLVING

In this section I have set you a couple of problems that you must think about. You can do this in groups or by yourself. Give the problems some careful thought. Record the results in your book.

n) SEA SOLITAIRE

You did some brief notes while you were sitting on your own. See if you can capture that feeling on paper. Use the notes you made. Write a short passage. (remember - sight, sound, feel, smell,

taste, thoughts)

o) SAND CASTLES

Give a brief description of your model you made. What problems did you have? Which one did you think was the best? Why?

p) FISHING COMPETITION

What were your feelings about the competition?

q) ENTERTAINMENT AND PERSONAL REFLECTIONS

We had some entertainment in the evenings. What did we do and what did you think of it? Try to make this funny and open. Talk about what we did and said.

r) THE TRIP BACK

Say something about the return home. How did you feel about leaving? Make it quite short.

s) WHAT I THOUGHT ABOUT THE WHOLE TRIP

Use three headings here:

My best memory

My worst memory

The most interesting thing that happened.

FEEL FREE TO ADD IN EXTRA INTERESTING THINGS IF YOU THINK ABOUT THEM THIS IS YOUR BOOK AS A RECORD OF WHAT YOU SAW AND DID AND LEARNT.

MAKE IT GOOD!!!