

Pleas, Plights and Environment: Part I

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Summary

The depletion of the world's natural resources continues relentlessly. Plants and animals alike are being trapped into ever more numerous shrinking pockets, as man advances to incorporate virgin estates into areas of productivity. The immediate consequence of such an all-out attack in the tropical areas of under-developed countries is the destruction of habitats and the likely break-up of food webs. The attendant disastrous effects on the reproduction of species, hence, puts natural selection at a premium. This scenario has distinctly impressed different people in different places. This suggests diverse sensitivity even for causes voiced in public as matters of sheer truism. The study concentrates on the examination of the dialectic nature/nurture controversy to see whether this may account for the state of disharmony recorded between man and nature. Conversion of nature is traditionally considered a realm of the scientific establishment. The study tries to suggest that the humanities cannot be left out in any debate on the interpretation of the environment. The synthesis reveals a blatant refusal of social determinism as causal agent and, with some reservation, projects

biological determinism into sharp focus for pertinent consideration. The cautious reconciliation with parts of sociobiological tenets was regarded as inevitable once grasped that will, knowledge, and sensitivity, were interpreted as the foundation of the main teleological argument.

Introduction

The rate of conversion of the earth's primary vegetation, as well as of scenic landscapes, is formidable by any standard. It is part of a societal movement that accepts the depletion of the world's natural organic and mineral resources, to satisfy a demand created by emergent post-war technologically-oriented societies. Men of science have decided to write about the effects of such a trend. Their plea to halt the destruction of biological diversity has established the framework for an assessment on how properly the question is being addressed in the light of immediate returned gains.

The state of disharmony and suffering reached by no means mirrors a random process. Chance effects are cause for outright dismissal in the realm of victimology, since rationality is an endowment of the dominant species. The main body of discussion addresses this dialectic.

The Plea and the Plight

From earliest times, man has been modifying sizeable chunks of nature (Westhoff, 1983), a trend that might have even started in biblical times (Stebbins, 1970). The current depletion of the vegetation of the African continent is assumed to express the continuation of a pre-historic trend (Aubréville, 1985). In medieval times distinct ethnic groups were converging toward a common

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aim. The Poles so heavily tapped the pine *Taxus bacata* that a royal decree of 1423 had to come to its rescue (Molski, 1979). The Portuguese, soon after 1503, virtually extinguished the "Brasil redwood" (*Caesalpinia echinata*) of Brazil's Atlantic coast forest (Oliveira Costa, 1983). Natural resources were, as nowadays, seen solely as "goods-to-be-used".

Man's mounting pressure upon the remaining primary vegetation on earth and on mineral resources has inspired a number of publications whose titles are suggestive of the magnitude of the problem (Gómez-Pompa *et al.*, 1972; Myers, 1979; Eckholm, 1982; Fittkau and Reichholf, 1983; Prance, 1984; Davis *et al.*, 1986; Wilson and Peter, 1988). Tropical forests, housing an estimated 20–40 percent of all animal and plant species of the biosphere (Myers, 1983b; Bourlière, 1983), became a major target of preservationist surveillance. A substantial fraction of the moist tropical forest (MTF) is still undisturbed or only slightly injured (Fearnside, 1982a, 1984; Myers, 1983b). However, the conversion of 245,000 km² of moist tropical forests a year (Myers, 1981, 1982, 1983a; Boerboom and Wiersum, 1983) or 92,000 km² a year converted, with another 100,000 km² grossly disrupted (Norman Myers, cited in Tangle, 1986a), is a blow to committed environmentalists. Besides, as they claim, sanctuaries spared today will have to reckon with subsistence agriculture and multinationals tomorrow. The conversion trend is actually increasing.

The conservationist plea is further reinforced by those who think that by educating the public on what nature should mean to man might produce a reversal of attitudes (Raven, 1976; Westman, 1977; Macbryde, 1979; Wahlberg, 1979). Others charge conservationists with the mission to change people's behaviour, thus suggesting the existence of resistance (Downes, 1981; Lovejoy and Napier, 1986). Still others (*e.g.* Mares, 1986) prefer a collective dilution of guilt. Such an unfortunate point of view reaches paroxysm with Janzen's (1986, p.306) deplorable statement that "if the tropics of the world go under, biologists of the world will have no one but themselves to blame". True, reason seems in short supply these days.

How great is the impact of the plea upon depleting natural resources? Very little, if one looks at the events of the last 30 years or so. This serves to bring to light the existence of an idiosyncratic conflict taking place between two

viewpoints. Conservationist publications invariably use the word "devastation" to mean something they would prefer not to observe. This sets the case, from an utilitarian point of view, for biased semantics. Economic man would argue that what is devastation for others is "progress" for him. This suggests that in modern society any activity that is not a direct threat to human life is open to multiple labelling. Take the example in temperate and tropical areas, where the annual increment of forests has overcome the annual removal of wood (King, 1978). Much of this afforestation and reforestation makes use of *Pinus* and *Eucalyptus* and the practice aims principally at serving the timber industry. While sounding convincing to a technically less-prepared public, it would appear sophism to a conservationist audience. As noted by Myers (1983a), the manipulation of statistical data for natural resources is a rampant practice of official agencies.

The reach of the conservationist plea is best illustrated by a definition of conservation. A recent version reads: "to denote policies and programmes for the long-term retention of natural communities under conditions which provide the potential for continuing evolution, as against preservation which provides for the maintenance of individuals or groups but not for their evolutionary change; thus, we would state that zoos and gardens may preserve, but only nature reserves can conserve" (Frankel and Soulé, 1981, p.4; see also in this connection Soulé, 1985). Such a wide-encompassing definition embraces, of necessity, the issue of how big reserves should be (Ralls and Ballou, 1983; Lewin, 1984; Diamond and May, 1985; Wilcox and Murphy, 1985), the crucial topic of "evolutionary ethics" (Frankel, 1974, 1976, 1983; Ehrenfeld, 1976, 1986; Potter, 1977; Soulé, 1983; Wilson, 1984) which claims man has no right to prevent the process of evolution from taking place, the economics of reserves (Western and Henry, 1979), and man's role in the management of these sanctuaries (Diamond, 1981). Governments, profit-seeking individuals and corporations are not succumbing significantly to these demands. There is enough everyday evidence to suggest that they are gradually leaning toward ancient and elusive concepts of conservation of the sort "the wise use without waste of the natural resources" (Buchinger, 1967, p.81).

The aim is not so much to reach academic circles but, for obvious reasons, the press, and by

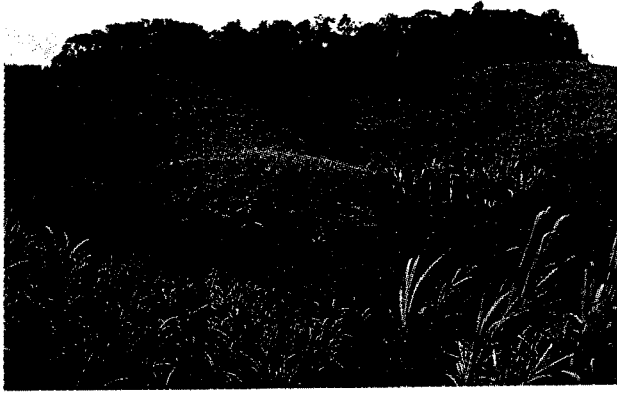


Fig.1 Monoculture of sugar-cane in NE Brazil. Most of Brazil's Atlantic coast forest has been wiped out from its northeastern states to make room for this crop. A pocket of secondary forest seen in the background is said to serve for firewood. Municipality of Goiana, State of Pernambuco, August, 1985.



Fig.2 Slash-and-burn techniques are widely used by both farmers and peasants in Brazil's Amazonia. Commodity crops such as cocoa, rubber, and coffee, together with cattle ranching and sawmills, are taking over vast areas of the jungle. The conversion of the region's natural resources is principally the work of southern and eastern migrants newly-arrived from impoverished rural areas. The arrival of peasants and entrepreneurs, devoid of any bond with the region, is partly accountable for quite a few towns displaying a gloomy "far west" look. Photograph taken near the municipality of Vilhena, State of Rondônia, May, 1986.

proxy, public opinion. The typical stance of western governments is best illustrated by a manifesto of an affiliate of the United Nations Organisation. UNESCO's Man and the Biosphere (MAB) programme has recently proposed its biosphere reserves programme. Concern for the verdict of the scientific community is clear in the voice of one of its mentors: "biosphere reserves are wholly excluded from economic exploitation, at least in the core zone" (Frankel, 1978, p.102). The official document is, however, political and pragmatic in content: "people and their activities are not excluded from a biosphere reserve; rather they are encouraged to participate in its management and this ensures a stronger social acceptance of conservation activities" and "biosphere reserves provide a framework demonstrating the economic benefits which can result from the protection of natural and managed ecosystems" (UNESCO, 1984, pp.2 and 10). Small wonder, then, that with such circumscription, UNESCO's pamphlet could boast of 65 countries contributing 243 such reserves by December, 1984. Conservationists would feel uneasy knowing that UNESCO's message tries to lure national parks and other protected areas into the realm of biosphere reserves.

The search for arable land is so intense in third world countries that much of remaining vegetation is likely to be wiped out in the next 20-30 years as new generations emerge to claim a share of the farm land (Figs 1 and 2). Birth rate increase in the order of two to four percent a year, coupled with a peculiar view of nature, where

aesthetics plays minor or no role at all, makes under-developed country's protective announcements on environmental matters sound unreliable. This is exemplified by the area of MTF protected by law in Brazil's Amazonia. In 1984 it was a mere 1.9 percent of the whole area (Leal, 1984).

The next target to suffer the consequences of utilitarianism might well be the plant taxonomist. The plant taxonomists' low standing in the public eye has been created because taxonomy has turned into an esoteric cult distancing itself from applied science (Heywood, 1984). This exposes the difficulties of a state-funded science in an industrial-oriented society. The indictment of Linnaeus for "his limited philosophical and intellectual horizons" and "his somewhat outdated philosophy" (Heywood, 1980, pp.100-101) leaves little hope of complacency for pure science in plant taxonomy. The availability of funds for research will increasingly become associated with compliance with the donor's will (Williams, 1985). Thus, scientists face a substantial loss of freedom because of practical subsistence imperatives.

The fact remains that plants and their specialists cannot compete fairly in an over-valued technological world. Plant taxonomists tend naturally to obstruct policies and practices aimed at making the most of the plant's natural resources, or the ground on which these plants

grow. Heywood's (1984) more sympathetic view of the role of the ecologist within the affluent society may serve rather as a warning of a grim situation in the near future, *i.e.* the scientific validation of the material wealth gained by corporate capitalism at the expense of natural resources. Harley (1978) opened the way when he advised ecologists not to judge the merit of environmental problems. A similar escapist standpoint appears on page 2 of the NRC (1986) study: "we treat only the biological side of environmental problems, to avoid taking on an unmanageably large task".

In short, the wilderness is in deep trouble. Further evidence comes from statements of the sort "it seems that the practical applications of our efforts are lagging far behind" (Hedberg, 1979, p.85), or when the conservationist is urged "to continue to the bitter end" (Westhoff, 1983, p.22). Rapid rate of conversion, man's interference in nature, and deafness to pleas have increased the plight of the environment and inculcated defeatist and conformist attitudes in man himself.

The Utilitarian Trend Versus Scientific Premonition

It would be convenient to halt human population growth if the accelerated rate of conversion of primary vegetation is to be relieved. However, current human population suffices to complete this conversion (Prance, 1979). This suggests man had better consider the role of holism in environmental affairs.

Theoretical studies suggest that should human actions alter the temperature of the CO₂ insulating layer surrounding the planet, by + or -1°C, cataclysmic effects (*e.g.* rise of the current sea level, shortage of rainfall in the tropics) could follow (Potter *et al.*, 1975; Lettau *et al.*, 1979; Boerboom and Wiersum, 1983). However, life as a whole on earth would seemingly be little disrupted. Also reassuring is the belief that current levels of oxygen would not be significantly altered should deforestation be complete. Sufficient accumulation of oxygen took place in the atmosphere during the geological past (Ehrlich *et al.*, 1973).

Climatic disturbance may, however, affect crop production. Should the temperature of the CO₂ insulating layer of the atmosphere be increased by a few degrees centigrade, rainfall levels may be altered more drastically with due results. Mankind depends on agriculture. Should

any significant disruption in grain output take place because of a lasting climatic change, not only is famine bound to ensue, but also warfare might break out, bringing about geopolitical changes. Brown (1981) reports that some Asian and African populations die of starvation in silence. This may merely suggest that warfare is inappropriate locally because of poor industrialisation and world power balance. In turn, Barr's (1981) comment that food trade is dependent on money suggests might as the stabilising factor of supply and demand. The fragility of the current balance may be seen from the fact that roughly two dozen crops sustain mankind. A dozen, mainly grains and legumes, provide the bulk of the protein consumed. Estimates made for eight US major crops revealed that diseases, pests and weeds accounted for a 9.3 percent decrease in yield of crop genetic potential, while inadequate soil and unfavourable climate accounted for 69.1 percent of the depression of yields (Boyer, 1982). Physical factors clearly stand out as the main causes of yield losses. Man can successfully fight pests and diseases affecting crops, but is no match for the climate.

The Psychology Behind Trends Depleting the Environment

Almost certainly landowners in past generations wished to make the most of their lands. Man's estimate of the utility of natural resources in ancient times could not have differed that much from today's. Hume's (1952, p.479) conclusion that human nature is uniform, both in principles and operations, is worth contemporary reflection. All that was missing in ancient societies was a perspective in time to make the most of an item's potential, namely to set forth an association between discovery and demand. It can be further speculated that what restrained ancient man from engaging in a rush toward the quick conversion of primary vegetation or minerals were the limitations imposed by the historical moment, *i.e.* lack of congenial technology, no sizeable consumer market, no means of transportation, poor development of medicine, *etc.* The restraint was dictated more by context than by distinct will.

Economic cycles may provide a clue to why man starts the exploitation of natural resources for reasons other than food. In Brazil the wood cycle was followed in quick succession by the gold and

rubber cycles (Oliveira Costa, 1983). The start of such economic cycles was, to a degree, dependent on man sensing, and subsequently assessing, the material return that would result from a labour investment in natural resources. In Australia the koala was killed for consumption by the aborigines but not by European settlers. The latter only started killing the koala as a fur-bearing species (Strahan and Martin, 1982). It is possible that the aborigines did not trade the koala because they were not familiar with an alien market where the animal was valued for other attributes. Were the aborigines aware of its existence, such a consumer market might have awakened silent components in their personalities. In a setting where men and beasts live harmoniously exploitation of a wild animal may suddenly appear as perception of profit surfaces.

Once the assessment of item value and utility renders it likely to be tradeable, distinct utilitarian behaviours will surface in a community. This suggests that inner components of human, and hence, social action may stay dormant before being triggered by an appropriate stimulus. It follows that only through continued observation on how allopatric human stocks react to the same stimulus can one safely talk of distinctive behaviour and distinctive attitude regarding item utility. It also sounds reasonable to assume that the non-display of a trend or trait during the individual's life span might simply mean that he did not find the proper stimulus.

The degree of exploitative behaviour applied to natural resources results from the acknowledgement that there is a relationship involving the production of goods conditioned to man's will. The exploitation of a resource will ultimately depend on the outcome of such an interplay. Natural resources are exchangeable for money, and money buys other goods. Accumulation of natural resources equals accumulation of capital. The *a priorist* question of why most people, given a chance, will strive to over-accumulate, while far fewer are content with a decent and safe material subsistence, has still to be answered. To what extent is this idiosyncratic reaction determined by the individual's innate components? Materially, the farthest one can go rationally is to associate man's self-survival with Marx's historical materialism and hence with subsistence agriculture. At a second stage, one could envisage man fighting for family safety and seeking conveniences to ease household life. Disproportional individual

accumulation of wealth may be traced to local societal components acting on a receptive mind.

How strong can innate components be in determining one's actions? John Watson's behaviourism offers little prospect for understanding, let alone explaining, human action. In turn, Eysenck (1967, p.79) dismissed any therapeutic effectiveness of psychoanalysis. He may be right, but his view on human differences, translated into physiological jargon, can hardly be used to vindicate the outright dismissal of in-depth psychology from human affairs. Darwin (1871, p.492) proposed that not only good and bad traits, but also dispositions, habits, and tendencies might be inherited by offspring. One may improve this by suggesting the individual is inheriting a behavioural matrix. Further arguments in support of the ontogenetic origin of personality traits are present in Kretschmer's (1936) and William Sheldon's body-typing theories. Body-typing theories and psychogenetics (Wells, 1980), suggesting an association between frame and mind, may confuse those doubting the congenital character of certain behavioural traits. Bolder views propose that biological factors determine social behaviour, thus leading to the development of sociobiology and the concept of genetic determinism (Wilson, 1978, 1980; Wilson and Lumsden, 1981). Within this context, man's exploitative stance to natural resources may tentatively be reduced to concealed aggressiveness. To some there is a biological basis behind much of man's aggressiveness (Fromm, 1977). However, to equate man's innate aggressive drives with Freud's death instincts (Storr, 1970) is clearly unsatisfactory. Perhaps more visionary is the opinion of the appearance of man's aggressive drives as a symptom that adequate outlets were not found in time (Lorenz, 1966, p.209). This hints at unknown psychic components working in man's mind, heralding the influence of culturally-acquired dispositions.

Conservationist essays are seldom sufficiently analytic in aim. To link the removal of the vegetation of the MTF to rampant materialism (Sioli, 1975) is to progress half-way in the search for an explanation. The approach is descriptive and not causal. Indictment, social or biological, has to overcome generalities. The *a priorist* idea is that there is something wrong with man's dealings with nature. To what extent this is culturally-conditioned is the realm of the social sciences. Positivism makes a poor contribution to this issue, since it rejects conjecture, inductivism,

and sensorial experience as epistemological assets (Popper, 1982; Munz, 1985). Man's reckoning with determinism can likewise count very little on structuralism for "structuralism emphasises the unconscious causation of social events and situations" (Bottomore and Nisbet, 1978, p.593).

Much of the contemporary damage being inflicted on the world's natural resources is due to corporate capitalism. The frenzy for quick profit is responsible for the frontal attack on forests (Budowski, 1976; Goodland and Irwin, 1977; Smith, 1981; Fearnside, 1984) or for their conversion to satisfy modern food habits (Myers, 1982; Nations and Komer, 1983).

The rationale of Freudian theory identifies the individual's primary impulses continuously coerced by means of cultural sanctions that prompt unconsciously-motivated behaviour. Freud's contribution to a more accurate appraisal of human nature came from his equation of identifying a relation between dissatisfied instinctive drives, mostly sexual in content, with a capacity to promote destruction. The importance of Freud's writings in connection with the environmental affair are that they grant the view that man is in search of constant activity. When man is not involved in ensuring his own immediate material survival, he is inventing something to do. Man needs to be perpetually busy or boredom or depression are likely to overcome him. Such a trait is visible even from early infancy, and probably arose as a side-effect of the unusual development of the sensorial system.

The dialectic linking psychoanalysis to conversion suggests that development does not necessarily halt once man's needs are fulfilled. This suggests that rather than following a specified path leading to the fulfilling of his needs, man took an unspecified course derived from multiple combinations. By contextually conceiving man as an alienated being, the analytical theory sets up the theoretical framework to rescue the individual, through proper access to his inner mental layers.

The logic of mutual self-estrangement between the creature and society, and the sinister inherent implications of what man may keep in store for nature, is unsurpassed in Aron's (1968a) 'Progress and Disillusion': "Man, as he progresses toward fulfillment (p.XI) – modern societies which seem to have as their objective not a certain way of living together but the advancement of science, wealth, and power

(p.XIV) – no one knows if tomorrow men will be satisfied with what society has to offer; if they are not, no one knows how they will express their dissatisfaction" (p.XVI).

Much of nature's sad plight is due to capitalist practices. However, what remains doubtful is whether this is cause or consequence. The psychoanalytic theory, by emphasising a shift of energy from original functions, thus amounting to repression, scores high as an explanation of the rise of the capitalist system. Moreover, the Marxist conception of historical materialism, that the satisfaction of a need creates demand for other needs (=praxis, Marx, 1963, p.76), is antagonistic to the Freudian image of the individual.

Unlike Freud's position which blends the ontological and structuralist components in moulding determinism, the social sciences shift the emphasis to cultural factors. Max Weber (1983), while acknowledging that the spirit of capitalism was present in antiquity, equated the rise of capitalism with the rise of protestantism in the 16th century. However, Beaud's (1984) revision contends that Catholic Spain and Portugal did too. Weber's (p.136) indignation that "in the protestant ascetic communities admission to the Lord's supper depended on ethical fitness which was identified with respectability in business" would nowadays indict nearly every religious group. The same scepticism holds for related views arguing that much of the present-day ecological crisis stems from the rising influence and expansion of christianity which, from the middle ages, prompted the speedy development of western technology (White, 1967, 1973). The weakness of such recrimination is their too structuralist content.

The expansion of capitalism in the middle ages paralleled the rise of a bourgeoisie responsive to an ever-increasing influence of the Christian church over family and government matters. There was, though, another social phenomenon taking place at the time, little noticed thus far, and which adversely influenced the interplay between man and nature – the foundation of the modern family. Its foundation coincides with a time when the relation between the sexes was regarded by scholars as anything but affectionate (Shorter, 1976; Flandrin, 1979; Anderson, 1980a; Shahar, 1983; Duby, 1984). The same emotionless relationship is reported in the 17th, 18th and 19th century western Europe (Anderson, 1980b; Shorter, 1982). Woman's contribution to a harmonious family life was not

one of a partner but of a hired employee (Stone, 1979; Flandrin, 1986). The latent conflict and animosity revolving around the sexes is far from resolved. This is clearly made explicit in the unrivalled statement of Martin Luther: "if they become tired or even die through bearing children that does not matter; let them die through fruitfulness – that is why they are there" (Passmore, 1980, p.156). The point is that females are natural moderators of male aggressiveness.

What is the relation to be drawn by comparing the bourgeoisie, natural resources and capitalism on the one hand, with the western family on the other? Just one word: time. Time bridges all the involved factors. Family affairs are increasingly giving signs of being in trouble. Nobody could have made the point better: "if, nowadays, historians are beginning to discuss the family, this is perhaps because the problems of private life have irrupted into the sphere of current events" (Flandrin, 1979, p.1). A fundamental action to be taken in any crisis is to gain time, to postpone the final outcome. What seems necessary to stress is that to make a profit on a continuous and sustained basis, demands time, time that could otherwise be more generously shared with the family or allocated to leisure.

If time cannot be allocated naturally, there persists a surplus of daily spared energy, in the form of libido, which somehow must find another outlet. It can dissipate in a variety of ways, not the least on organic and inorganic forms of nature. Hedgpeth (1986, p.52) provides a fine example of this dialectic, when recalling a part of his infancy: "I do not forget when I was ten years old – when a large pine tree was cut down on a Sunday afternoon simply because the loggers had nothing else to do with their time."

Adler's (1929) theory brings to light an association drawn between social unrest and non-conformity with one's genetic endowment. While one can disagree with his urging the individual to overcome the painful experience battling to rise in social prestige (Adler, 1928), there can be little doubt that such a proposal is tantamount to make the most of one's time, as a

way to counter emergent personality disorders. However, Freud's comment that "I have made a pigmy great" (Roazen, 1979, p.201), reveals the peculiar way science often develops. 'Either-or' ideological doctrines must be chosen at the expense of knowledge as well as views.** Savage ideologically-motivated barrages fired at Adler (e.g. Jacoby, 1977) missed the point. Wells (1983), and to an extent Roazen (1979), do not explore the full cultural and sociological implications of Adler's central theory, linking up the dissatisfaction with one's own image, the follow-up social interplay, and the release of destructive forces. Adler was anticipated by nearly 300 years by Hobbes' (1968). The intersection between this theory and historical materialism, with the attendant consequences on the environment, is addressed in the section on the dialectic of power.

The working hypothesis that man's dealings with the environment, in the search of profit, may partly derive from an attempt to escape from societal inadequacies, is conjectural, as is the gene-centred hypothesis. The acceptance of either will ultimately depend on further empirical evidence.

Morals and Environment

Is man's assault on nature a moral issue or not? If one adheres to the definition of morals, as that part of philosophy dealing with the regulation of man's duties to his fellows, the answer is negative. In the same tone, there are those who do not admit the use of "rights" in the relation of man to nature (Passmore, 1980). Likewise, a sense of deception is felt, when it is known that "illuminated" philosophers such as Immanuel Kant demonstrated an icy regard to the value of animals (Midgley, 1983). In the same vein, to indict the Roman Catholic Church for passing on a historical tradition of regarding nature in a utilitarian way (Passmore, 1980), is to redeem the individual's misdeeds. Whether Pope Pius IX said that the Church could not come to the rescue of mistreated animals for they lacked a soul (Russell, 1950; Marcuse, 1964), or to refuse to set

** It may be assumed that Freud was committed to the search for truth (see, though, Masson, 1984). However, contrary to Popper's view that dogmatism has to be exercised in a balanced way (Munz, 1985, note 13), Freud was often authoritarian in scientific disputes, not admitting dissent, and obsessed with priority. It is a sad thing that his obstination with the Oedipus complex, the 'edifice of psychoanalysis', had been spotted as useful to the purposes of dogmatism: "the infant's satisfactions bear the indelible and constitutive mark of the law, of the claims of human law" and "Lacan thinks nothing but Freud's concepts, giving them the form of our scientificity, the only scientificity there can be" (Althusser, 1984, pp.163, 167).

up a society for the prevention of cruelty to animals for fear that such an action might be interpreted as recognition of man's duties to animals (Passmore, 1980) becomes irrelevant to the main body of discussion.

The plight of the environment revolves around humanistic principles. It is a matter of knowledge, not cognition. The limitations to their implementation are expressed by Arendt (1978, p.270) when paraphrasing Kant's ethical philosophy: "you can only 'court' the agreement of everybody else; in this persuasive activity you actually appeal to the community sense."

It becomes obvious that from an utilitarian point of view, harm to organic and inorganic nature becomes a moral issue only if fellow men, or the community at large, are in some way threatened, or when monopolistic use may create the conditions for other men's exploitation. The analysis of plant and animal plight reveals the dogmatic character of utilitarian philosophy. However, public support for a species is highly dependent on its capacity to impress human senses, as evidenced by the excessive protection now granted to the Australian koala, traceable to its attractive appearance (Strahan and Martin, 1982).

The concepts of right and wrong in environmental disputes are, to a great extent, subordinated to value sets and the degree of internal sensitivity. However, this is not to say that actions taken in this sphere are not open to moral scrutiny. If common resource sharing gives rise to individual abuse (Hardin, 1968), which in turn is difficult to halt because of ethnic and sociological factors (Crowe, 1969), even so the context does not favour conformism. It is part of the western tradition to make this a moral issue, for nature transcends the mere existential.

Ethics and Nature

The western world's clash with the environment has been fully documented thanks to improvement of the means of communication and freedom of the press. Gradually, state-planned economies are also revealing their environmental predicaments. The remark that capitalist and socialist societies differ little in their regard for natural resources (Passmore, 1980) suggests that the state is taking over the individual's pertinent role. The two giants of communism, the Soviet Union (Kramer, 1983; Elias, 1983; Pryde, 1983) and China (Tuan, 1970; Sun, 1983; Caufield,

1984), have problems. To judge from the view held as to the value of nature by one of the ideological mentors of this economic system, it is small wonder local ecological disasters appear: "Industry is the real historical relation of nature to man; thus nature, as it develops through industry is truly anthropological nature" (Marx, 1963, p.88).

It is hard to think of the environment dissociated from the presence of a strong moral sense. The Darwinian view of innate evolutionary ethics has commonality with sociobiological tenets. Hegelian political philosophy is the backbone of the marxian appreciation of the role of the state. It may be noted in passing that biology counts for little in these texts. That, since Engels published his 'The Origin of the Family, Private Property and the State', in 1884, biology has become anathema to materialism. Generations of marxian theoreticians deny it any role whatsoever in the explanation of human social behaviour. With the official excommunication of biological determinism, ideology of the state was to rebuff the existence of free will and ethics (Kolakowski, 1978, pp.58, 60).

There has long been controversy as to whether morals are innate or acquired in man. To some, regard for the other's view accounts for the observance of man's morality (Hume, 1952, p.486; Darwin, 1871, p.485; however, see the contradiction when postulating an innate feeling of guilt - Ghiselin, 1973). This amounts to saying that man knows what is expected of him, but may not comply. Western scholasticism is prodigal in the further spread of this inductive reasoning. Hume (1952, p.480), for example, is adamant: "pretexts and appearances no longer deceive us", a thought further elaborated in Swift's (1975) prose. For Darwin (1871, p.471), "any animal whatever, endowed with well-marked social instincts, - would inevitably acquire a moral sense of conscience, as soon as its intellectual powers had become as well, or nearly as well developed, as in man." It is clear that Darwin conceived moral conscience as an ontogenetic self-awakened character in man, hence his criticism of John Stuart Mill on the subject. How far Darwin stands from Freud's merciful view is made evident in the text concerning criminals: "we can go farther and risk saying that a great part of the feeling of guilt is naturally unconscious, for the genesis of the moral conscience is inextricably linked to the Oedipus complex, the latter belonging to the realm of the

unconscious" (Freud, 1923, p.2723).

To others, man's moral feelings are not innate but rather acquired (Dobzhansky, 1955; Dobzhansky *et al.*, 1977, p.455; Mill, 1979) or, worse, innately pluralistic (Wilson, 1980). However, rapport between sociobiology and Darwinian evolutionary ethics is achieved acknowledging that "morality evolved as instinct" (Wilson, 1978, p.5).

Darwin's (1871, p.493) estimate that morals arose in the beginning of the history of man seems logical. This faculty dispenses the simultaneous rise of language, since to pass judgement one can count on rational intuition. In fact, it is advanced that morals do not admit explanation, for their description go beyond the domain of language (Quinton, 1982, vindicating Wittgenstein's passing over the subject). Darwin's (1871, p.481) "why should a man feel that he ought to obey one instinctive desire rather than another" sets up the framework upon which reason rests. Hesitation calls for reason, and this in turn calls for morals. The sequence can be regarded as the individual pondering introspectively his chances. This is clearly put by Hare (1982, p.139): "as you wish that men should do to you, do to them likewise."

Coercion, Politics and Environment

To some, tight coercion in environmental matters levels with the creation of a police state (Passmore, 1980). This is an exaggeration. Rather, the opposite is true: "freedom in a commons brings ruin to all" (Hardin, 1968, p.1244).

The permeating view of man's innate goodness is associated with the idea that the supply of cognition has the potential to bring about a change in behaviour. This view becomes wishful thinking. It is born from expectation and, hence, not scientific. It is hard to foresee a reversal of behaviour other than that brought about by the adoption of coercive measures.

Views on how best to control social behaviour, and for that matter societal problems, differ in tone but little in substance. Hobbes' (1968) chapter XIII ("Of the naturall condition of mankind") conceives man as unable to live harmoniously without the tutelage of the state. Darwin (1871, p.485), in Hobbes' tracks, conceived man and law as two inseparable entities. He admitted that there can certainly be bad men and that they can so behave owing to

innate components: "if his desires leading to bad actions are at the time strong, and when recalled are not over-mastered by the persistent social instinct, and the judgement of others, then he is essentially a bad man; and the sole restraining motive left is the fear of punishment." Darwin was pragmatic in not overestimating the moderating influence of the super-ego on social behaviour. However, others preferred to stress this component more: "the main reason why the individual behaves himself – is the social pressure applied by his informal groups" (Brown, 1963, p.50).

In Darwin's tracks behaviourism offers a pragmatic coercive programme: "behaviour depends upon the control exerted by the social environment" and "fairness or justice – depend on reinforcers being used wisely" (Skinner, 1973, pp.110–111). Support for this view comes from the recognition that no amount of guilt is ever willingly acknowledged (Sanford *et al.*, 1950; Darley and Zanna, 1982). On punishment "the problem is to induce people not to be good but to behave well" (Skinner, 1973, p.70).

The implications of some Freudian tenets favouring leniency vis-à-vis the treatment of victimology is sharply taken by a professor of Law who, in Darwinian style, suggests the ontogenetic character of social accountability: "while there are some disunities of self revealed by psychoanalytic theory, they are not the sort of disunities that raise havoc with our basic metaphysical, moral, or legal presuppositions of who we are" (Moore, 1983, p.199).

The scientific establishment has proposals to put into practice a reversal of current behaviour. But the reversal of the tide depends on two other factors which are inextricably associated, power and will.

Will

This faculty is scarcely recalled in the environmental dialectic but, undoubtedly, without being taken into consideration, any pertinent discussion soon becomes obsolete. A few examples from the area of conservation point to its being decisive to the achievement of success. While it is noted that protection for wildlife around farms is not a matter of techniques but of will (Carlson, 1985), it is also acknowledged that success in preventing pollution in the great lakes was the result of permeating good will present in the communities concerned (Bruce, 1982).

Parts of the humanities do not hesitate to relate the causation of social phenomena to human will. Hume (1952, p.484) is straightforward on human actions. For him, to act or not to act depends on constitutional will, well in accordance with Thomist moral theory (Copleston, 1955). In much the same vein, John W.N. Watkins insists that events are ontologically-precipitated. He regards man as the prime source behind the shield of social determinism. Watkins' thought is paraphrased by Dray (1980, p.50): "what we call social phenomena – are just individuals acting and tending to act; social events, conditions and processes are constituted by what people think and do." Likewise, optimistic views about human nature bend to the evidence that persuasion comes second to will, thus highlighting once more behaviourist tenets: "no compulsion that is contrary to the will of the individual can secure more than an outward conformity" (Aaron, 1979, p.14).

John Locke was a philosopher optimistic as to man's potentialities and self-determination. He regarded man as having disposition to learn and hence to change everyday life experiences (*c.f.* "The Epistle to the Reader", Locke, 1974). On "How men come to pursue different courses", he comes remarkably near Hobbes, since he unwittingly implies that coexistence in society cannot dispense a stabilising force, because of the existence of innate diversity: "And to this I say that the various and contrary choices that men make in the world do not argue that they do not all pursue good, but that the same thing is not good to every man alike. This variety of pursuits shows that everyone does not place his happiness in the same thing, or choose the same way to it. Were all the concerns of man terminated in this life, why one followed study and knowledge, and another hawking and hunting, why one chose luxury and debauchery, and another sobriety and riches, would not be because every one of these did not aim at his own happiness, but because their happiness was placed in different things" (Locke, 1974, p.176). It is thus clear that Locke, like Adler later, considered it possible to change a course which went astray in the pursuit of happiness. Locke assumed that reason could lose itself in the search for happiness, but that this might be overridden by knowledge supplied from outside. His philosophy did not consider change in behaviour through exogenous compulsion *vis-à-vis* change in behaviour due to endogenous

self-awareness, despite Aaron's citing him acknowledging that man can pretend.

Such optimised views on man's philanthropic potential suffer from the fatal path of what is to be regarded as the most serious epistemological flaw ever conceived by the mind, namely to assess alien actions through the use of one's own mental parameters. The ensemble of sociality embraces three main components. Social display (talent, gift, *etc.*), social behaviour (mood, temperament, inadequacy, *etc.*), and social action (effect, result, consequence, *etc.*). Of course, all such traits are to some degree changeable, but it is necessary first to distinguish between behaviour and attitude, as Brown (1963) does. Wilson (1978) invariably uses 'human social behaviour' when attitude is meant. Behaviour, as a way of behaving, like manners, is highly susceptible to self-containment, because of ecological moderators. What indeed rests on genetic foundation is 'attitude', a way of thinking, on a level with Wilson's (1978, p.20) genetic determinism. In psychoanalytical terminology, it is a figure known as true (real) self. Experimental observation tends to substantiate the innate origin of virtues. Infants show temperamental differences, which do not tend to die out with time (Kagan, 1971). Furthermore, the nuclear personality shows trends of option very early in life, and attitudes, except in trivial matters, are hardly changeable, if at all (Brown, 1963, pp.36, 67, 77).

The transect linking the will and the depletion of resources leads to an analysis of consumption. The fetishist character of commodities (*e.g.* the conversion of wood into a chair) and their ensuing use-value (for Marx, the usefulness of a thing) are two of Marx's (1976, pp.126, 163) definitions applicable to the hermeneutic discussion. It comes as a surprise to discover how Marx managed to introduce principles into a system he ostensibly combated. His statement (1976, p.125) that it does not make any difference whether the wish for a commodity arises from the stomach or from the imagination, since both are legitimate, vindicated far in advance the arrival of the technological society.

Exponents of 'The Frankfurt school of critical theory' disagree with Marx on the psychology of consumption but, following Locke, redeem the individual. Thus Marcuse (1964) insistently advances the theory that consumption in industrial societies is greatly conditioned by psychological components working on the mind. For him,

consumer awareness is due to massive advertising campaign. He did not consider that advertising has no effect on unreceptive minds. Actually, the rejection of technical rationality (Marcuse, 1969, 1978; Adorno and Horkheimer, 1979) views a passive, astounded and defenceless creature before a villain state (see Marx's structuralist view on human nature in Bottomore, 1984). Such a structuralist estimate of a non-active participation of the creature as another cog in the wheel, is antithetic to Pareto's theory and, accordingly, no longer tenable.

It is obvious that a new sort of mentality has to evolve if changes in the area of consumption, with immediate reflexes in the area of extractivism, are to take place. Human nature is resistant to change, principally when people become used to their environment, but it can change and adapt. For instance, as from 1984 there has been a boom of metal-made and glass-made furniture in Brasilia, due to timber shortage. Despite a shortage of wooden furniture, need and advertisement kept the dealers open. Likewise, when there was a shortage of plastic bags in supermarkets, replaced by paper bags, people initially complained but soon adapted. Some conditioning of consumers can be successful. It is a distinct matter to change the mentality of producers when profit is involved.

Marketing policies can, of course, be combated and even extinguished. It depends on the social rules prevailing in local society (e.g. Britain does not permit propaganda of cigarettes on radio and television nor the association of ordinary commodities, such as soft drinks, with scenes suggestive of sex). A change of course in the area of consumption is naturally possible when the design of new policies of the modes of production force the adoption of novel consuming habits.

Likewise, the dialectic encompassing the search for happiness and depletion of the environment cannot pass unnoticed. Why should the accumulation of capital, with the ensuing corporate expansion, be the main objective in a given activity involving the production of goods? A likely answer is that material goods of any sort form the basis of exchange relations in any given society. In societies where materialism looms as a way of life and status, there is a close association between a need to spare money today to await the launching of goods-to-be tomorrow. It is generally accepted that material man has very limited concern for posterity (Passmore, 1980).

Such a man may be more conditioned by social mores. This conditioning may render a life span devoid of novelties. Money, through materialism, can make things happen, thus satisfying innate wishes. The association of money with the acquisition of happiness occupies material man's mind.

What is happiness? Faithful to scholasticism, Kant (1797, p.457) defines happiness as "the satisfaction of all our desires", as man's ultimate goal in life. There is also the view that the production of goods does not aim at contributing toward the finding of happiness, but rather relates to tradition and myth (Galbraith, 1979, pp.273-275). However, the view ignores the compelling dialectic of historical materialism.

Frustration and unfulfilment of wealthy man in old age may be a tell-tale detail of his sensing having been cheated by the sensorial system on the way to happiness (Proust, 1981). Proust's effort to identify the elements of happiness singled out will- power as one of these elements. In this way, his prose merges with Adler's and Stekel's analytical views that the exertion or non-exertion of this faculty determines part of man's social suffering. In turn, Freud placed great emphasis on the satisfaction of physical urges, while Marx shifted the focus to materialism. Within this context, it is a revelation that Malthus anticipated marxian views by a full half century, while simultaneously voicing a fundamental element of happiness, which is so easily taken for granted: "I do not mean to enter into a philosophical discussion of what constitutes the proper happiness of man, but shall merely consider two universally acknowledged ingredients, health, and the command of the necessaries and conveniences of life" (Malthus, 1970, p.183).

Value Sets and Environment

Much of the conversion rate being exerted on the vegetation is blamed on agriculture but to many the latter has become a means rather than an end. Further profit is what land use is all about (Harris, 1978), and directly proportional to the size of the estate. Man does not produce food for the good of the species. This has become a by-product in the profit-making web. There is no philanthropical farming in the western world. When the price of a commodity is not satisfactory to the producer and to maintain prices, produce will be deliberately wasted. Social considerations

count little in the production of goods (Luxemburg, 1951).

To be in contact with the land and the wild does not necessarily reconcile man with his environment. Money invariably acts as the catalytic agent: "Farmers will not be persuaded by financial incentives to conserve wildlife and landscape features unless the grants or compensation they receive are more than equal to existing incentives to improve their enterprise and its productivity" (Davidson, 1977, p.238). A wish for further profit is also behind the reported difficulty to conserve traditional western European landscapes well into the year 2000. Conservative farmers are said to be gradually outnumbered by progressive ones who are said to be ready to change and assimilate new trends (Leonard and Stoakes, 1977).

Average man is so familiar with the gradual replacement of scenic landscapes that a once provocative Orwellian phrase now turns into a timely addition: "what's wrong with plastic trees? My guess is that there is very little wrong with them" (Krieger, 1973, p.453). As noted, "visitors are little interested in the abundant and diversified plant life of rain forests" (Myers, 1983b, p.332). Likewise, the biological sciences are ready to herald the new era: "those species capable of adapting to the activities of mankind have unparalleled opportunities for evolutionary change and dominance of the landscape" (Bates, 1985, p.260). The following thought reminds of the great burning of books in Germany in 1933: "most species of plants and animals have no resource value: do we really need snail darters and condors and black lion tamarins?" (Levine, 1986, p.309).

It should be common sense that a novel mentality had to evolve if changes were to take place in the area of conservation. But, as shrewdly put in ecological matters, "I cannot, in fact, teach you to drive unless the stuff of driving is already in you" (W.T. Williams, quoted in Lambert and Goodman, 1967, p.9). Sectors of the intelligentsia endorse no few aspects of current reality, contrary to conservationist policies,

pointing to the breakdown of common sense as a settling factor.***

(TO BE CONTINUED)

References

- Aaron, R.I. 1979. *John Locke. Encyclopaedia Britannica*, Vol.11, pp.12-15. William Benton, Chicago.
- Adler, A. 1928. *Understanding Human Nature*. Allen and Unwin, London.
- Adler, A. 1929. *The Practice and Theory of Individual Psychology*, 2nd edn. Routledge and Kegan Paul, London.
- Adorno, T. and Horkheimer, M. 1979. *Dialectic of Enlightenment*. Verso, London.
- Althusser, L. 1984. *Essays on Ideology* ('Freud and Lacan', pp.147-171). Verso, London.
- Anderson, M. 1980a. *Approaches to the History of the Western Family, 1500-1914*. Macmillan, London.
- Anderson, M. 1980b. The relevance of family history. In: M. Anderson (ed.), *Sociology of the Family*, 2nd edn, pp.33-63. Penguin, Harmondsworth.
- Arendt, H. 1977. *Eichmann in Jerusalem*. Penguin, Harmondsworth.
- Arendt, H. 1978. *The Life of the Mind*, Vol.2. Willing. Secker and Warburg, London.
- Aron, R. 1968a. *Progress and Disillusion: The Dialectics of Modern Society*. Pall Mall Press, London.
- Aubréville, A.M.R. 1985. La muerte de los bosques del Africa tropical. *Unasyva*, 37, 18-27.
- Barr, T.N. 1981. The world food situation and global grain prospects. *Science*, 214, 1087-1095.
- Bates, D.M. 1985. Plant utilization: patterns and prospects. *Econ. Bot.*, 39(3), 241-265.
- Beaud, M. 1984. *A History of Capitalism 1500-1980*. Macmillan, London.
- Berkeley, G. 1962. *The Principles of Human Knowledge*. Collins/Fontana, Glasgow.
- Boerboom, J.H.A. and Wiersum, K.F. 1983. Human impact on tropical moist forest. In: Holzner, W., Weger, M.J.A. and Ikusima, I. (eds), *Man's Impact on Vegetation*, pp.83-106. W. Junk, The Hague.
- Bottomore, T. 1984. *Sociology and Socialism*. Wheatsheaf Books, Brighton.
- Bottomore, T. and Nisbet, R. 1978. Structuralism. In: Bottomore, T. and Nisbet, R.N. (eds), *A History of Sociological Analysis*, pp.557-598. Basic Books, New York.
- Boulière, F. 1983. Animal species diversity in tropical forests. In: Golley, F.B. (ed.), *Tropical Rain Forest Ecosystems*, pp.77-91. Elsevier, Amsterdam.
- Boyer, J.S. 1982. Plant productivity and environment. *Science*, 218, 443-448.

*** The expression 'common sense' is principally associated with Berkeley's (1962) philosophy, in his attempt to prove the existence of god. Its impotence before the will is best and dramatically illustrated by a dialogue which took place during Eichmann's trial in Jerusalem. Dr Servatius, the presiding judge, is here indignantly asking propst Grüber: "Did you try to influence him? Did you, as a clergyman, try to appeal to his feelings, preach to him, and tell him that his conduct was contrary to morality?" The churchman replied that "deeds are more effective than words" and "words would have been useless". Of course they would. But Eichmann, grasping the situation, tried to tip the scale to his favour: "Nobody came to me and reproached me for anything in the performance of my duties" (see Arendt, 1977, pp.130-131).

- Brown, J.A.C. 1963. *Techniques of Persuasion: From Propaganda to Brainwashing*. Penguin, Harmondsworth.
- Brown, L.R. 1981. World population growth, soil erosion, and food security. *Science*, 214, 995–1002.
- Bruce, J.P. 1982. La ética y el ambiente. *Unasyva*, 17–21.
- Buchinger, M. 1967. Problems of nomenclature and their influence on conservation policies in Latin America. In: Lent, H. (ed.), *Atas do Simpósio sobre a Biotá Amazônica*, Vol.7, pp.79–95. Conselho Nacional de Pesquisas, Rio de Janeiro.
- Budowski, G. 1976. Why save tropical rain forests? Some arguments for campaigning conservationist. *Amazoniana*, 4, 529–538.
- Carlson, C.A. 1985. Wildlife and agriculture: can they coexist? *J. Soil and Water Cons.*, 40(3), 263–266.
- Caufield, C. 1984. A window on China's environment. *New Sci.*, 101, 28–29.
- Copleston, F.C. 1955. *Aquinas*. Penguin, Harmondsworth.
- Crowe, B.L. 1969. The tragedy of the commons revisited. *Science*, 166, 1103–1107.
- Darley, J.M. and Zanna, M.P. 1982. Making moral judgements. *Am. Sci.*, 70, 515–521.
- Darwin, C. 1871. *The Descent of Man and Selection in Relation to Sex*. Random House, New York.
- Davidson, J. 1977. The prospects for action. In: Davidson, J. and Lloyd, R. (eds), *Conservation and Agriculture*, pp.231–242. John Wiley, Chichester.
- Davis, S.D. et al. 1986. *Plants in Danger. What do We Know?* International Union for Conservation of Nature and Natural Resources, Gland.
- Diamond, J.M. 1981. Current issues in conservation. *Nature*, 289, 350–351.
- Diamond, J.M. and May, R.M. 1985. Conservation biology: a discipline with a time limit. *Nature*, 317, 111–112.
- Dobzhansky, T. 1955. *Evolution, Genetics, and Man*. John Wiley, New York.
- Dobzhansky, T., Ayala, F.J., Stebbins, G.L. and Valentine, J.W. 1977. *Evolution*. Freeman, San Francisco. (Chapter 14 'Evolution of Mankind' by T. Dobzhansky.)
- Downes, R.G. 1981. Whither goest conservation? *J. Soil and Water Cons.*, 36(5), 250–260.
- Dray, W. 1980. *Perspectives on History*. Routledge and Kegan Paul, London.
- Duby, G. 1984. *The Knight, the Lady and the Priest: The Making of Modern Marriage in Medieval France*. Allen Lane, London.
- Eckholm, E.P. 1982. *Down to Earth: Environment and Human Needs*. Norton, New York.
- Ehrenfeld, D.W. 1976. The conservation of non-resources. *Am. Sci.*, 64, 648–656.
- Ehrenfeld, D.W. 1986. Thirty million cheers for diversity. *New Sci.*, 110, 38–43.
- Ehrlich, P.R., Ehrlich, A.H. and Holdren, J.P. 1973. *Human Ecology*. Freeman, San Francisco.
- Elias, T.S. 1983. Rare and endangered species of plants: the Soviet side. *Science*, 219, 19–23.
- Eysenck, H.J. 1967. *The Biological Basis of Personality*. Charles C. Thomas, Springfield.
- Fearnside, P.M. 1982a. Deforestation in the Brazilian Amazon: how fast is it occurring? *Interciencia*, 7(2), 82–88.
- Fearnside, P.M. 1984. A floresta vai acabar? *Ciência Hoje*, 2(10), 42–52.
- Fittkau, E.J. and Reichholf, J.H. 1983. Amazonia: a challenge for the future. Introductory remarks. *The Environmentalist*, 3(1), 5–6.
- Flandrin, J.L. 1979. *Families in Former Times: Kinship, Household and Sexuality*. Cambridge University Press, Cambridge.
- Flandrin, J.L. 1986. A vida sexual dos casados na sociedade antiga. In: Ariès, P. and Béjin, A. (eds), *Sexualidades Ocidentais*, pp.135–152. Brasiliense, São Paulo.
- Frankel, O.H. 1974. Genetic conservation: our evolutionary responsibility. *Genetics*, 78, 53–65.
- Frankel, O.H. 1976. The time scale of concern. In: Simmons, J.B., Beyer, R.I., Brandham, P.E., Lucas, G.L. and Parry, V.T.H. (eds), *Conservation of Threatened Plants*, pp.245–248. Plenum Press, New York.
- Frankel, O.H. 1978. Biosphere reserves: the philosophy of conservation. In: Hawkes, J.G. (ed.), *Conservation and Agriculture*, pp.101–106. Duckworth, London.
- Frankel, O.H. 1983. The place of management in conservation. In: Schonewald-Cox, C.M., Chambers, S.M., MacBryde, B. and Thomas, W.L. (eds), *Genetics and Conservation*, pp.1–14. The Benjamin/Cummings Publ. Co., London.
- Frankel, O.H. and Soulé, M.E. 1981. *Conservation and Evolution*. Cambridge University Press, Cambridge.
- Freud, S. 1923. El 'Yo' y el 'Ello'. *Obras Completas*, Vol. 3, 3rd Edn. (1973), pp. 2701–2728. Editorial Biblioteca Nueva, Madrid.
- Fromm, E. 1977. *The Anatomy of Human Destructiveness*. Penguin, Harmondsworth.
- Galbraith, J.K. 1979. *The Affluent Society*, 3rd edn. Penguin, Harmondsworth.
- Ghiselin, M.T. 1973. Darwin and evolutionary psychology. *Science*, 179, 964–968.
- Gómez-Pompa, A., Vázquez-Yanes, C. and Guevara, S. 1972. The tropical rain forest: a nonrenewable resource. *Science*, 177, 762–765.
- Goodland, R.J. and Irwin, H.S. 1977. Amazonian forest and cerrado: development and environmental conservation. In: France, G.T. and Elias, T.S. (eds), *Extinction is Forever*, pp.214–233. The New York Botanical Garden, New York.
- Hardin, G. 1968. The tragedy of the commons. *Science*, 162, 1243–1248.
- Hare, R.M. 1982. Moral philosophy. In: Magee, B. (ed.), *Men of Ideas*, pp.125–141. Oxford University Press, New York.
- Harley, J.L. 1978. Los objetivos de la conservación. *Unasyva*, 30, 25–28.
- Harris, D.H. 1978. The environmental impact of traditional and modern agricultural systems. In: Hawkes, J.G. (ed.), *Conservation and Agriculture*, pp.61–69. Duckworth, London.
- Hedberg, I. 1979. Possibilities and needs for conservation of plant species and vegetation in Africa. In: Hedberg, I. (ed.), *Systematic Botany, Plant Utilization and Biosphere Conservation*, pp.83–104. Almquist and Wiksell, Stockholm.
- Hedgpeth, J.W. 1986. Man and nature: controversy and philosophy. *Quart. Rev. Biol.*, 61(1), 45–67.

- Heywood, V.H. 1980. The impact of Linnaeus on botanical taxonomy – past, present and future. *Veröff. Joachim Jungius-Geswiss., Hamburg*, 43, 97–115.
- Heywood, V.H. 1984. The mythology of taxonomy. *Trans. Bot. Soc. Edinb.*, 44, 79–94.
- Hobbes, T. 1968. *Leviathan*. Penguin, Harmondsworth.
- Hume, D. 1952. An Enquiry Concerning Human Understanding. 'Great Books of the Western World'. In: Hutchins, R.M. (ed.). *Encyclopaedia Britannica*, Chicago.
- Jacoby, R. 1977. *Social Amnesia: A Critique of Conformist Psychology from Adler to Laing*. The Harvester Press, Hassocks.
- Janzen, D.H. 1986. The future of tropical ecology. *Ann. Rev. Ecol. Syst.*, 17, 305–324.
- Kagan, J. 1971. *Change and Continuity in Infancy*. John Wiley, New York. (Cited in 'Current Contents', *Social and Behavioral Sciences*, 17, July 29, 1985.)
- Kant, I. 1979. *Critique of Pure Reason, 2nd edn of 1787*, Dent/Dutton, London.
- King, K.F.S. 1978. Development and conservation of forest resources. In: Hawkes, J.G. (ed.), *Conservation and Agriculture*, pp.161–170. Duckworth, London.
- Kolakowski, L. 1978. *Main Currents of Marxism, Vol.3. The Breakdown*. Oxford University Press, Oxford.
- Kramer, J.M. 1983. Environmental problems. In: Cracraft, J. (ed.), *The Soviet Union Today*, pp.153–161. Educational Foundation for Nuclear Science, Chicago.
- Kretschmer, E. 1936. *Physique and character: An Investigation of the Nature of Constitution and of the Theory of Temperament*, 2nd edn. Kegan Paul, London.
- Krieger, M.H. 1973. What's wrong with plastic trees? *Science*, 179, 446–455.
- Lambert, J.M. and Goodman, G.T. 1967. Basic problems in the teaching of ecology. In: Lambert, J.M. (ed.), *The Teaching of Ecology*, pp.3–10. (A symposium of the British Ecological Society, Goldsmiths' College, University of London, 13–16 April 1966). Blackwell, Oxford.
- Leal, R.P. 1984. Estratégias para conservação da floresta tropical úmida brasileira. In: *1st Symposium on the Humid Tropics*, pp.417–418. Abstracts. EMBRAPA/CPATU, Documentos 31. Belém.
- Leonard, P.L. and Stoakes, C. 1977. Landscape and agricultural change. In: Davidson, J. and Lloyd, R. (eds), *Conservation and Agriculture*, pp.121–143. John Wiley, Chichester.
- Lettau, H., Lettau, K. and Molion, L.C.B. 1979. Amazonia's hydrologic cycle and the role of atmospheric recycling in assessing deforestation effects. *Monthly Weather Review*, 107, 227–238.
- Levine, N.D. 1986. Preservation versus elimination. *Bioscience*, 36(5), 308–309.
- Lewin, R. 1984. Parks: how big is big enough? *Science*, 225, 611–612.
- Locke, J. 1974. *An Essay Concerning Human Understanding*. Meridian, New York.
- Lorenz, K. 1966. *On Aggression*. Methuen, London.
- Lovejoy, S.B. and Napier, T.L. 1986. Conserving soil: sociological insights. *J. Soil and Water Cons.*, 41(5), 304–308.
- Luxemburg, R. 1951. *The Accumulation of Capital*. Routledge and Kegan Paul, London.
- Macbryde, B. 1979. Plant conservation in North America: developing structure. In: Hedberg, I. (ed.), *Systematic Botany, Plant Utilization and Biosphere Conservation*, pp.105–109. Almquist and Wiksell, Stockholm.
- Malthus, T.R. 1970. *An Essay on the Principle of Population and a Summary View of the Principle of Population*. Penguin, Harmondsworth.
- Marcuse, H. 1964. *One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society*. Beacon Press, Boston.
- Marcuse, H. 1969. *An Essay on Liberation*. Beacon Press, Boston.
- Marcuse, H. 1978. Some social implications of modern technology. In: Arato, A. and Gebhardt, E. (eds), *The Essential Frankfurt School Reader*, pp.138–162. Blackwell, Oxford.
- Mares, M.A. 1986. Conservation in South America: problems, consequences, and solutions. *Science*, 233, 734–739.
- Marx, K. 1963. In: Bottomore, T.B. and Rubel, M. (eds), *Selected Writings in Sociology and Social Philosophy*. Penguin, Harmondsworth.
- Marx, K. 1976. *Capital: A Critique of Political Economy, Vol.1*. Penguin/New Left Review, London.
- Masson, J.M. 1984. *The Assault on Truth: Freud's Suppression of the Seduction Theory*. Farrar, Straus and Giroux, New York.
- Midgley, M. 1983. *Animals and Why They Matter*. Penguin, Harmondsworth.
- Mill, J.S. 1979. *Utilitarianism, On Liberty, Essay on Bentham*. Collins/Fount, Glasgow.
- Molski, B.A. 1979. The relationship between the national reserves and the activities of botanic gardens in plant genetic resource conservation. In: Syngé, H. and Townsend, H. (eds), *Survival or Extinction*, pp.53–62. The Bentham-Moxon Trust, Royal Botanic Gardens, Kew.
- Moore, M.S. 1983. The unity of the self. In: Ruse, M. (ed.), *Nature Animated*, Vol.2, pp.163–202. D. Reidel, Dordrecht.
- Munz, P. 1985. Dna, falsification, and dogmatism: continuities and discontinuities in Popper's evolutionism. *Et Cetera*, 42(3), 254–271.
- Myers, N. 1979. *The Sinking Ark*. Pergamon Press, Oxford.
- Myers, N. 1981. Conservation needs and opportunities in tropical moist forests. In: Syngé, H. (ed.), *The Biological Aspects of Rare Plant Conservation*, pp.141–154. John Wiley, Chichester.
- Myers, N. 1982. Depletion of tropical moist forests: a comparative review of rates and causes in the three main regions. *Acta Amazonica*, 12(4), 745–758.
- Myers, N. 1983a. Conversion rates in tropical moist forests. In: Golley, F.B. (ed.), *Tropical Rain Forest Ecosystems*, pp.289–300. Elsevier, Amsterdam.
- Myers, N. 1983b. Conservation of rain forests for scientific research, for wildlife conservation, and for recreation and tourism. In: Golley, F.B. (ed.), *Tropical Rain Forest Ecosystems*, pp.325–334. Elsevier, Amsterdam.
- Nations, J.D. and Komer, D.C. 1983. Rainforests and the hamburger society. *Environmentalist*, 25(3), 12–25 (Wash. DC).
- NRC. 1986. *Ecological Knowledge and Environmental Problem-Solving*, National Research Council.

- National Academy of Sciences, Washington, DC.
- Oliveira Costa, J.P. de. 1983. History of the Brazilian forests: an inside view. *The Environmentalist*, 3(5), 50–56.
- Passmore, J. 1980. *Man's Responsibility for Nature: Ecological Problems and Western Traditions*, 2nd edn. Duckworth, London.
- Popper, K. 1982. *Unended Quest: An Intellectual Autobiography*, Sixth imp. Fontana/Collins, Glasgow.
- Potter, V.R. 1977. Evolving ethical concepts. *Bioscience*, 27(4), 251–253.
- Potter, G.L., Ellsaesser, H.W., MacCracken, M.C. and Luther, F.M. 1975. Possible climatic impact of tropical deforestation. *Nature*, 258, 697–698.
- Prance, G.T. 1979. Exploitation and conservation in Brazil. In: Hedberg, I. (ed.), *Systematic Botany, Plant Utilization and Biosphere Conservation*, pp.146–149. Almquist and Wiksell, Stockholm.
- Prance, G.T. 1984. Completing the inventory. In: Heywood, V.H. and Moore, D.M. (eds), *Current Concepts in Plant Taxonomy*, pp.365–396. Academic Press, London.
- Proust, M. 1981. *Remembrance of Things Past*, Vol.3. Chatto and Windus, London.
- Pryde, P.R. 1983. The 'decade of the environment' in the U.S.S.R. *Science*, 220, 274–279.
- Quinton, A. 1982. The two philosophies of Wittgenstein. In: Magee, B. (ed.), *Men of Ideas*, pp. 77–93. Oxford University Press, Oxford.
- Ralls, K. and Ballou, J. 1983. Extinction: lessons from zoos. In: Schonewald-Cox, C.M., Chambers, S.M., MacBryde, B. and Thomas, W.L. (eds), *Genetics and Conservation*, pp.164–184. The Benjamin/Cummings Publ. Co., London.
- Raven, P.H. 1976. Ethics and attitudes. In: Simmons, J.B., Beyer, R.J., Brandham, P.E., Lucas, G.L. and Parry, V.T.H. (eds), *Conservation of Threatened Plants*, pp.155–179. Plenum Press, New York.
- Roazen, P. 1979. *Freud and his Followers*. Penguin, Harmondsworth.
- Russell, B. 1950. *Unpopular Essays*. Unwin, London.
- Sanford, R.N., Adorno, T.W., Frenkel-Brunswik, E. and Levinson, D.J. 1950. The measurement of implicit antidemocratic trends. In: Horkheimer, M. and Flowerman, S.H. (eds), *The Authoritarian Personality*, pp.222–279. Harper and Row, New York.
- Shahar, S. 1983. *The Fourth Estate: A History of Women in the Middle Ages*. Methuen, London.
- Shorter, E. 1976. *The Making of the Modern Family*. Collins, London.
- Shorter, E. 1982. *A History of Women's Bodies*. Penguin, Harmondsworth.
- Sioli, H. 1975. Preface. In: Goodland, R.J. and Irwin, H.S. (eds.), *Amazon Jungle: Green Hell to Red Desert?* Elsevier, Amsterdam.
- Skinner, B.F. 1973. *Beyond Freedom and Dignity*. Penguin, Harmondsworth.
- Smith, N.J.H. 1981. Colonization lessons from a tropical forest. *Science*, 214, 755–761.
- Soulé, M.E. 1983. What do we really know about extinction? In: Schonewald-Cox, C.M., S.M. Chambers, MacBryde, B. and Thomas, W.L. (eds), *Genetics and Conservation*, pp.111–124. The Benjamin/Cummings Publ. Co., London
- Soulé, M.E. 1985. What is conservation biology? *Bioscience*, 35(11), 727–734.
- Stebbins, G.L. 1970. The natural history and evolutionary future of mankind. *Amer. Nat.*, 104, 111–126.
- Stone, L. 1979. *The Family, Sex and Marriage in England, 1500–1800*. Penguin, Harmondsworth.
- Storr, A. 1970. *Human Aggression*. Penguin, Harmondsworth.
- Strahan, R. and Martin, R. 1982. The koala: little fact, much emotion. In: Groves, R.H. and Ride, W.D.L. (eds), *Species at Risk Research in Australia*, pp.147–155. Springer Verlag, Berlin.
- Sun, M. 1983. China faces environmental challenge. *Science*, 221, 1271–1272.
- Swift, J. 1975. *Gulliver's Travels*. Dent, London.
- Tangley, L. 1986a. Biological diversity goes public. *Bioscience*, 36(11), 708–711;715.
- Tuan, Yi-Fu. 1970. Our treatment of the environment in ideal and actuality. *Am. Sci.*, 58, 244–249.
- UNESCO. 1984. Action plan for biosphere reserves. *Nature and Resources*, 20(4), 1–12.
- Wahlberg, S. 1979. Good created, Linnaeus arranged: project Linnaeus, an effort to save that good work for the future. In: Syngé, H. and Townsend, H. (eds), *Survival or Extinction*, pp.25–30. The Bentham-Moxon Trust, Royal Botanic Gardens, Kew.
- Weber, M. 1983. *Max Weber on Capitalism, Bureaucracy and Religion: A Selection of Texts*. George Allen and Unwin, London.
- Wells, B.W.P. 1980. *Personality and Heredity*. Longman, London.
- Wells, B.W.P. 1983. *Body and Personality*. Longman, London.
- Western, D. and Henry, W. 1979. Economics and conservation in third world national parks. *Bioscience*, 29(7), 414–418.
- Westhoff, V. 1983. Man's attitude towards vegetation. In: Holzner, W., Werger, M.J.A. and Ikusima, I. (eds), *Man's Impact on Vegetation*, pp.7–24. W. Junk, The Hague.
- Westman, W.E. 1977. How much are nature's services worth? *Science*, 197, 960–964.
- White, Jr. L. 1967. The historical roots of our ecological crisis. *Science*, 155, 1203–1207.
- White, Jr. L. 1973. Continuing the conversation. In: Barbour, I.G. (ed.), *Western Man and Environmental Ethics: Attitudes Towards Nature and Technology*, pp. 55–61. Addison-Wesley, Reading, Mass.
- Wilcox, B.A. and Murphy, D.D. 1985. Conservation strategy: the effects of fragmentation on extinction. *Am. Nat.*, 125, 879–887.
- Williams, R.J.P. 1985. A policy to corrupt young? *New Scientist*, 1471, 52–53.
- Wilson, E.O. 1978. *On Human Nature*. Harvard University Press, Cambridge.
- Wilson, E.O. 1980. *Sociobiology: The Abridged Edition*. Belknap Press, Cambridge.
- Wilson, E.O. and Lumsden, C.J. 1981. *Genes, Mind, and Culture: The Coevolution Process*. Harvard University Press, Cambridge.
- Wilson, E.O. 1984. *Biophilia*. Harvard University Press, Cambridge.
- Wilson, E.O. and Peter, F.M. 1988 (eds). *Biodiversity*. National Academy Press, Washington, DC.