

The

Ecologist

The Journal of the Post Industrial Age

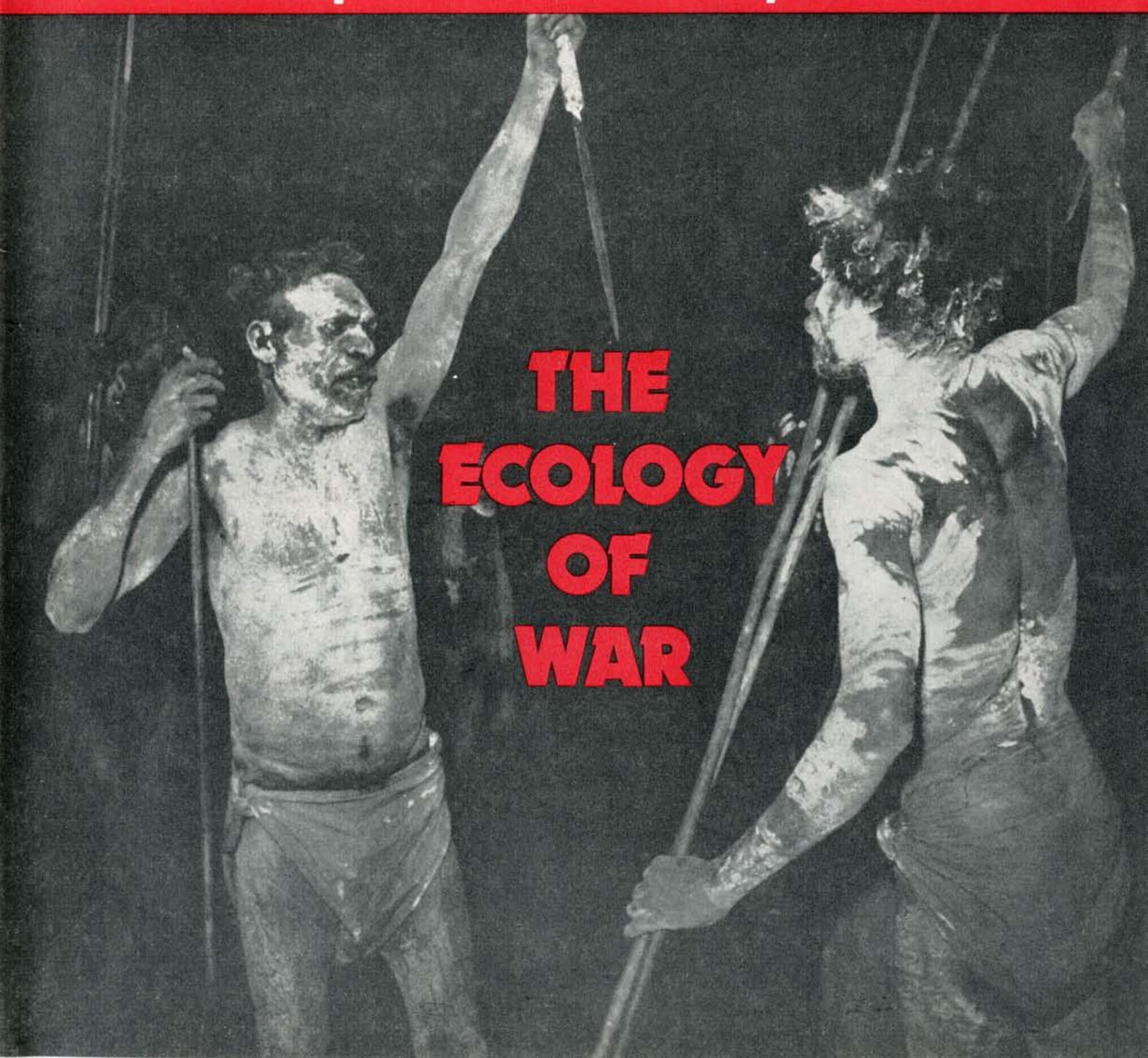
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May 1974. 25p

The Ecology of War • William Cobbett - cottage economist

The energy ration • Human Milk: a natural resource

The attempt to abolish the family in Russia



**THE
ECOLOGY
OF
WAR**

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We regret our failure to acknowledge the Radio Times Hulton Picture Library for the Photographs used in the article "Anarchism and Ecology" and on the cover, March/April *Ecologist*

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Comment

Grandpa's Tougher Than We Thought

The "Limits To Growth" and other ecologically orientated studies of the future of industrial society point to some of the major constraints on further economic growth, such as resource shortages, global pollution loads and social disintegration. Critics, who for various reasons are incapable of facing the implications, search frantically for arguments which will persuade themselves and others that such constraints are either illusory or that, for various technical reasons, they will never become operative.

One such argument is that these studies have overstated the situation, and that things are not quite as bad as they appear to be. This argument is used in varying degrees by our most outspoken ostriches such as Zuckerman, Beckerman, Maddox and also the World Bank in its Report on "The Limits To Growth". The latter for instance sets out explicitly to demonstrate that the estimated reserves of non-renewable resources cited by the "Limits" team are very pessimistic. It points out, for instance, that in 1954, world iron ore reserves were estimated at 85 billion gross tons with an iron content of 42 billion tons. In 1966 reserves were in the order of 250 billion gross tons and another 200 billion gross tons were identified as potential ores, leading together to an estimate of about 200 billion tons of metallic iron in both categories, or five times larger than the 1954 estimate. The "Limits" estimate is 110 billion tons, or roughly half the 1966 estimate of "reserves and potential ores" which most people agree is extremely con-

servative. According to the US Bureau of Mines, the price increase required to double the current reserve estimates is 35-40 per cent.

With regard to bauxite, the situation is even more favourable as world reserves increased seven-fold between 1950 and 1972, from 1.6 billion tons to 11.7 billion tons.

It must not be forgotten that the "Limits" model has allowed for such uncertainty by assuming that resources exceed proven reserves by five times. Meadows (the head of the "Limits" team) and his colleagues regard this as a generous assumption. The World Bank, however, considers this claim as "patently absurd, since possible developments in resource expansion—through discovery and technology, and resource creation (the commercialisation of heretofore unutilised or underutilised goods)—can individually raise reserves much above five times their current levels, nothing to say of what they can do jointly by interaction".

There are many things wrong with the World Bank's position. The fact that estimates were wrong on one or two previous occasions does not mean that they will always be wrong. The number of wrong estimates cited is very small, far too small to provide a satisfactory sample of estimates on which to base a prediction regarding the accuracy of future estimates.

The critics forget that it is not only massive resource and energy supplies which have permitted the growth of industrial society in the last 150 years but the fact that *these were available at an unrealistically low price*. Industrialisation has, to a large extent, taken the form of substituting synthetics for natural products. As the price of the resources with which the synthetics are made increases, so does this substitution become increasingly less economic until eventually industrialisation must go into reverse. Let us not forget that the price of many of the resources cited has gone up by as much as four times in one single year!

The same argument is used against the "Limits to Growth" position on global pollution. On this subject the "Limits" team considers that a pollution catastrophe could be averted if pollution generation from all sources were reduced to one fourth its assumed initial level, but expresses great scepticism that this could be accomplished.

Their model assumes a linear relationship between pollution level (POL) and capital stock per capita (CIR). The Bank consultants, on the other hand, consider that a reduction of the ratio POL/CIR to three-eighths the value originally assumed—an adjustment well within the error range of the data—erases the prediction of catastrophe. "Since data on the actual relationship between pollution and capital stock are sparse, and especially in view of the high degree of aggregation of the pollution variable, they consider that there is no particular reason to favour one value for this relationship over the others." Besides they estimate that, "crudely speaking, it appears that industrial pollutants can be reduced to 80 per cent from 90 per cent through annual expenditures of the order of 5 per cent or less of the total value of the particular industrial output". For electric power generation, similar reductions would cost about 2 per cent of total power costs. Automobile emissions (CO and NO) can be reduced to one-tenth of the present rate which would mean increasing prices by 10 per cent. Resources for the future estimate that for about 46 billion dollars a year (including the cost of solid waste disposal) this would mean just under 2 per cent of GNP." There is a lot wrong with this argument. Firstly, it is simply not true that pollution levels can, even in theory, be reduced by 80 per cent or 90 per cent. This may be true for specific pollutants, but not for a host of pollutants whose emissions cannot be controlled by technical means at all: heat, for instance, save by generating less energy, carbon dioxide by burning less fossil fuels, nitrates and phosphates and pesticides in agriculture by using less of them.

The World Bank consultants and Resources for the Future also forget that an 80 per cent or even a 90 per cent reduction of pollution levels is of negligible account when GNP is increasing exponentially, as it has been, by 6 per cent per annum world-wide. In 30 years—assuming an 80 per cent reduction—total pollution generated would equal that which obtained before any measures were introduced, if we were to reduce pollution by 90 per cent, then such a point would be reached in 70 years.

They also assume the willingness of an industrial society faced with mount-

ing expenditures and ever worsening crises to invest such sums in pollution control. Indeed, the experience of last year in the US should be sufficient to show just how low a priority is pollution control when an industrial state is faced with an *energy and resource crisis as is the case today*. (See The Caviar Chimera, *Ecologist* March/April issue).

In addition, the World Bank does not seem to have understood the relationship between capital and pollution (CIR-POL). The former is a measure of the building up of the technosphere which is a new organisation of matter deriving its resources from the biosphere and consigning to it its waste products. It is important to realise however, that for the biosphere, *not only the waste products of the technosphere but the technosphere itself are waste products*. Capital expenditure is thus almost entirely devoted to the production of waste, though the toxicity of this waste will vary in different conditions.

Of course the main error is in attributing too great a sensitivity of the model to changes in the value of its variables. The question is not whether pollution levels must be reduced to a quarter or three eighths of the present levels to avoid catastrophe. In the face of exponential growth of 6 per cent per annum such reductions are neither here nor there. The "Limits" team would have done better in fact to resist attributing any values at all to the variables used. This would have forced their critics to concentrate on the principles involved rather than divert attention to the measurable data. *The figures at best are guess work, the principles, on the other hand, are unassailable.*

The consultants write, "Even small changes in the assumptions concerning population growth, pollution and technology could alter not only the volume but also the composition of future output with far-reaching implications for resource requirements". This may be true of the "Limits" model as it stands but it is certainly not true of the real situation facing us today.

In reality, a satisfactory model of the effect of industrialisation on the biosphere would be very insensitive to changes in the value of the variables in terms of which it would be described. Basically, it would show that industrialisation is a process involving the build-

ing up of a new organisation of matter: the technosphere which is in direct competition with the biosphere. The one can only expand at the cost of the other. *Economic growth is thereby biological contraction*. The process will come to an end when the technosphere can no longer be sustained by the biosphere. When this day will occur, is difficult to predict with accuracy, though everything points to the likelihood that it is very close at hand.

On the other hand, it is essential to realise that the more economic growth we allow, the more our society will become geared to the use of resources which will become increasingly expensive and eventually unavailable and the greater must be the social consequences of the inevitable crash. On the other hand, the earlier we start phasing out non-sustainable activities, the smoother will be the transition to a sustainable situation. Indeed we must start now on a programme of systematic negative-growth, de-industrialisation and decentralisation. There is not a day to lose.

The conclusion reached by the critics shows that they have totally missed the point. The World Bank consultants

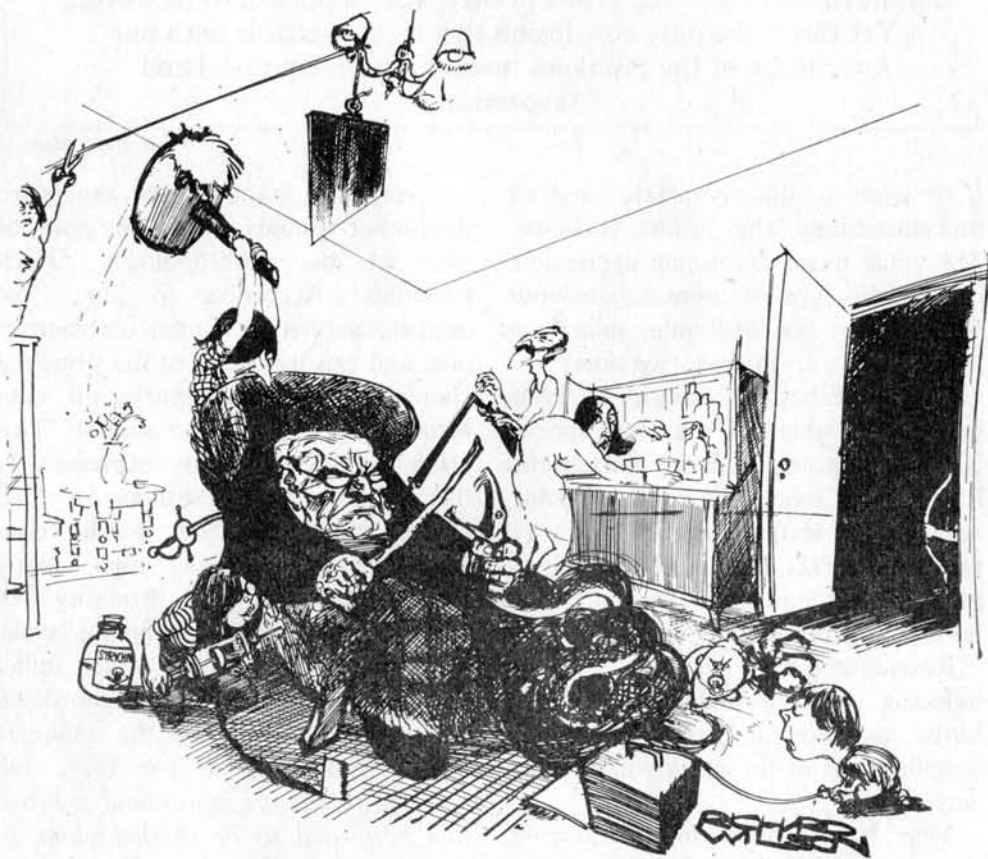
write, "We do not wish to imply that pollution is of little global concern or is unrelated to economic growth. This does not mean that there is no danger; it does mean that pollution build up and world's collapse is not necessarily inevitable even with continued economic growth."

The Social Policy Research Unit comes to the same unbelievable conclusion. "Since we believe that brute poverty is still a major problem for most people in the world, and since in general we do not believe that the physical constraints are quite so pressing as the MIT team suggest, we do not accept their enthusiastic endorsement of zero growth as the ideal for the world. (FUTURES, Vol. 5, No. 1, p. 10).

The argument is thus that we can go on poisoning the world simply because it appears still capable for a while longer to provide us with and to absorb the poisons we are methodically administering to it.

Grandpa, in fact is tougher than we thought, so we can go on pouring cyanide into his morning coffee.

Edward Goldsmith



Grandpa's tougher than we thought.



The Ecology of War

by EDWARD GOLDSMITH

Never before have so many governments throughout the world committed themselves so piously and so persistently to the ideal of world peace — yet never before has this world been ravaged by so many wars and on so vast a scale.

This seeming paradox, our politicians would undoubtedly explain in terms of some technicality, such as a shortage of funds with which to implement their peace-making strategies. None, perhaps, would even conceive the possibility that it was the strategies themselves that were at fault, and that they were based on a total misunderstanding of the problem they were supposed to be solving.

Yet this is the only conclusion that is reconcilable with our knowledge of the problems involved, both empirical and theoretical.

Photo World Medicine

If we want to control warfare we must first understand why, in fact, it occurs. This must mean examining aggression, i.e. that feature of animal behaviour which, in the case of human animals at least—gives rise to war. (see note)

As Eibl Eibesfeldt writes,¹ "fighting between members of the same species is almost universal among vertebrates from fish to man". This is no hazard. Animals are simply designed that way, which is a fact that is confirmed by physiological studies of the neural and hormonal processes involved.²

Researchers have even succeeded in inducing fighting behaviour among birds and mammals by stimulating specific areas of the brain with electric currents.

Man is no exception to the rule, though many of us would like to think he is.

If anything man is more aggressive than other animals. This is the point of view of the anthropologist Derek Freeman.³ According to him, "the extreme nature of human destructiveness and cruelty is one of the principal characteristics which marks off man behaviourally from other animals. This point has been cogently expressed by the biologist Adolf Portman:⁴ "when terrible things, cruelties hardly conceivable, occur among men, many speak thoughtlessly of 'brutality', of bestialism or a return to animal levels. As if there were animals which inflict on their own kind what men can do to men. Just at this point the zoologist has to draw a clear line, *these evil horrible things are no animal survival that happened to be carried along in the imperceptible transition from animal to man, this evil belongs entirely*

on this side of the dividing line, it is purely human...⁵"

Whether man when living in his natural habitat is an unpleasant animal as Freeman makes him out to be, is very debatable. Freeman may have been deceived by the fact that most societies we know about are, to a large extent, aberrant.

The Comanches, for instance, were regarded as particularly bloodthirsty warriors, but they were not always so. They came to adopt this way of life only after they had come in contact with the white invaders who among other things provided them with horses. In their previous cultural pattern to quote Kardiner,⁶ "there were no aggressive war patterns in the older culture and little intertribal fighting. Though there was a little fighting with warlike neighbours there were no special honour aspects to war."

The same can also be said of the Zulus. The career of Chaka, the founder of the Zulu Empire, was considerably affected by contact with the Boers whose activities gave rise to the freak situation he so fully exploited.

As I shall show later, aggression between human societies living in an environment to which they have been adapted phylogenetically and culturally takes a far less destructive form.

The fact that aggression must be a feature of social behaviour among non-human and human animals can be deduced from the fact that it fulfils important functions on whose fulfilment societies depend for their very survival. Thus Eibl Eibesfeldt regards aggression as serving "the important function of spacing out individuals or groups in the area they occupy. This thereby secures for each the minimum territory required to support its existence, prevents overcrowding and promotes distribution of the species."⁷

Aggression among primitive societies, in particular among hunter gatherers, leads to fission of the group into rival factions which part company and develop on their own. This prevents society from getting too big. This is particularly important as the bonds holding together a society as Mallinowski was perhaps the first to point out are derived from those which serve to hold a family together and cannot be extended to hold together too big a social unit. When the maximum size is reached, the unit must break up, alternatively it disintegrates

into a mass society incapable of adaptive behaviour. It is in this light that Margaret Mead interprets the fission of social groups among the Maori.⁸ "The disintegrative potentiality in the Maori form of organisation was this factor of size: when the society grew too large it was not possible to maintain this complete identification, and a subgroup would split off and become another autonomous, closed, co-operative unit, competing without and co-operating within."

In this way a society remains a cohesive unit characterised more by co-operation than by competition and bickering and fighting are reduced to a minimum.

Competition and Co-operation

Aggression is best regarded as a form of competition. Competition, as we shall see, takes a slightly different form as we move up from one level of organisation to the next. At each step, it plays a bigger role, and can become more violent, i.e. can resemble more what we call aggression, without thereby bringing about the collapse of the system.

Competition is a means whereby a hierarchy is set up. In the right conditions, as we shall see, the competing individuals eventually arrange themselves so as to constitute a hierarchy and learn to accept their respective positions within this hierarchy. Hierarchy is another word for organisation or order. Without it, there can only be entropy, disorder or randomness, which are all one and the same.

Undifferentiated individuals competing for the same ecological niche cannot co-operate in any way. They can only compete with each other. It is only when, as a result of competition, they have been forced to specialise in such a way that each one learns to exploit a different sub-niche, that co-operation becomes possible and the competing individuals are transformed into a viable social unit. It is only by competition therefore that conditions are established in which co-operation can occur.

Competition does not establish just any type of organisation, but that which best satisfies environmental requirements, i.e. that which is most adaptive. Thus, in a social system that earns its livelihood by hunting, the position of an individual in the hierarchy will

depend on his hunting ability. In a society in which the main activity is warfare, war-like qualities will be determinant. It is important to note that the basis of a hierarchical structure will change in accordance with its adaptiveness. Thus any important change in environmental conditions will call for a modification in a system's behaviour pattern which can only be ensured by a reorganisation of its hierarchical structure in such a way that a premium is placed on the new qualities which the system must display in order to adapt to the new conditions.

The influence of an individual subsystem will depend on his position in the hierarchy and so will his command over resources. He will obtain the best territory, the most desirable females etc. In times of serious shortage this means that he is less likely to succumb than are those lower down in the hierarchy. All these conditions must favour the adaptiveness of the social system.

Competition is a means whereby a hierarchy is set up. In the right conditions the competing individuals arrange themselves so as to constitute a hierarchy and learn to accept their respective positions within this hierarchy.

Seen over a longer time scale, it is the individuals at the top of the hierarchy which are most likely to transmit their characteristics to their progeny. This is the principle of natural selection established by Charles Darwin which, though he did not appear to realise it, is but an instance of the more general principle of competition.

Competition also serves the purpose of eliminating randomness or "noise" from a system. In a social system deviants who, for various reasons, do not fit into the social structure, will tend to be eliminated. In a traditional society this is probably a minor function as, on the whole, most cultural patterns provide socially acceptable outlets for predictable deviant forms.

A hierarchy, once established, can be maintained for varying lengths of time according to environmental requirements.

Undoubtedly, the first multi-cellular organism developed as the result of competition between its previous in-

dependent cells. Once established, however, the latter became capable of maintaining its hierarchical structure from one generation to the next, the information determining this structure being transmitted genetically.

In the human family the relative roles of the father, the mother, the children, the grandmother, etc. have also to a certain extent been determined genetically, while cultural tradition, transmitted during socialisation will complete the differentiation process. Thus there is little need for much competition. Aggression has some role to play in sexual behaviour in many animals, probably also among humans in the initial stages of a relationship. Its role may well be to establish the basis of what then becomes a co-operative association.

As we move from the family to the community, so does competition tend to increase. Competition is in fact necessary to establish an individual's status when this has not been established by inheritance. Societies vary according to their degree of co-operation and competition. *The competitive society will have the advantage of being able to modify at more frequent intervals the basis of its hierarchical structure. This will enable them to adapt to a rapidly changing environment.* It does not appear to have any advantage however in a relatively static environment.

Since aggression is a basic feature of human behaviour, the idea of eliminating it altogether to bring about the universal brotherhood of man is naive, while efforts to implement it can only be absurdly counterproductive.

In traditional societies, however, a number of strategies are exploited to reduce its destructiveness to the very minimum. One such strategy is fission. In hunter gatherer groups a dispute between two factions usually leads to separation to form two separate social groups, as has already been pointed out. Significantly when population pressure increases, fission is no longer practicable, on the contrary, the distance between social groups is increasingly reduced, and warfare becomes correspondingly more destructive. Thus among the Nuer in the southern Sudan whose territory has shrunk considerably as a result of increased population pressure, according to McDermott,⁹ tribal disputes lead to considerably more casualties than was once the case.

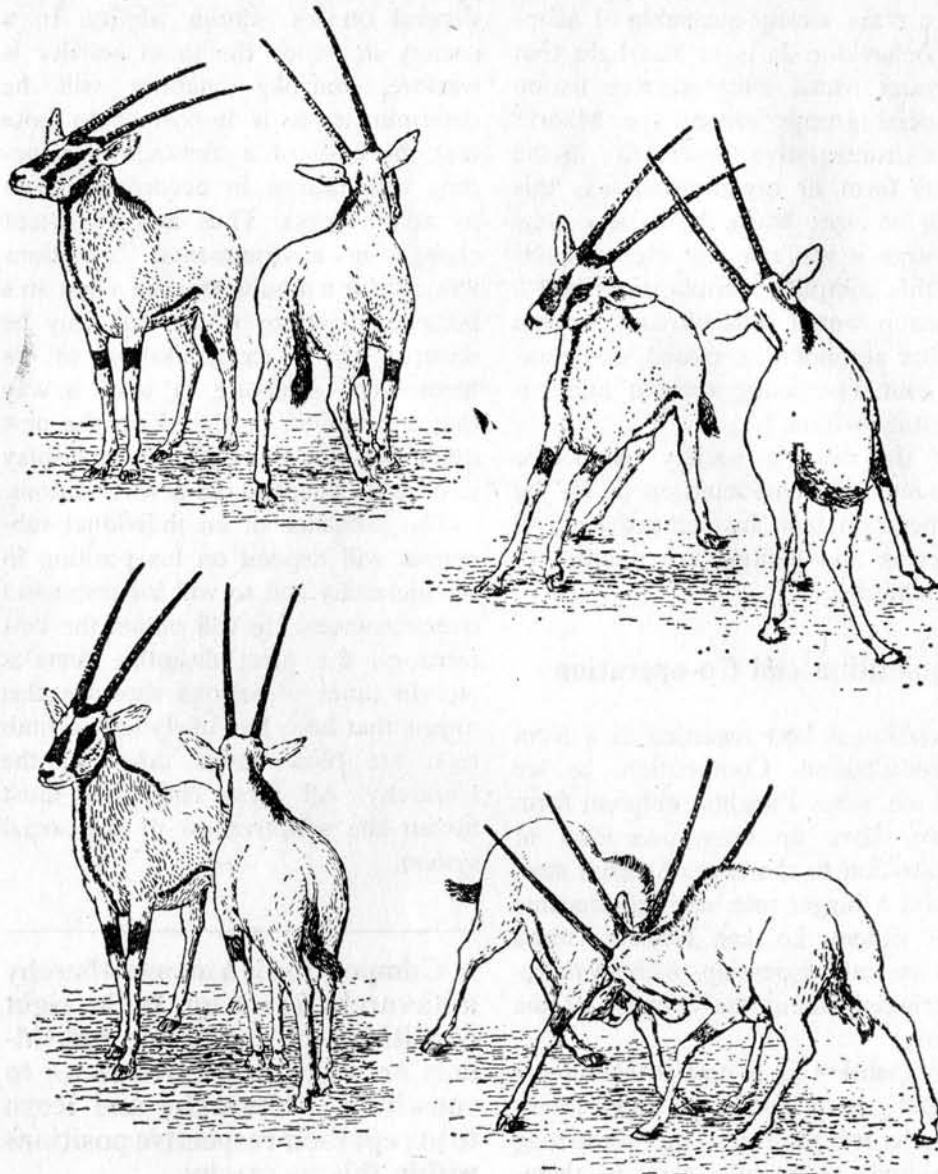
Ritualisation

One of the most important means of reducing the destructiveness of aggression is to ritualise it. This means providing it with an outlet at the minimum cost in terms of physical damage and loss of life.

The concept of ritualisation applicable to other things besides aggression, economic activity for instance, is totally alien to industrial society which places a premium on achieving the maximum results with the minimum human effort. Ritualisation ensures the opposite: *the achievement of the minimum results with the maximum human effort. Contrary to what we have all been taught, it is the latter goal not the former which is most adaptive.*¹⁰

The ritualisation of aggression is a feature to be found among all animals including man. That it should be so widespread is not surprising. As Lorenz points out, "a particularly successful solution is often found by the different branches independently of one another. Insects, fishes, birds and bats have 'invented' wings, squids, fishes, ichthyosaurs and whales, the torpedo form. It is not surprising that fight-preventing behaviour mechanisms based on ritualised redirection of attack occur in analogous developments in many different animals."¹¹

As it happens among non-human animals, inter-species conflict is simply not designed to lead to death or mutilation. It is more than anything else a ritual and is conducted according to a set of rules designed above all to prevent death or mutilation from occurring. Thus rattlesnakes, capable of killing each other with a single bite, never in fact bite a rival. Their conflict is a strange ritual resembling Indian wrestling. "The successful snake pins the loser for a moment with the weight of his body and then lets him escape."¹² The oryx antelope who is equipped with horns capable of putting a lion to flight does not use his horns as daggers in an interspecific fight. As Eibl-Eibesfeldt writes, "a hornless bull observed by Walthe carried out the full ritual of combat as if he still had horns. He struck at his opponent's horns and missed by the precise distance at which his non-existent horns would have made contact. Equally remarkable, his opponent acted as though his horns were in place and responded to his imaginary blows."¹³



Scientific American

Among birds and mammals conflict usually ends when the weaker contestant makes a recognised gesture of submission. Such appeasement gestures often consist in offering a vulnerable part of the body to the victor. Desmond Morris¹⁴ uses a term "remotivating displays" to refer to "actions which arouse in the attacker a non-aggressive tendency which then competes with and inhibits the aggressiveness that is present. Two common examples of this that occur in many species, are pseudo-infantile displays and pseudo-sexual displays. In these instances the submissive animal performs either juvenile or sexual patterns which arouse parental or sexual responses in the aggressor and in this way stop the attack." This triggers off a peace response on the part of the victor. In this way conflicts rarely end in serious mutilation or death.

The same is true of aggression in human societies. Among hunter-gatherers such as the Bushmen or the

Australian aborigines who are still living in conditions approaching those to which man as a species has been adapted by evolution, warfare appears to be limited to border skirmishes giving rise to very few casualties. This is illustrated by an incident recounted by Love.¹⁵ In 1837 a party of men led by Sir George Gray, one of the first Englishmen to land in Australia, was assailed by a group of armed Aborigines who threw spears at them and gravely wounded Gray himself: as a result Gray had to fire at them himself and shot and killed one man. The others immediately dispersed and shortly came back to collect the man they had left behind who was wounded and subsequently died. It did not seem to occur to them that the English might shoot at them again. The accounts given by Napier of the killing of one of their number were remarkably similar. We now know that it is the normal procedure in Australian aboriginal warfare for hostilities to cease

at the death of one man, which provides the explanation for the otherwise inexplicable behaviour of the aborigines.

Among the Maori leadership was all important and hostilities came to an end once the leader of one of the rival groups was put out of action. Vayda writes, "Even when on the verge of victory an attacking force might withdraw because of the loss of a leader."¹⁶

Even among the most warlike tribes the object of war is seldom to kill or to conquer territory which, in any case, they usually regarded as inhabited by hostile spirits. The tendency, on the contrary, was to stick to their own territory which was inhabited by the friendly spirits of their ancestors. This is even true of the specially warlike Jivaro Indians who, in any case, as Karston¹⁷ points out, "inhabit endless virgin forests, where they can make new settlements almost anywhere and have no need of conquering the territory of other tribes". Rather than kill or conquer territory the aim of such warlike tribes was to achieve certain largely ritualised goals. In the case of the Crow Indians who were among the most warlike of American tribes, the first of such goals was to cut loose and steal a horse picketed within a hostile camp. The second was to take an enemy's bow or gun in an hand-to-hand encounter. The third was to touch an enemy with a weapon or even the bare hand. The fourth was to lead a victorious war expedition.¹⁸

In the middle of the nineteenth century the Blackfoot Indians were the most warlike and the most feared of the Indian tribes in the valley of the Saskatchewan and the upper Missouri. As Ewers¹⁹ points out, "Blackfoot warfare was aimed at neither the systematic extermination of enemy tribes nor the acquisition of their territory. It was not organised and directed by a central military authority nor was it prosecuted by large, disciplined armies. Rather, Blackfoot warfare was carried on primarily by numerous small parties of volunteers who banded together to capture horses from enemy tribes... The killing of enemy tribesmen and the taking of scalps were not major objectives of these raids." Bohannon describes in greater detail what were the most prestigious feats of war among the Blackfoot Indians. "They graded war honours on the basis of the degree of courage displayed in



Photo: World Medicine

winning them. They recognised that a man might scalp an enemy who had been killed by another and that a man might kill an enemy from a considerable distance with bullet or arrow. Their term for war honour, 'namach-kani' means literally 'a gun taken'. The capture of an enemy's gun ranked as the highest war honour. The capture of a bow, shield, war bonnet, war shirt, or ceremonial pipe was also a coup of high rank. The taking of a scalp ranked below these deeds, but ahead of the capture of a horse from the enemy. The capture of a horse was too common an accomplishment to receive a higher rating."

Another form of ritualisation is the substitution of a match or tournament between two or more champions for a conflict between two armies. The contest between David and Goliath is an obvious example. This strategy was resorted to a great deal during the Middle Ages in Europe. The modern equivalent is, of course, sport, though this was also resorted to among tribal societies. Lacrosse, for instance, was used as a means of ritualising conflict among the Creek Indians.

The transition from war to sport on the small island of Truk in Micronesia was traced by Murdock. This island was occupied successively by the Japanese, the Germans and the Americans. The Germans abolished traditional warfare, the Japanese introduced baseball as a means of replacing it. As Murdock²⁰ writes, "The natives don't play baseball, they wage it. An inter-island game is serious business. The players practise almost daily and observe all the sexual and other taboos

which used to precede war. For several days before a game, for example, they sleep apart from their wives in the men's clubhouse. The women and children form groups around the playing field, singing songs and executing magical dances designed to discommode the foe. Special baseball songs constitute one of the principal forms of native music."

In our industrial society, football plays an important part too in ritualising latent aggression between various groups. This is particularly so in Glasgow where a match between the two principal teams, one of which represents the local Protestants, the other the immigrant Irish Catholics, arouses tremendous enthusiasm on both sides. The most perfect example of the systematic ritualisation of aggression in a modern society is the Palio in Siena, a horse race around the Piazza del Campo, the city's main square. This city of about 70,000 people has probably since the Middle Ages been divided into a number of "Contrades" of which there are now 17. These were originally military associations whose function it was to raise a company to serve in the continual wars of the Sienese Republic against its neighbours. The Contrades, most of which are named after animals, such as "Oca" the Goose, "Istrice" the porcupine, "Giraffa" the giraffe, "Lupa" the wolf, have their own territory within the city, their own Contradal church, their own patron saint, their own museum, clubhouse, uniforms, songs and traditions, so much so that they constitute veritable little cities within the city. Competition between them is intense

especially during the period of the Palio. Its intensity varies between the different Contrades, some of which are traditional allies while others are traditional enemies. Hostilities between such Contrades as "Lupa" and "Istrice" is so intense that a member of one Contrade would hesitate to venture into the territory of the other.

The most striking thing about the Palio is the extraordinary enthusiasm it arouses among all the citizens of Siena regardless of their age or social and economic status. The local papers talk about practically nothing else all year round, while, during the week of the Palio, multi-coloured special issues are on display everywhere. On the actual day of the event the entire city gathers in the Piazza del Campo. The rest of the city is deserted.

The rejoicings afterwards are quite extraordinary. The whole city resounds with the shouts and songs of the victors who parade through the streets in their medieval costumes until the early hours. That night the whole city is invited to drink in the victors' clubhouse and everybody is encouraged to visit its museum in which are triumphantly displayed all the trophies of the past.

The institution of the Palio makes of Siena the closest approximation today in the modern world to an ideal city. All aggression is systematically directed into ritualised channels which are not only harmless but which serve to create an extraordinary feeling of cohesion, and of common Siennese citizenship which overrides all class or age differences. As might be expected crime and delinquency, drug addiction, alcoholism and all the other manifestations of social disintegration are largely absent in Siena even today when they are reaching epidemic proportions in most of our urban conurbations.

Aggressivity at Different Levels of Organisation

Ritualisation is favoured by reducing the level of organisation at which aggression is allowed to occur, since the sort of aggression or competition that can be built into a social system will vary at different levels of organisation. In a family unit we can expect that which is necessary for the father to maintain his authority over his sons. It would be unadaptive if this were to take a violent form. Homicide within the extended family or village is strictly forbidden in all known tradi-



tional societies and very seldom occurs. This is even the case among such reputedly bloodthirsty people as the Jivaro Indians.

In normal conditions aggression at the level of the society as a whole is more tolerable. The extermination of neighbouring societies, however, will also be unadaptive. A society requires neighbours if, for no other reason, to provide the challenges that will elicit aggressive behaviour on the part of society and maintain the necessary cohesiveness. The closer is the relationship between two societies (so long of course as they maintain their separate identity and separate cultural patterns and do not compete for the same ecological niche) the greater the chance that they will have learnt to coexist without destroying each other, even if their main relationship is one of mutual hostility. Aggression towards a society with whom there has been little contact

however, and, on which no dependence has been built up, is likely to be more destructive.

It follows that societies that migrate to a new land and find themselves faced with new and unknown neighbours are likely to behave more aggressively towards them than to their original neighbours in the area they previously inhabited. Significantly, the Bantus, invading Southern Africa, encountered Bushmen groups which they fought and often exterminated. Their tendency was to regard these strange people of whom they had had no previous experience, as not even falling into the normal category of human beings. The Tswana, for instance, used the prefix WA to apply to things which are human and the prefix MA to things which are not. Significantly, their word for bushmen is Masarwa: it is unnecessary to point out the attitude of Western Colonialist powers to members of

tribal societies. The hunter gatherers in particular were often regarded as "vermin" and a price paid on their head as for wolves and coyotes. This was true in particular of the Tasmanian aborigines who were exterminated to the very last man.

It must follow that by lowering the level at which aggression occurs it becomes easier to ritualise it, as is so effectively done in Siena.

Needless to say, this principle no longer holds once a society has disintegrated and its cultural controls are no longer operative.

Learning to Live With it

Societies, among whom warfare plays an important role, will to a large extent adapt to suffering the casualties which warfare, however ritualised, must give rise to inevitably.

One can only understand how this can occur if one understands just how closely integrated are the cultural traits making up a society's behaviour pattern. Among head-hunters, for instance, head-hunting is so "intricately interwoven with the whole social system" as Lorenz²¹ puts it, that its abolition could lead to the disintegration of the whole culture, "Even seriously jeopardising the survival of the people." Cultural traits therefore cannot be judged by themselves but only as part of a cultural pattern.

Consider the Eskimos: during the hunting season, the basic social unit is the family, inter-personal aggression is fairly high and there is occasional loss of life. If one adds to this the hazards of the Eskimo hunter's life in the inhospitable Arctic wastes that he inhabits, then it is not surprising that his society should have to resort to some strategy, among other things, for evening out the number of females to males. This has been achieved by female infanticide. We may not like it but who are we to judge it? It may provide the least disagreeable compromise to ensure the stability of an Eskimo society.

Among the Jivaros, polygamy plays an analogous role. Without it there simply would not be enough males to go round.

Among the warlike Nilo-Hamites, such as the Masai and the Sambutu, warfare is carried out exclusively by the young men in specific age grades who together are referred to as the "Moran". These live outside the village

in promiscuity with the unmarried girls of the same age. However, they are not allowed to marry and have children. Only the elders, who are no longer of fighting age can indulge in such activities. This strategy limits the social disruption caused by casualties incurred during raiding expeditions on the neighbouring tribes. The few who do not get killed will have established the minimum social ties and responsibilities. When one considers it, it is barbaric to send to war, as we do, men who have wives and children to look after.

The Conditions required for Maximum Reduction of Destructiveness of Aggression

We have seen that there are four strategies that can be exploited for achieving this goal: fission, ritualisation, the reduction of the level at which aggression is ritualised and learning to live with it. It is important to realise however that their extraordinarily effective mechanisms do not act in unnatural environmental conditions, by which is meant those which have diverted too radically from the environment to which a species has been adapted by evolution. Thus as Harrison Matthews²² writes, "when population numbers have overtaken the resources of the environment so that serious overcrowding is brought about. This produces a situation similar to that of animals in captivity where the environment is artificially restricted so that aggression is increased and any chance of escape from the aggressor is denied. In both situations the animals are living in a biologically unsound environment which inevitably distorts the normal patterns of social behaviour."

When the environment changes too radically from that to which a species has been adapted phylogenetically or a society has been adapted culturally, then adaptive behaviour, which must include that which reduces the destructiveness of aggression can no longer be mediated.

The same thing happens if the informational pattern, in the case of a society, that which is organised in its culture, is interfered with by alien influences such as Western Colonialist powers, centralised governments imitating the industrialised nations or by large commercial enterprises.

The reason for this is obvious. Consider two people sitting down to a

game of chess. The principal *sine qua non* for a successful game is that both contestants should know the rules and accept them. So it is with the strategies for reducing the destructiveness of aggression. Since they affect people's lives much more deeply than a game of chess is likely to, people must be taught the rules from their earliest youth and inculcated with the belief that they are fair, just and necessary. This is what happens as children are educated or socialised in a traditional society.

The rules they learn provide them with an integrated pattern of instructions which will give rise to a correspondingly integrated behaviour pattern among which should figure the various strategies for reducing to a minimum the destructiveness of aggressive behaviour.

Experiments with monkeys as well as experience with humans reveal that individuals deprived of a satisfactory upbringing, who have not been subjected to the normal socialisation process will find it difficult, if not impossible, to accept a position in a social hierarchy.

As a result the normal cultural mechanisms ensuring the ritualisation of aggression are not operative. Each individual is on his own, his neighbours are his enemies and he fights and bickers for every petty advantage he can thereby obtain. He may also display gratuitous violence, probably as a pathological response to the social deprivation from which he must inevitably suffer.

Unfortunately, a society's cultural pattern can only remain intact under specific conditions. For instance, it must not be subjected to environmental conditions that are changing too rapidly or too radically, otherwise the control mechanisms ensuring adaptation simply cannot cope. A society must not expand beyond a certain size, as there is a limit to the extendability of the bonds which hold it together. Also, its culture must not be modified by extraneous influences such as missionaries, colonialist educational authorities etc.

Unfortunately as a society 'progresses' through the various stages that take it from a hunter gatherer group to a modern industrial state, so are these conditions ever less well satisfied, while it develops new features which tend to increase rather than

decrease the destructiveness of aggression, sometimes in a dramatic way.

This is well illustrated in a study by Otterbein²³ of warfare among the Zulus during different phases of their history in the nineteenth century.

Zulu Warfare

As is generally known the Bantu tribes moved southwards into what is now South Africa between the 16th and the 19th century. Among these tribes were the Nguni, who were shifting cultivators and cattle raisers. The unit of social organisation was kept small by rivalry between the sons of a tribal leader which often led to fissions and also by the very nature of the economic system which required a nomadic way of life and which could not support large groups of people living together. Conflicts between tribes were settled by combat. Combat was very much a duelling battle. The main weapon used was the Javelin, while each warrior protected himself with a shield. The object of war was to obtain prisoners and cattle, the former to be ransomed, the latter to be permanently retained. Pursuit of a fleeing enemy would stop as soon as the pursued dropped their spears. "This was a sign of surrender and no more blood would be shed." Since wounds were seldom fatal the number of casualties was low.

All this began to change by the beginning of the 19th century when populations started to expand. There was no longer enough empty land to permit the continual fission of tribes and also to maintain shifting agriculture. As Gluckman writes, "It became more difficult for tribes to divide and dissident sections to escape to independence; as the Nguni cultural stress on seniority of descent and the relatively great inheritance of the main heir caused strong tensions in the tribes, chiefs began to press their dominion not only on their subordinate tribal sections, but also on their neighbours. The development of this trend was possibly facilitated by the unequal strength of the tribes." As a result powerful tribes started subduing smaller ones, creating larger social units. The most successful such tribe was the Mtewa whose chief Dingiswayo was a particularly talented general who was able to achieve military success by organising the age grades of warriors into regiments of soldiers and hence increasing organisation and efficiency.

EXPANSION OF THE ZULU EMPIRE

Year	Size of territory in square miles	Number of tribes in the kingdom	Size of army
1822	80,000	300	20,000
1819 ^a	11,500	46	10,000
1818 ^b	7,000	30	8,000
1817 ^c	400	6	2,000
1816 ^d	200	2	1,000
1816	100	1	500

^aAfter battle of Umhlatuze

^bAfter battle of Qokli Hill

^cAfter second battle with Butelezi

^dAfter incorporation of one tribe

Between 1806 and 1809 he established himself as chief of over 30 tribes. One such subject tribe was the Zulu and it was Dingiswayo who was instrumental in arranging for Shaka, the illegitimate son of a Zulu chief, to become their chief. Shaka had been in touch with the Boer who very much influenced his way of thinking. He totally changed Zulu military tactics, introduced the short stabbing spear which Dingiswayo disapproved of because of the greater number of casualties occurring between armies equipped with it. He discarded the sandals that had hitherto been worn by Zulu warriors, in order to gain greater mobility. He also arranged his soldiers in a "close order" shield-to-shield formation with two "horns" designed to encircle the enemy or to feint at his flanks, the main body of troops at the centre and the reserve in the rear, ready to exploit the opportunities of battle.²⁴ From 1819 to 1822 Shaka fought a series of wars which led to the creation of an empire comprising no fewer than 300 different tribes occupying 80,000 square miles of territory, almost the size of the British Isles. During the last four years of his life the empire ceased to expand and military activities were limited to long range campaigns in search of plunder, mainly cattle.

In examining the evolution of Zulu warfare it is essential to look first at what was the goal of warfare at each particular stage of development. It is only when we know the goal that we can understand the military equipment and tactics used and the actual nature of the conflict. During the first stage conflicts are best regarded as duelling

battles fought mainly to obtain bounty. Spears were used only as projectiles. Casualties were slight especially as fleeing enemies were spared. During the second stage, conflicts were "battles of subjugation" the object being to subdue neighbouring tribes. The army became more efficient, and casualties were still slight.

During the third stage, conflict evolved into battles of conquest whose goal was the creation of an empire. Tactics and weaponry changed, and casualties became very high. During the 4th stage, the goal "was to keep the army busy rather than conquering new peoples", and casualty rates became low again. What is particularly important is that "these four types of war correspond to a different level of socio-political development". In terms of Service's²⁵ taxonomy, "duelling battles" occurred, on the tribal level "battles of subjugation" led to the development of chiefdoms, "battles of conquest" brought about the emergence of the state, and with the eventual development of empires, long range "campaigns" became the dominant form of war.

Aggression in Industrial Society

Industrialisation further erodes those precarious cultural conditions which alone are capable of reducing to a minimum the destructiveness of human aggression. With the massive population growth that it inevitably gives rise to, societies are forced to live ever closer to each other and anything remotely resembling fission among discordant social groups becomes impossible. The traditional behaviour

SIX ZULU BATTLES

Year and name of battle	Tribes involved	Size of armies	Number killed	Average number killed	Average percentage killed
1 1810	Butelezi	600	50	35	3
	Mtetwa	1,800	20		
2 1813	Ndwandwe	2,500	500	325	15
Um Mona	Mtetwa	1,800	150		
3 1816	Butelezi	600	550	300	44
	Zulu	750	50		
4 1818	Ndwandwe	11,000	7,500	4,550	60
Ookli Hill	Zulu	4,300	1,600		
5 1819	Ndwandwe	18,000	17,000	11,000	80
Umhlatuze	Zulu	10,000	5,000		
6 1826	Ndwandwe	20,000	19,000	12,000(?)	42(?)
Ndololwane	Zulu	40,000	6,000(?)		

patterns permitting ritualisation of aggression break down, while the inevitable collapse in social structures mean that aggression takes a more violent form at lower levels of organisation such as that of the family and what remains of the small community which means that the expedient of reducing the level of organisation of which aggression is allowed to occur becomes counter-productive.

This must be so since interpersonal aggression in the larger American urban conurbations has reached epidemic proportions and has attained a degree of violence that is no longer compatible with the maintenance of viable family and communal units. Sadly, the rest of the industrialised world is closely imitating the aberrant American pattern.

In addition to this as industrial growth proceeds new freak conditions arise which systematically increase the destructiveness of aggression at all levels of organisation to previously unknown levels.

Artificial States

In our efforts to bring the other countries of the world into the orbit of our industrial society, that we may more easily persuade them to part with their resources and buy our finished products, we have everywhere forced ethnic groups to join together into totally artificial political units on the Western model. Co-operation on the part of such groups whose principal

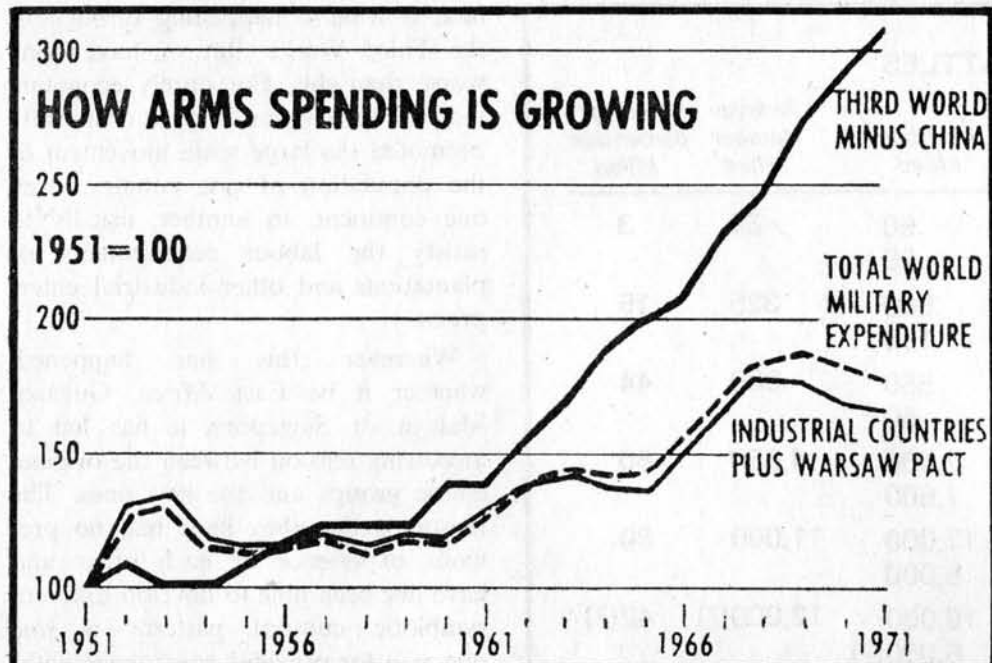
relationship is often one of mutual hostility, being difficult to achieve, the tendency has been to put them under the domination of one such group—the most “advanced”, hence the one most easily inculcated with the industrial ethic. These purely artificial nation-states tend consequently to be empires in disguise, West Pakistan being until now the Punjabi Empire; Nigeria that of the Hausas: Kenya that of the Kikuyu, etc. We go out of our way to confer on these empires the outward trappings of parliamentary government. Their rulers are endowed with the meaningless titles of their western counterparts, issued with the formal dress of Western dignitaries. Prestige buildings are put up to house assemblies that masquerade as Western parliaments. In the meantime the age old rivalry between tribal groups is simply directed into different channels (more modern ones), and it expresses itself clandestinely, more bitterly and more destructively. Whichever ethnic group, by whatever means, and however temporarily is able to control the shaky apparatus of government is consecrated in its legitimacy by international law. Its regime is automatically bolstered by the support of multinational companies, by the governments of industrialised countries and by United Nations agencies, all anxious to protect their investments and expand the sphere of their economic and political influence.

Such an unstable situation can only lead to constant civil wars which, in

fact, is what is happening throughout the Third World. But we have done worse than this. For purely economic motives we have encouraged or actively promoted the large scale movement of the population of one country, even one continent, to another, usually to satisfy the labour requirements of plantations and other industrial enterprises.

Wherever this has happened, whether it be East Africa, Guyana, Malaya or Singapore, it has led to increasing tension between the original ethnic groups and the new ones. The reason is that they have had no previous experience of each other and have not been able to develop different symbiotic cultural patterns—a *sine qua non* for peaceful coexistence within the same territory. At the same time, the monolithic nation state of which they are part does not offer them the possibility of territorial separation. In these conditions such countries must constantly be on the verge of civil war, unless the original inhabitants are exterminated or reduced to a subject people.

Our influence has also led everywhere to terrible population pressures, causing people to migrate to less populous lands where tensions are inevitably created with the local inhabitants. In this way the Nepali have been migrating in large numbers to Sikkim, where they now outnumber the local population and have recently upset the regime itself, and are also subordinating the local to their rule. Alternatively, white settlers have set themselves up as a dominant cast of administrators and land-owners as in Rhodesia, where they are gradually eroding local cultural patterns, the morale and the self-esteem of their subject peoples the Mashona and the Matabele. This too can only lead to increased tensions, and one can predict that a great deal of force will have to be resorted to if the status quo is to be maintained. In other areas, such as India, Ruanda and Burundi, we have upset existing culturally determined arrangements between distinct ethnic groups, that previously permitted them to coexist symbiotically in the same territory. These groups are now competing for the same ecological niche. Warfare has broken out between them and it is but a question of time before one group or the other has been effectively eliminated.



Increased Dependence of Different Societies on Each Other

Thus one of the obvious causes of war must be a resource shortage of some sort, making it desirable for one country to acquire a resource in the possession of another. Among hunter gatherers this is very unlikely to occur. As already mentioned, they tend to have all the land they need, use very few resources and that which they use is easily provided by the environment in which they live, especially as they live off the interest and not the capital of available resources.

This is also largely the case with traditional agricultural societies. These will probably indulge in trade with neighbouring peoples, but this is likely to involve their surpluses only, their dependence on foreign goods being minimal.

On the other hand, as society develops, so does it become more specialised and hence increasingly dependent on others for those goods whose production it has abandoned in order to specialise on those things it produces most "economically". The industrial societies of today have become totally dependent for their raw materials (especially in the case of Britain and Japan) and largely so for their food on non-industrialised ones. Any threat to their supplies can bring about economic and social collapse, very much as certain non-industrial countries have achieved a state of unparalleled vulnerability by diverting the major portion of their energies to the production of a single commodity,

such as copper in the case of Zambia, cocoa in the case of Ghana, and sugar in the case of Jamaica. As world consumption of renewable and non-renewable resources is gradually outstripping supply, thus the situation must lead to increased conflict. It is unlikely, in fact, that industrial growth can be maintained without some very unpleasant wars over resources.

We have recently seen how Britain has reacted to a resource shortage. Fish is getting scarce, the Icelanders are making it scarcer, at least to the British, so out goes the Royal Navy. Precisely the same thing is happening in the Mediterranean. The Moroccans are threatening Spanish fish catches and the latter are threatening violence to ensure their supplies. Not long ago the Israelis and the Jordanians nearly went to war for their water supplies. The former were diverting the waters of the River Jordan to satisfy their own requirements. Water, like fish, is also becoming a valuable resource. In Britain there is already talk of rationing it, and it is impossible to satisfy the US's ever increasing needs for water without importing it from Canada. Are the Canadians willing to see their lakes plundered for the benefit of American industry? There is already considerable opposition and it is likely to grow. If it becomes too powerful what will the Americans do? Allow the economy to collapse or invade Canada?

Energy is, as everybody knows, the key resource. Its use is proportionate to Gross National Product. If the latter does not increase from year to year, the result is unemployment and a stock

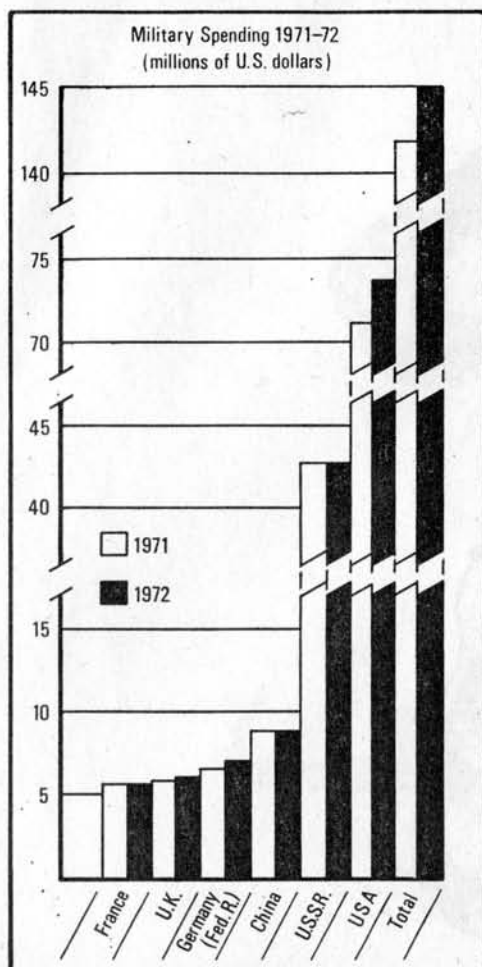
exchange crash with even worse unemployment—a combination of events that no government can support.²⁶

Yet a few Arab leaders now have it in their power to cut off the West's oil supplies—which provide an ever increasing proportion of our energy requirements. What would the US do if this were really to occur? Senator William Fulbright, Chairman of the Senate Foreign Affairs Committee, has stated in the Senate that American policy-makers "may come to the conclusion that military action is required" to protect American oil interests. Needless to say, there was an outcry. Highly cherished illusions were shattered. America, like Britain, likes to think it is a benign and peace-loving country whose sole preoccupation is the happiness and welfare of the people of the earth. Now we are told that she should actually go to war, and for what reason? Not to defend some great ideal like "the American way of life" against those wicked Communists, but simply in the interests of commerce.

Maurice Strong, Executive Director of United Nations Environment Programme,²⁷ has recently pointed out the new possibility for armed conflict, created by modern technology. Since rain-making is now a possibility, he foresees "rain stealing" where one country sets out purposefully to steal another's rainfall thereby causing drought. There have already been disputes between countries over claims of pollution damage to waterways and the atmosphere. Such disputes are likely to increase with the further development of large scale technology. Countries may well attempt to melt the Polar ice cap in search of minerals, create artificial earthquakes and tidal waves. "We are only beginning to realise the potential areas for conflict," said Strong.

The US has already been accused of using weather modification in South East Asia to increase and control rain for military purposes.

In the Declaration of Principles adopted at the UN Conference on the Human Environment in Stockholm in June 1972, a declaration to which all governments represented were a party, pledged governments to ensure that their activities did not cause damage to the environment of others. What action can the UN apply against the infringements of this declaration? The answer is practically none. Other than



awakening world public opinion against any possible culprits. France has just openly flouted the Declaration she was party to, by exploding hydrogen bombs in the Pacific, in the face of a particularly hostile world opinion. What is to prevent other countries from doing likewise?

The Increased Capital Intensity of Weaponry

The capital-intensity of modern weaponry is constantly increasing. Consider a few examples. The Churchill tanks used by the British Army between 1940-50 cost about \$50,000 each; the Centurian tanks in service between 1950-60, \$100,000; and the Chieftains used between 1960-70 \$300,000. US Air Force bombers such as the B17 and B29 used between 1940-50 cost between \$200,000-\$700,000, the B47, B36 and B52 in use between 1950-60 cost between \$2,000,000 and \$9,000,000 while the FB111 in use between 1960-70 cost between \$7,000,000-\$8,000,000.²⁸

One of the consequences of increasing capital-intensity is an ever greater use of non-renewable resources. It also means a corresponding increase in environmental disruption, simply in the production of the weapons, let alone in their use.

It also means an increasing polarisation between the influence of the rich countries which can afford these weapons, and those that cannot.

The question to ask, however, is whether deterrents are in fact capable of preventing a world war? They certainly have not prevented minor ones. At the present moment there is armed conflict in almost every part of the world. The only difference is that whereas they would previously have been waged with primitive weaponry, causing but minor damage, in almost every case both sides now succeed in laying their hands on the most lethal modern weaponry which world powers, eager to extend their sphere of influence and to increase their exports of armaments, are only too pleased to provide.

This often leads to quite ludicrous situations. Thus in the recent war between the Ibos and the Mausa the former were armed by the Chinese, the French and the Czechs, whereas the Mausa obtained their armament from the Soviet Union, Egypt and the UK.

Vulnerability

As industrialisation proceeds, as society becomes increasingly dependent on technical devices for its physical sustenance, so must it become correspondingly more vulnerable. Consider the vulnerability of a large modern urban conurbation: it depends for its fresh water supplies on complex sewage and purification plants; for its food on increasingly distant agricultural enterprises, elaborate processing plants, and a network of roads and railway lines. It requires a vast bureaucracy to provide the welfare that prevents its inhabitants from succumbing to all sorts of material and psychological deprivations, a massive national health service with hospitals, surgeries, pharmaceutical laboratories and distributors to prevent them from succumbing to disease, an increasingly large police force, a fleet of armoured cars, vast numbers of safes, burglar alarms and other devices to protect them from the depredations of an ever expanding criminal class, and an increasing number of factories, office buildings and department stores, to provide them with employment and the basic necessities of life. The whole of this precarious edifice could collapse like a house of cards in the face of strikes, sabotage, or simply as a result

of a shortage of some key resource such as energy.²⁹

With the accumulation of nuclear weapons, by an ever larger number of different governments, the possibility of their accidental use, if nothing else, must increase correspondingly. If there is a finite possibility that something will happen then it must be but a matter of time before it actually does. Accidents are tolerable when they are on a small scale, not so however when they occur on a scale that can lead to the annihilation of whole populations.

Apart from the danger of accidents there is also the danger that nuclear devices might be stolen by terrorist groups. With the development of breeder reactors, the amount of available plutonium will increase considerably. The possibility that some of this key substance might be acquired by irresponsible groups is a very real one, and once it is available the production of nuclear devices by such groups becomes relatively feasible. Let us not forget that three months ago there was real fear that Palestinian terrorists had laid their hands on some Sam ground to air missiles—so much so that Heathrow Airport had to be occupied by troops and surrounded by tanks to thwart any terrorist attempt to use this deadly weapon against incoming aeroplanes. If they can steal a Sam missile it is surely but a question of time before such groups will be able to lay their hands on still more lethal weapons, as Hydrogen bombs for instance.

Development of Authoritarian Government

Armed conflict is also likely to be favoured by the rise to power of dictators who are in a position to flout public opinion and act on personal impulse.

It is important to note that dictators do not exist in traditional societies.³⁰ Such societies are governed by public opinion, which in turn reflects traditional values. The Council of Elders, which is the closest thing they have to an institutionalised government, does little more than interpret traditional usage. Kings, even divine ones, are subjected to all sorts of social constraints which eliminate the possibility of arbitrary action outside the most limited sphere of his most personal relationships. As social systems disintegrate and as highly structured

society breaks down into a heterogeneous mass of people, so is there created by the same token the most fertile possible ground for the emergence of dictators. This was in essence the message of Aristotle's politics and his reason for opposing the mass society. It is becoming evident that throughout the world government is becoming increasingly authoritarian, in fact only an authoritarian government will soon be capable of governing our industrial societies, whose maintenance in the face of mounting social and ecological stresses is becoming increasingly difficult.

Vicious Circle

As industrialisation proceeds so does it mean increasing the damage done by conflict when it occurs, a sort of ritualisation in reverse. Thus, not only are the discontinuities constituted by wars more frequent, but also increasingly serious. The armaments race thereby introduces positive feedback into the complicated process of increasing instability and eventual collapse.

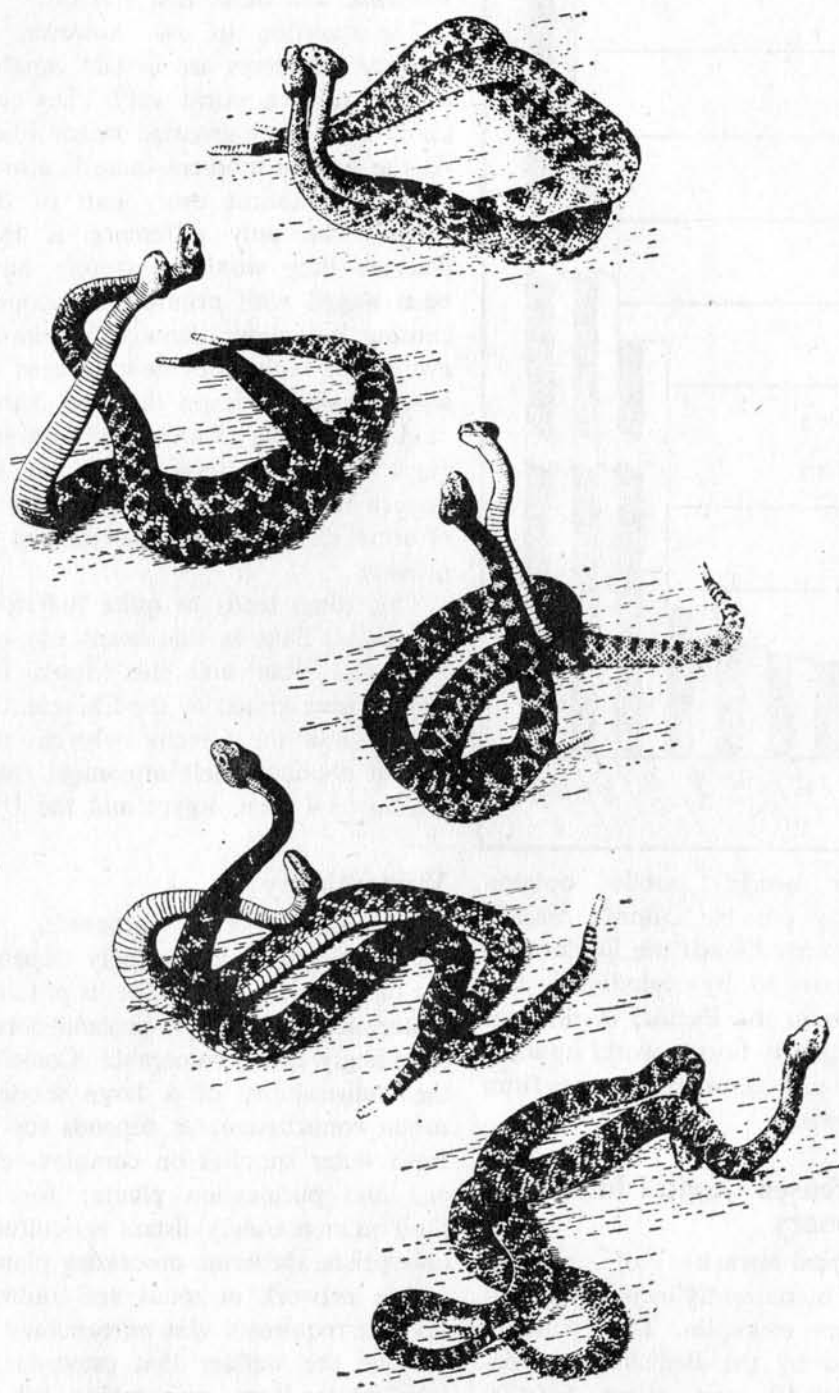
Unfortunately, once we are caught up in it, it becomes very difficult to extricate oneself. Apart from not being able to take the risk that a rival power could obtain an advantage over one, the country is faced with another equally daunting problem. If the arms race came to an end, there would be very serious unemployment. Already arms production is used as a means of bolstering employment. Thus, as Mary Kaldor points out³¹ "...one of the reasons given for the fact that the military version of the VC10 costs £1.4 million per unit more than the civil version was the extra cost of £366,000 per aircraft involved in a policy decision to subcontract work in Northern Ireland. In Italy, most defense contracts specify that 30 per cent of the work must be done in the South." Let us not forget that world military expenditure now stands at about \$200,000 million at 1970 prices. This is 6.5 per cent of world GNP. The amount just spent on research into new military equipment is about \$25,000 million a year, which is nearly half the entire amount spent throughout the world on all research and development.

As Westlake writes: "Nuclear disarmament would, of course, release thousands of scientists and engineers, and tons of materials. It has been esti-

mated that 50 million people—more than the whole working population of Britain and West Germany—are engaged directly or indirectly for military purposes throughout the world. By 1970 the armed forces absorbed 23 to 24 million people."

Professor Leontet, from Harvard, involved in the recent UN study on Disarmament and Development, recently admitted that "It would be foolish to deny that many groups in society, both entrepreneurs and workers, are seriously concerned as to what will happen to their livelihood if the Government stops purchasing

arms".³³ The Committee responsible for the study suggested that the problem could be partly solved if funds were diverted from armament to development aid. This appears a little utopian. The amount of money spent on armament is at present 30 times the total annual aid to developing countries; and is increasing all the time, whereas the latter is actually decreasing. In the meantime, world employment is becoming ever more dependent on the sale of arms, which in US sales on a government to government basis reached nearly \$4,000 million in the fiscal year 1973, which ended 30th



June. That is nearly double the fiscal 1971 sales of \$2,070 million and quadruple the fiscal 1970 sales of \$914 million. This does not take into account straight commercial deals which may account today for another \$500 million.³⁴ Sales are likely to rise still further as restrictions of sales to Latin American countries and the Middle East are relaxed. As the Secretary of State William Rogers told Congress, "...if US equipment isn't available Latin American countries will go elsewhere". France is also concentrating on the sale of armaments, which have trebled in the last ten years, accounting last year for more than £500 million, \$1,250 million, one twelfth of all France's exports. Britain is rapidly taking over third place; it has recently signed a contract with Saudi Arabia for the provision of something like £250 million worth of equipment. As tensions mount, resource producing countries will become more affluent, and the industrialised ones more desperate to maintain exports so as to pay for the increasing social and ecological side-effects of industrial activity and the increasing cost of ever scarcer and more expensive resources. At the same time they will be increasingly preoccupied with maintaining unemployment at an acceptable level. One can thus expect the armaments business to continue expanding and the nations of the world to be further caught up in the vicious circle of the armaments race, which must continue until such time as global catastrophe, towards which it is inextricably leading us, reduces once and for all our capacity to produce instruments of mass death on the present scale.

Summary and Conclusion

Aggression is a normal and necessary feature of the behaviour of social animals including man. Its function is primarily to establish the status of each individual within a social group. In this way fighting and bickering are avoided and co-operation becomes possible. In this way the group becomes an organisation or a society rather than a random collection of individuals. The qualities which will determine one's position within a social hierarchy will vary according to the ecological niche which a society fills (whether it earns its livelihood by fishing for instance or by agriculture).

Aggression between societies serves the purpose of spacing them out, preventing them from becoming too big, and maintaining their integrity and internal cohesion.

The destructiveness of aggression can be reduced to a minimum in a number of ways: firstly, by fission, secondly by ritualisation, thirdly by reducing the level at which ritualisation occurs, fourthly by learning to live with it. The mechanisms involved are culturally determined. They are only operative when a society is living in an environment that closely approximates that in which it has evolved. As one departs from this situation, as large scale agricultural societies develop and worse still as industry takes over, so do they become increasingly inoperative.

Aggression is a normal and necessary feature of the behaviour of social animals including man. Its function is primarily to establish the status of each individual within a social group.

New conditions appear which have the opposite effect of increasing the destructiveness of aggression. These conditions are created principally by the increased dependence of societies on each other, the increased capital-intensity of weaponry, the development of authoritarian government and the general disintegration of societies under the stresses of industrialisation.

Self-righteous exhortations in favour of peace or pious declarations of the universal brotherhood of man can serve no purpose save to mask the real issues.

The problem can, in fact, only be solved by methodically and systematically deindustrialising and decentralising society, thereby recreating those conditions in which new cultural patterns can re-emerge to regulate once more aggression between men and between the societies into which they are organised.

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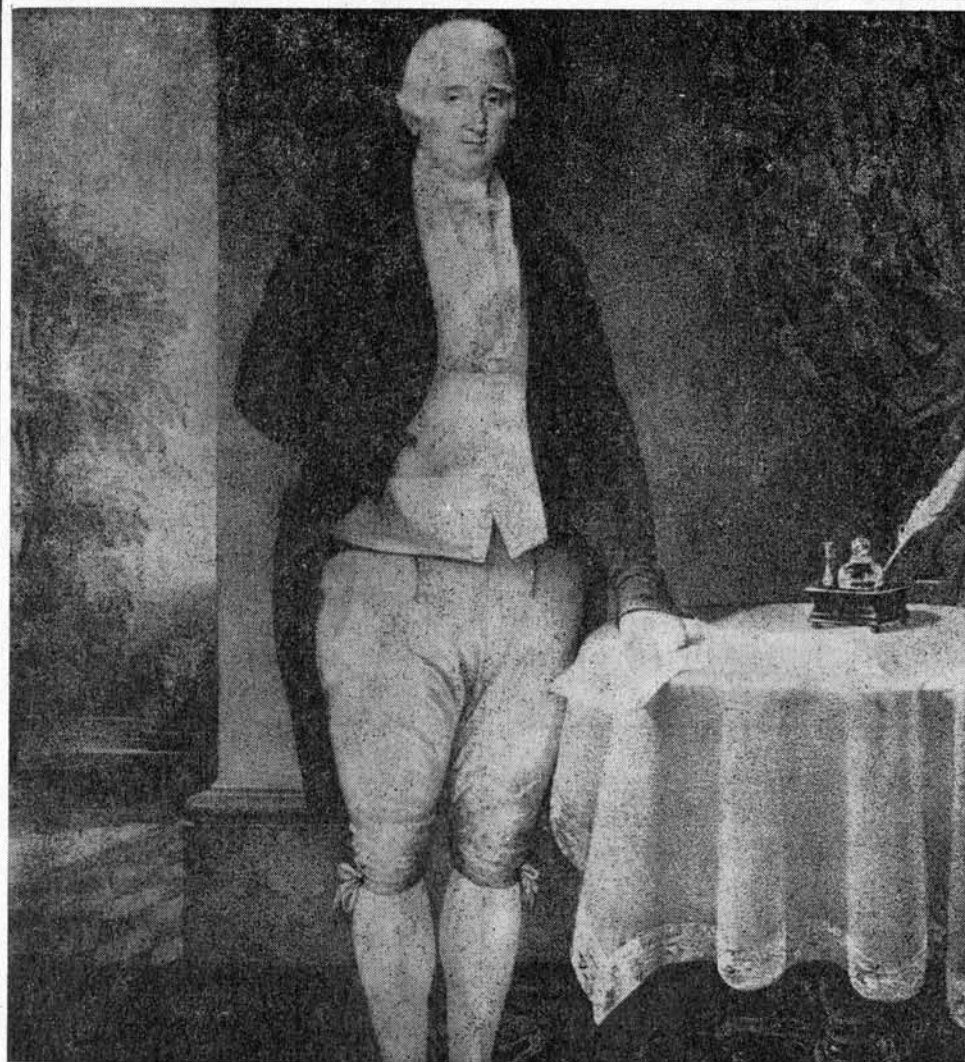


Photo: The Hulton Picture Library

William Cobbett - cottage economist

We usually regard a great man as one whose life was a great success: a man whose opinions and activities changed the course of history, so that we can say "without him such-and-such would not have happened". But another, and arguably a nobler, class of great men are those who were in a wordly sense failures: men whose lives were spent struggling against the current of the times, who refused to shrug off every change for the worse with the glib assertion that "you can't stop progress". Such a one was William Cobbett: and it is significant that even today the period from 1790 to 1830 is often spoken of as the Age of Cobbett — the Age, that is, of the man who more than any other stood in four-square opposition to all the tendencies which made that age what it was. Here, it seems, is a man whose very failure was a greater and more memorable achievement than most men's success.

by Nicholas Gould

William Cobbett was born in 1763, at Farnham in Surrey. His father was a small farmer and also kept an inn; his grandfather had been a labourer; further than that Cobbett himself could not trace his ancestry. His upbringing was that of a peasant: "I do not remember", he wrote, "the time when I did not earn my living". Such elementary education as he received came from his father, after the day's work in the fields. At the age of 20 he

left Farnham for good, and most of the next 17 years he spent abroad, in Canada as a soldier, and in the United States as a journalist and publisher. When he returned to England in 1800, the young peasant had been transformed by his own efforts into a knowledgeable and forceful writer: or rather, not quite transformed, for he remained a peasant at heart. He was that rare thing, a peasant-turned-writer, which is a very different species from

the more common writer-turned-peasant. For the next 35 years, the most down-trodden and inarticulate member of English society, the rural worker, was to have a spokesman; and the new industrial way of life was to have a heroic opponent.

This is not the place to go into the details of Cobbett's political career. Much has been made by his biographers of its apparent paradox: how he began a Tory and became a Radical. Certainly, the change of label did not represent any real change of attitude: he was, in fact, a *reactionary* (I mean the term as a compliment). His opinion of the right state of man had been formed in the Surrey countryside of his youth: for the rest of his life he judged the present by the standards of that remembered past, and found it wanting. His great desire was "to see the poor men of England what the poor men of England were when I was born". This was Radicalism in a true sense, as Cobbett pointed out—"belonging to the root"—but it is very far from the innovating, "progressive", egalitarian tendencies we would now think of as radical. Cobbett's ideal society was essentially feudal: paternal squires, sturdy peasants, self-supporting village communities, a society ruled by established institutions and customs sanctioned by long usage.

It is a more real paradox that Cobbett's own roots in the soil had throughout his life to suffer frequent transplanting. His longest tenure of one place was the 15 years during which he owned a farm at Botley in Hampshire; and even this was interrupted by a two-year prison sentence and a two-year exile in the United States. But wherever he settled for more than a few months he would begin to cultivate the soil, grow vegetables, keep livestock, plant trees. "I never saw myself down in any spot, without causing fruits and flowers and trees (if there was time) and all the beauties of vegetation to rise up around me." His ideal was the stable, permanent life which he himself was fated never to enjoy for long—the life, for example, of a "very neat, smart, and pretty woman" he met at Tangley in Wiltshire, who told him she had never been more than two and a half miles from her home. "Let no one laugh at her, and, above all others, let not me, who am convinced that the

facilities which now exist of moving human bodies from place to place are amongst the curses of the country, the destroyers of industry, of morals, and, of course, of happiness". The facilities he mentions are presumably stage-coaches and turnpike roads: one can scarcely imagine with what passion he would denounce our modern methods of *moving human bodies from place to place*.

Hope in Reform

But though a life rooted to the soil was denied him, Cobbett was not content to sit back and see it denied to others. All over England the social catastrophe of the Industrial Revolution was reducing small farmers to landless paupers, or driving them to the slums and factories of the towns. To halt or reverse this process was the great aim of Cobbett's life. Politically, he placed his hope in parliamentary reform: and hence gave much of his best effort to the campaign which led eventually to the Reform Bill of 1832. In the event, his hope proved unjustified. Reform did not reinstate the peasant; rather it confirmed the power of Commerce and Finance, and set the nation firmly on the course it is still following today. Cobbett, in the meantime, had set about helping the rural poor in a more direct way, with his book *Cottage Economy*, containing (the sub-title informs us) *Information relative to the brewing of Beer, making of Bread, keeping of Cows, Pigs, Bees, Ewes, Goats, Poultry, and Rabbits, and relative to other matters deemed useful in the conducting of the affairs of a Labourer's Family*. It is significant, of course, that such a book had to be written at all: true peasants do not need manuals of instructions in such elementary matters. But Cobbett's motive in writing it was a laudable one. He regarded a full larder as the foundation of all virtue, private and public. "There never yet was, and never will be, a nation permanently great, consisting, for the greater part, of wretched and miserable families". Not that he would have had much sympathy with present-day apologists of an ever-rising standard of living. "By poverty, I mean real want, a real insufficiency of the food and raiment and lodging necessary to health and decency; and not that imaginary poverty of which some persons complain. The man who, by his own and

his family's labour, can provide a sufficiency of food and raiment, and a comfortable dwelling-place, is not a poor man". Poverty, for Cobbett, was something *absolute*: many of our present problems spring from the assumption that it is relative.

Cottage Economy, then, sets out "to show that... from a very small piece of ground, a large part of the food of a considerable family may be raised". After 150 years the book is still worth reading for the practical advice it contains. Cobbett's arguments for the economic and dietary advantages of home brewing and baking are no less valid today than in 1822: and now that the days of cheap meat, eggs, and dairy products have evidently gone for good, his advocacy of domestic livestock may regain much of its force. And the owner of the smallest garden may take heart from Cobbett's declaration that even a large family can be supplied with vegetables the year round from under three rods of land. (Incidentally, the standard municipal allotment plot is *ten* rods). Of course, manuals of instruction on these topics are much more plentiful now than they were in Cobbett's day: but *Cottage Economy* is more than a mere textbook. Like everything Cobbett ever wrote, it is peppered with prejudices—and the prejudices are half the pleasure. Instructions on brewing are interspersed with tirades against tea-drinking ("a destroyer of health, an enfeebler of the frame, an engenderer of effeminacy and laziness, a debaucher of youth and a maker of misery for old age"); the virtues of home-baked bread contrast with the vices of the potato, "the root of slovenliness, filth, misery, and slavery". And politics are never far away: indeed, some of Cobbett's enthusiasm for self-sufficiency seems to stem from a desire to deprive the government of the commodity taxes which were going to swell the ranks of sinecurists and other state-sponsored parasites.

Cobbett's *economy* should appeal to modern environmentalists: *waste* was abhorrent to him. For example, when brewing beer you are to feed the spent malt to your pig, keep the excess yeast for baking, and even the residue of the hops may be put on the dung heap. He was a firm believer in compost: "a great deal more is done by the fermentation of manures than people generally imagine". But we should not

look to him for sensitive descriptions of the world of nature: his ideal was to see nature and man in co-operation, each serving the other. He saw landscape always with the eyes of a farmer. *Rural Rides*, the other of his books which is still fairly widely read, covers an itinerary of thousands of miles of English countryside; but the passages of pure, lyrical description would not fill half a dozen pages. When Cobbett looks at a field of corn golden in the sunshine, he speculates on how many bushels it will yield to the acre; when he rides over a grassy down, his concern is for the number and quality of the sheep who graze it. Mere beauty, divorced from use, was a concept foreign to him. For example, Hindhead, today a famous "beauty spot", he castigates as "certainly the most villainous spot that God ever made": it is, in fact, virtually useless for agricultural purposes, which is evidently what aroused his hostility. When he denounced the plantations of spruce and larch which were already beginning to displace our native hardwoods, it was because he regarded their timber as "fit only to be burnt". Yet he was not insensitive to beauty. His attitude seems to have been that it was an inevitable by-product of good husbandry—*farm* right, and you may be sure the land will *look* right. In the hopeful dawn of industrialism this may have seemed sentimental nonsense; now, as we lurch towards its inevitable twilight, we can see that Cobbett's instinctive action was a sound one.

Sound Principles

Cobbett's reactions were always instinctive. In character as in physique, there was something bull-like about the man (his resemblance to the archetypal Englishman, John Bull, was seized on with delight by contemporary caricaturists): when he sensed injustice or corruption, he did not stop to consider arguments or weigh advantages; he simply put his head down and charged. But it is remarkable how often his instinct led him to attack the right target. Often, with uncanny prescience, he seems to have seen the evils of his time not as they were, but as they would become; and it is this which frequently gives him such surprising relevance for us today. Thus, he denounced the new finance system, based on credit, of which paper-currency was a symbol: he abominated

the growing cities (still so small by our standards), and above all London, the "Great Wen", or *tumour*, drawing into itself the resources of the nation and turning all to corruption: the tendency towards shoddy, superficial luxury in private life: the replacement of the natural social relationship between master and man by the anonymous mass wage-slavery of big industrial concerns: the rise of depersonalised state charity hand-in-hand with a system which denied the poor the power to help themselves: the increasing extent to which the prosperity and even the survival of Britain seemed to depend on large-scale international trade. In all these preoccupations Cobbett was seeing in his own times the mirror of the future.

On one subject he was less perceptive—population. He protested incessantly against the "horrible doctrine" of the "monster Malthus" and all his disciples. Today, it is easier to see that Malthus was right in his basic contention; but in the 19th century the Malthusians got themselves a bad name with every humane person, by denouncing all attempts to improve the condition of the poor as an encouragement to further breeding and an interference with the natural controls on population. We must sympathise with Cobbett's revulsion at starvation being used as a calculated deterrent to the production of children, at working men being urged to defer marrying for 10 years, at the deliberate segregation of the sexes in workhouses, at the "emigration schemes" whereby the "surplus poor" were thrown dead or alive on to the rubbish heaps of the colonies. In fact, Cobbett was right to hate Malthusianism in the form it took in his day: what is more questionable is his distortion of the facts, as in his refusal, in face of all the evidence, to believe that the population of England was increasing. He even pointed to the number and size of mediaeval churches as a proof that the population had declined since the Middle Ages. The fact that so clear-sighted a man could have this particular blind spot should be a lesson to us. Population is a topic on which the heart has a tendency to be more in evidence than the head. When representatives of Third World countries argue that the "population explosion" is a myth the rich employ to justify keeping the poor in their place, and claim that an extra pair of

hands can produce as much food as an extra mouth can eat, we should remember that Cobbett, our own spokesman for pre-industrial man, held the same belief with equal sincerity. The germ of truth in Cobbett's attitude was that it is very like hypocrisy for the *rich* to point to overpopulation as the principal cause of *other people's* poverty.

Controversial Views

Education is a subject of never-failing controversy. Cobbett, as usual, had forceful and unorthodox views on it. He had all the peasant's contempt for "book-learning"—that is, for a purely theoretical education divorced from the practicalities of everyday life. Projects for "improving the minds" of the poor aroused his hostility on various counts: that they encouraged the drift to the towns, that officially-sponsored education was likely to indoctrinate the working class with ideas of submission to authority, that such education was designed to provide machine-minders for the factories, and that it encouraged too high an opinion of brain-work as opposed to hand-work. He maintained that a craftsman expert in his own skills was an educated man, even if he had never opened a book. Not that Cobbett had any objection to literacy *per se*: but he believed it was essentially a private matter. If we must send our children to school, at least let the school be small: large schools, like "jails, barracks and factories", corrupt "not by their walls, but by their condensed numbers". How he would have hated a modern urban comprehensive school! Mass-production was as abhorrent to him in education as in economics.

Like Bertrand Russell, Cobbett put his theories of education to the test on his own children. His starting-point was the resolution that "as long as I could cause them to do it, my children should lead happy lives". Everything was done by example and encouragement, nothing by compulsion. Theoretical knowledge grew out of practical activities: every child had his own garden, plantation and livestock. Book-learning "*crept in*, of its own accord, by imperceptible degrees... I could safely take my oath that I never *ordered* a child of mine... to look into a book". Cobbett, so fiery and pugnacious in his public life, was unbelievably patient and tolerant at home. "You must live with your child-

ren; you must make them feel by your conduct that you prefer this to any other mode of passing your time. Many a score of papers have I written amidst the noise of children, and in my whole life never bade them be still. When they grew up to be big enough to gallop about the house, I have written the whole day amidst noise that would have made some authors half mad". He paints a delightful picture of the family at home on a winter's evening, all sitting round one huge table, Cobbett at work on an article, his wife at her needlework, all the children busy with various activities. "On the table were ink-stands, pens, pencils, india-rubber and paper all in abundance and everyone scribbled about as he or she pleased. There were prints of animals of all sorts; books treating of them; others treating of gardening, of flowers, of husbandry, of hunting, coursing, shooting, fishing, planting, and in short of everything with regard to which we had something to do". It is pleasant to record that this education, "progressive" enough to satisfy A. S. Neill himself, seems to have served Cobbett's children well, since the seven who survived him all seem to have led long and interesting lives.

However successful in his private life, Cobbett was, as I have said, a public failure. The disasters he foresaw did not take place: the changes he had seen and denounced made England, for a century after his death, one of the greatest economic and political powers in the world. In view of this it may seem rash to insist on his relevance for the present day. But he is relevant, I believe, because he stands in a central, pivotal position between the old world and the new—between an agrarian, decentralised, rural society and an industrial, centralised, urban one. He is an Englishman, yet speaks a language the young revolutionaries of the Third World might find curiously sympathetic. As a prophet, he failed in his own time because he saw too far, beyond the temporary and local successes of industrialism to its ultimate failure. He perceived instinctively much that we are re-learning by painful experiment. Above all, though, his message is a hopeful one. In a mad world, he was no armchair critic, but a fighter and a worker: and his ideal of an organic society is one that we can fight and work for too.

THE ENERGY RATION

by Malcolm Slesser



For Western Europe, energy rationing maybe a feature of life for the next 20 years. Armed with the necessary political, economic and resource data, such a conclusion can be reached by anyone, from figures scratched on the back of an envelope. The Middle East war has simply hastened the advent of an inevitable situation. It was inevitable because having organised our society around the principles of economics and accounting, we have ignored the need to invest in long term energy solutions until it is too late. The energy gap is with us

probably to the end of the century. Such a drastic situation calls for drastic measures. Yet 25 years is a long time. A draconian system of rationing will simply not be acceptable. Rather must we search for means of sharing the burden, finding less energy intensive ways of doing things, while at the same time leaving the private citizen that element of free choice which is his birthright as a member of a democracy. It is with these thoughts that Malcolm Slesser proposes the following highly democratic system for energy allocation.

Each government will from time to time establish the energy available to its national economy, and upon this basis allocate to each citizen exactly a year's supply of energy coupons, drawable at the post-office through the Giro. There will be no favours. Every citizen, old or young, poor or rich, will get the same.

Every service and all goods will carry not only a price tag, but an energy tag. Prices will not again be controlled. The energy tag will be computed in the same way as value added tax is computed, only here we shall have a value-lessened system. The manufacturer will obtain his energy by ordering it from his supplier and will pay cash and tokens (as with VAT, many transactions can be book transactions, and each citizen and organisation could have a post office Giro account in energy). When he sells to his buyers, he requires of them energy tokens, as do the people who transport the goods. At each step, the energy content builds up, until finally it

reaches the retailer, who, as with VAT, must get his energy tokens in order to balance his energy books.

What will now be the effect of this system? First, since the total amount of energy is limited, and fiscally limited by the existence of the tokens, a manufacturer's business can only grow if his use of energy is more efficient than that of his competitors. The customer, faced with a choice of goods, will tend to opt for the less energy intensive one, prices being equal.

Secondly, the system discourages unnecessary transport, which is a very energy intensive activity. For example, in the matter of food in the UK, something like three times as much energy as the farmer expends in making it, is expended between the farm gate and the consumer, simply in handling the food. One could foresee a trend away from centralised food collection, and a tendency for the local supplier to enter directly into the market. Indeed, if one carries the thinking to all kinds of product, one finds that the

tendency would be to decentralise production and distribution, thus creating a social effect desired by many people these days, who see over-weening centralisation as a blight on their lives.

The energy market

It will be quickly pointed out that the distribution of an equal share of energy to every citizen is absurd. The poorer sections of the population simply do not have the opportunity to spend the national average. But this is one value of the proposed system. Here we have a scarce resource equally distributed. Those with the surplus will sell, those with a deficiency will buy. Unlike other forms of rationing it will not be illegal to buy and sell coupons, though it will be illegal to counterfeit them. Considering the size of the population and the vast disparities in income, it is clear that the trade in energy coupons will be enormous and brisk. Thus there should be no difficulty in establishing a daily market rate. The poor man has no more inclination to waste his energy coupons than has the rich. The latter is short of energy, the former is short of cash. The latter can buy the energy and so transfer some of his wealth to the poor, while the poor can grasp a greater share of financial cake by selling. His energy tokens are as good as money to him.

Free choice

The citizen is left with free choice. He can spend his tokens any way he wants. His only limitation is that he does not overspend, or else he will be forced to go into the free market, and buy his coupons. In a time of economic buoyancy these coupons are likely to rise sharply in value. One can just hear the old age pensioners cheering—for once—as prices rise.

The ordinary family is unlikely to place any undue burden on the system. A modestly run family may even be able to raise a penny or two by selling surplus energy coupons. (They do not remain valid after the year of issue). A jet-set bachelor may have to buy extra coupons or change his habits. He can still get abroad twice a year if he cares to cut down on his motoring and central heating. Alternatively he might make one of the journeys by train—much less energy intensive. He still has free choice and a much better choice than asking a man whether he wants to be hanged or shot.

The problems

The main problem is that of dealing with life's minor payments—the bus fares, the packet of sweets and so on. I propose that all centrally operated social services should not require energy tokens for their use. The local bus service would be free of energy tokens. The energy to run it would be taken by the Council or region in the form of energy rates at the same time as the money rates. Nationally operated systems like trains and long distance buses would receive their energy ration through the government machinery, the government retaining a portion of the national energy budget for this purpose. This would have the happy effect of giving a real boost to public transport. We might even be able to de-Beech the railways.

Regional differences

Does the system proposed put the peripheral regions of the economy at a disadvantage? Not at all. Scotland, for example, as a major protein exporter, will find its beef significantly cheaper than the same product will be in London. In turn it may have to pay more energy for goods manufactured in the South of England—or make the goods in Scotland.

It's worth a try and better than petrol rationing and power cuts. It's fairer, its neater and it drives the economic machine in the right direction.

The economy

Will the system proposed depress the economy? There are two answers to this. The first is that any system of rationing from above like petrol coupons, or cuts in oil to industry, will depress the economy. Such a proposal generates no useful feed back loops either to the manufacturer or the consumer. However, the system I propose gives very real feed back. Everyone has an incentive to save energy. Everyone is still free to make his or her trade-off between energy, time and money. By rating one form of energy more energy pricey than another, the government can drive the consumer towards one or other forms of energy. But most important of all, the system proposed would produce a deflationary economy without the nasty effects of unemployment. It would do so in the following way: when business was buoyant and the

economy tending to grow, the free market price of tokens would rise.

People would thus become more discriminating between goods of low and high energy cost. How then can the manufacturer cope with this? He can make use of technology. The economists are ever tired of telling us that there can be no collapse in the sense that the Club of Rome forecast, because new technology will always find ways round the problems. The riposte to this has been that the economists have blithely ignored the second law of thermodynamics. Under the system I

propose the pressure would be on the manufacturer, through better technology to reduce the energy costs of production. But there is a limit, as will be found, and has already been found in the case of ammonia fertiliser manufacture. If the economy was flagging, the reduction in demand would reduce the free market price of energy tokens and thus stimulate a demand.

Here we have then the classic elements necessary for controlling a stable system—a negative feed back with goal seeking.

Malcolm Slessor (46) is a senior member of the University of Strathclyde. In 1972 he was a visiting professor at Cornell University in the Program on Science, Technology and Society. He now works very actively in the field of systems research. He is consultant to OECD in Paris and is carrying out research for the UK Department of the Environment.



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HUMAN MILK: A NATURAL RESOURCE

by ALAN BERG

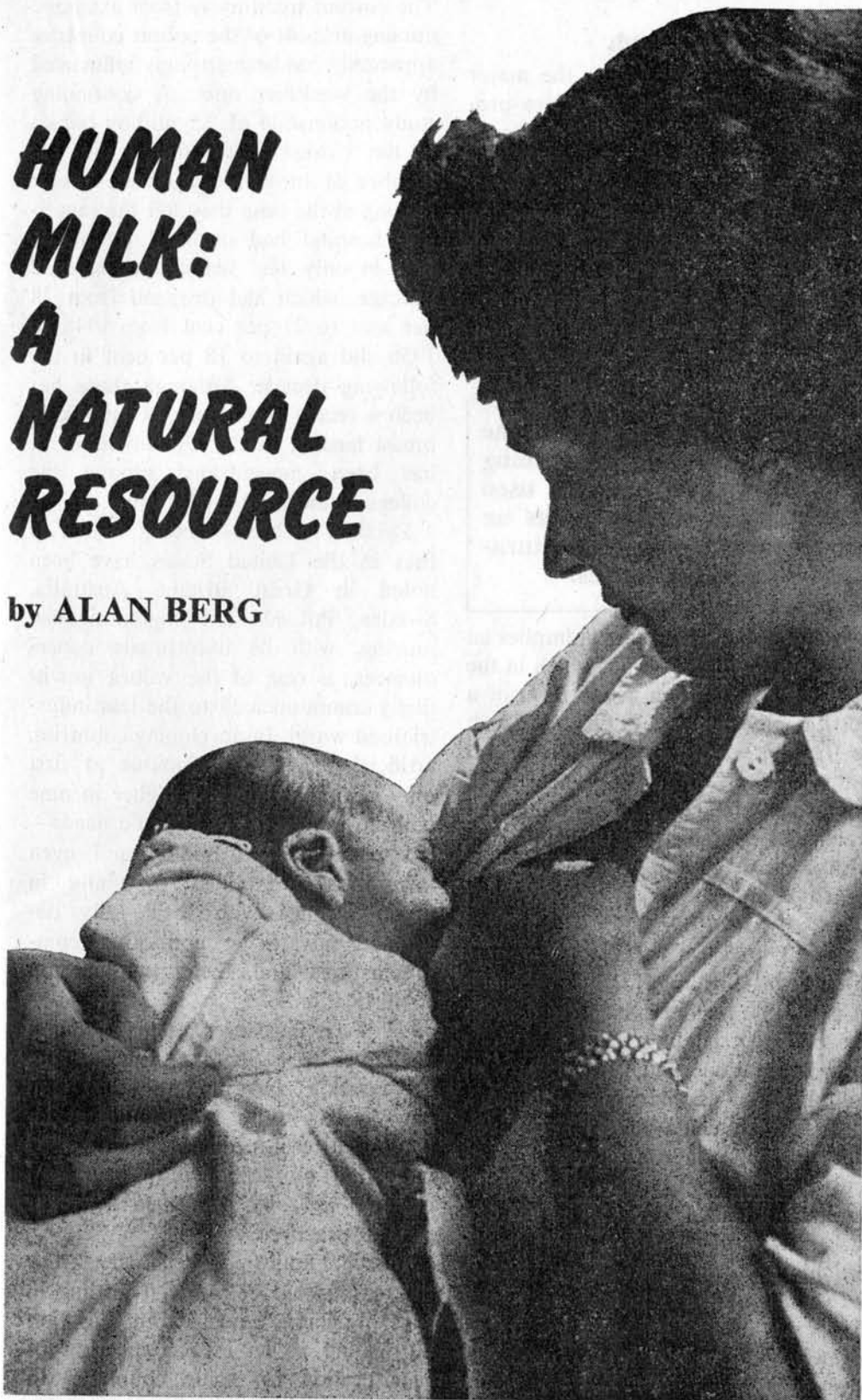


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An unusual depletion in the crude oil reserves of an oil-producing country of Asia or Latin America would be termed a crisis. Yet a comparable crisis, involving a valuable natural resource and losses in the hundreds of millions of

dollars, is going virtually unnoticed in many of the poor countries of the world. The resource is human breast milk, and the loss is caused by the dramatic and steady decline of maternal nursing in recent decades.

Breast feeding is the traditional and ideal form of infant nutrition, usually capable of meeting a child's nutritional needs for his first four to six months of life. Even after the essential introduction of supplemental foods, human milk can serve as an important continuing source of a child's nutritional well-being. From the sixth to the twelfth month it can supply up to three-quarters of a child's protein needs and a significant portion for some months beyond.

For most infants in low-income countries, prolonged breast feeding is vitally necessary to growth and, quite often, survival, as it represents the only easily available source of protein of good quality containing all the essential amino acids. Yet, in many developing countries, mothers are abandoning breast feeding. Twenty years ago, 95 per cent of Chilean mothers breast-fed their children beyond the first year; by 1969, only 6 per cent did so, and only 20 per cent of the babies were being nursed for as long as two months. Potential breast milk production in Chile in 1950 was 57,700 tons, of which all but 2,900 tons, or 5 per cent, were realised. By 1970, 78,600 tons (or 84 per cent) of 93,200 tons were unrealised. The milk of 32,000 Chilean cows would be required to compensate for that loss. In Kenya, where the decline in breast feeding is less dramatic, the estimated \$11.5 million annual loss in breast milk is equivalent to two-thirds of the national health budget or one-fifth of the average annual economic aid. In the few developing countries where surveys of breast feeding have been conducted over the years, the common pattern is one of significant decline.

In most low-income countries, breast feeding is the general rule in rural areas. Its abandonment is primarily an urban phenomenon, often not so much because urban mothers work as because bottle feeding is one of the sophistications of city life the urban migrant adopts.

Three-quarters of all mothers in the rural Punjab in India still breastfeed 20 months after delivery, half at 26 months, and a quarter at 33 months. In major Indian cities, however, approximately one-third of the mothers either do not begin nursing or discontinue it within a year. The concentration of the loss of breast feeding in urban environments is especially alarming because

cities in developing countries are undergoing mammoth growth. In addition, as communications techniques become more effective, city habits and life styles will have an increasing influence on rural societies.

An estimated 87 per cent of the world's babies are born in the developing countries, about a quarter of them in urban areas. If 20 per cent of the estimated 27 million mothers in urban areas do not breast-feed, the loss in breast milk is \$365 million. If half of the other 80 per cent do not continue to breast-feed after the first six months, the total loss reaches \$780 million. These estimates, however, clearly understate the situation; losses to developing countries more likely are in the billions.

Breast feeding as birth control

In terms of national development, lactation has another major economic asset—its link to family planning. As a key to child survival, better nutrition through breast feeding may be an important precondition for reducing birth rates. Another benefit of breast feeding is its role in limiting conception; in some societies, in fact, it may constitute a major form of contraception. There is little doubt that breast feeding offers better protection against pregnancy for up to 10–12 months than does the sort of haphazard and ineffective contraception practiced in many places.

The pregnancy-preventing effect of lactation is firmly rooted in the folklore of unsophisticated societies. Recent studies have lent credence to the notion. One investigation reported that the incidence of pregnancy in the first nine months after childbirth of non-nursing mothers was twice that of mothers who breast-fed, including those who simultaneously used other foods. Others confirm that although breast feeding does not serve as a perfect contraceptive, the risk of pregnancy is relatively small for mothers whose babies receive only breast milk.

The contraceptive value of lactation is most effective if in the first four to six months the infant receives only human milk, for the suckling stimulus appears to inhibit ovulation. In the lactating mother, menstruation and ovulation are delayed from 10 weeks to as long as 26 months. In Taiwan it was estimated that lactation prevented as many as 20 per cent of the births that would have occurred otherwise.

In India the same ratio would mean prevention of approximately five million births a year.

Costs in infant health

Just as breast milk can be the major source of nutrition, the failure to provide breast milk is a major cause of infant malnutrition and mortality. And just as premature weaning is harmful, human milk unsupplemented with other foods is, after four to six months, inadequate both in protein and calories. A child fed breast milk only until the age of 12 or 18 months becomes "breast starved".

Anthropologists, struck by the relationship of artificial feeding to societal change, have used the duration of nursing as an inverse measure of acculturation for some countries.

Discontinuance of nursing implies an alternative source of food, which in the early months is often in the form of a nutritionally inadequate substitute, such as barley water or cornstarch and water. Milk "formulas", when used, are usually mixed with contaminated water and offered in an unclean bottle with a crusty nipple. The reasons are clear. Poor parents usually cannot afford sustained purchases of commercial milk and as a result commonly dilute it or substitute for it. Their lack of education prevents them from reading or understanding the instructions for preparation and, together with ignorance of sanitary requirements, fosters a high incidence of illness. Even mothers aware of hygienic needs often find it difficult to meet them with limited and unclean water, inadequate fuel, poor storage, and a single bottle and nipple. For these reasons, bottle-fed infants have illnesses, especially diarrhoea, more frequently, more severely, and earlier than breast-fed babies.

Breast milk is healthful; it meets most of the metabolic needs of the baby; it contributes to good growth; it is clean, thus lowering the risk of intestinal illness and general infection. Furthermore, it provides a host of protective factors. Breast-fed babies are more resistant to malaria and to infection caused by bacteria or viruses (including the polio virus). And they are less likely to suffer from rickets and iron-deficiency anaemia.

Modernisation and the decline in breast-feeding

The current trend away from extended nursing in most of the poorer countries apparently has been strongly influenced by the wealthier ones. A continuing study nationwide of 2.5 million babies in the United States found that the number of mothers who were breast feeding at the time they left the maternity hospital had declined by nearly half in only ten years; the national average, which had dropped from 38 per cent to 21 per cent from 1946 to 1956 slid again to 18 per cent in the following decade. Although there has been a recent resurgence of interest in breast feeding in the United States, it has been concentrated among the college-trained and well-to-do.

Declines in breast feeding similar to that in the United States have been noted in Great Britain, Australia, Sweden, Poland. The stigma against nursing, with its unfortunate consequences, is one of the values unwittingly communicated to the less industrialised world. In developing countries, artificial feeding—fashionable at first only among mothers of higher income with an awareness of hygienic needs—has penetrated to middle and even lower-income families, especially in urban settings with their fully developed advertising and other communications and their premium on sophistication.

What are the causes for the dramatic decline in breast feeding? Encroaching urbanisation and modernisation and new social values are significant influences. Breast feeding is often looked on as an old-fashioned or backward custom, and, by some, as a vulgar peasant practice.

Indeed, anthropologists, struck by the relationship of artificial feeding to societal change, have used the duration of nursing as an inverse measure of acculturation for some countries. In most developing countries, the greater the sophistication, the worse the lactation; the bottle has become a status symbol.

Failure of lactation is one of the responses to the stress of modernisation. Among the tensions in a changing environment is the mother's anxiety about her capacity to breast feed. Her failure to initiate or to continue breast feeding is rarely traced to a physical cause but often to psycho-physiological

causes. Changing social attitudes regarding the body reinforce the trend. Convenience is also a factor in the abandonment of breast feeding. Women no longer bound by tradition and now enabled by the changing pattern of home life to take advantage of an increasing number of diversions have turned to artificial feeding to free themselves from the constraints of motherhood. Although this is especially true of those who wish to join the organised work force, they are only a small part of the women who have abandoned breast feeding.

A conservation policy

Given societal sensitivities and the highly personal nature of the subject, it is possible to intervene to reverse this trend? The most essential objective of a campaign to counter the current trend is improved understanding of the benefits of breast feeding and the dangers of forgoing it. (Linked with this should be an effort to encourage added caloric intake for the mother during the nursing period and adequate food supplements to the child in the second six months of life).

The stark facts about illness and death among nonbreast-fed babies in low-income countries must be convincingly communicated. Where feasible, the message that human milk is a safe, ready-made, simple, and inexpensive form of nutrition should be carried via mass media because of their effectiveness in changing food habits. The same advertising techniques that are partly responsible for the increase in artificial feeding can be used to counter the trend.

One forceful step toward halting the undesirable trend away from breast feeding is government action to control the advertising that might best be described as "antinutrition education". At a minimum, advertisers should be required to abandon the misleading claims of some patented baby foods, both explicit and implicit. Intrusion on an existing commercial activity is, of course, difficult. Advertising means revenue for the media and sales to the manufacturers, benefits they will not relinquish without battle. Food firms are large and their markets extensive, and they are not without their influence on government. If political realities make regulation impossible, informal pressures should be applied to make the

food companies aware of the harm their products can do and to encourage voluntary compliance to some standards.

Governments can encourage breast feeding by making it more convenient. In urban areas where privacy is virtually nonexistent, inexpensive facilities can be provided. Just as governments build bus stands and public rest-rooms, so they might provide small structures in crowded downtown areas for nursing mothers. Similarly, special rooms for nursing could be set aside in factories and other places of employment. Mothers who breast-feed might also be given incentives. For the working mother, this may mean government regulations requiring that she be allowed nursing time. Monetary and material bonuses may also serve as inducements for mothers who nurse their youngsters.

Steps can be taken to stem the loss of such a major resource. The size and implications of the problem should be examined and techniques designed to deal with it. For the vulnerable infant and young child, an effective public effort to counter the current trend may be of greater significance than any other form of nutrition intervention. ■

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When breast-feeding help or advice is wanted, the following women are specially trained to offer guidance according to the La Leche League approach to mothering:

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The attempt to abolish the family in Russia

by Nicholas S Timasheff

In the 1920s the newly established communistic state instituted a programme aimed at abolishing the family as it existed in Western civilisation. Had the experiment worked, the universality of the family could no longer have been maintained. Professor Timasheff traces how the programme, like many other programmes of economic and political change, failed and finally had to be abandoned.

In their attempts to create a new culture, the revolutionists always meet resistance. This resistance is displayed by individuals, but they resist because they have been moulded by mighty institutions through which social structure and culture are perpetuated. In modern society, these pillars of society are the family, the school, and the church. From the standpoint of the revolutionists, two of them, the family and the church, are hopeless, for it is their very nature to preserve tradition. But the school might perhaps be transformed into an instrument of cultural revolution.

Hence, for those who are eager to endow a nation with a new culture, a definite programme of action follows: they must loosen the family ties; they must destroy or at least weaken the church; and they must transform the school into an accelerator of cultural

revolution. This was the natural programme of the Communists while they performed their Great Experiment.

In 1919, an authoritative representative of the regime said: "The family has ceased to be a necessity, both for its members and for the State". A few years later, another high dignitary declared that the Communists had to undermine the family, "this formidable stronghold of all the turpitudes of the old regime". And acts were still more conclusive than words.

The family, which was to be destroyed, was of the patriarchal type. In old Russia, marriage was a religious institution. Only religious marriage and divorce were recognized, so that the rules of the corresponding religious communities were exclusively applied. The superiority of the husband over the wife was legally recognised, but there was no joint property of the

consorts.

The wife received the husband's last name, but the Russians emphasised that, in contradiction to the West, their women never were addressed as "Mrs John Doe"; their first names had to be used. Parental authority was strong; up to the age of twenty-one, children needed parental consent for marriage and quite a few other significant acts. Naturally, the institution of inheritance existed. Thus, the strong family structure prevailed; this was especially the case among the peasants and the lower-middle class, whereas among the upper classes, the intellectuals, and the workers there was a well-expressed tendency to weaken the family ties.

This stronghold of the old order, this instrument of culture tradition, was attacked by the Communists from the very start of their rule. The general tendency was to destroy the stable

character of marital relations and make marriage as easily soluble as possible. Naturally, marriage was liberated from all bonds with religion: after a certain date, church weddings ceased to be accorded any legal effect. Instead of going to church, the prospective consorts had to apply for a "registration" of their marriage to local boards established for that purpose. Measures were taken to deprive the registration of the character of an impressive ceremony. The boards were usually located in some dark and abject room of an office building, and no words about the significance of marriage were uttered by the officials.

The most drastic change concerned divorce: in contradiction to the old law which made it so difficult, the decrees of December 17 and 18, 1917, permitted every consort to declare that he wanted his marriage to be cancelled. No reasons were to be given to the board. Receiving the application, it had to grant the cancellation immediately if there was mutual consent; if this was not the case, divorce was to be granted by the court, but this was a meaningless formality, since the court had to do it at the request of each consort, even if the other one opposed it. If one of the consorts was absent, he or she was notified by a postcard.

In addition to this, incest, bigamy, and adultery were dropped from the list of criminal offences. Abortion was explicitly permitted by the decree of November 20, 1920, provided that it was performed by an approved physician in a state hospital. Under these conditions, the physician had to accede to requests for abortion even if no valid reasons could be established. Under war communism, inheritance ceased to exist.

Weakening of Parental Authority

When marriage can be cancelled by means of a postcard, when there is no distinction between legitimacy and illegitimacy, when inheritance is unknown, parental authority is naturally weakened, and this effect was one of the purposes of the measures described. In official propaganda, the idea was persistently emphasised that children had to obey their parents only insofar as the parents complied loyally with the directions of those in power.

This signified, among other things, that unless they wanted to risk placing themselves in a dangerous position, parents could not oppose the propaganda of the Marxist doctrine, including atheism, to which the children were exposed at school. There they were taught to do their best to re-educate their parents in the Communist spirit and denounce them to the authorities if they displayed a marked counterrevolutionary attitude. Numerous family tragedies evolved on that basis, the state backing the children against the parents. Time and again the idea was publicly discussed as to whether family education ought not to be abolished and replaced by education in state institutions. Reluctantly, the idea was rejected as impractical, at least for the period of transition.

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A new Family Code was prepared in 1925 which became law as of January 1, 1927. The main innovation was the introduction of the institution of "the non-registered marriage", legally equal to the registered one. This meant that courts and boards were obliged to consider every union of a man and woman as marriage provided that at least one of the following conditions were present: (1) durable cohabitation; (2) common menage; (3) declaration of the relationship before third persons, or (4) mutual support and common education of the children. The unforeseen effect was the legalisation of bigamy: applying the new law, the Supreme Court prescribed the division of the estate of a deceased man between his registered and non-registered wife.

The period of the Second Socialist Offensive was characterised by additional efforts to uproot the traditional structure of the family. The labour law of the period made it obligatory to accept any job imposed on the individual, and often husband and wife were assigned work in different towns. To the complaint of a teacher that she

was artificially separated from her husband, the Labour Board replied that divorce was easy and that she probably could find another husband in the place of her occupation. In Stalingrad, it was decided to create "socialist suburbs" consisting of houses without apartments for family life, replaced by single rooms, refectories, and nurseries. The plan fell through because nobody but bachelors agreed to live in such suburbs.

The antifamily policy was crowned by partial success: around 1930, on the average, family ties were substantially weaker than they had been before the revolution. But this partial success was more than balanced by a number of detrimental effects unforeseen by the promoters of the Communist experiment. About 1934, these detrimental effects were found to endanger the very stability of the new society and its capacity to stand the test of war. Let us review these effects.

1. The abuse of the freedom of divorce and abortion resulted in an ominous decrease of the birth rate. No birth statistics have ever been published for the crucial years, but in 1937, the population proved to be 13 million behind expectation, so that around 1934, the deficit must already have been large. To what extent this was due to the freedoms just mentioned cannot be established. But the following figures speak for themselves: in 1934, in the medical institutions of the city of Moscow, 57 thousand children were born, but 154 thousand abortions were performed; in 1935, already under changing conditions, the figures were 70 thousand, and 155 thousand. As to divorce, the frequency of which also pushes down the birth rate, the following figures were reported from Moscow: in 1934, in 100 marriages there were 37 divorces, and in the first half of 1935, there were 38.3 divorces.

2. The dissolution of family ties especially of the parent-child relations threatened to produce a wholesale dissolution of community ties, with rapidly increasing juvenile delinquency as the main symptom.

In 1935, the Soviet papers were full of information and indignation about the rise of hooliganism, i.e., of crimes in which the sadistic joy of inflicting pain on somebody or destroying something of value was paramount. Everywhere, wrote the papers, gangs in-

vaded workingmen's dwellings, ransacked them, and destroyed or spoiled what they did not take away; if somebody dared to resist, he was mercilessly killed. In trains, the hooligans sang obscene songs; to prolong the fun, they did not permit travellers to alight at their destinations if they had not finished singing. Sometimes the schools were besieged by neglected children; other times gangs beat the teachers and attacked women, or regularly fought against one another.

3. Finally, the magnificent slogans of the liberation of sex and the emancipation of women proved to have worked in favour of the strong and reckless, and against the weak and shy. Millions of girls saw their lives ruined by Don Juans in Communist garb, and millions of children had never known parental homes.

Disturbing Effects

The disintegration of the family did not disturb the Communists, since this was precisely what they wanted to achieve, but they were disturbed by quite a few collateral effects of the disorganisation. The unfavourable trend of the population figures threatened to undermine both the labour supply and the strength of the nation at arms—for wars to be waged by the next generation. In the specific circumstances of 1934, the waste of human energy in juvenile delinquency, the combat against it, and love affairs, and the accumulation of unfavourable attitudes among the victims of the new family order—or perhaps disorder is the correct word?—could no longer be tolerated: they undermined the strength of the nation for the war which was straight ahead. The unfavourable development had to be stopped, and to achieve this the government had no other choice but to re-enforce that pillar of society which is the family. These were the main lines of development:

1. Contrary to the teachings of the previous years, young people were instructed to consider marriage “as the most serious affair in life”, since in principle it should be a union for life. Statements such as follow, which never could have appeared in the course of the Communist experiment, now daily adorned the Soviet papers and magazines: “There are people who dare to assert that the Revolution destroys the family; this is entirely wrong: the

family is an especially important phase of social relations in socialist society. . . . One of the basic rules of Communist morals is that of strengthening the family. . . . The right to divorce is not a right to sexual laxity. A poor husband and father cannot be a good citizen. People who abuse the freedom of divorce should be punished”. And actually, in 1935, the Soviet government started to prosecute men for rape who “changed their wives as gloves”, registering a marriage one day and divorce the next. *Pravda* told the following story:

Engineer P. seduced a girl by promising to marry her. When symptoms of pregnancy appeared, the girl reminded him of his promise. His reply was: “Look, dear, you are the seventh girl in my life to whom the same unpleasant thing has occurred. Here is a letter from another woman who is also bearing a child of mine. Could I marry her too?” The girl insisted, but the engineer terminated the discussion by

saying: “Forget about marriage. Do as you like. Here is money to pay for an abortion”. Having told the story, the paper added. “This man should be tried, and his trial ought to be a ‘demonstrative trial’.”

In the official journal of the Commissariat of Justice these amazing statements may be found:

The State cannot exist without the family. Marriage is a positive value for the Socialist Soviet State only if the partners see in it a lifelong union. So-called free love is a bourgeois invention and has nothing in common with the principles of conduct of a Soviet citizen. Moreover, marriage receives its full value for the State only if there is progeny, and the consorts experience the highest happiness of parenthood.

To include the rediscovered value of marriage into the minds of the younger generation, not only the negative method of deterrence of trials and producing indignation by well-chosen stories was used, but also the

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positive method of glorifying marriage by well-staged ceremonies; perhaps one could speak of "demonstrative marriage." Here is a story from *Izvestia*. The people involved are a *kolhoz* brigadier, V., and the first parachutist among *kolhoz* girls, B. The scene is Northern Caucasus, one of Russia's granaries.

The romance lasted about two years. In the beginning, V. hated B. He did his best to organise a shock brigade, but she preferred dancing and diverted the energy of youth towards that futility. When V. saw that he was unable to discourage that attraction he joined the movement, even started helping young people organise dances and athletic performances, and in return was helped by them in work. Then suddenly, when B. made her first jump, V. decided that life without her would be valueless, and proposed to her. She accepted. The secretaries of the regional and local party organisations decided to sponsor the marriage. Stimulated by them, the collective farm took over all preparations and decorated the village beautifully for the great day. The people's commissar for agriculture was invited to come. He could not accept, but congratulated the young people by wire and offered them a magnificent gift, a phonograph and a set of records.

The story is continued in *Pravda*. Early in the morning guests started arriving. Among them were leaders of the party, the Soviets, and the economic organisations, as well as the champion of the girl parachutists of the Union. About noon, a score of aeroplanes appeared in the sky. The betrothed were offered a ride, after which they were enthusiastically acclaimed by the crowd. About five o'clock, 800 guests were invited to dinner. Tables were overloaded with mutton, hams, ducks, chickens, pies, and other dishes. After a while the regional party secretary rose and made a speech congratulating the V's on their marriage, the most serious step in their lives. He expressed the hope that they would live in perfect unity and procreate an abundant Bolshevik progeny. The 800 present rose and drank to the health of the newlyweds. The people danced and rejoiced far into the night.

Was not this an invitation to millions of young people to reconsider those ideas about marriage which,

until quite recently, they were taught as belonging to the very essence of the doctrine? To re-enforce the new ideas, very simple, but probably very effective symbolic means were used. The registration offices ceased to be filthy places. Now, young people found them clean, comfortable, well furnished; the officers became polite, friendly, underlining the seriousness of the act. Marriage certificates started being issued on decent paper, no longer on wrapping paper, as was the case previously. For a small additional sum, the newlyweds could receive a marriage certificate designed by artists. Then, in the fall of 1936, wedding rings started being sold in Soviet shops. Since these rings are used in church weddings, this novelty could be interpreted as an invitation, on the part of the government, to have the civil marriage, or registration re-enforced and made almost indissoluble by the church.

The dissolution of family ties especially of the parent-child relations threatened to produce a wholesale dissolution of community ties, with rapidly increasing juvenile delinquency as the main symptom.

2. The freedom of divorce was first curtailed and then almost abolished. The first phase appears in the law of June 27, 1936, which introduced a number of inhibitions. It calls for the summoning of both parties when a divorce is to be registered.

Moreover, according to the law of September 28, 1935, the fact of divorce must be marked in the passports and birth certificates of the consorts. Commenting on this regulation, *Izvestia* expressed the hope that before marrying a "fluttering scoundrel", a girl would ask him to produce his papers and then perhaps renounce the honour of becoming his thirtieth bride.

Finally, the fee for divorce which previously had been rather nominal was substantially raised; instead of three rubles, one had to pay 50 rubles for the first divorce, 150 for the second, and 300 for the third and each subsequent divorce.

The effect of the antidivorce drive may be measured by the following figures: in the course of the second half of the year 1936, the number of

divorces in the Ukraine was 10,992, against 35,458 in the second half of 1935, in other words, it decreased more than three times.

The second phase appears in the decree of July 8, 1944.

Prospective applicants for divorce will henceforth be obliged to state their reasons and satisfy the courts that these reasons are serious and valid. Both parties must appear personally before a lower court which hears all the evidence and then seeks to determine if it cannot effect a reconciliation. If this is believed impossible, the petition can be carried to a higher court. Witnesses must be heard in both courts. The divorce fees have been raised to 2,000 rubles.

The Family Reinstated

Moreover, the decree of July 8, 1944, abolished the institution of "un-registered marriage" introduced in 1926. Now, only "registered marriage" is legally recognised; as a corollary, the "bourgeois" distinction between legitimate and illegitimate children has reappeared in Soviet law. In addition to this, "the research of paternity" has been explicitly forbidden, so that illegitimate children and their mothers will receive no alimony. Very definitely, this will prove a mighty deterrent to extra-marital relations, insofar as girls are concerned.

3. The freedom to dispose of unborn children through abortion no longer exists. Early in 1935 a campaign against abortion was started. Articles began to appear in Soviet papers written by high medical authorities explaining the harm which abortion, especially repeated abortion, inflicts on women. Praising maternity, these authorities declared that the longing for children had suddenly reappeared among the women of the Soviet Union—a manner of saying that now Stalin wanted them to bear as many children as possible. Trials resulting in severe sentences finished the careers of persons operating clandestine "abortaria": their very emergence disclosed that, without change in the law, Soviet hospitals no longer performed abortion at the simple request of the pregnant woman. Finally, a draft law prohibiting abortion was published and offered for public discussion. Numerous objections were raised, mainly based on

intolerable dwelling conditions. Nevertheless, the law of June 27, 1936, abolished the freedom of abortion which had been considered one of the highest achievements of Communism by many pro-Communists.

Repealing the notorious law of November 20, 1920, the new law prohibited abortion in all cases except where there was danger to life or health of the pregnant woman or danger of hereditary transmission of serious sickness. As in the former law, only medical men were permitted to perform the operation. Pressure exerted on a woman to induce her into abortion was declared a crime punishable by two years in prison. To make more child-bearing possible, the law promised a large extension of the network of maternity hospitals, day nurseries, and kindergartens. Maternity grants were increased, and special allowances were promised to mothers of six or more children.

4. The peculiar parent-child relationship which had obtained under the Communist experiment, and which granted superiority to the children, was reversed to one which is considered normal in the world; once more, children have to recognise the

authority of their parents. Obviously, the change could not be effected through legal enactment, and the method of persuasion through propaganda was used exactly in the same manner as it was used to stabilise marriage. Statements like these could be found almost daily on the pages of Soviet papers, beginning with the spring of 1935.

Young people should respect their elders, especially their parents. . . . The respect and care of parents is an essential part of the Comsomol morals. . . . One must respect and love his parents, even if they are old-fashioned and do not like the Comsomol.

In 1939, the official journal of the Union Prosecutor declared:

Sound moral ideas must be inculcated into the minds of young persons. They must know that lack of care for their parents is found only among savages and that in every civilised society such conduct is considered dishonest and base.

To corroborate these ideas, the journal cited the laws of Solon and Xenophon's works.

The method of positive demonstration was also used, and Stalin himself found it necessary to set the example.

In October, 1935, he paid a visit to his old mother living in Tiflis, and in the detailed accounts of this visit signs of love and respect to the old lady by the leader of the world proletariat were emphasised. A high degree of intimacy in family relations was displayed through the reproduction of such questions as: how did Stalin's children like the jam made for them by their grandmother. Another day Stalin appeared in one of Moscow's gardens with his children, something he had never done previously. Up to that time, the majority of Soviet citizens did not even know that Stalin had any children.

Gradually, the unlimited freedom granted to young people under the Communist experiment was curbed. One of the most conspicuous items in the process has been the decree of July 15, 1943, excluding children below the age of sixteen from evening performances in theatres and movies.

To strengthen parental authority, an indirect method has been used in the new inheritance law of March 20, 1945. While previous laws limited possible heirs to direct or adopted descendants, consorts, and needy dependants, the new law broadens this list to include parents, brothers, sisters, and public organisations. Although according to the new law the testator may not deprive his minor children or jobless heirs of their rightful portion, its impact on the family is clear: the greater the freedom to dispose of one's estate, the greater is the authority of the head of the family relating to presumptive heirs.

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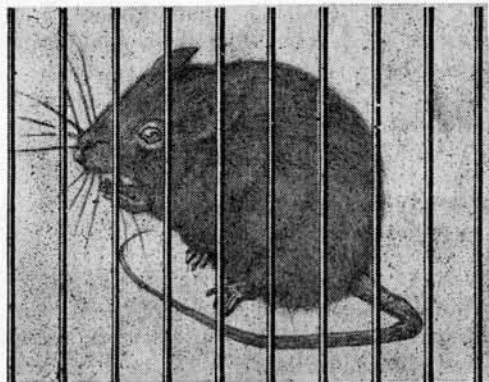
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Journal Review

Uptake of DDT from soil by earthworms

C. A. Edwards, K. Jeffs, *Nature*, 247 (5437) 157 (1974) Previous reports of DDT levels in earthworms range up to 700ppm. Usually they are in less than 10ppm. This paper shows that earthworms living in soil containing DDT at 1ppm accumulated DDT (with DDE, a product formed from DDT in the worm) in their tissues to about 4ppm in a month, and thereafter no further net accumulation occurred. When placed in a clean environment, earthworms eliminated DDT from their tissues in about a month. However, the DDE breakdown product was lost more slowly.

Planetary alignments and climatic change

J. Gribbin, *Nature*, 246 (5434) 453 (1973) Historical data suggest a link between solar activity and climate. Since solar activity is influenced by planetary alignments through tidal interactions on the sun, might it not be useful to consider predicting climatic change by studying these alignments?

Moisture can be poisonous

C. McJilton, R. Frank, R. Charlson, *Science*, 182 (4111) 503 (1973) Studies with guinea pigs show that high humidities enhance the effect of sulphur dioxide/aerosol mixed atmospheric pollutant on the lung.

Placental transfer of DDT in beef cattle

T. S. Rumsey, G. Samuelson, K. P. Bovard, B. M. Priode, *J. Animal Science*, 37 (5) 1186 (1973) If a pregnant heifer is given an injection of DDT, the pesticide can be detected in fetal liver and fat 3 hours later. Over an extended period of maternal DDT exposure, maternal and fetal fat tissue approach equal DDT residue levels.

Recording noise and air pollution

R. Freedman, J. R. Hyde, S. B. Reed, *Environmental Health*, p. 3 (Jan 74) A progress report on the methods of data handling at present being explored by the Environmental Sciences Group of the Scientific Branch of the Greater London Council.

Background noise

M. R. Ruocco, *Environmental Health*, p. 6 (Jan 74) Practical aspects of measuring background noise in a town, with special reference to a survey carried out in Harlow in 1972.

Water quality, trace elements and cardiovascular disease

WHO Chronicle, 27 (12) 534 (1973) In industrialised countries, cardiovascular disease accounts for 50 per cent of all deaths. The causes of cardiovascular disease, and its rapid increase since 1900 are poorly understood, but may be related to mineral elements in drinking water, food and the environment. The WHO research programme in this area is discussed.

Rubbish in the Thames Estuary

P. A. Board, *Marine Pollution Bulletin*, 4 (11) 165 (1973) Contrary to common wisdom, a nett landward drift of water occurs in the Thames Estuary near the river bed. Certain debris dumped in the Estuary is not carried out to sea, but tends to move less conveniently.

What does 'red mud' do to marine animals?

R. A. A. Blackman, K. W. Wilson, *Marine Pollution Bulletin*, 4 (11) 169 (1973) 'Red mud', a waste formed in the production of aluminium, has been dumped in the Bristol Channel for 6 years with no apparent ill effects on fisheries. But preliminary North Sea experiments suggest it is inadvisable for German industry to dump 'red mud' there. This paper notes slight differences in the toxicities of red muds of German and British origin. However, the physical and hydrological character of the dumping site and the mode of dumping are of central importance as rapid dispersion of the mud minimises risk. Perhaps more important still, the authors observe that the Bristol Channel site is "an area with very limited fauna and of little or no value to fisheries".

Typographic errors and technological solutions

D. H. Meadows, D. L. Meadows, *Nature*, 247 (5436) 97 (1974) While accepting a recently uncovered error in the computer simulation model for "Limits to Growth", the authors go on to state that this error does not alter their conclusion in any way. In a lucid non-technical account they summarise the basic notions on which the World Model rests as:

- i) that population and capital tend to grow exponentially
- ii) that there exist limits to the growth of any physical quantity on a finite earth
- iii) that significant delays exist in the feedback processes acting to contain population and capital within the global carrying capacity.

It follows that the present global population-capital system is dynamically unstable and that a disastrous over-shoot of the sustainable physical limits of population and capital will occur unless basic changes in social values are made.

Tar and plastic afloat in the Pacific

C. S. Wong, D. R. Green, W. J. Cretney, *Nature*, 247 (5435) 30 (1974) First quantitative measurements (Autumn 72) on the occurrence of tar and plastic wastes in the surface waters of the North Pacific are presented. Tar, as lumps up to about 1 in. diam. (and frequently colonised by small marine organisms) was more prevalent in the western Pacific (perhaps because 10 times more crude oil is transported by sea in the western ocean) while plastic waste was commoner in the eastern Pacific. Wind and current transportation effects influence distribution.

Absence of significant chromosome damage in men occupationally exposed to lead

M. L. O'Riordan, H. J. Evans, *Nature*, 247 (5435) 51 (1974) and

Lead over-absorption in a population of oxy-gas burners

W. Taylor, M. K. B. Molyneux, E. S. Blackadder, *Nature*, 247 (5435) 53 (1974) Burning lead-painted metal with a high temperature flame presents a health hazard to the worker, particularly in confined conditions, e.g. between decks of a ship in a ship-breaking yard. From the heavily painted plates of a merchant ship, lead in air concentrations of 4 to 14 mg/m³ were measured in the breathing zone (threshold limit value for 40 hr. week exposure, 0.2mg/m³). Zinc, copper and cadmium may also be present in the air. The actual exposure of workmen depends on variations in air movement and on the extent of voluntary use of respirators. The survey compared a group of 35 men employed as burners in a shipbreaking yard (average weekly exposure, 50 hr; length of exposure, 3 months to 43 years) with 35 other men in the same yard employed in other jobs. Symptoms of lead absorption (eg colic, dyspepsia, blue line in gums, etc) were noted in certain burners but not in the other group. High blood lead levels were noted in the burner group. At one time, none had blood lead in the "normal" range (less than 40 g/100ml) while 29 had blood lead in the "excessive" and "dangerous" categories (greater than 80 g/100ml). The long term health risk to "susceptible" employees must be considered. However no link could be found between chromosomal damage and a history of lead exposure.

Foreigners not wanted

T. M. Zaret, R. T. Paine, *Science*, 182 (4111), 449 (1973) The fish *Chichla ocellaris* (Peacock bass), a native of the Amazon, was introduced in 1967 into Gatun Lake in the Panama Canal Zone for the benefit of sporting fishermen. This paper documents the profound and unanticipated consequences of this introduction. These are still continuing. A devastating toll was taken of the native fish population and there is even the possibility of a resurgence of the local mosquito population caused by the reduction in the numbers of insect-eating fish.

K. R. Albane
E. S. Albane

Information for Survival

Seas and Oceans

Food or Fuel?

How are we to protect fisheries which have, if managed on a sustained yield basis, a permanent contribution to make to human welfare, from the economic pressures of short-term, but highly profitable, extraction of minerals—oil, gas, gravel and so on?

Int. Ocean Inst. Report VIII.

Ref: 000,615.

... Industry in the Seas

..... the possible failure of delegations to the UN Law of the Sea Conference to appreciate the nature and pace of technical developments and their impact on legal questions. For example, the special problems arising from the existence of submerged and semi-submerged storage tanks, deep pipelines, supertankers and their super-ports and offshore terminals, and of artificial islands—received scant consideration in the background documents.

Int. Ocean Inst. Report VIII.

Ref: 000,613.

Sewage

For four decades New York and surrounding cities have dumped about 5 million cubic yards of sewage a year, about 12 miles offshore. Some time around 1970, the resulting mass containing huge counts of bacteria and viruses began to move, creeping back to haunt New York and the beaches of Long Island. Studies have placed the leading edge of the sludge at two to three-and-a-half miles from the Long Island beaches. Three years ago the sludge was about 8 miles out. A federal report in 1972 said many lobsters and crabs near the site were found to be diseased. Fish were found with their fins rotting off.

Reported from *Los Angeles Times* by Robert Jones. *The Guardian* 14.1.74

Ref: 000,588.

Inland Waters

Management

In addition to letting water percolate through the soil and reach the streams and rivers as it will, men are today taking a hand in the cycle, using energy for the purpose. Water is being pumped out of, and also into, underground water-bearing areas in order to provide a regular supply. The process has analogies with homeostasis.

Dr. W. B. Wilkinson. *Financial Times* 28.1.74. Ref: 000,610.

The way in which water is managed in this country does not make any more of it. It makes more water available for more people. In this undertaking 75,000 people and £320 million are spent each year. Half the rain which falls gets into the water

system—about 190 cubic metres per day. This is over 10 times what is used by water supply units. The problem is to administer it in order to act as a water supply; a sink for industry; a recipient of sewage effluent; for amenity and recreational purposes; and to provide fresh water fisheries. Administration is to be restructured in April under 10 authorities—nine will apparently deal with natural drainage areas, the 10th will provide an overseer.

After Colin Jones, *Financial Times* 28.1.74 p. 32. Ref: 000,608.

A Purified Thames?

The Greater London Council was suffering a slightly red face at the weekend over its hearty claims to have radically improved fishing in the once-polluted Thames. Its sixth annual fishing contest, conducted between Battersea Park and Tower Bridge, was won by a man who caught one dace and one baby eel—which happened to be the total of fish caught by 54 anglers.

The Guardian 29.10.73 p. 7.

Ref: 000,596.

Food, Agriculture and Fisheries

Energy Expended

Distant water fishing—and even some near-water trawling—is one of the methods of food production consuming the highest amount of fuel per calorie of food produced.

Int. Ocean Inst. Report VIII.

Ref: 000,614.

Below the Sahara

On January 18th 1974 the FAO reported that the food situation in Niger causes serious concern, with supplies expected from abroad not sufficient to cover requirements. The government expected a shortfall of 33,000 tons of food grains.

FAO Press Release 18.1.74.

Ref: 000,606.

Ethiopia

About a third of the people in about half of Ethiopia's total land area are again threatened with starvation. About 3 million out of 10 million people in this half of the land are so threatened. Soil erosion is rampant. "The crux of the entire problem lies in the serf-like relationship existing between peasant farmers in most areas and the absentee landlords—a system which, among other things, limits the farmer's ability to build up adequate emergency stocks to overcome periods of crop failure."

Financial Times, 19.2.74 p. 7.

Ref: 000,618.

Fat

That animal production has become a system of fat production is obvious if one does some simple arithmetic. A standard carcass will produce some 30 per cent fat and 50 per cent lean but we neglect the additional fat infiltrated between the muscle cells as a result of the "high energy" feeds and management systems; four-fifths of that lean is water. Consequently there is only 10 per cent solid nutrient compared with 30

per cent fat. That is, we now produce three times as much fat as solid nutrient, although free-living or extensive animal systems produce 5 per cent carcass fats and 15 per cent solid nutrient.

Prof. M. A. Crawford, 36 Regents Park Rd. Letter to the *Times* 17.10.73.

Ref: 000,561.

World Grain Supplies

The global carryover stocks of grain were estimated by the FAO in October to be drawn down further in 1973 by 5 million tons to 40 million tons. Total world production of wheat in 1973/4 (excluding China) is tentatively forecast as almost 15 million tons more than in 1972/3.

Recent trends in world wheat consumption point to a yearly increase of at least 2.5 per cent (about 8 million tons).

FAO Press Release 73/90. Oct. 5, '73.

Ref: 000,605.

Fish

Although scientific proof is lacking, it is virtually certain that many stocks in the Mediterranean are now overfished, and that a few of them have been in such a state for some time. International regulations are almost non-existent, small mesh sizes are used in trawling, illegal use of explosives and other destructive methods are prevalent, and national regulations are often not enforced. The wide disparity in participation in the fisheries by the more developed northern countries and the less developed southern countries perhaps contributes to the continuation of this unsatisfactory state of affairs.

Dr. S. J. Holt. *Options Mediterraneennes*.

June '73 p. 86. Ref: 000,616.

Plants

The Lost Forests

Dr. Jurgen E. Raeder-Roitsch has completed a study of the Upper Volta and other countries of the Sub-Sahara zone. "If these regions had not been de-forested by over-grazing and systematic pillage of the vegetation they certainly would have resisted the present drought better." Inhabitants of parts of the drought stricken West African countries lack, not only water, food and animal fodder but also wood for cooking, building and heating in the cold desert nights.

FAO Press Release 73/79 17.9.73.

Ref: 000,563.

Animals

The Cheetah

Dr. Myers, a consultant ecologist, reports that there are only between 15,000 and 20,000 in the continent of Africa, mainly in the South West. Whatever figure one cares to place on the number of cheetah, this number is likely to be reduced by half well before the end of the decade because of habitat modification.

Michael Frenchman, *The Times* 18.8.73.

Ref: 000,599.



Reports

Defending the Landscape

Over the last 40 years the East Anglian Real Property Co. Ltd. has gradually been buying the land surrounding the village of Southrepps in North Norfolk. The policy of the company has been to skim down banks to field level on the principle that first and foremost we are farmers. As a result Southrepps has become an oasis in a desert.

The company recently bought a further 47 acres which had running across it an old road that fell out of use some 70 years ago. The road was bordered by high hedges and some oaks and has been used as a rural walk—one of the last left in the parish—ever since. When the executors sold the land, they reserved this green lane from the sale to be dedicated to the parish as a public right of way. I walked up the lane with one of the executors who was proud of the lane: he had many childhood memories of playing there and was delighted that it should belong to the parish.

Two days later we went up again and one of the hedges had been completely levelled to the ground by a bulldozer, two oaks were lying on their side with birds still flying in and out of the fallen branches. We were astounded at the brutal vandalism of the company. They had only had possession of the land for four days.

The driver of the bulldozer said that he had been instructed to level the other side as well. The parish was immediately called to arms: it was already afternoon: two parish councillors fetched a cartload of iron stakes and drove them along the boundaries of the lane to mark it out and to prevent the bulldozer from coming over the lane as it cleared the debris: the lane had already been churned up.

The press and the BBC were then informed of what had happened, as well as local conservation bodies. *Look East*, the BBC news, showed the bulldozer at work and the people of the parish lining the lane, each one standing by a stake. The manager of the Southrepps farms belonging to the company drove round and round in his van but did not get out.

The company made no attempt to consult with the parish: it simply claimed that the right of ownership entitled it to mow down the hedges and uproot the trees. The attitude of the general manager has been one of open cynicism. He called levelling the hedge "tidying the place up" and said that "If Green Lane has been used by the parish, then as far as I am concerned, they are lucky because it is so overgrown". His intention was to make the area into one large field, one further addition to the prairie. He then said that he had planted 300 trees in the village of Southrepps. In fact the trees had been planted round his manager's house "to keep the wind off".

Despite the publicity given to the destruction the next day more oak trees came down. By this time the Southrepps

Parish Council had lobbied the County Council and the CPRE (Norfolk Society) as well as many private individuals to bring pressure on the Company to respect the hedges and trees that bound the right of way, and—while the legal side was being investigated—the general manager of the Company finally appeared on the scene and met the Council Chairman and deputy Chairman. He then agreed to do nothing more than trim the remaining hedge. Meanwhile the vigilantes dug 30 holes, their intention being to plant 30 oaks in the place of those destroyed. The planting is being delayed while the legal width of the right of way is established though there is no doubt as to the positions of the fallen trees.

Although the old hedge and trees can now never be restored to their former beauty, at least the other side has been preserved. Southrepps hopes that this will be an example to other parish councils that something can be done by local government working with the general public to protect the landscape. The village intends to fight for a Government Bill protecting suitable hedges.

Robert Waller



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Friends of the Earth

At some unremarked point in the last few weeks the one-hundredth FOE local group came quietly into existence. Somehow in the hurly-burly of too little time to do too much work we forgot the champagne. But for all that it passed unsaluted, the occasion must count as a significant milestone in the development of FOE.

Like many good things, the growth of FOE local groups was not a totally premeditated and well-planned occurrence. In fact, when all the fuss surrounding the first Schweppes dump had died down, we were somewhat surprised to find that we had half a dozen or so local groups clamouring for attention. Since then their number has grown steadily, if a little intermittently, to the point where the time of two staff members is now fully occupied in co-ordinating their activities.

It has always been FOE policy for the local groups to be fully autonomous organisations—owing allegiance to the name and ideas embodied by FOE rather than to any constitution or structure. This approach has influenced the way we work in two important ways. Firstly, it has ensured that at the central office we recognise the importance of remaining constantly sensitive to the feelings of our grass roots. With no formal structure, and therefore no system of sanctions, the only way we have of ensuring the co-operation of

our groups in our campaigns is to be genuinely in touch with their aspirations and the realities of their situation.

The result of not being so would be for our groups to vote against us in the most effective way of all—with their feet. Secondly, this approach has meant that we have spent little or no time discussing the relative merits of various patterns of organisation for FOE. The time of both the full-time staff and the local groups has been devoted almost entirely to the issues at hand and the campaigns in progress.

What we feel we have come up with, partly by intention, partly by accident, is a way of working that is both powerful and flexible. Powerful because, when necessary and provided the issue is right, we can generate a public response from Penzance to the Orkneys, and moreover, we can do it quickly. Flexible in that we can adapt national or international issues and thus make them relevant to different areas. What we have is the ability to ask questions and raise issues with decision-makers and know that these same questions and issues are being raised all over the country—with MPs in their constituencies, with councillors in their wards and with the public in their own backyard.

We in London have seen our function not as one of directing or leading our local groups in what they should do, but rather as providing them with the tools to do the jobs they feel to be important. The Campaigners' Manual, the monthly co-ordinators' newsletter and the various regional meetings are all part of the strategy to improve the flow of experience between groups. The intention all the time is to keep raising the effectiveness of the campaigns we conduct. Increasingly we feel that it is not enough to lobby with hard-hitting documents on national issues. We must complement those actions with a strong

grass-roots organisation taking up issues at the community level. We cannot rely on fashions in the media or the intervention of the Arabs to continue putting the message across for us. In the long run it is what the vast mass of ordinary people think and feel that determines the kind of world we live in. It is only community-based local groups who can be really effective in getting the message through to them. The responsibility falls squarely on the local groups.

We have no illusions about what all this means for part-time voluntary workers. It is hard, hard work that often shows little or no tangible results. There is no glamour and almost everything one does seems so insignificant against the scale of the problems. All the future can promise for each FOE group, or indeed for any environmental organisation or committed individual, is work, more work and then work again.

Is it all worth it? The question becomes irrelevant when one considers what has been achieved. There have been some victories—Snowdonia, bans on whale products and big-cat skins—but more importantly we have helped to shift the whole basic attitude towards the environment. People are now at least aware that there are problems. These are our problems—and there are a lot of us trying to solve them.

Tom Burke,

Groups Co-ordinator FOE,
9 Poland Street, W1V 3DG.



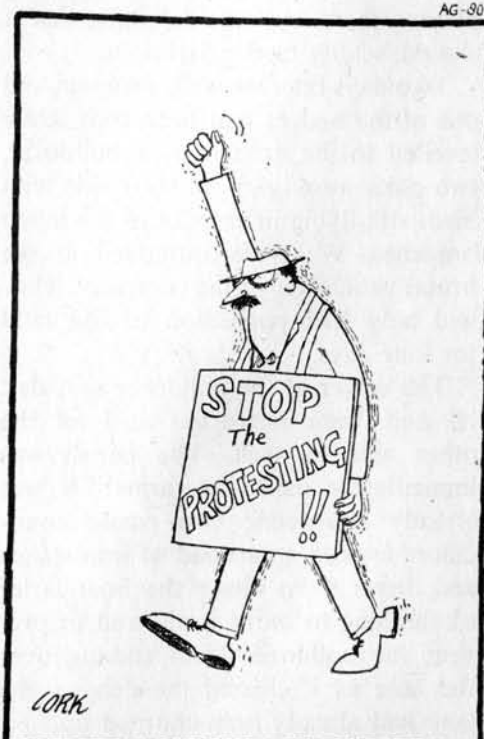
Boycott the Bullfight

Bulls are sent into the ring in such a condition that a lady could dispatch them with ease. So, unless you enjoy the wanton letting of blood, or seeing such sadistic cruelty, *join us*, an entirely voluntary organisation. Membership £1 (min) or send donation to:

The International Council Against Bullfighting
(Dept EC), 10, Queensborough Terrace, London W.2.

BOYCOTT THE BULLFIGHT

Last season, 6,600 bulls were needlessly tortured to death for fun, over 200 horses were crushed, maimed or died with serious internal injuries. There is so much more to Spain than these barbaric shows—the locals prefer football! Yet it is only the tourist ticket money that maintains these unequal contests.





Books

Man at a Dead End

HOMO SAPIENS IN DECLINE. A Reappraisal of Natural Selection by Gerhard Kraus, The New Diffusionist Press, London 1973. £2.25 hardback, £1 paperback.

Gerhard Kraus has written a fascinating book full of persuasively-argued insights into the origins of civilisations and human culture. His thesis is basically simple and for those who accept it, it must be the death knell of any belief in human progress and *ipso facto* in a theory of dialectical materialism. Indeed Kraus dispenses rather admirably with the idea that cultural change is primarily the result of a response to an environmental stimulus. Necessity can therefore no longer be invoked as the mother of invention.

The ramifications of Kraus' attitude to cultural evolution are enormous. No more can the origins of agriculture be seen as a desperate but ingenious

attempt to step up food production so as to nullify the environmental effects of a harsh and unremitting ice age. Nor can the rise of industrialism—together with its associated theories of social democracy—be seen as a straightforward development arising out of new environmental challenges to the human race. Instead both agriculture and industrialism came into being because of a fortuitous combination of human situation and personality, with man the dreamer acting out his fantasies. It is those fantasies that have changed the world for man not the reasoning of cold intellect.

Kraus begins his argument by marshalling evidence that the average size of man's cranial capacity reached a peak some 70,000 years ago with Neanderthal man and then began its slow decline to the present average of around 1,450 cc. Curiously brain size and cultural evolution appear to have inverse correlates. Indeed the almost unbelievable development of human civilisations and cultures appeared long after man's brain size began to decline. Why brain size should have declined to its present level is not entirely clear but Kraus does suggest that hunter gatherer man, in contrast to a large proportion of modern man, needed sharp wits to survive.

His next point is that much of human culture has a diffusionist base. This agriculture did not arise spontaneously at more or less the same time in the Middle East, in Central America, the Far East and Asia, but diffused outwards from the Middle East, obviously acquiring new crop types and

indeed livestock en route. Kraus claims that the time differences between the origins of agriculture in different parts of the world can be explained on the basis of the spreading out of the discovery from one particular nucleus. Many archaeologists argue against Kraus on this point, believing instead that agriculture had many different origins. But why then, Kraus asks, did all these origins have to occur in such a limited time span when man had thousands of years behind him—and a bigger brain?

Having once been a relatively peaceful creature who lived in tribes and co-operated with his fellow beings, man settled, became a farmer and pastoralist and invented religion, and a social conscience. In the name of both religious and libertarian movements, says Kraus, man began to wage war and kill, in spite of his innately peaceful tendencies. To cap all man has become an industrialist and a ravager of the environment. Nothing of human activity since Neanderthal man therefore indicates the progress of man either biologically or culturally. Man, according to Kraus is not only in decline, he is at a dead end.

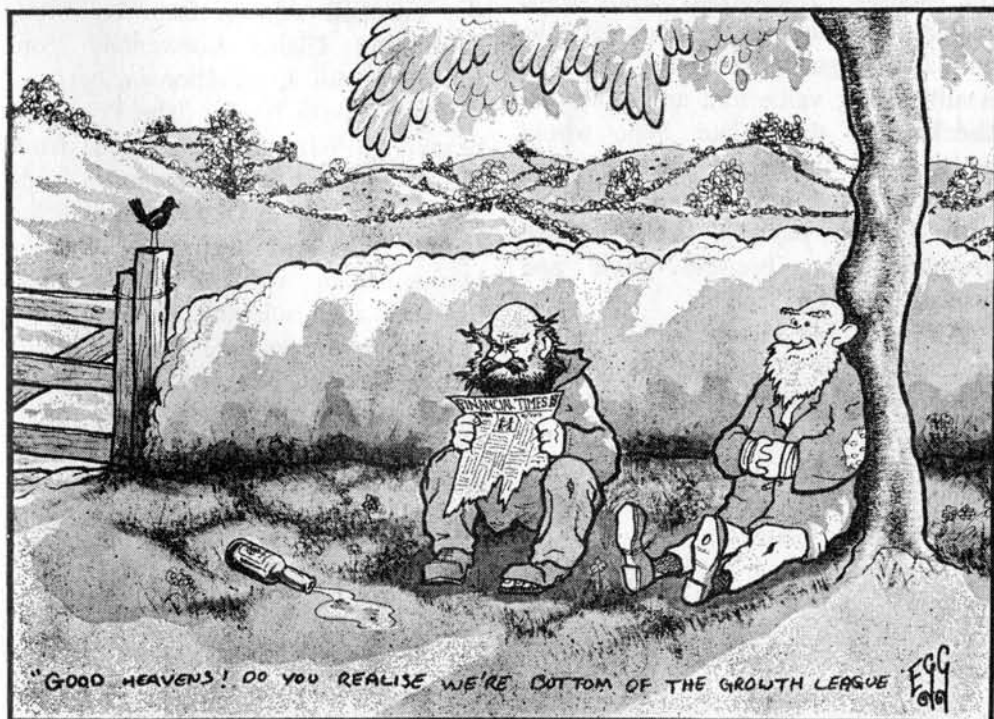
One cannot help asking oneself, could Kraus be right? *Peter Bunyard*

Human Ecology

NATURAL MAN by Robert Allen. Aldus Books. £2.50.
FOREST LIFE by Michael Boorer. Aldus Books. £2.50.
EVERY LIVING THING by Malcolm Ross-Macdonald. Aldus Books. £2.50.

These three attractively produced and beautifully illustrated books from Aldus form part of a series which will eventually build into an encyclopaedia of Natural Life. Taken together they make an excellent introduction to ecology, and should be in every school library.

Robert Allen begins his book, *Natural Man*, with a description of man's evolution from the apes, and follows with an absorbing section on the !Kung bushmen of the Kalahari desert in which he gives the reader an insight into the real meaning of tribal life. Remarkable statistics show that the !Kung people enjoy a high standard of nutrition, a great deal of leisure time for social activities and care for



their children, their sick and their old people in a way which leaves the efforts of civilised man at the starting post. They are among the most successful hunter-gatherer societies still surviving today, but unhappily for future generations, their way of life is threatened by the inevitable whittling away of their territory.

In the following sections Robert Allen discusses Natural Man's hunting activities, social mores and his relationship to his environment as shown in such widely distributed peoples as the Eskimos the Amerindians and the Aborigines. In the final disturbing part of his book we are brought back with a jolt from this happy expedition to the cruel contemplation of the conditions these people live in today, deprived of their territory and their culture. There is much for modern man to learn from natural man about social behaviour, about food plants, natural medicine and hallucigens, much valuable knowledge that we would do well to acquire now if we hope to survive in the post industrial world.

Michael Boorer's *Forest Life* is a clear and attractive account of the ecological niches provided by the world's forests from the coniferous belts of the far north to the tropical forests of the southern hemisphere.

The intricate balance of nature demonstrated by the interaction of animal and plant life in the forest is illustrated by excellent food-chain diagrams and the colour photography is superb. Mr Boorer, like Robert Allen, by showing how superlatively well nature has ordered her own affairs for millions of years, brings home to his readers the enormity of industrial man's disregard for his inheritance.

This theme is inherent again in Malcolm Ross-Macdonald's *Every Living Thing*. His subject is perhaps too large for so slim a volume and selection must have been a problem, but his book too is full of insights in to specific examples of the interdependence of all living things. Mr Ross-Macdonald does not mince his words when he states unequivocally that there is no way in which the present world population can ever enjoy the standards of the developed minority, and points out that the vast wealth of the developed world was achieved "...at a staggering cost to the environment". He believes, however, that a process of slowing down the destruction of the en-

vironment can begin, and that through the increasing concern of individuals this is happening. Since people cannot be engaged in a totally lost cause it is necessary to pass this belief on to new generations.

The message from this collection is urgent and not in dispute. Industrial man, through greed and ignorance, has already done an inconceivable amount of damage in the world he shares with all living things. Much is already lost and beyond repair; now every one of us must learn to care passionately and to contribute actively to the struggle to set the world free from further devastation.

Ruth Lumley-Smith

Eating your way to health

THE NATURAL FOODS PRIMER by Beatrice Trum Hunter. George Allen and Unwin, £2.25.

THE A TO Z OF HEALTH FOOD TERMS by Michael Balfour and Judy Allen. Garnstone Press, £1.60.

Reading between the chatty homilies and home spun philosophy, this American book contains a considerable amount of useful and accurate information for the bewildered beginner in health foods.

Anyone taking up the health food banner anew could well benefit from the simple descriptions and basic recipes although a number of the culinary suggestions are of doubtful health giving value and are somewhat shocking to the palate. Who would really enjoy "bite-sized pieces of fresh coconut baked in a low oven mixed with garlic, paprika, kelp, mixed crushed herbs, brewers yeast and ground cummin seed"?

Although Mr Hanssen has done a competent job of editing the English edition, the American author has an unpleasant tendency of talking down to the reader.

The A to Z of Health Food Terms represents far better value for money and is an excellent handbook and an invaluable guide both for the newcomer to health foods and for the old hand.

Some of the contributors are more

authorative than others and it is those who avoid the moral, nutritional and ecological extremes whose contributions carry most weight. Scientific conclusions should be experimentally demonstrable and some of the contributors fall into the trap of making claims which are outside the realms of scientific proof at this time.

Muriel Mackay, writing on apple cider vinegar says, "it will render ineffective disease bacteria in the alimentary tract". Is there any published evidence to substantiate this claim? It may well be true and if so, should be seriously researched, but claims such as these without proof will serve to alienate many people from the health food path. In the same chapter, Miss Mackay states that it (cider vinegar) ... "prevents loss of blood from the body and tenderises the tissues". Such statements are meaningless mumbo jumbo.

Dr Milton however, writing on subjects such as biochemistry, calcium, carbohydrates, nicotinamide, vitamin 'E' and zinc, provides clear concise descriptions which are easily understandable by the layman and make sense to the scientist. His explorations of many scientific terms will make understanding of health food problems much easier.

Margaret Brady writes with great authority and simplicity on subjects such as bread, flour and wheat germ and explains once and for all the differences between white flour and brown flour.

All dairy questions are expertly answered by Arthur Hollins, owner of the Fordhall organic farm in Shropshire and Claire Loewenfeld contributes useful information on herbs.

From Aduki beans, "the Prince of beans", to Whakame, a seaweed from the Japanese islands, Gregory Sands and J. Landesman take us through the rather uncharted waters of macrobiotics, again with rather more enthusiasm than scientific fact.

If you are desperate to learn about Hiziki, Kombu, Niso, Mung beans, or Tahini or if you want to know more about amino acids, barley, bread, carbohydrates or cooking oils, this is the book for you.

Well presented, a handy reference book, easy to read and easy to understand, this volume will usefully fill a gap on the bookshelf.

Michael A Van Straten



Kropotkin's Commune

Sir,

It is quite clear that industrial society as it now functions, with its prodigal use of energy and resources, its hyper-mobility, its subjection of people to monster machines and monster institutions is heading for disaster. But there may still be time to organise alternatives, maybe only as lifeboats, but hopefully as pilot experiments for a post-industrial society, along the lines suggested by the 'Blueprint for Survival'.

There may be, by now, enough people with ecological awareness and consciences who would be ready to try to start one or more prototype eco-communities of sufficient size to permit an independent internal economy (from 500 to 1500 people seems about right). Such communities would aim to support themselves as far as possible from local resources, to limit their energy and resource use and to maintain a local ecological balance. They would probably need about an acre of land per person. Communities of this kind were envisaged and researched in the early 1800s by Charles Fourier and in the early 1900s by Peter Kropotkin, and the practical possibilities have been demonstrated already if we combine the experience of the kibbutzim of Israel, the communes of China and the communities of the Amish, the Hutterites (and formerly the Shakers) in America.

A good deal of preparatory research and planning relating to current conditions in this country would be required. But 1,000-acre farms are bought and sold quite frequently, and entire villages may sometimes be available in remoter areas. Financial and planning-permission obstacles would need to be overcome, but should not prove insurmountable. Agricultural and manufac-

turing techniques using alternative or intermediate technology would need to be developed or rediscovered. Internal organisation should be thought out in advance as far as possible, but flexibility and variety will be important. Communities would probably function best today if they comprised individual family units alongside some small communal-living groups—this comes closer to Kropotkin's plan than Fourier's.

Some people have already begun to communicate about this project, and if a sufficient nucleus of committed people can be formed, regular planning meetings will be started. We have available a short introductory leaflet and a rather theoretical reading list relating to the idea. Anyone interested in being in at the start (or even later) should please contact us.

*Roger Franklin,
Don and Lin Warren,
3 Salubrious,
Broadway, Worcs.*

Sulphur emissions

Sir,

I think a very misleading impression of the effects of sulphur dioxide emissions from the UK may have been created by the quotation in a letter from Mr B. Rome printed in your January 1974 issue.

I am not familiar with the article to which Mr Rome refers and will not question the statement that lichens have been devastated right across the North European Plain and are absent entirely in Denmark and the Netherlands. However, for the blame to be laid entirely on the 6 + million tons p.a. of sulphur dioxide released by UK sources is totally erroneous. The sulphur dioxide emissions in the countries of the North European Plain account for at least 5 million tons a year (Ottar, paper to 1973 Clean Air Congress, Dusseldorf) without the emission of around 6½ million tons p.a. from the D.D.R. (based on the 1968–80 projected increase in brown coal production) coalfields nearby. When emissions from Silesia and northern Bohemia are taken into account, the figure for the Eastern Bloc countries could be in the region of 11 million tons a year.

It is not unreasonable to suppose that in west and north-west winds, which carry our emissions to the mainland, dilution and removal of the sul-

phur dioxide will be considerable: UK emissions represent a line source crossed normally by these airflows which are commonly very turbulent and accompanied by precipitation, often heavy. Observations I have made on the west coast of Jutland at two locations over two winter periods have shown this to be the case: mean sulphur dioxide concentrations due to emissions in the UK account for only 9–12 $\mu\text{g}/\text{m}^3$. On the other hand, emissions in mainland Europe would be carried to the UK in south-easterly and easterly airflows. Their effects would be integrated since the passage of the air would be along the axis of sources but dilution and removal would generally be very limited as east and south-east winds tend to be low in speed, lack turbulence and are frequently dry. Observations at Dungeness and Flamborough Head show this to be the case. Mean sulphur dioxide concentrations in east winds at Dungeness for the winter period 1971/2 I found to be 42 $\mu\text{g}/\text{m}^3$, with one 24 hour observation reaching 12½ $\mu\text{g}/\text{m}^3$. At Flamborough the corresponding mean value for south-east winds was 32 $\mu\text{g}/\text{m}^3$.

Yours faithfully,

*R. A. Barnes,
Department of Geography,
University College London,
Gower Street,
London, WC1E 6BT.*

It's faster by bike

Sir,

In recent years we seem to have become so obsessed with the rapid mobility of the individual by means of the motor car that we completely ignore many of the more traditional modes of transport. Before the building of the Severn Bridge and its network of feeder motorways an excellent service of passenger ferries provided daily trips between the ports of South Wales and Devon and Somerset. Unhappily the bridge has taken away the ferries customers. Instead of taking the delightful trip across the Channel, in the lee of the islands of Flatholme and Steepholme, they prefer to drive their cars along the nerve-wracking route along the South Wales coast, over the bridge, and through Bristol into the West of England.

As a student living near Taunton in Somerset and attending college in Barry Glamorgan, I have to make the

journey from South Wales to Somerset several times a year. By car, with motorways almost from door to door, this thoroughly unpleasant journey takes 2½ hours. By bus and train through the Severn Tunnel it takes anything from three to five hours. During the summer months, however, there is an alternative when the last of the Severn ferries provides a limited service of day excursions for holiday-makers about once a fortnight. One-way passages are discouraged by high prices and there is no suggestion that this service can compete with the motorway in the serious business of getting from one place to another in the shortest possible time. Despite these limitations I was able to put myself and my bicycle on the ferry at Barry and sail across to Weston-super-Mare. From Weston I then cycled the 30 or so miles home past an almost endless traffic jam. I had taken this route simply to avoid the motorway but to my surprise the total journey time from door to door was only 2¼ hours!

This had been achieved using a bicycle to make the ferry connections, before the demise of the ferries they had all been served with good bus and train services.

The cost in resources and the destruction of the environment involved in the provision of the Severn Bridge route from Somerset to South Wales as an example of a 'high speed' transport system does not bear thinking about. And yet if only our obsession with the motor car allowed us to see an inch beyond the ends of our noses we would have realised that in many cases we are replacing a possibly

superior transport network. The demise of the Severn ferries as a result of our mindless insistence on travelling by car has deprived us of a shorter, cheaper (in every sense of the word) and infinitely more enjoyable means of getting from South Wales to South West England. Just what are we trying to achieve?

Yours,
Geoffrey Garbett,
'Harvest Cottage',
Stoke St. Gregory,
Taunton, Somerset.

Fluoridation

Sir,

As from April the Area Health Authorities will be advising the regional water authorities if they wish to fluoridate their water supplies. According to the Dept. of Health: "There will continue to be elected local authority representatives in both health and water authorities". Should that give us hope that they will understand the true implications of fluoridation?

"The Government has no intention at the present time of bringing forward legislation for the introduction of fluoridation generally" (28 Dec. 1973), but it also admits (9 Jan. 1974): "The Secretary of State for Social Services recommends fluoridation in view of the scientific and factual evidence in support of the measure, but the decision whether to fluoridate will remain one to be taken locally".

What scientific and factual evidence? This is not merely a dental matter and that too is questionable. Our enthusiasm for good teeth must start with nutritional wisdom, and common sense

cleansing. Dental caries are a symptom of faulty diet and not due to a lack of sodium fluoride. Where posters in schools advocate an apple etc. after meals, this should be encouraged verbally and in practice. Teachers, doctors, nurses, psychologists, parents, and even dentists should avoid "rewarding" children with sweets. Let the whole public, not only those with access to British Medical Journals and M.O.H. files be shown this so-called evidence. How should one measure the moral implications of mass medication even if the medical, dental and environmental case in favour were sure and safe in short and long term. Let us hear the history of fluoridation from its American beginnings in the aluminium slag heaps and big business, and let us wonder why so much of Europe has abandoned or rejected fluoride programmes. When shall we hear the voice of environmental groups such as Friends of the Earth, on this matter? Yours faithfully,
J. M. Harriot (Mrs),
156 Lancaster Road,
London, W11 1QU.

The changing climate

Sir,

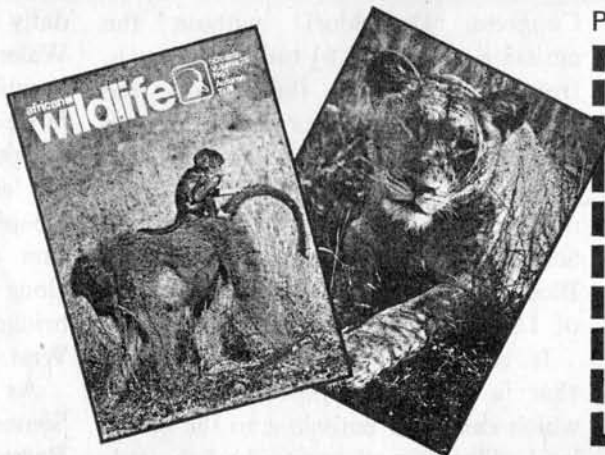
Dr Reid A. Bryson's article in the October issue on the position of the Inter-tropical Discontinuity and its effect on the drought now occurring in the Sahelian zone of Africa and other parts of the world is very disturbing. He shows that its latitude is related to the temperature difference between the polar and equatorial zones. I observe however that this temperature differ-

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ence can be affected by changes at either end: that is a change at the polar end—he shows that a fall has occurred recently; or a change at the equatorial region; or by a combination of each.

I wonder whether there is any information available on a possible rise in the tropical temperature caused perhaps by the extensive cutting of forests which has occurred in many parts of the tropical zone. I suspect that this area of Kenya, which was formerly dense forest, is now much hotter than it was before the forest cover was removed. Those areas which are still forested are noticeably cooler than the cleared areas, especially during the dry season.

If this is an effect distributed over a large proportion of the equatorial zone, as I suspect it is, could this have contributed to the southerly drift of the ITD? If it has, it seems likely that the reafforestation schemes being proposed by the Sahelian governments might be effective in pushing the ITD north again.

It also suggests that the proportion of land devoted to forest in other parts of the equatorial zone ought to be carefully controlled. For example, few people in Kenya consider that Kenya is in danger of being engulfed by the desert, and perhaps there is little danger of this (although many parts of the country are experiencing a severe drought at present) but it could be that the proportion of forest in Kenya is affecting the rainfall in Ethiopia.

Interference with the Amazon forest would also have to be carefully controlled lest it affect Central America's rainfall.

I should be interested to know whether the effect of forest cover on the position of the ITD has been assessed.

Yours faithfully,
E. G. Matthews,
Musingu High School,
P.O. Box 151,
Kakamega,
Kenya.

The UN Development Programme

Sir,

I have no wish to heap further controversy on to an already overloaded topic. However, because your publication is so widely influential, and because

the issues involved clearly deserve an airing of all reasonable points of view, I feel duty-bound to comment on Michael Allaby's critique of the United Nations Development Programme's publication *Beyond Conflict or Compromise*.

First of all, Mr Allaby suggests that the booklet ignores assertions by the Stockholm Conference that "man must operate within constraints imposed by the availability of the resources on which he depends, and by the physical and biological systems of which he is a part". Quite to the contrary, however, "Beyond Conflict or Compromise" explicitly states that "there are fixed limits on the natural resources available to support development and on the capacity of the biosphere to tolerate the pollution that development often engenders". It goes on to stress that this makes imperative the finding of a new "third way" under which the very real differences between the developers and the environmentalists can be affectively reconciled. In short, it definitely does not advocate, as the review declares, "more of the same".

This point is repeatedly made in the booklet's description of UNDP-supported activities and of development problems in general. Michael Allaby's commentary on these descriptions omits key portions of the text and links together other portions which are completely separate. The result is considerable distortion.

The review also declared that "one year after Stockholm, Africa and India face one of the most serious famines in history". This is certainly true of Sahelian Africa (but probably not of India in anything like the same degree). In any case, the basic cause is a totally unprecedented series of natural disasters, both drought and flood, which can hardly be attributed, as Mr Allaby implies, to human malfeasance or developmental sins. As a matter of fact, the UNDP is urgently seeking ways in which the effects of such catastrophes can be mitigated by advance planning, crop diversification, the introduction of more scientific agricultural methods, etc. Finally your reviewer says that if and when the developing countries need aid or advice they will ask for it. This is precisely the case with the United Nations Development Programme.

We provide no assistance whatsoever

except upon the direct request of the countries involved and under terms these countries themselves very largely specify. Actually, these developing countries are the firmest supporters of the Programme. They voluntarily pay for more than half of their own UNDP-supported development activities, and also contribute to our central resources on a generous scale.

All this is in no way to denigrate the serious issues raised in your commentary. It is, however, intended to give your readers a more rounded version of the ideas put forward in *Beyond Conflict or Compromise* than they would obtain from Mr Allaby's review. Sincerely,

John von Arnold,
Chief, Special Projects Section,
Division of Information,
United Nations Development
Programme,
866 United Nations Plaza,
New York, N.Y. 10017, U.S.A.

Drab Victoriana

Sir,

Two points did not ring true in James Stevens Curl's "The Destruction of Towns", January 1974 issue, and need correction or at least reappraisal.

Of the "acres of low-rise houses (... perfectly capable of being updated to modern standards)..." which he mentions, a relatively small proportion is really worthy of being retained for aesthetic and social reasons. The rest are simply nineteenth century Britain's very mediocre solution for housing the population explosion. The British, it seems, are conditioned to accept and even admire these endless rows of more or less mean little boxes which too easily obliterated our often not very robust landscape and topography with their stupefying repetitiveness, trivial ornament, and sour and disjunctive little gardens, and strangled urbanity and community life with their remoteness from shops, churches, cinemas, theatres, exhibition space and other centres for sociable congregation.

The second heresy in the otherwise sound doctrine was the suggestion that "the vandalism of the frustrated youngster"... "intent on smashing up his own immediate environment" should be "related to the vandalistic model set by the developers..." This is just sentimental moralising, the cant with which the wrong-doers justify their

misdeemeanours, obligingly provided by the Easy Left. To Curl's credit, it is not his own work, but, also, it is not up to the standard of his work. There is no parallel between destroying in order to replace with something more useful—at least, according to some criteria—and destroying for pleasure. If the developer gives aesthetics a lower value than economic usefulness or his concept of social need in some contentious instances, this does not mean that he is wantonly destructive. The contempt for their environment which these youngsters show has clearly a different origin. It is important to identify it accurately—but that is outside the intention of this letter.

Yours faithfully,
Robin McEwan,
40 Castle Avenue,
London, E.4.

The post-industrial age

Sir,

I see that the *Ecologist* starts off 1974 by calling itself the journal of the post industrial age. I do not think this a very logical description of the *Ecologist*, for the post industrial age is certainly not here yet, and the *Ecologist* concerns itself mainly with problems associated with the industrial age: problems which will not exist in the post industrial age. What is more, it is extremely unlikely that the necessary materials, money, and machinery for the production of the *Ecologist* will be available when and if the post industrial age arrives.

Yet I must admit that someone is showing commendable optimism in assuming that the post industrial age is in sight, and will come, without Homo

Sapiens killing off the terrestrial biosphere in the meantime.

Yours faithfully,
Justin Cooke,
6 Abbotts Road,
Winchester,
Hants.

The Channel Tunnel

Sir,

I feel I have to take exception to Peter Bunyard's repeated lumping together as "harebrained schemes", the Channel Tunnel, with Concorde and Maplin.

The only harebrained part of the Tunnel scheme are the proposed Tunnel mouth terminals to carry the obsolete private car and juggernaut lorries, together with the construction of motorways at each end to provide for them. This, of course, is lunacy of a high order, as it is obvious that the traffic should pass to the railway at its point of origin.

The tunnel will be constructed for a high speed electric railway, the only pollution-free form of transport available to us, other than the sailing ship, electric tram and trolleybus, and these three are likely to be used again in the not too distant future.

The electric railway, of which the Channel Tunnel will provide a vital link between British and European systems, is the transport form which is least wasteful of energy resources, costs far less to build than a motorway, and occupies a minimal amount of land to carry a maximum load. A 100 ton Railway Wagon, for example costs about a third of the cost of a 32 ton gross Lorry, and has a life of at least 30 years against the average for the lorry

of six years. The carrying capacity of a double track railway is about three to four times that of a six lane motorway at its peak loading, and it operates at a minimal noise level, and potentially far higher speed.

Therefore, whilst we have a transport need that is unlikely to decline in the foreseeable future, it is bound to be the electric railway of which the Tunnel will form an essential part.

Yours faithfully,
Roland F. White,
Latymer,
The Drive,
Belmont,
Surrey.

Dangerous occupations

Sir,

In his fascinating article on Education (January issue) Edward Goldsmith says "In China, university graduates in large numbers are being made to return to the land as farm labourers, which we cannot possibly do in a democratic country". In fact, a good many university graduates are working on the land in communes, and is there any reason why everyone who wants further education should not be required to earn it by some form of national service? This could take the form of work on the land, in factories or in the mines. Professor Gabor, in a recent talk to environmental journalists, made the point that no one should have to spend his whole life in an unpleasant job like mining, but if this formed part of a national service, the industry would be assured of a continuing work force, with perhaps some extra incentive

SUBSCRIPTIONS

We are sorry to announce that in common with almost every other comparable periodical the ECOLOGIST is now forced to increase its price. This is due to phenomenal increases in the cost of paper, printing and postage. The new rates applying from JUNE are:

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—a shorter period, for instance, to qualify. Mr Edward Heath has recently referred to agriculture as being also unpleasant and dangerous, but it has no need to be so and it is to be hoped that farming in the future may be freed from hazards of tractor accidents, poisoning from insecticides, disease contracted from intensively reared animals and other drawbacks. Altogether, there would seem to be some very good arguments for such service, which would form a basis of true understanding between white collar and manual workers.

Yours faithfully,

J. Bower,

Hon. Secretary,

The Farm and Food Society,

37 Tanza Road,

London, N.W.3.



Self Sufficiency

It is not possible, by definition, to be completely self-sufficient. Even John and Sally Seymour, those expert homesteaders and authors of the recently published *'Self Sufficiency'* (Faber) are not truly independent.

What is possible is to be *more* self-sufficient, regardless of whether we live in town, country or somewhere in between.

For those contemplating organic husbandry for the first time, either on a farm, small-holding, allotment, garden or backyard, the problem may initially be one of lack of information. There are several organisations which can help:

The Soil Association is conscious of this need and has organised a one-week course entitled "A Biological Approach to Soil Husbandry" at Ewell Technical College, Surrey, from 8th-12th July. This will consist of lectures, discus-

sions and a visit to an organic farm or market-garden. Further details may be had from Dr Deavin at the College.

At Cowley Wood Conservation Centre the organisers are running four courses of five days' duration each, from 30th September—25th October. The emphasis is on practical tuition and providing the knowledge necessary for successful organic growing, non-intensive small livestock rearing and fish culture.

Working Weekends on Organic Farms (WWOOF) is a non-profit making organisation which will arrange for you to stay and work at an organic farm in the South of England on an exchange basis—you work on the land in exchange for meals and a place to sleep (sleeping bag essential). They also provide a list of farms which you can contact yourself to make your own arrangements. (I shall be pleased to hear from any other individual, organisation or society who can help in this field—write to Self-Sufficiency, 19 Anne Boleyn's Walk, Cheam, Surrey).

Useful addresses: (S.A.E. appreciated).

The Soil Association, Walnut Tree Manor, Haughley, Stowmarket, Suffolk, IP4 3RS.

Soil Husbandry Course, c/o Dr Deavin, Ewell Technical College, Ewell, Surrey.

Cowley Wood Conservation Centre, Parracombe, North Devon.

WWOOF, 23 Maple Grove, London W.5.

Henry Doubleday Research Association, 20 Convent Lane, Bocking, Braintree, Essex.

Good Gardeners' Association, Arkley Manor, Arkley, S. Herts.

Machines—

masters or slaves of man?

by Prof. M. W. Thring

'Machines—master or slaves of man?' is the first volume in a new series, from Peter Peregrinus Ltd., entitled 'Mankind and the engineer'. Its author Prof. Meredith Thring hardly needs an introduction; his articles in a number of journals, his appearances on television, and articles about him in the Press, have distinguished him not only as an innovator, but also as one whose prognostications about the future of civilisation must be seriously heeded by all sensible people. As a professional man whose qualifications embrace electrical, mechanical, chemical and aeronautical engineering, he is ideally placed to write on many aspects of technology. Equally important is his deep love of humanity which shows clearly in the pages of this book.

Prof. Thring examines the good and bad effects that engineering can have on our future development by it leading us into an affluent but dehumanised society, or into an alternative creative society in which the quality of life is set as a more important aim than ever expanding consumption of goods.

Topics covered include: the vital need for a 21st-century Utopia; the misuse of technology; how technology can provide an adequate standard of living for everyone in a crowded world; life, politics and economics in the creative society; the role of education; and how we can reach such a society.

The book has 120 pages, 234 x 156 mm, in soft covers, and was published on the 10th December 1973, price £1.95.

Inquiries and orders with remittances, should be sent to:

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Further information from:

Dr. A. Deavin, Research Director
Ewell County Technical College
Reigate Road, Ewell, Surrey, England.

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on

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Paris, 24-28 June 1974

The symposium is organised by The Commission of European Communities, The Environmental Protection Agency of the United States and The World Health Organisation.

Secretariat of the symposium: Health Protection Directorate, 29 rue Aldringen, Luxembourg.

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will be held in The Hague, The Netherlands, between 8-14 September 1974.

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Information: Secretariat First International Congress of Ecology, P.O. Box 9000, The Hague, The Netherlands.

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If you are interested write to me for a fuller description of TSS. (Please send foolscap s.a.e.)

Keith Hudson,
Co-ordinating Secretary, TSS,
79 Sutton Avenue, Eastern Green,
Coventry CV5 7ER. Tel: 0203 463062

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A FOOT IN BOTH CAMPS. Housing Society (not self-build) setting up to provide new low-energy homes with family privacy plus communal sharing, for ecological living with organic gardening, etc. In Herts within commuting distance of the treadmill. Box No. PD 35.

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PUBLICATIONS

"THE UNIFIED QUANTUM FIELD THEORY" by Victor G. Hobson, now available, is an astounding new theory which unifies Science.

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Order from universities, book-shops, or direct from the author (90p each). "Aysgarth," Leamington Road, Broadway, Worcester.

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GIRL—18-25, intelligent, imaginative, rational, social conscience, physically fit, sought by young man of similar attributes who fears inevitable eco-catastrophe and desires companionship of attractive like-minded partner with whom to share happily the remaining years of industrial civilisation. No children desired of course. Perfectly serious. All letters answered. Box No. PD.27.

SCHOOL TEACHER/PARENT interested in exploring the role that Parent/Teacher organisations could play in environmental action within the community, would welcome advice, suggestions, etc., from interested individuals, organisations. Box No. PD.30.

EXCEPTIONALLY ATTRACTIVE NEW COUNTRY COTTAGE with garage offered couple in exchange for help and co-operation with weekenders in their garden, fields and house. Country-lovers with knowledge of chickens, bees, etc., appreciated. Might suit early retired army or self-employed. Box No. PD 36.

CARPENTER/JOINER (freelance) and wife who is S.R.N. would like to meet other couples who would be keen to start a self-supporting co-operative farm. Ring Paul or Mary evenings, Walton-on-Thames 43435.

THE J. PAUL GETTY WILDLIFE CONSERVATION PRIZE

Mr J. Paul Getty has donated \$50,000 to the World Wildlife Fund to establish the J. Paul Getty Wildlife Conservation Prize. This will be awarded to a person(s) or institution who has made an outstanding achievement or rendered outstanding service for the benefit of mankind in the conservation of wildlife in the period ending 31 December 1973.

Nominations for this prize should be made in writing to The Director-General, The International Union for Conservation of Nature and Natural Resources, 1110 Morges, Switzerland, not later than 30 May 1974, and must be accompanied by a full and complete description of the candidate's achievements.

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SMALLHOLDING, West Cardiganshire, 23 acres. Farm buildings only. Planning permission for dwelling applied for. Offers around £13,000. G. W. Young, Crynfryn, Penwch, Tregaron, Cards. Tel: Llangeitho 286.

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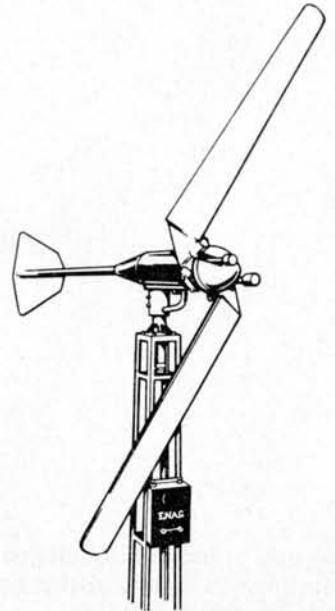
STOCK COCKERELS. R.I.R. L.S. Dorsets. Shipton Poultry Farm, Bridport, Dorset. Tel. Burton Bradstock 327.

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4 teak office wardrobes £100. Genuine Canadian canoe £125. 10 ft. car-top mahogany family sailing/rowing dinghy £95. 6 ft. mahogany tender £50; all handmade. Also 300 ft. of 6 ft. high shiplap cedar fencing panels with posts £200. Builder's heavy duty trailer £25. Ring Walton-on-Thames 43435.

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Ecologist's Conference on "Ecology and Economics"

Conventional economics (Capitalist and Marxist alike) with its ethos of expansion and economic growth, is supposed to provide complete answers to any central economic and human problems. But when it does not, or has not provided any answers at all, what is to be done?

Today the world is faced with the side effects of the tools of conventional economics — mass unemployment, pollution, destruction and exhaustion of natural resources, energy shortage, psychological and social breakdown of industrial society. What is the way out of this predicament? A continuation of the present acquisitive growth economy which recklessly exploits nature for commercial gain, or the development of a less acquisitive growth economy, which takes a holistic view of nature by keeping *PEOPLE* instead of *PRODUCTS* at the centre of attention?

In other words, the creation of economics of permanence, stability and survival, which makes ecological sense and does little damage to the ecosystem and society. This is the theme of a two-day conference organised by the "ECOLOGIST" to be held at Conway Hall, 25 Red Lion Square, Holborn, London W.C.1 on Thursday and Friday 30th and 31st of May, 1974.

REGISTRATION FEE: £5.00 including tea, coffee and refreshments on both days. (Students, £2.50).

CHAIRMAN: The Rt. Hon. Bruce Douglas-Mann. Labour M.P. (Kensington North).

Among those who have agreed to speak at the Conference are:-

Robert Waller, Author of "*Be Human or Die*" — A study in Ecological Humanism and Associate Editor "*Ecologist*".

John Adams, Lecturer, Department of Geography, University College, London.

Andrew MacKillop, Managing Director, Low Impact Technology Ltd. and Associate Editor "*Ecologist*".

Peter Hain, Former Chairman of the Young Liberals; and co-author of the Young Liberals' Pamphlet, "*Scarborough Perspective*".

Edward Goldsmith, Publisher and Joint Editor "*Ecologist*".

Dr. Bernard Dixon; Editor, "*New Scientist*".

Paul Derrick, Researcher in the Research Department of the International Co-operative Alliance; Secretary of the International Co-operative Alliance Consumer Working Party and Secretary of the Robert Owen Bicentenary Association.

Richard Grinham, Associate Editor, "*Land and Liberty*".

And many others.



REGISTRATION FORM

Closing Date of Registration: Friday, 24th May 1974

TO: The "ECOLOGIST", 73 Molesworth Street, Wadebridge, Cornwall, PL27 7DS (Tel. 020 881 2996/7).

I wish to reserve place(s) at £ for the Conference "Ecology and Economics".

I enclose £

Name Dr/Mr/Mrs/Miss/Rev

Address:

If student, state University, Polytechnic, College, School.....

Cheques, Postal Orders etc. should be made payable to the "ECOLOGIST" and crossed. Registration will be acknowledged by post.